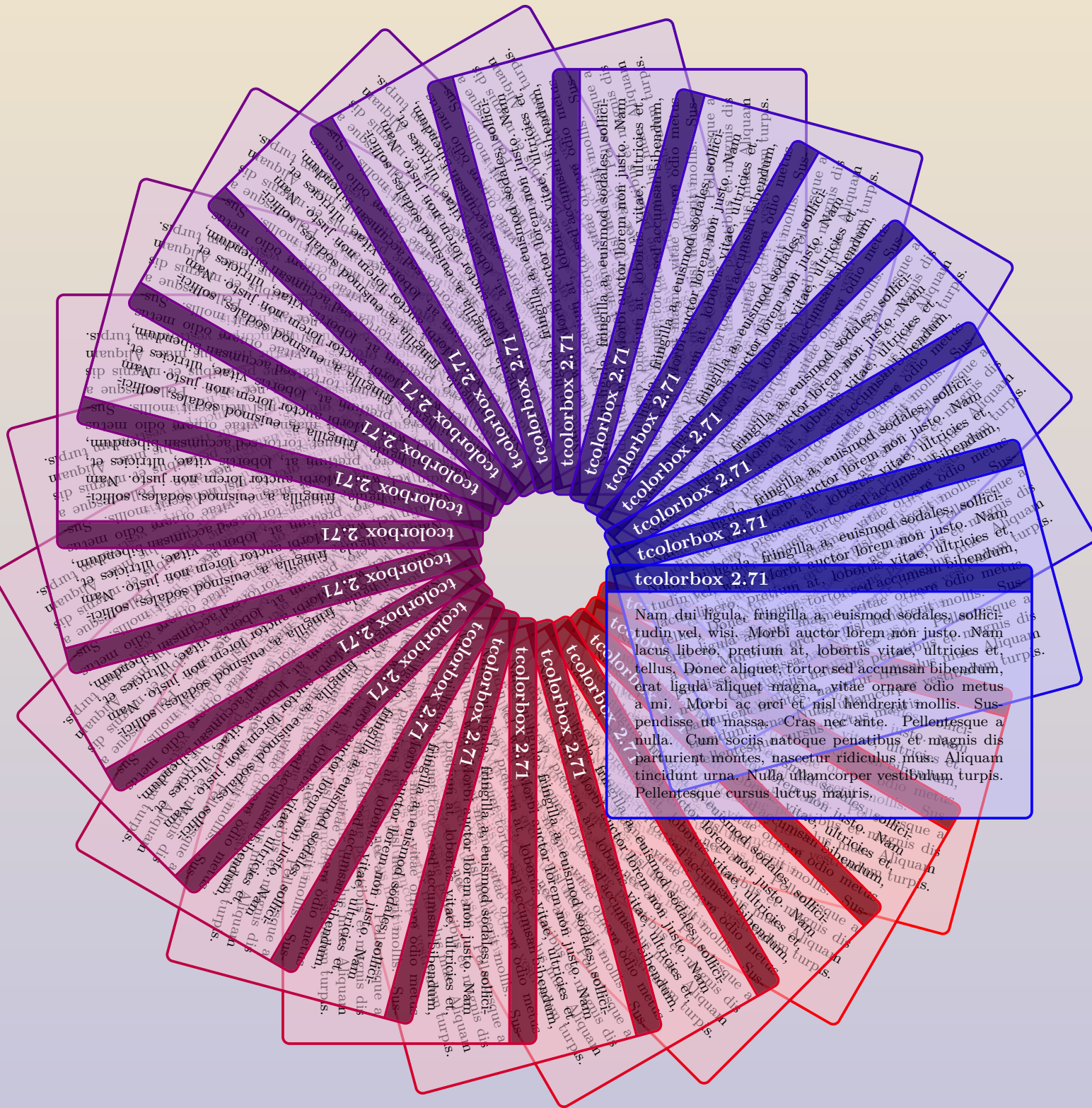


tcolorbox



Cover code

```
% \usepackage{incgraph}
\begin{inctext}
\begin{tikzpicture}
\definecolorseries{boxcol}{rgb}{last}{red}{blue}
\resetcolorseries[24]{boxcol}
\coordinate (A) at (0,0); \coordinate (B) at (21,29.7);
\path[use as bounding box,top color=Goldenrod!25!white,bottom color=Navy!25!white]
  (A) rectangle coordinate (C) (B);
\foreach \w in {-15,-30,...,-360}
{
\node[below right,rotate around={\w:(C)}] at ([xshift=1cm]C) {%
  \begin{tcolorbox}[width=8cm,title=tcolorbox \version,
    fontupper=\scriptsize,fonttitle=\small\bfseries,
    colback=boxcol!25!white,colbacktitle=boxcol!!+!50!black,colframe=boxcol,
    enhanced jigsaw,opacityback=0.5,opacitybacktitle=0.75]
    \lipsum[2]
  \end{tcolorbox}};
}
\node[font=\Huge\bfseries] at ([yshift=12cm]C) {|tcolorbox|};
\node[font=\large\bfseries] at ([yshift=-12cm]C)
  {Manual for version \version\ (\datum)};
\end{tikzpicture}
\end{inctext}
```

The tcolorbox package

Manual for version 2.71 (2014/02/21)

Thomas F. Sturm¹

Abstract

`tcolorbox` provides an environment for colored and framed text boxes with a heading line. Optionally, such a box can be split in an upper and a lower part. The package `tcolorbox` can be used for the setting of L^AT_EX examples where one part of the box displays the source code and the other part shows the output. Another common use case is the setting of theorems. The package supports saving and reuse of source code and text parts.

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¹Prof. Dr. Dr. Thomas F. Sturm, Institut für Mathematik und Informatik, Universität der Bundeswehr München, D-85577 Neubiberg, Germany; email: thomas.sturm@unibw.de

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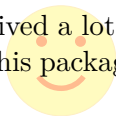
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1 Introduction

The package originates from the first edition of my book «*L^AT_EX – Einführung in das Textsatzsystem*» [16] in about 2006. For the L^AT_EX examples and tutorials given there, I wanted to have accentuated and colored boxes to display source code and compiled text in combination. Since, in my opinion, this type of boxes is also quite useful to highlight definitions and theorems, I applied them for my lecture notes in mathematics [13–15] as well. With this package, you are invited to apply these boxes for similar projects.

Starting with version 2.00, for all internal calculations ϵ -T_EX [1] expressions are used in replacement of the package `calc` [18]. The breaking news for version 2.00 is the support for breakable boxes. This new feature allows new applications of the package without affecting the core package too much if you do not need boxes to break automatically. With version 2.20, the often requested 'side by side' mode for listings has been added.

Since the first public release in 2011, I received a lot of feedback from all over the world. I want to thank all who wrote me for supporting this package by sending bug reports and ideas for new or better features.



1.1 Installation

Typically, `tcolorbox` will be installed as part of a major L^AT_EX distribution and there is nothing special to do for a user.

If you intend to make a local installation *by hand*, see the `README` file of the `tcolorbox` package for some hints. The short story is: you have to install not only `tcolorbox.sty`, but also all `*.code.tex` files in the local `texmf` tree.

1.2 Loading the Package

The base package `tcolorbox` loads the packages `pgf` [17], `verbatim` [12], `etoolbox` [6], and `environ` [10]. `tcolorbox` itself is loaded in the usual manner in the preamble:

```
\usepackage{tcolorbox}
```

The package takes option keys in the key-value syntax. Alternatively, you may use these keys later in the preamble with `\tcboxuselibrary`^{P.7} (see there). For example, the key to typeset listings is:

```
\usepackage[listings]{tcolorbox}
```

1.3 Libraries

The base package `tcolorbox` is extendable by program libraries. This is done by using option keys while loading the package or inside the preamble by applying the following macro with the same set of keys.

```
\tcbuselibrary{<key list>}
```

Loads the libraries given by the `<key list>`.

```
\tcbuselibrary{listings,theorems}
```

The following keys are used inside `\tcbuselibrary` respectively `\usepackage` without the key tree path `/tcb/library/`.

`/tcb/library/skins`

(LIB skins)

Loads the package `tikz` [17] and provides additional styles (skins) for the appearance of the colored boxes; see Section 6 from page 79.

`/tcb/library/listings`

(LIB listings)

Loads the package `listings` [5] and provides additional macros for typesetting listings which are described in Section 7 from page 155.

`/tcb/library/listingsutf8`

(LIB listingsutf8)

Loads the packages `listings` [5] and `listingsutf8` [8] for UTF-8 support. This is a variant of the library LIB listings and is described in Section 7 from page 155.

`/tcb/library/minted`

(LIB minted)

Loads the package `minted` [11] to typeset listings with the `Pygments` [9] tool, also see Section 7 on page 155.

`/tcb/library/theorems`

(LIB theorems)

Provides additional macros for typesetting theorems which are described in Section 8 from page 185.

`/tcb/library/breakable`

(LIB breakable)

Provides support for automatic box breaking from one page to another; see Section 9 from page 206.

`/tcb/library/fitting`

(LIB fitting)

Provides support for font size adaption of the box content to the box dimensions; see Section 10 from page 220.

`/tcb/library/hooks`

(LIB hooks)

Extends several option keys to 'hookable' keys; see Section 11 from page 230.

`/tcb/library/documentation`

(LIB documentation)

Provides additional macros for typesetting \LaTeX documentations which are described in Section 12 from page 238.

/tcb/library/many (style, no value)

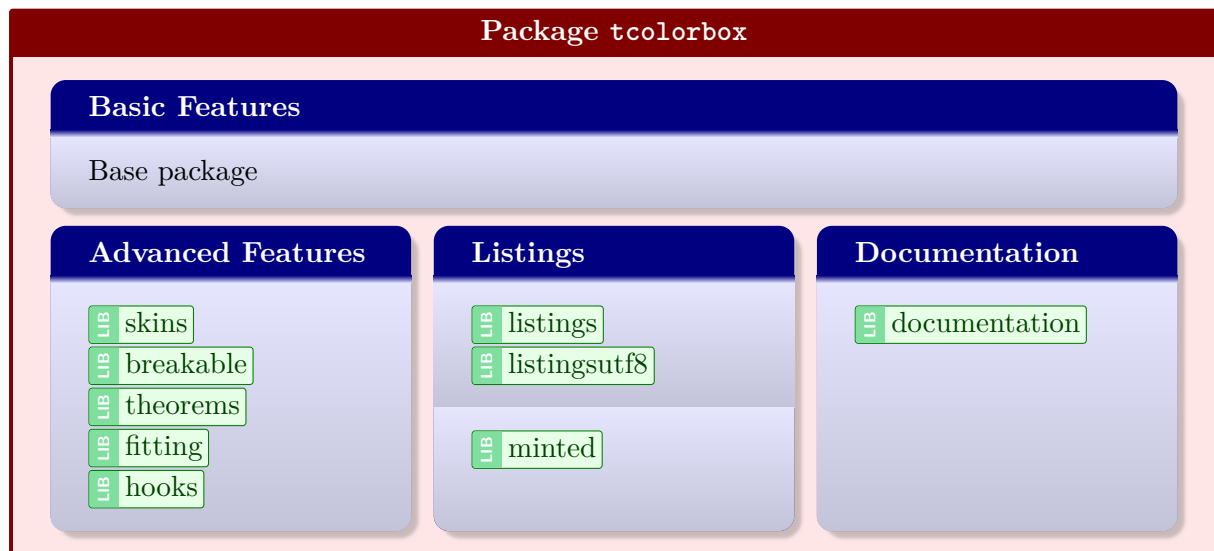
Loads the libraries `\LIB skins`, `\LIB breakable`, `\LIB hooks`, `\LIB theorems`, and `\LIB fitting`. Use this shortcut, if you want to use all features of `tcolorbox` with exception of typesetting listings and using the specialized `\LIB documentation` library.

/tcb/library/most (style, no value)

Loads all libraries except `\LIB minted` and `\LIB documentation`. Use this shortcut, if you want to use all features of `tcolorbox` with exception of using the `minted` package and using the specialized `\LIB documentation` library.

/tcb/library/all (style, no value)

Loads all libraries. Use this shortcut only, if you intend to use the `\LIB documentation` library.



2 Macros for Box Creation

```
\begin{tcolorbox}[\langle options \rangle]  
  \langle environment content \rangle  
\end{tcolorbox}
```

This is the main environment to create an accentuated colored text box with rounded corners and, optionally, two parts. The appearance of this box is controlled by numerous options. In the most simple case the source code

```
\begin{tcolorbox}  
  This is a \textbf{tcolorbox}.  
\end{tcolorbox}
```

creates the following compiled text box:

This is a **tcolorbox**.

The text content of the box can be divided in an upper and a lower part by the command `\tcblower`. Visually, both parts are separated by a line. For example:

```
\begin{tcolorbox}  
  This is another \textbf{tcolorbox}.  
  \tcblower  
  Here, you see the lower part of the box.  
\end{tcolorbox}
```

This code gives the following box:

This is another **tcolorbox**.

Here, you see the lower part of the box.

The `\langle options \rangle` control the appearance and several functions of the boxes, see Section 3 on page 14 for the complete list. A quick example is given here:

```
\begin{tcolorbox}[colback=red!5!white,colframe=red!75!black,title=My nice heading]  
  This is another \textbf{tcolorbox}.  
  \tcblower  
  Here, you see the lower part of the box.  
\end{tcolorbox}
```

My nice heading

This is another **tcolorbox**.

Here, you see the lower part of the box.

`\tcblower`

Used inside `tcolorbox` to separate the upper box part from the optional lower box part. The upper and the lower part are treated as separate functional units. If you only want to draw a line, see `\tcblines` ^{→ P. 122}.

`\tcbset{⟨options⟩}`

Sets options for every following `tcolorbox`^{→P.9} inside the current \TeX group. By default, this does not apply to nested boxes, see Section 3.13 on page 64.

For example, the colors of the boxes may be defined for the whole document by this:

```
\tcbset{colback=red!5!white,colframe=red!75!black}
```

`\tcbsetforeverylayer{⟨options⟩}`

Sets options for every following `tcolorbox`^{→P.9} inside the current \TeX group. In contrast to `\tcbset`, this does also apply to nested boxes, see Section 3.13 on page 64. Technically, the `⟨options⟩` are appended to the default values for every `tcolorbox` which are applied by `/tcb/reset`^{→P.72}.

You should not use this macro, if you are not completely sure that you want to have the `⟨options⟩` also for boxes in boxes (in boxes in boxes ...).

```
\tcbset{colback=green!10!white}
\tcbsetforeverylayer{colframe=red!75!black}

\begin{tcolorbox}[title=All options for this box]
  This is a tcolorbox.\par\medskip
  \begin{tcolorbox}[title=Nested box]
    Note that this nested box has a red frame but no green background.
  \end{tcolorbox}
\end{tcolorbox}
\bigskip

\begin{tcolorbox}[reset]
  Options given with |\tcbsetforeverylayer| survive a |reset|.
\end{tcolorbox}
```

All options for this box

This is a tcolorbox.

Nested box

Note that this nested box has a red frame but no green background.

Options given with `\tcbsetforeverylayer` survive a `reset`.

`\tcbox[<options>]{<box content>}`

Creates a colored box which is fitted to the width of the given *<box content>*. In principal, most *<options>* for a `tcolorbox` ^{P.9} can be used for `\tcbox` with some restrictions. A `\tcbox` cannot have a lower part and cannot be broken.

```
\tcbset{colframe=blue!50!black,colback=white,colupper=red!50!black,
fonttitle=\bfseries,nobeforeafter,center title}

Text \tcbox[tcbbox raise base]{Hello World}\hfill
%
\tcbbox[left=0mm,right=0mm,top=0mm,bottom=0mm,boxsep=0mm,
toptitle=0.5mm,bottomtitle=0.5mm,title=My table]{%
\arrayrulecolor{blue!50!black}\renewcommand{\arraystretch}{1.2}%
\begin{tabular}{r|c|l}
One & Two & Three \\\hline\hline
Men & Mice & Lions \\\hline
Upper & Middle & Lower
\end{tabular}}\hfill
%
\tcbbox[colback=blue!85!black,
left=0mm,right=0mm,top=0mm,bottom=0mm,boxsep=1mm,arc=0mm,boxrule=0.5pt,
title=My picture]{%
\includegraphics[width=5cm]{Basilica_5.png}}
```

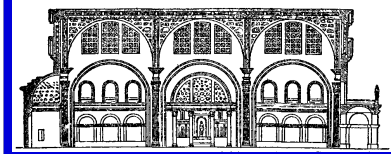
Text

Hello World

My table

One	Two	Three
Men	Mice	Lions
Upper	Middle	Lower

My picture



```
% \usepackage{tikz}
\tcbset{colframe=blue!50!black,colback=white,colupper=red!50!black,
fonttitle=\bfseries,center title}

% Fixed width box
\begin{tcolorbox}Hello\World!\end{tcolorbox}

% Fitted width box (like hbox or makebox)
\tcbbox{Hello\World!}

% Fitted width box (using a TikZ node)
\tcbbox[tikznode]{Hello\World!}
```

Hello
World!

HelloWorld!

Hello
World!

`\newtcolorbox``[<init options>]{<name>}[<number>][<default>]{<options>}`

Creates a new environment *<name>* based on `tcolorbox` ^{→ P.9}. Basically, `\newtcolorbox` operates like `\newenvironment`. This means, the new environment *<name>* optionally takes *<number>* arguments, where *<default>* is the default value for the optional first argument. The *<options>* are given to the underlying `tcolorbox`. Note that `/tcb/savedelimiter` ^{→ P.18} is set to the given *<name>* automatically. The *<init options>* allow setting up automatic numbering, see Section 4 from page 73.

```
\newtcolorbox{mybox}{colback=red!5!white,
colframe=red!75!black}

\begin{mybox}
This is my own box.
\end{mybox}
```

This is my own box.

```
\newtcolorbox{mybox}[1]{colback=red!5!white,
colframe=red!75!black,fonttitle=\bfseries,
title=#1}

\begin{mybox}{Hello there}
This is my own box with a mandatory title.
\end{mybox}
```

Hello there

This is my own box with a mandatory title.

```
\newtcolorbox{mybox}[2][{}]{colback=red!5!white,
colframe=red!75!black,fonttitle=\bfseries,
title=#2,#1}

\begin{mybox}[colback=yellow]{Hello there}
This is my own box with a mandatory title
and options.
\end{mybox}
```

Hello there

This is my own box with a mandatory title and options.

Definition in the preamble:

```
\newtcolorbox[auto counter,number within=section]{pabox}[2][{}]{%
colback=red!5!white,colframe=red!75!black,fonttitle=\bfseries,
title=Examp.~\thetcbcounter: #2,#1}
```

```
\begin{pabox}[colback=yellow]{Hello there}
This is my own box with a mandatory
numbered title and options.
\end{pabox}
```

Examp. 2.1: Hello there

This is my own box with a mandatory numbered title and options.

`\renewtcolorbox``[<init options>]{<name>}[<number>][<default>]{<options>}`

Operates like `\newtcolorbox`, but based on `\renewenvironment` instead of `\newenvironment`. An existing environment is redefined.

\newtcbox[*<init options>*]{\<name>}[*<number>*][*<default>*]{*<options>*}

Creates a new macro \<name> based on \tcbox^{P.11}. Basically, \newtcbox operates like \newcommand. The new macro \<name> optionally takes <number>+1 arguments, where <default> is the default value for the optional first argument. The <options> are given to the underlying tcbox. The <init options> allow setting up automatic numbering, see Section 4 from page 73.

```
\newtcbox{\mybox}{colback=red!5!white,
colframe=red!75!black}
```

```
\mybox{This is my own box.}
```

This is my own box.

```
\newtcbox{\mybox}[1]{colback=red!5!white,
colframe=red!75!black,fonttitle=\bfseries,
title=#1}
```

```
\mybox{Hello there}{This is my own box.}
```

Hello there

This is my own box.

```
\newtcbox{\mybox}[2][ ]{colback=red!5!white,
colframe=red!75!black,fonttitle=\bfseries,
title=#2,#1}
```

```
\mybox[colback=yellow]{Hello there}%
{This is my own box.}
```

Hello there

This is my own box.

Definition in the preamble:

% counter from previous example

```
\newtcbox[use counter from=pabox]{\pbbbox}[2][ ]{%
colback=red!5!white,colframe=red!75!black,fonttitle=\bfseries,
title=(\thetcbcounter) #2,#1}
```

```
\pbbbox[colback=yellow]{Hello there}%
{This is my own box.}
```

(2.2) Hello there

This is my own box.

```
\newtcbox{\mybox}[1][red]{nobeforeafter,tcbbox raise base,
arc=0pt,outer arc=0pt,colback=#1!10!white,colframe=#1!50!black,
boxsep=0pt,left=1pt,right=1pt,top=2pt,bottom=2pt,
boxrule=0pt,bottomrule=1pt,toprule=1pt}
\newtcbox{\xmybox}[1][red]{nobeforeafter,tcbbox raise base,
arc=7pt,colback=#1!10!white,colframe=#1!50!black,
before upper={\rule[-3pt]{0pt}{10pt}},boxrule=1pt,
boxsep=0pt,left=6pt,right=6pt,top=2pt,bottom=2pt}
```

The \mybox[green]{quick} brown \mybox{fox} \mybox[blue]{jumps} over the
\mybox[green]{lazy} \mybox{dog}. \par
The \xmybox[green]{quick} brown \xmybox{fox} \xmybox[blue]{jumps} over the
\xmybox[green]{lazy} \xmybox{dog}.

The quick brown fox jumps over the lazy dog.

The quick brown fox jumps over the lazy dog.

\renewtcbox[*<init options>*]{\<name>}[*<number>*][*<default>*]{*<options>*}

Operates like \newtcbox, but based on \renewcommand instead of \newcommand. An existing macro is redefined.

3 Option Keys

For the $\langle options \rangle$ in `tcolorbox`^{→P.9} respectively `\tcbset`^{→P.10} the following pgf keys can be applied. The key tree path `/tcb/` is not to be used inside these macros. It is easy to add your own style keys using the syntax for pgf keys, see [16, 17] or the examples starting from page 172.

3.1 Title

`/tcb/title= $\langle text \rangle$` (no default, initially empty)
Creates a heading line with $\langle text \rangle$ as content.

```
\begin{tcolorbox}[title=My heading line]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
```

My heading line

This is a **tcolorbox**.

`/tcb/notitle` (no value, initially set)
Removes the title line if set before.

`/tcb/adjusted title= $\langle text \rangle$` (style, no default, initially unset)
Creates a heading line with $\langle text \rangle$ as content. The minimal height of this line is adjusted to fit the text given by `/tcb/adjust text`. This option makes sense for single line headings if boxes are set side by side with equal height. Note that it is very easy to trick this adjustment.

```
\tcbset{colback=White,arc=0mm,width=(\linewidth-4pt)/4,
equal height group=AT,before=,after=\hfill,fonttitle=\bfseries}
```

```
The following titles are not adjusted:\\
\foreach \n in {xxx,ggg,AAA,\"Ägypten}
{\begin{tcolorbox}[title=\n,colframe=red!75!black]
Some content.\end{tcolorbox}}
Now, we try again with adjusted titles:\\
\foreach \n in {xxx,ggg,AAA,\"Ägypten}
{\begin{tcolorbox}[adjusted title=\n,colframe=blue!75!black]
Some content.\end{tcolorbox}}
```

The following titles are not adjusted:

xxx	ggg	AAA	Ägypten
Some content.	Some content.	Some content.	Some content.

Now, we try again with adjusted titles:

xxx	ggg	AAA	Ägypten
Some content.	Some content.	Some content.	Some content.

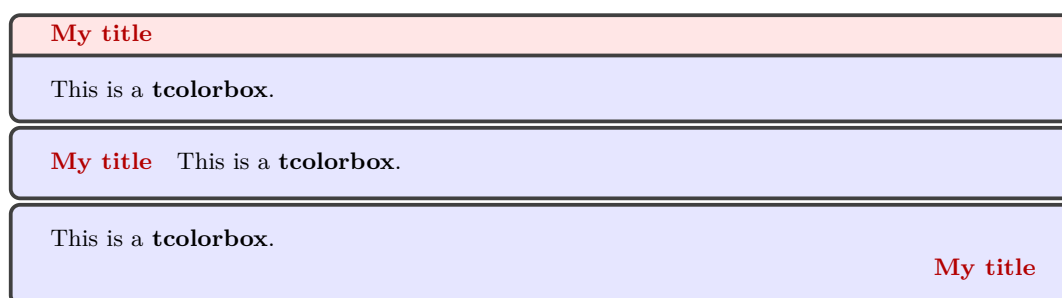
`/tcb/adjust text= $\langle text \rangle$` (no default, initially `\pgjy`)
This sets the reference text for `/tcb/adjusted title`. If your texts never exceed '`\pgjy`' in depth and height you don't need to care about this option.

`/tcb/detach title` (no value)

Detaches the title from its normal position. The text of the title is stored into `\tcbtitletext` and the formatted title is available by `\tcbtitle`. The main application is to move the title from its usual place to another one.

```
\newtcolorbox{mybox}[2][\colbacktitle=red!10!white,
colback=blue!10!white,coltitle=red!70!black,
title={#2},fonttitle=\bfseries,#1]

\begin{mybox}{My title}
  This is a \textbf{tcolorbox}.
\end{mybox}
\begin{mybox}[detach title,before upper={\tcbtitle\quad}]{My title}
  This is a \textbf{tcolorbox}.
\end{mybox}
\begin{mybox}[detach title,after upper={\par\hfill\tcbtitle}]{My title}
  This is a \textbf{tcolorbox}.
\end{mybox}
```



`/tcb/attach title` (no value)

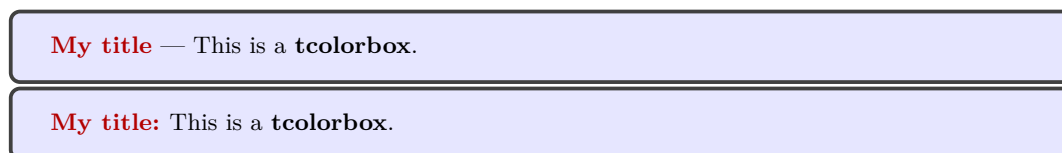
Attaches the title to its normal position. This option is used to reverse `/tcb/detach title`.

`/tcb/attach title to upper=<text>` (style, default empty, initially unset)

Attaches the title to the begin of the upper part of the box content. The optional `<text>` is set between the formatted title and the box content.

```
\newtcolorbox{mybox}[2][\colbacktitle=red!10!white,
colback=blue!10!white,coltitle=red!70!black,
title={#2},fonttitle=\bfseries,#1]

\begin{mybox}[attach title to upper={\ ---\ }]{My title}
  This is a \textbf{tcolorbox}.
\end{mybox}
\begin{mybox}[attach title to upper,after title={:\ }]{My title}
  This is a \textbf{tcolorbox}.
\end{mybox}
```



More title options are documented in Section 3.7 on page 40.

3.2 Lower Part

`/tcb/lowerbox=<mode>` (no default, initially visible)

Controls the treatment of the lower part of the box. Feasible values for $\langle mode \rangle$ are:

- **visible**: usual type setting of the lower part,
- **invisible**: empty space instead of the lower part contents,
- **ignored**: the lower part is not used (here).

The last two values are usually applied in connection with `savelowerto`.

```
\begin{tcolorbox}[lowerbox=invisible,colback=white]
This is a \textbf{tcolorbox}.
\tcblower
This is the lower part (but invisible).
\end{tcolorbox}

\begin{tcolorbox}[lowerbox=ignored,colback=white]
This is a \textbf{tcolorbox}.
\tcblower
This is the lower part (but ignored).
\end{tcolorbox}
```

This is a **tcolorbox**.

This is a **tcolorbox**.

`/tcb/savelowerto=<file name>` (no default, initially empty)

Saves the content of the lower part in a file for an optional later usage.

```
\begin{tcolorbox}[lowerbox=invisible,savelowerto=\jobname_bsp save.tex,colback=white]
This is a \textbf{tcolorbox}.
\tcblower
This is the lower part which may be quite complex:

$$f(x)=\frac{1+x^2}{1-x^2}$$

\end{tcolorbox}

Now, we load the saved text:\\
\input{\jobname_bsp save.tex}
```

This is a **tcolorbox**.

Now, we load the saved text:

This is the lower part which may be quite complex: $f(x) = \frac{1+x^2}{1-x^2}$.

`/tcb/lower separated=true|false` (default `true`, initially `true`)

If set to `true`, the lower part is visually separated from the upper part. It depends on the chosen skin how the visualization of the separation is done.

```
% \tcbuselibrary{skins}
\tcbset{colback=red!5!white,colframe=red!75!black,fonttitle=\bfseries,nobeforeafter,
width=(\linewidth-4mm)/2,fontlower=\itshape}

\begin{tcolorbox}[title=Lower separated]
This is the upper part.
\tcblower
This is the lower part.
\end{tcolorbox}\hfill
\begin{tcolorbox}[title=Lower not separated,lower separated=false]
This is the upper part.
\tcblower
This is the lower part.
\end{tcolorbox}
\par\bigskip\par
\begin{tcolorbox}[sidebyside,title=Lower separated]
This is the upper part.
\tcblower
This is the lower part.
\end{tcolorbox}\hfill
\begin{tcolorbox}[sidebyside,title=Lower not separated,lower separated=false]
This is the upper part.
\tcblower
This is the lower part.
\end{tcolorbox}
\par\bigskip\par
\begin{tcolorbox}[beamer,title=Lower separated]
This is the upper part.
\tcblower
This is the lower part.
\end{tcolorbox}\hfill
\begin{tcolorbox}[beamer,title=Lower not separated,lower separated=false]
This is the upper part.
\tcblower
This is the lower part.
\end{tcolorbox}
```

Lower separated

This is the upper part.

This is the lower part.

Lower not separated

This is the upper part.

This is the lower part.

Lower separated

This is the upper
part.

*This is the lower
part.*

Lower not separated

This is the upper
part.

*This is the lower
part.*

Lower separated

This is the upper part.

This is the lower part.

Lower not separated

This is the upper part.

This is the lower part.

`/tcb/savedelimiter=<name>` (no default, initially `tcolorbox`)

Used in connection with new environment definitions which extend `tcolorbox` and use or allow the option `savelowerto`. To catch the end of the new box environment `<name>` has to be the name of this environment. Additionally, the environment definition has to use `\tcolorbox` instead of `\begin{tcolorbox}` and `\end{tcolorbox}` instead of `\end{tcolorbox}`.

```
\newenvironment{mybox}[1]{%
  \tcolorbox[savedelimiter=mybox,
    savelowerto=\jobname_bspsave2.tex,lowerbox=ignored,
    colback=red!5!white,colframe=red!75!black,fonttitle=\bfseries,
    title=#1]{}%
  {\end{tcolorbox}}

\begin{mybox}{My Example}
Upper part.
\tcblower
Saved lower part!
\end{mybox}

Now, the saved part is used:
\begin{tcolorbox}[colback=green!5]
\input{\jobname_bspsave2.tex}
\end{tcolorbox}
```

My Example

Upper part.

Now, the saved part is used:

Saved lower part!

The `savedelimiter` is used implicitly with `\newtcolorbox`^{P.12} which allows a more convenient usage:

```
\newtcolorbox{mybox}[1]{%
  savelowerto=\jobname_bspsave2.tex,lowerbox=ignored,
  colback=red!5!white,colframe=red!75!black,fonttitle=\bfseries,
  title=#1}%

\begin{mybox}{My Example}
Upper part.
\tcblower
Saved lower part!
\end{mybox}

Now, the saved part is used:
\begin{tcolorbox}[colback=green!5]
\input{\jobname_bspsave2.tex}
\end{tcolorbox}
```

My Example

Upper part.

Now, the saved part is used:

Saved lower part!

3.3 Colors and Fonts

/tcb/colframe= $\langle color \rangle$ (no default, initially black!75!white)

Sets the frame $\langle color \rangle$ of the box.

```
\begin{tcolorbox}[colframe=red!50!white]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
```

This is a **tcolorbox**.

/tcb/colback= $\langle color \rangle$ (no default, initially black!5!white)

Sets the background $\langle color \rangle$ of the box.

```
\begin{tcolorbox}[colback=red!50!white]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
```

This is a **tcolorbox**.

/tcb/title filled=true|false (default true, initially false)

Switches the drawing of the title background according to the given value. This option is set to true automatically by `/tcb/colbacktitle`, `/tcb/opacitybacktitle`^{→P.32}, and `/tcb/title style`^{→P.85}, and `/tcb/title code`^{→P.88}.

```
\begin{tcolorbox}[title=My title,title filled]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
\begin{tcolorbox}[title=My title,
title filled=false]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
```

My title

This is a **tcolorbox**.

My title

This is a **tcolorbox**.

/tcb/colbacktitle= $\langle color \rangle$ (no default, initially black!50!white)

Sets the background $\langle color \rangle$ of the title area of the box.

```
\begin{tcolorbox}[colbacktitle=red!50!white,
title=My title,coltitle=black,
fonttitle=\bfseries]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
```

My title

This is a **tcolorbox**.

/tcb/colupper= $\langle color \rangle$ (no default, initially black)

Sets the text $\langle color \rangle$ of the upper part.

```
\begin{tcolorbox}[colupper=red!75!black]
This is a \textbf{tcolorbox}.
\tcblower
This is the lower part.
\end{tcolorbox}
```

This is a **tcolorbox**.

This is the lower part.

/tcb/collower= $\langle color \rangle$ (no default, initially black)

Sets the text $\langle color \rangle$ of the lower part.

```
\begin{tcolorbox}[collower=red!75!black]
This is a \textbf{tcolorbox}.
\tcblower
This is the lower part.
\end{tcolorbox}
```

This is a **tcolorbox**.

This is the lower part.

/tcb/coltext= $\langle color \rangle$ (style, no default, initially black)

Sets the text $\langle color \rangle$ of the box. This is an abbreviation for setting **colupper** and **collower** to the same value.

```
\begin{tcolorbox}[coltext=red!75!black]
This is a \textbf{tcolorbox}.
\tcblower
This is the lower part.
\end{tcolorbox}
```

This is a **tcolorbox**.

This is the lower part.

/tcb/coltitle= $\langle color \rangle$ (no default, initially white)

Sets the title text $\langle color \rangle$ of the box.

```
\begin{tcolorbox}[coltitle=red!75!black,
colbacktitle=black!10!white,title=Test]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
```

Test

This is a **tcolorbox**.

`/tcb/fontupper=<text>` (no default, initially empty)

Sets `<text>` before the content of the upper part (e.g. font settings).

```
\begin{tcolorbox}[fontupper=Hello!\sffamily]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
```

Hello! This is a **tcolorbox**.

`/tcb/fontlower=<text>` (no default, initially empty)

Sets `<text>` before the content of the lower part (e.g. font settings).

```
\begin{tcolorbox}[fontlower=\sffamily\bfseries]
This is a \textbf{tcolorbox}.
\tcblower
This is the lower part.
\end{tcolorbox}
```

This is a **tcolorbox**.

This is the lower part.

`/tcb/fonttitle=<text>` (no default, initially empty)

Sets `<text>` before the content of the title text (e.g. font settings).

```
\begin{tcolorbox}[fonttitle=\sffamily\bfseries\large,title=Hello]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
```

Hello

This is a **tcolorbox**.

More color options are provided by using skins documented in Section 6 from page 79.

3.4 Geometry

/tcb/width= $\langle length \rangle$ (no default, initially `\linewidth`)

Sets the total width of the colored box to $\langle length \rangle$. See also `/tcb/height`^{P. 34}.

```
\tcbset{colback=red!5!white,colframe=red!75!black}

\begin{tcolorbox}[width=\linewidth/2]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
```

This is a **tcolorbox**.

/tcb/toprule= $\langle length \rangle$ (no default, initially 0.5mm)

Sets the line width of the top rule to $\langle length \rangle$.

```
\tcbset{colback=red!5!white,colframe=red!75!black}

\begin{tcolorbox}[toprule=3mm]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
```

This is a **tcolorbox**.

/tcb/bottomrule= $\langle length \rangle$ (no default, initially 0.5mm)

Sets the line width of the bottom rule to $\langle length \rangle$.

```
\tcbset{colback=red!5!white,colframe=red!75!black}

\begin{tcolorbox}[bottomrule=3mm]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
```

This is a **tcolorbox**.

/tcb/leftrule= $\langle length \rangle$ (no default, initially 0.5mm)

Sets the line width of the left rule to $\langle length \rangle$.

```
\tcbset{colback=red!5!white,colframe=red!75!black}

\begin{tcolorbox}[leftrule=3mm]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
```

This is a **tcolorbox**.

`/tcb/rightrule=<length>` (no default, initially 0.5mm)

Sets the line width of the right rule to $\langle length \rangle$.

```
\tcbset{colback=red!5!white,colframe=red!75!black}

\begin{tcolorbox}[rightrule=3mm]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
```

This is a **tcolorbox**.

`/tcb/titlerule=<length>` (no default, initially 0.5mm)

Sets the line width of the rule below the title to $\langle length \rangle$.

```
\tcbset{enhanced,colback=red!5!white,colframe=red!75!black,
colbacktitle=red!90!black}

\begin{tcolorbox}[titlerule=3mm,title=This is the title]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
```

This is the title

This is a **tcolorbox**.

`/tcb/boxrule=<length>` (style, no default, initially 0.5mm)

Sets all rules of the frame to $\langle length \rangle$, i.e. `/tcb/toprule`^{→ P. 22}, `/tcb/bottomrule`^{→ P. 22}, `/tcb/leftrule`^{→ P. 22}, `/tcb/rightrule`, and `/tcb/titlerule`.

```
\tcbset{colback=red!5!white,colframe=red!75!black}

\begin{tcolorbox}[boxrule=3mm]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
```

This is a **tcolorbox**.

More options for drawing a `/tcb/borderline`^{→ P. 101} are provided by using skins documented in Section 6 from page 79.

/tcb/arc= $\langle length \rangle$ (no default, initially 1mm)

Sets the inner radius of the four frame arcs to $\langle length \rangle$.

```
\tcbset{colback=red!5!white,colframe=red!75!black}

\begin{tcolorbox}[arc=0mm]
This is a \textbf{tcolorbox}.
\end{tcolorbox}

\begin{tcolorbox}[arc=4mm]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
```

This is a **tcolorbox**.

This is a **tcolorbox**.

/tcb/outer arc= $\langle length \rangle$ (no default, initially unset)

Sets the outer radius of the four frame arcs to $\langle length \rangle$.

```
\tcbset{colback=red!5!white,colframe=red!75!black}

\begin{tcolorbox}[arc=4mm,outer arc=1mm]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
```

This is a **tcolorbox**.

/tcb/auto outer arc (no value, initially set)

Sets the outer radius of the four frame arcs automatically in dependency of the inner radius given by **/tcb/arc**.

/tcb/boxsep= $\langle length \rangle$ (no default, initially 1mm)

Sets a common padding of $\langle length \rangle$ between the text content and the frame of the box. This value is added to the key values of **left**, **right**, **top**, **bottom**, and **middle** at the appropriate places.

```
\tcbset{colback=red!5!white,colframe=red!75!black,width=(\linewidth-4mm)/2,
before=,after=\hfill}

\begin{tcolorbox}[boxsep=5mm]
This is a \textbf{tcolorbox}.
\end{tcolorbox}

\begin{tcolorbox}[boxsep=5mm,draft]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
```

This is a **tcolorbox**.

frame: w=195.33255pt, h=48.97505pt

upper: w=115.2724pt, h=6.2965pt

interior: w=192.4873pt, h=46.1298pt

`/tcb/left=<length>` (style, no default, initially 4mm)

Sets the left space between all text parts and frame (additional to `boxsep`). This is an abbreviation for setting `lefttitle`, `leftupper`, and `leftlower` to the same value.

```
\tcbset{colback=red!5!white,colframe=red!75!black}

\begin{tcolorbox}[left=0mm]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
```

This is a **tcolorbox**.

`/tcb/lefttitle=<length>` (no default, initially 4mm)

Sets the left space between title text and frame (additional to `boxsep`).

```
\tcbset{colback=red!5!white,colframe=red!75!black}

\begin{tcolorbox}[lefttitle=3cm,title=My Title]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
```

My Title

This is a **tcolorbox**.

`/tcb/leftupper=<length>` (no default, initially 4mm)

Sets the left space between upper text and frame (additional to `boxsep`).

```
\tcbset{colback=red!5!white,colframe=red!75!black}

\begin{tcolorbox}[leftupper=3cm,title=My Title]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
```

My Title

This is a **tcolorbox**.

`/tcb/leftlower=<length>` (no default, initially 4mm)

Sets the left space between lower text and frame (additional to `boxsep`).

```
\tcbset{colback=red!5!white,colframe=red!75!black}

\begin{tcolorbox}[leftlower=3cm]
This is a \textbf{tcolorbox}.
\tcblower
This is the lower part.
\end{tcolorbox}
```

This is a **tcolorbox**.

This is the lower part.

/tcb/right=*<length>* (style, no default, initially 4mm)

Sets the right space between all text parts and frame (additional to **boxsep**). This is an abbreviation for setting **righttitle**, **rightupper**, and **rightlower** to the same value.

```
\tcbset{colback=red!5!white,colframe=red!75!black}

\begin{tcolorbox}[width=5cm,right=2cm]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
```

This is a **tcolorbox**.

/tcb/righttitle=*<length>* (no default, initially 4mm)

Sets the right space between title text and frame (additional to **boxsep**).

```
\tcbset{colback=red!5!white,colframe=red!75!black}

\begin{tcolorbox}[width=5cm,righttitle=2cm,title=My very long title text]
This is a \textbf{tcolorbox} with standard upper box dimensions.
\end{tcolorbox}
```

My very long title text

This is a **tcolorbox** with standard upper box dimensions.

/tcb/rightupper=*<length>* (no default, initially 4mm)

Sets the right space between upper text and frame (additional to **boxsep**).

```
\tcbset{colback=red!5!white,colframe=red!75!black}

\begin{tcolorbox}[width=5cm,rightupper=2cm,title=My very long title text]
This is a \textbf{tcolorbox} with compressed upper box dimensions.
\end{tcolorbox}
```

My very long title text

This is a **tcolorbox** with compressed upper box dimensions.

/tcb/rightlower= $\langle length \rangle$ (no default, initially 4mm)

Sets the right space between lower text and frame (additional to **boxsep**).

```
\tcbset{colback=red!5!white,colframe=red!75!black}

\begin{tcolorbox}[width=5cm,rightlower=2cm]
This is a \textbf{tcolorbox} with standard upper box dimensions.
\tcblower
This is the lower part with large space at right.
\end{tcolorbox}
```

This is a **tcolorbox** with standard upper box dimensions.

This is the lower part with large space at right.

/tcb/top= $\langle length \rangle$ (no default, initially 2mm)

Sets the top space between text and frame (additional to **boxsep**).

```
\tcbset{colback=red!5!white,colframe=red!75!black}

\begin{tcolorbox}[top=0mm]
This is a \textbf{tcolorbox}.
\tcblower
This is the lower part.
\end{tcolorbox}
```

This is a **tcolorbox**.

This is the lower part.

/tcb/toptitle= $\langle length \rangle$ (no default, initially 0mm)

Sets the top space between title and frame (additional to **boxsep**).

```
\tcbset{colback=red!5!white,colframe=red!75!black}

\begin{tcolorbox}[toptitle=3mm,title=My title]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
```

My title

This is a **tcolorbox**.

/tcb/bottom= $\langle length \rangle$ (no default, initially 2mm)

Sets the bottom space between text and frame (additional to **boxsep**).

```
\tcbset{colback=red!5!white,colframe=red!75!black}

\begin{tcolorbox}[bottom=0mm]
This is a \textbf{tcolorbox}.
\tcblower
This is the lower part.
\end{tcolorbox}
```

This is a **tcolorbox**.

This is the lower part.

/tcb/bottomtitle= $\langle length \rangle$ (no default, initially 0mm)

Sets the bottom space between title and frame (additional to **boxsep**).

```
\tcbset{colback=red!5!white,colframe=red!75!black}

\begin{tcolorbox}[bottomtitle=3mm,title=My title]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
```

My title

This is a **tcolorbox**.

/tcb/middle= $\langle length \rangle$ (no default, initially 2mm)

Sets the space between upper and lower text to the separation line (additional to **boxsep**).

```
\tcbset{colback=red!5!white,colframe=red!75!black}

\begin{tcolorbox}[middle=0mm,boxsep=0mm]
This is a \textbf{tcolorbox}.
\tcblower
This is the lower part.
\end{tcolorbox}
```

This is a **tcolorbox**.

This is the lower part.

`/tcb/oversize=<length>` (style, default 0pt)

Sets the text width of the upper part to the current line width plus an optional `<length>`. This is achieved by changing the keys `/tcb/width`^{P.22} `/tcb/enlarge left by`^{P.59}, and `/tcb/enlarge right by`^{P.59} appropriately. The resulting box is overlapping into the left and right margin of the page. Note that this style option has to be given *after* all other geometry keys!

```
\tcbset{colback=red!5!white,colframe=red!75!black,fonttitle=\bfseries}

\textit{Normal text for comparison:}\
\lipsum[2]

\begin{tcolorbox}[oversize,title=Oversized box]
\lipsum[2]
\end{tcolorbox}

\begin{tcolorbox}[title=Normal box]
\lipsum[2]
\end{tcolorbox}
```

Normal text for comparison:

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

Oversized box

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

Normal box

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

`/tcb/toggle left and right=<toggle preset>` (default `evenpage`, initially `none`)

According to the `<toggle preset>`, the left and the right settings of the `tcolorbox` are switched or not. Feasible values are:

- `none`: no switching.
- `forced`: the values of the left and right rules and spaces are switched.
- `evenpage`: if the page is an even page, the values of the left and right rules and spaces are switched. It is recommended that one use this setting in conjunction with `/tcb/check odd page`^{→ P. 71}.

```
% \usepackage{changepage} for 'check odd page'
% \usepackage{lipsum}
% \usetikzlibrary{patterns}
% \tcbuselibrary{skins,breakable,hooks}
\begin{tcolorbox}[skin=enhancedmiddle,breakable,
  check odd page,toggle left and right,
  boxrule=0mm,top=0mm,bottom=0mm,left=1mm,right=1mm,
  rightrule=1cm,colupper=blue!25!black,
  watermark graphics=lichtspiel.jpg,watermark opacity=0.5,
  watermark overzoom=1.00,watermark opacity=0.25,
  frame style={pattern=crosshatch dots light steel blue},
  overlay app={%
    \ifoddpage\coordinate (X) at ([xshift=-5mm]frame.east);
    \else\coordinate (X) at ([xshift=5mm]frame.west);\fi
    \fill[shading=ball,ball color=blue!50!white,opacity=0.5] (X) circle (4mm);}]
\lipsum[1-6]
\end{tcolorbox}
```

This example switches a 1cm thick rule from the left to the right side depending on the page number. Thereby, the rule is always on the outer side of the double-sided paper. Additionally, a ball is drawn on the outer side with help of an overlay.

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris. Nulla malesuada porttitor diam. Donec felis erat, congue non, volutpat at, tincidunt tristique, libero. Vivamus viverra fermentum felis. Donec nonummy pellentesque ante. Phasellus adipiscing semper elit. Proin fermentum massa ac quam. Sed diam turpis, molestie vitae, placerat a, molestie nec, leo. Maecenas lacinia. Nam ipsum ligula, eleifend at, accumsan nec, suscipit a, ipsum. Morbi blandit ligula feugiat magna. Nunc eleifend consequat lorem. Sed lacinia nulla vitae enim.

Pellentesque tincidunt purus vel magna. Integer non enim. Praesent euismod nunc eu purus. Donec bibendum quam in tellus. Nullam cursus pulvinar lectus. Donec et mi. Nam vulputate metus eu enim. Vestibulum pellentesque felis eu massa. Quisque ullamcorper placerat ipsum. Cras nibh. Morbi vel justo vitae lacus tincidunt ultrices. Lorem ipsum dolor sit amet, consectetur adipiscing elit. In hac habitasse platea dictumst. Integer tempus convallis augue. Etiam facilisis. Nunc elementum fermentum wisi. Aenean placerat. Ut imperdiet, enim sed gravida sollicitudin, felis odio placerat quam, ac pulvinar elit purus eget enim. Nunc vitae tortor. Proin tempus nibh sit amet nisl. Vivamus quis tortor vitae risus porta vehicula.

Fusce mauris. Vestibulum luctus nibh at lectus. Sed bibendum, nulla a faucibus semper, leo velit ultricies tellus, ac venenatis arcu wisi vel nisl. Vestibulum diam. Aliquam pellentesque, augue quis sagittis posuere, turpis lacus congue quam, in hendrerit risus eros eget felis. Maecenas eget erat in sapien mattis porttitor. Vestibulum porttitor. Nulla facilisi. Sed a turpis eu lacus commodo facilisis. Morbi fringilla, wisi in dignissim interdum, justo lectus sagittis dui, et vehicula libero dui cursus dui. Mauris tempor ligula sed lacus. Duis cursus enim ut augue. Cras ac magna. Cras nulla. Nulla egestas. Curabitur a leo. Quisque egestas wisi eget nunc. Nam feugiat lacus vel est. Curabitur consectetur.

Suspendisse vel felis. Ut lorem lorem, interdum eu, tincidunt sit amet, laoreet vitae, arcu. Aenean faucibus pede eu ante. Praesent enim elit, rutrum at, molestie non, nonummy vel, nisl. Ut lectus eros, malesuada sit amet, fermentum eu, sodales cursus, magna. Donec eu purus. Quisque vehicula, urna sed ultricies auctor, pede lorem egestas dui, et convallis elit erat sed nulla. Donec luctus. Curabitur et nunc. Aliquam dolor odio, commodo pretium, ultricies non, pharetra in, velit. Integer arcu est, nonummy in, fermentum faucibus, egestas vel, odio.

3.5 Transparency

Transparency effects are likely to be used in conjunction with *jigsaw* skin variants, see Section 6.9 on page 114.

/tcb/opacityframe= $\langle fraction \rangle$ (no default, initially 1.0)

Sets the frame opacity of the box to the given $\langle fraction \rangle$.

```
\begin{tcolorbox}[opacityframe=0.25]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
```

This is a **tcolorbox**.

/tcb/opacityback= $\langle fraction \rangle$ (no default, initially 1.0)

Sets the background opacity of the box to the given $\langle fraction \rangle$.

```
\begin{tcolorbox}[standard jigsaw,
opacityframe=0.5, opacityback=0.5]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
```

This is a **tcolorbox**.

/tcb/opacitybacktitle= $\langle fraction \rangle$ (no default, initially 1.0)

Sets the title background opacity of the box to the given $\langle fraction \rangle$.

```
\begin{tcolorbox}[standard jigsaw,
opacityframe=0.5, opacitybacktitle=0.5,
title filled, title=This is a title]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
```

This is a title

This is a **tcolorbox**.

/tcb/opacityfill= $\langle fraction \rangle$ (style, no default, initially 1.0)

Sets the fill opacity for frame, interior and optionally the title background to the given $\langle fraction \rangle$.

```
\begin{tcolorbox}[standard jigsaw,
opacityfill=0.7, title=This is a title]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
```

This is a title

This is a **tcolorbox**.

/tcb/opacityupper= $\langle fraction \rangle$ (no default, initially 1.0)

Sets the text opacity of the upper box part to the given $\langle fraction \rangle$.

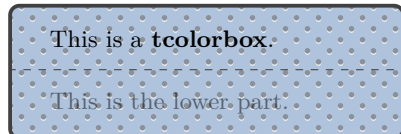
```
\begin{tcolorbox}[enhanced,opacityupper=0.5,
  interior style={pattern=crosshatch dots }
    {light steel blue}]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
```



/tcb/opacitylower= $\langle fraction \rangle$ (no default, initially 1.0)

Sets the text opacity of the lower box part to the given $\langle fraction \rangle$.

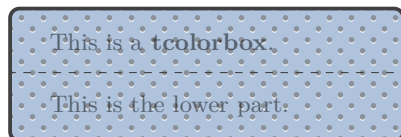
```
\begin{tcolorbox}[enhanced,opacitylower=0.5,
  interior style={pattern=crosshatch dots }
    {light steel blue}]
This is a \textbf{tcolorbox}.
\tcblower
This is the lower part.
\end{tcolorbox}
```



/tcb/opacitytext= $\langle fraction \rangle$ (no default, initially 1.0)

Sets the text opacity of the upper and the lower box part to the given $\langle fraction \rangle$.

```
\begin{tcolorbox}[enhanced,opacitytext=0.5,
  interior style={pattern=crosshatch dots }
    {light steel blue}]
This is a \textbf{tcolorbox}.
\tcblower
This is the lower part.
\end{tcolorbox}
```



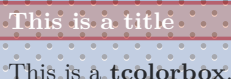
/tcb/opacitytitle= $\langle fraction \rangle$ (no default, initially 1.0)

Sets the text opacity of the box title to the given $\langle fraction \rangle$.

```
\begin{tcolorbox}[enhanced,opacitytitle=0.7,
  fonttitle=\bfseries,title=This is a title,
  title style={pattern=crosshatch dots light }
    {steel blue}]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
```



```
\begin{tcolorbox}[enhanced jigsaw,fonttitle=\bfseries,title=This is a title,
  opacityframe=0.5,opacityback=0.25,opacitybacktitle=0.25,opacitytext=0.8,
  colback=red!5!white,colframe=red!75!black,colbacktitle=yellow!20!red]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
```



3.6 Height Control

In a typical usage scenario, the height of a `tcolorbox` is computed automatically to fit the content. Nevertheless, the height can be set to a fixed value or to fit commonly for several boxes, e.g. if boxes are set side by side.

The height control keys are only applicable to unbreakable boxes. If a box is set to be `/tcb/breakable`^{→ P. 208}, the height is always computed according to the *natural height*.

`/tcb/natural height` (no value, initially set)

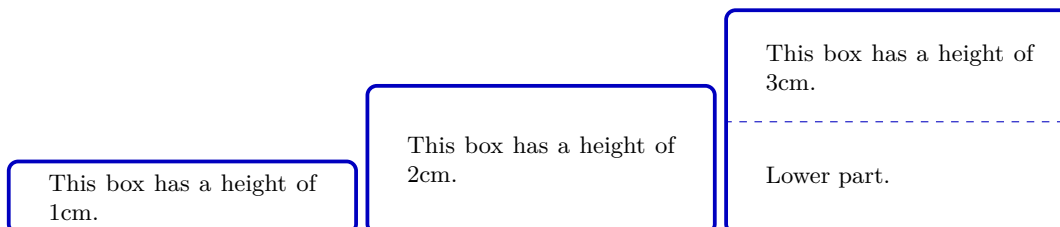
Sets the total height of the colored box to its natural height depending on the box content.

`/tcb/height=<length>` (no default)

Sets the total height of the colored box to `<length>` independent of the box content. `<length>` is the minimum height of the box, if `/tcb/height plus` is larger than zero.

```
\tcbset{width=(\linewidth-2mm)/3,before=,after=\hfill,
colframe=blue!75!black,colback=white}

\begin{tcolorbox}[height=1cm,valign=center]
  This box has a height of 1cm.
\end{tcolorbox}
\begin{tcolorbox}[height=2cm,valign=center]
  This box has a height of 2cm.
\end{tcolorbox}
\begin{tcolorbox}[height=3cm,split=0.5,valign=center,valign lower=center]
  This box has a height of 3cm.
  \tcblower
  Lower part.
\end{tcolorbox}
```

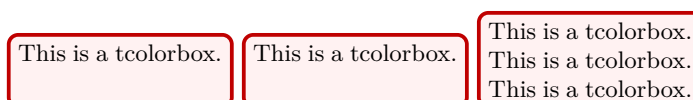


`/tcb/height plus=<length>` (no default, initially 0pt)

The box may extend a given fixed `/tcb/height` up to the given `<length>`.

```
\tcbset{colback=red!5!white,colframe=red!75!black,left=1mm,top=1mm,bottom=1mm,
right=1mm,boxsep=0mm,width=3cm,nobeforeafter}

\begin{tcolorbox}[height=1cm]
  This is a tcolorbox.
\end{tcolorbox}
\begin{tcolorbox}[height=1cm,height plus=1cm]
  This is a tcolorbox.
\end{tcolorbox}
\begin{tcolorbox}[height=1cm,height plus=1cm]
  This is a tcolorbox. This is a tcolorbox. This is a tcolorbox.
\end{tcolorbox}
```



`/tcb/height from= $\langle min \rangle$ to $\langle max \rangle$` (style, no default)

Sets the box height to a dimension between $\langle min \rangle$ and $\langle max \rangle$.

```
% \usepackage{lipsum}
\newtcolorbox{mybox}{colback=red!5!white,colframe=red!75!black,left=1mm,top=1mm,
  bottom=1mm,right=1mm,boxsep=0mm,width=4.5cm,nobeforeafter,
  height from=2cm to 8cm}

\begin{mybox}
This is a tcolorbox.
\end{mybox}
\begin{mybox}
This is a tcolorbox. This is a tcolorbox. This is a tcolorbox.
\end{mybox}
\begin{mybox}
\lipsum[2]
\end{mybox}
```

This is a tcolorbox.

This is a tcolorbox. This is
a tcolorbox. This is a tcolor-
box.

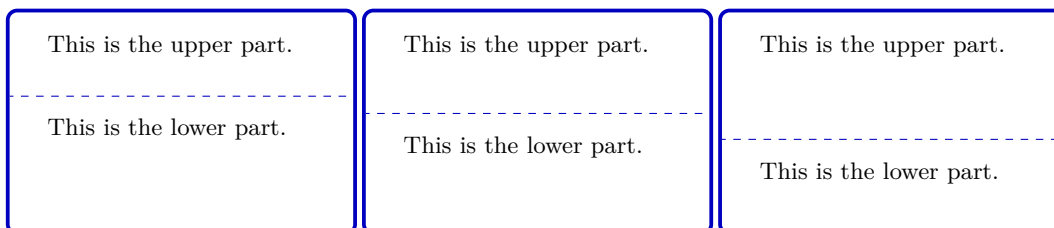
Nam dui ligula, fringilla a,
euismod sodales, sollicitudin
vel, wisi. Morbi auctor lorem
non justo. Nam lacus libero,
pretium at, lobortis vitae, ul-
trices et, tellus. Donec ali-
quet, tortor sed accumsan
bibendum, erat ligula aliquet
magna, vitae ornare odio me-
tus a mi. Morbi ac orci et
nisl hendrerit mollis. Sus-
pensis ut massa. Cras nec
ante. Pellentesque a nulla.
Cum sociis natoque penati-
bus et magnis dis parturi-
ent montes, nascetur ridiculus
mus. Aliquam tincidunt urna.
Nulla ullamcorper vestibulum
turpis. Pellentesque cursus
luctus mauris.

`/tcb/space= $\langle fraction \rangle$` (no default, initially 0)

If the height of a `tcolorbox` is not the natural height, the space difference between the forced and the natural size is distributed between the upper and the lower part of the box. This space could also be negative. $\langle fraction \rangle$ with a value between 0 and 1 is the amount of space which is added to the upper part, the rest is added to the lower part. If there is no lower part, then all of the space is added to the upper part always.

```
\tcbset{width=(\linewidth-2mm)/3,before=,after=\hfill,
colframe=blue!75!black,colback=white,height=3cm}

\foreach \f in {0.2,0.4,0.7}
{\begin{tcolorbox}[space=\f]
  This is the upper part.
  \tcblower
  This is the lower part.
\end{tcolorbox}}
```



`/tcb/space to upper` (style)

This is an abbreviation for `space=1`, i. e. all extra space is added to the upper part.

`/tcb/space to lower` (style, initially set)

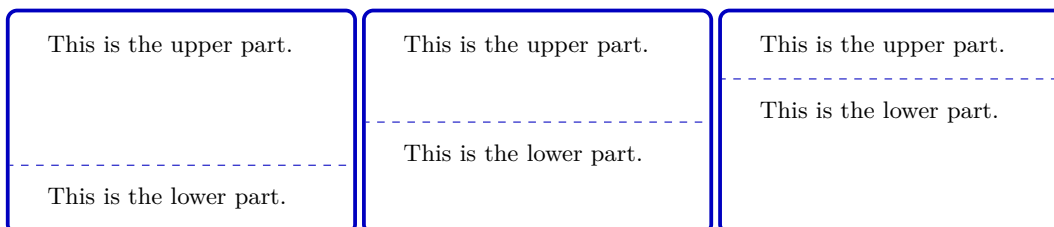
This is an abbreviation for `space=0`, i. e. all extra space is added to the lower part (if there is any).

`/tcb/space to both` (style)

This is an abbreviation for `space=0.5`, i. e. the extra space equally distributed between the upper and the lower part.

```
\tcbset{width=(\linewidth-2mm)/3,before=,after=\hfill,
colframe=blue!75!black,colback=white,height=3cm}

\foreach \myspace in {space to upper,space to both,space to lower}
{\begin{tcolorbox}[\myspace]
  This is the upper part.
  \tcblower
  This is the lower part.
\end{tcolorbox}}
```

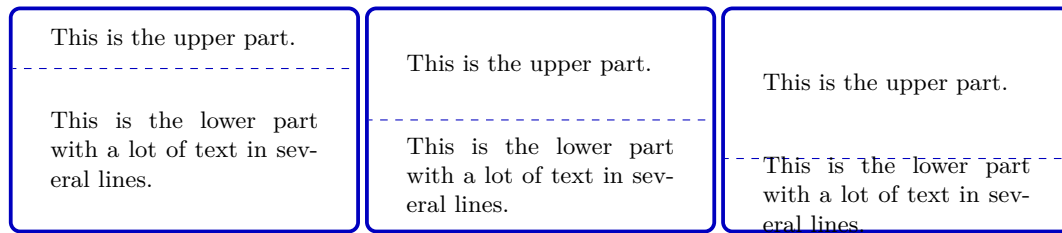


/tcb/split= $\langle fraction \rangle$ (no default)

If the height of a `tcolorbox` is not the natural height, the $\langle fraction \rangle$ with a value between 0 and 1 determines the positioning of the segmentation between the upper and the lower part. Here, 0 stands for top and 1 for bottom. Note that the box is split regardless of the actual dimensions of the text parts!

```
\tcbset{width=(\linewidth-2mm)/3,before=,after=\hfill,height=3cm,
colback=white,colframe=blue!75!black,valign=center,valign lower=center}

\foreach \f in {0.1,0.5,0.8}
{\begin{tcolorbox}[split=\f]
This is the upper part.
\tcblower
This is the lower part with a lot of text in several lines.
\end{tcolorbox}}
```

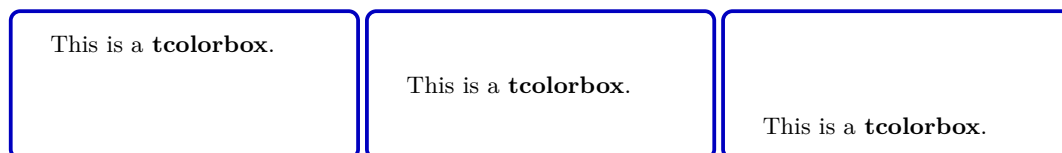


/tcb/valign= $\langle alignment \rangle$ (no default, initially top)

If the height of a `tcolorbox` is not the natural height, `valign` determines the vertical $\langle alignment \rangle$ of the upper part. Feasible values are `top`, `center`, and `bottom`. For a box with natural height, these values are meaningless.

```
\tcbset{width=(\linewidth-2mm)/3,before=,after=\hfill,
colframe=blue!75!black,colback=white,height=2cm}

\foreach \myalign in {top,center,bottom}
{\begin{tcolorbox}[valign=\myalign]
This is a \textbf{tcolorbox}.
\end{tcolorbox}}
```



/tcb/valign lower= $\langle alignment \rangle$ (no default, initially top)

This key has the same meaning for the lower part as `valign` for the upper part, i.e. it determines the vertical $\langle alignment \rangle$ of the lower part with feasible values `top`, `center`, and `bottom`.

`/tcb/equal height group=<id>` (no default)

Boxes which are members of an `equal height group` will all get the same height, i.e. the maximum of all their natural heights. The `<id>` serves to distinguish between different height groups. This `<id>` should contain only characters which are feasible for T_EX macro names, typically alphabetic characters but no numerals and spaces. Note that you have to compile twice to see changes and that height groups are global definitions.

```
\tcbset{width=(\linewidth-2mm)/3,before=,after=\hfill,arc=0mm,
colframe=blue!75!black,colback=white,fonttitle=\bfseries}

\begin{tcolorbox}[equal height group=A,adjusted title={One}]
  My smallest box.
\end{tcolorbox}%
\begin{tcolorbox}[equal height group=A,adjusted title={Two}]
  This box is also small.
  \tcblower
  But with a lower part.
\end{tcolorbox}%
\begin{tcolorbox}[equal height group=A,adjusted title={Three}]
  This box contains a lot of text just to fill the space
  with word flowing and flowing and flowing until the box
  is filled with all of it.
\end{tcolorbox}\linebreak
%
\tcbset{width=(\linewidth-1mm)/2,before=,after=\hfill,arc=0mm,
colframe=red!75!black,colback=white}
%
\begin{tcolorbox}[equal height group=B]
  Now, we use another equal height group.
\end{tcolorbox}%
\begin{tcolorbox}[equal height group=B]
  \begin{equation*}
    \int\limits_0^1 x^2 = \frac{1}{3}.
  \end{equation*}
\end{tcolorbox}
```

One	Two	Three
My smallest box.	This box is also small. <hr style="border-top: 1px dashed;"/> But with a lower part.	This box contains a lot of text just to fill the space with word flowing and flowing and flowing until the box is filled with all of it.
Now, we use another equal height group.	$\int_0^1 x^2 = \frac{1}{3}.$	

`/tcb/minimum for equal height group=<id>:<length>` (no default, initially unset)

Plants a $\langle length \rangle$ into the equal height group with the given $\langle id \rangle$. This ensures that the height will not drop below $\langle length \rangle$. Note that you cannot reduce a computed height value by using this key with a small value. The difference to applying `/tcb/height`^{P. 34} directly is that the boxes are never too small for their content.

```
\tcbset{colframe=blue!75!black,colback=white,arc=0mm,
  before=,after=\hfill,fonttitle=\bfseries,left=2mm,right=2mm,
  width=3.5cm,
  equal height group=C,
  minimum for equal height group=C:3.5cm}

\begin{tcolorbox}
  My first box. All boxes will get 3.5cm times 3.5cm
  if the content height is not too large.
\end{tcolorbox}%
\begin{tcolorbox}
  My second box.
  \tcblower
  This is the lower part.
\end{tcolorbox}%
\begin{tcblisting}{\textbf{Mixed}}
  with a listing.
\end{tcblisting}
\begin{tcolorbox}[title={Fourth box}]
  My final box.
\end{tcolorbox}%
```

My first box. All boxes will get 3.5cm times 3.5cm if the content height is not too large.

My second box.

This is the lower part.

\textbf{Mixed}
with a listing.

Mixed with a listing.

Fourth box

My final box.

3.7 Box Content Additions

The following options introduce some arbitrary *<code>* to the content of a `tcolorbox`. These additions can be given at the beginning or at the ending of the title, the upper part, or the lower part.

`/tcb/before title=<code>` (no default, initially unset)

The given *<code>* is placed *after* the color and font settings and *before* the content of the title.

```
\tcbset{before title={\textcolor{yellow}{\large Important:}~},
colback=red!5!white,colframe=red!75!black,fonttitle=\bfseries}

\begin{tcolorbox}[title=My title]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
```

Important: My title

This is a **tcolorbox**.

`/tcb/after title=<code>` (no default, initially unset)

The given *<code>* is placed *after* the content of the title.

```
\tcbset{after title={\hfill\colorbox{Navy}{approved}}},
colback=red!5!white,colframe=red!75!black,fonttitle=\bfseries}

\begin{tcolorbox}[title=My title]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
```

My title

approved

This is a **tcolorbox**.

`/tcb/before upper=<code>` (no default, initially unset)

The given *<code>* is placed *after* the color and font settings and *before* the content of the upper part.

```
\tcbset{before upper={\textit{The story:}\par},
colback=red!5!white,colframe=red!75!black,fonttitle=\bfseries}

\begin{tcolorbox}[title=My title]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
```

My title

The story:
This is a **tcolorbox**.

`/tcb/after upper=<code>` (no default, initially unset)

The given `<code>` is placed *after* the content of the upper part.

```
\tcbset{after upper={\par\hfill\textit{Read more next week}},
  colback=red!5!white,colframe=red!75!black,fonttitle=\bfseries}

\begin{tcolorbox}[title=My title]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
```

My title

This is a **tcolorbox**.

Read more next week

`/tcb/before lower=<code>` (no default, initially unset)

The given `<code>` is placed *after* the color and font settings and *before* the content of the lower part.

```
\tcbset{before lower=\textit{Behold:~},colback=red!5!white,colframe=red!75!black}

\begin{tcolorbox}
This is a \textbf{tcolorbox}.
\tcblower
This is the lower part.
\end{tcolorbox}
```

This is a **tcolorbox**.

Behold: This is the lower part.

`/tcb/after lower=<code>` (no default, initially unset)

The given `<code>` is placed *after* the content of the lower part.

```
\tcbset{after lower=\ \textit{This is the end.},
  colback=red!5!white,colframe=red!75!black}

\begin{tcolorbox}
This is a \textbf{tcolorbox}.
\tcblower
This is the lower part.
\end{tcolorbox}
```

This is a **tcolorbox**.

This is the lower part. *This is the end.*

`/tcb/center title` (style, no value, initially unset)

This style sets `/tcb/before title`^{→ P. 40} to `\centering`.

```
\tcbset{center title,colback=red!5!white,colframe=red!75!black,fonttttitle=\bfseries}

\begin{tcolorbox}[title=My title]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
```

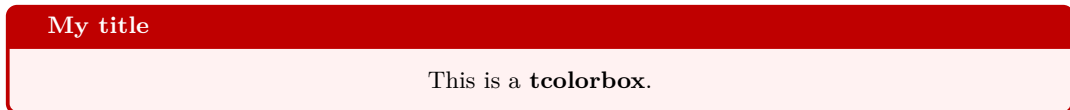


`/tcb/center upper` (style, no value, initially unset)

This style sets `/tcb/before upper`^{→ P. 40} to `\centering`.

```
\tcbset{center upper,colback=red!5!white,colframe=red!75!black,fonttttitle=\bfseries}

\begin{tcolorbox}[title=My title]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
```

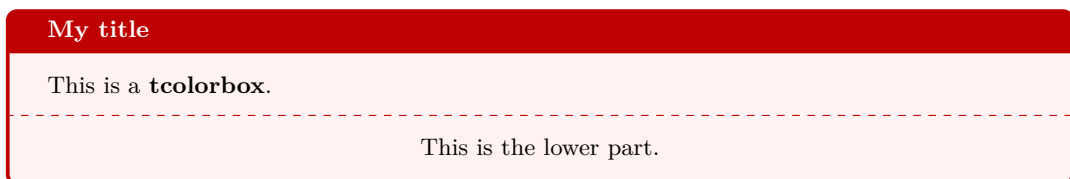


`/tcb/center lower` (style, no value, initially unset)

This style sets `/tcb/before lower`^{→ P. 41} to `\centering`.

```
\tcbset{center lower,colback=red!5!white,colframe=red!75!black,fonttttitle=\bfseries}

\begin{tcolorbox}[title=My title]
This is a \textbf{tcolorbox}.
\tcblower
This is the lower part.
\end{tcolorbox}
```



`/tcb/flushleft title` (style, no value, initially unset)

This style sets `/tcb/before title`^{→ P. 40} to `\raggedright`.

```
\tcbset{flushleft title,colback=red!5!white,
colframe=red!75!black,fonttitle=\bfseries}

\begin{tcolorbox}[title=My title which is
quite long but always flushed left]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
```

My title which is quite
long but always flushed
left

This is a **tcolorbox**.

`/tcb/flushleft upper` (style, no value, initially unset)

This style sets `/tcb/before upper`^{→ P. 40} to `\raggedright`.

```
\tcbset{flushleft upper,colback=red!5!white,
colframe=red!75!black,fonttitle=\bfseries}

\begin{tcolorbox}[title=My title]
This is a \textbf{tcolorbox}. Here, the
content is flushed left.
You see the effect on the right hand side.
\end{tcolorbox}
```

My title

This is a **tcolorbox**. Here,
the content is flushed left.
You see the effect on the
right hand side.

`/tcb/flushleft lower` (style, no value, initially unset)

This style sets `/tcb/before lower`^{→ P. 41} to `\raggedright`.

```
\tcbset{flushleft lower,colback=red!5!white,
colframe=red!75!black,fonttitle=\bfseries}

\begin{tcolorbox}[title=My title]
This is a \textbf{tcolorbox}. The upper part
is not flushed left or right. This could be
unpleasant for small boxes.
\tcblower
This is the lower part. Here, the
content is flushed left.
You see the effect on the right hand side.
\end{tcolorbox}
```

My title

This is a **tcolorbox**. The up-
per part is not flushed left or
right. This could be unpleas-
ant for small boxes.

This is the lower part. Here,
the content is flushed left.
You see the effect on the
right hand side.

/tcb/flushright title (style, no value, initially unset)

This style sets /tcb/before title^{→ P. 40} to \raggedleft.

```
\tcbset{flushright title,colback=red!5!white,
colframe=red!75!black,fonttitle=\bfseries}

\begin{tcolorbox}[title=My title]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
```

My title

This is a **tcolorbox**.

/tcb/flushright upper (style, no value, initially unset)

This style sets /tcb/before upper^{→ P. 40} to \raggedleft.

```
\tcbset{flushright upper,colback=red!5!white,
colframe=red!75!black,fonttitle=\bfseries}

\begin{tcolorbox}[title=My title]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
```

My title

This is a **tcolorbox**.

/tcb/flushright lower (style, no value, initially unset)

This style sets /tcb/before lower^{→ P. 41} to \raggedleft.

```
\tcbset{flushright lower,colback=red!5!white,
colframe=red!75!black,fonttitle=\bfseries}

\begin{tcolorbox}[title=My title]
This is a \textbf{tcolorbox}.
\tcblower
This is the lower part.
\end{tcolorbox}
```

My title

This is a **tcolorbox**.

This is the lower part.

`/tcb/tabularx=<preamble>` (style)

This style sets `/tcb/before upper`^{→P.40} and `/tcb/after upper`^{→P.41} and several geometry keys to support a `tabularx` with the given `<preamble>`. The packages `tabularx` [2], `array`, and `colortbl` have to be loaded separately.

```
% \usepackage{array,tabularx}
% \usepackage{colortbl} - or - \usepackage[table]{xcolor}
\newcolumntype{Y}{>\raggedleft\arraybackslashX}% see tabularx
\tcbset{enhanced,fonttitle=\bfseries\large,fontupper=\normalsize\sffamily,
  colback=yellow!10!white,colframe=red!50!black,colbacktitle=Salmon!30!white,
  coltitle=black,center title}

\begin{tcolorbox}[tabularx={X||Y|Y|Y|Y|Y},title=My table]
Group & One & Two & Three & Four & Sum\\ \hline \hline
Red & 1000.00 & 2000.00 & 3000.00 & 4000.00 & 10000.00\\ \hline
Green & 2000.00 & 3000.00 & 4000.00 & 5000.00 & 14000.00\\ \hline
Blue & 3000.00 & 4000.00 & 5000.00 & 6000.00 & 18000.00\\ \hline \hline
Sum & 6000.00 & 9000.00 & 12000.00 & 15000.00 & 42000.00
\end{tcolorbox}
```

My table					
Group	One	Two	Three	Four	Sum
Red	1000.00	2000.00	3000.00	4000.00	10000.00
Green	2000.00	3000.00	4000.00	5000.00	14000.00
Blue	3000.00	4000.00	5000.00	6000.00	18000.00
Sum	6000.00	9000.00	12000.00	15000.00	42000.00

`/tcb/tabularx*={<code>}{<preamble>}` (style)

This is a variant of `/tcb/tabularx` which adds some `<code>` before the table starts.

```
% \usepackage{array,tabularx}
% \usepackage{colortbl} - or - \usepackage[table]{xcolor}
\tcbset{enhanced,fonttitle=\bfseries\large,fontupper=\normalsize\sffamily,
  colback=yellow!10!white,colframe=red!50!black,colbacktitle=Salmon!30!white,
  coltitle=black,center title}

\begin{tcolorbox}[tabularx*={\arrayrulewidth0.5mm}{X|X|X},title=My table]
One & Two & Three \\ \hline \hline
1000.00 & 2000.00 & 3000.00\\ \hline
2000.00 & 3000.00 & 4000.00
\end{tcolorbox}
```

My table		
One	Two	Three
1000.00	2000.00	3000.00
2000.00	3000.00	4000.00

`/tcb/tikz upper=<options>` (style)

This style adds a centered `tikzpicture` environment to the start and end of the upper part. The `<options>` may be given as TikZ picture options.

```
% \usepackage{tikz}

\begin{tcolorbox}[tikz upper,fonttitle=\bfseries,colback=white,colframe=black,
                 title=TikZ drawing]
  \path[fill=yellow,draw=yellow!75!red] (0,0) circle (1cm);
  \fill[red] (45:5mm) circle (1mm);
  \fill[red] (135:5mm) circle (1mm);
  \draw[line width=1mm,red] (215:5mm) arc (215:325:5mm);
\end{tcolorbox}
```

TikZ drawing



`/tcb/tikz lower=<options>` (style)

This style adds a centered `tikzpicture` environment to the start and end of the lower part. The `<options>` may be given as TikZ picture options.

```
% \usepackage{tikz}
% \usetikzlibrary{skins,listings}
\tcbset{tikz lower,listing side text,fonttitle=\bfseries,
        bicolor,colback=LightBlue!50!white,colbacklower=white,colframe=black,
        righthand width=3cm}

\begin{tcblisting}{title=TikZ drawing}
\path[fill=yellow,draw=yellow!75!red]
  (0,0) circle (1cm);
\fill[red] (45:5mm) circle (1mm);
\fill[red] (135:5mm) circle (1mm);
\draw[line width=1mm,red]
  (215:5mm) arc (215:325:5mm);
\end{tcblisting}
```

TikZ drawing

```
\path[fill=yellow,draw=yellow!75!red]
  (0,0) circle (1cm);
\fill[red] (45:5mm) circle (1mm);
\fill[red] (135:5mm) circle (1mm);
\draw[line width=1mm,red]
  (215:5mm) arc (215:325:5mm);
```



`/tcb/tikznode upper=<options>` (style)

This style places the upper part content into a centered TikZ node. The `<options>` may be given as TikZ node options. This style is especially useful for boxes with multiline texts which are fitted to the text width.

```
% \usepackage{tikz}
\newtcbbox{\headline}[1][]{enhanced,before=\begin{center},after=\end{center},
fontupper=\Large\bfseries,colframe=red!50!black,colback=red!10!white,
drop fuzzy shadow=yellow,tikznode upper,#1}

\headline{Important\Headline}
```

Important
Headline

`/tcb/tikznode lower=<options>` (style)

This style places the lower part content into a centered TikZ node. The `<options>` may be given as TikZ node options.

```
% \usepackage{tikz}
\begin{tcolorbox}[bicolor,colback=LightBlue!50!white,colbacklower=white,
colframe=black,tikznode lower={inner sep=2pt,draw=red,fill=yellow}]
Upper part.
\tcblower
Lower part.
\end{tcolorbox}
```

Upper part.

Lower part.

`/tcb/tikznode=<options>` (style)

Shortcut for setting `/tcb/tikznode upper` and `/tcb/tikznode lower` the same time.

`/tcb/code=<code>` (no default, initially unset)

The given `<code>` is executed immediately. This option is useful to place some arbitrary code into an option list.

```
\tcbset{colback=red!5!white,colframe=red!75!black,
code={Useless at this spot but functional.},
fonttitle=\bfseries}

\begin{tcolorbox}[code={\newcommand{\mycommand}{\textit{working}}},
title=My \mycommand\ title]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
```

Useless at this spot but functional.

My *working* title

This is a **tcolorbox**.

3.8 Overlays

With an overlay, arbitrary *graphical code* can be added to a `tcolorbox`. This code is executed *after* the frame and interior are drawn and *before* the text content is drawn. Therefore, you can decorate the `tcolorbox` with your own extensions. Common special cases are *watermarks* which are implemented using overlays. See Subsection 6.4 from page 89 if you want to add *watermarks*.

If you use the core package only, the *graphical code* has to be `pgf` code and there is not much assistance for positioning. Therefore, the usage of the `/tcb/enhanced`^{P.119} mode from the library skins is recommended which allows `tikz` code and gives access to `/tcb/geometry nodes`^{P.81} for positioning.

`/tcb/overlay=<graphical code>` (no default, initially unset)

Adds *graphical code* to the box drawing process. This *graphical code* is drawn *after* the frame and interior and *before* the text content.

```
% \tcbuselibrary{skins} % preamble
\tcbset{frogbox/.style={enhanced,colback=green!10,colframe=green!65!black,
  enlarge top by=5.5mm,
  overlay={\foreach \x in {2cm,3.5cm} {
    \begin{scope}[shift={([xshift=\x]frame.north west)}]
      \path[draw=green!65!black,fill=green!10,line width=1mm] (0,0) arc (0:180:5mm);
      \path[fill=black] (-0.2,0) arc (0:180:1mm);
    \end{scope}}}}

\begin{tcolorbox}[frogbox,title=My title]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
```



```
% \usetikzlibrary{patterns} % preamble
% \tcbuselibrary{skins} % preamble
\tcbset{ribbonbox/.style={enhanced,colback=red!5!white,colframe=red!75!black,
  fonttitle=\bfseries,
  overlay={\path[fill=blue!75!white,draw=blue,double=white!85!blue,
    preaction={opacity=0.6,fill=blue!75!white},
    line width=0.1mm,double distance=0.2mm,
    pattern=fivepointed stars,pattern color=white!75!blue]
    ([xshift=-0.2mm,yshift=-1.02cm]frame.north east)
    -- ++(-1,1) -- ++(-0.5,0) -- ++(1.5,-1.5) -- cycle;}}}

\begin{tcolorbox}[ribbonbox,title=My title]
This is a \textbf{tcolorbox}.
\tcblower
This is the lower part.
\end{tcolorbox}
```



/tcb/no overlay (style, no default, initially set)

Removes the overlay if set before.

/tcb/overlay broken= $\langle graphical\ code \rangle$ (no default, initially unset)

If the box is set to be **/tcb/breakable**^{→ P. 208} and *is* broken actually, then the $\langle graphical\ code \rangle$ is added to the box drawing process. **/tcb/overlay**^{→ P. 48} overwrites this key.

/tcb/overlay unbroken= $\langle graphical\ code \rangle$ (no default, initially unset)

If the box is set to be **/tcb/breakable**^{→ P. 208} but *is not* broken actually or if the box is set to be **/tcb/unbreakable**^{→ P. 209}, then the $\langle graphical\ code \rangle$ is added to the box drawing process. **/tcb/overlay**^{→ P. 48} overwrites this key.

/tcb/overlay first= $\langle graphical\ code \rangle$ (no default, initially unset)

If the box is set to be **/tcb/breakable**^{→ P. 208} and *is* broken actually, then the $\langle graphical\ code \rangle$ is added to the box drawing process for the *first* part of the break sequence. **/tcb/overlay**^{→ P. 48} overwrites this key.

/tcb/overlay middle= $\langle graphical\ code \rangle$ (no default, initially unset)

If the box is set to be **/tcb/breakable**^{→ P. 208} and *is* broken actually, then the $\langle graphical\ code \rangle$ is added to the box drawing process for the *middle* parts (if any) of the break sequence. **/tcb/overlay**^{→ P. 48} overwrites this key.

/tcb/overlay last= $\langle graphical\ code \rangle$ (no default, initially unset)

If the box is set to be **/tcb/breakable**^{→ P. 208} and *is* broken actually, then the $\langle graphical\ code \rangle$ is added to the box drawing process for the *last* part of the break sequence. **/tcb/overlay**^{→ P. 48} overwrites this key.

/tcb/overlay unbroken and first= $\langle graphical\ code \rangle$ (no default, initially unset)

This is an optimized abbreviation for setting **/tcb/overlay unbroken** and **/tcb/overlay first** together. **/tcb/overlay**^{→ P. 48} overwrites this key.

/tcb/overlay middle and last= $\langle graphical\ code \rangle$ (no default, initially unset)

This is an optimized abbreviation for setting **/tcb/overlay middle** and **/tcb/overlay last** together. **/tcb/overlay**^{→ P. 48} overwrites this key.

This example demonstrates the application of break sequence specific overlay options. Here, we define an environment **myexample** based on **tcolorbox** where the visible drawing is done totally by overlay keys.

Here, the first application of **myexample** produces an unbroken **tcolorbox**. The frame is drawn by the code given with **/tcb/overlay unbroken**.

The second application of **myexample** is broken into several parts which are drawn by the codes given with **/tcb/overlay first**, **/tcb/overlay middle**, and **/tcb/overlay last**.

% Preamble:

```
%\usepackage{tikz,lipsum,calc}
```

```
%\tcbuselibrary{skins,breakable}
```

```
%\newcounter{example}
```

```
%\newlength{\examlen}
```

```
\colorlet{colexam}{red!75!black}
```

```
\newtcolorbox[use counter=example]{myexample}{%
```

```
phantom={\settowidth{\global\examlen}{\Large\bfseries Example \thetcbcounter}},%
```

```
title={Example \thetcbcounter},
```

```
coltitle=colexam,fonttitle=\Large\bfseries,
```

```
enhanced,breakable,before=\par\medskip,parbox=false,
```

```
frame hidden,interior hidden,segmentation hidden,
```

```

boxsep=0pt,left=0pt,right=3mm,toptitle=2mm,pad at break=0mm,
overlay unbroken={\draw[colexam,line width=1pt] (frame.north west)
--([xshift=-0.5pt]frame.north east)--([xshift=-0.5pt]frame.south east)
--(frame.south west);
\draw[colexam,line width=2pt] ([yshift=0.5pt]frame.north west)
-- +(\examlen,0pt);},
overlay first={\draw[colexam,line width=1pt] (frame.north west)
--([xshift=-0.5pt]frame.north east)--([xshift=-0.5pt]frame.south east);
\draw[red!75!black,line width=2pt] ([yshift=0.5pt]frame.north west)
-- +(\examlen,0pt);},
overlay middle={\draw[colexam,line width=1pt] ([xshift=-0.5pt]frame.north east)
--([xshift=-0.5pt]frame.south east); },
overlay last={\draw[colexam,line width=1pt] ([xshift=-0.5pt]frame.north east)
--([xshift=-0.5pt]frame.south east)--(frame.south west);}%
}

\begin{myexample}
\lipsum[1]
\end{myexample}

\begin{myexample}
\lipsum[2-11]
\end{myexample}

\lipsum[12]% following text

```

Example 1

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

Example 2

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

Nulla malesuada porttitor diam. Donec felis erat, congue non, volutpat at, tincidunt tristique, libero. Vivamus viverra fermentum felis. Donec nonummy pellentesque ante. Phasellus adipiscing semper elit. Proin fermentum massa ac quam. Sed diam turpis, molestie vitae, placerat a, molestie nec, leo. Maecenas lacinia. Nam ipsum ligula, eleifend at, accumsan nec, suscipit a, ipsum. Morbi blandit ligula feugiat magna. Nunc eleifend consequat lorem. Sed lacinia nulla vitae enim. Pellentesque tincidunt purus vel magna. Integer non enim. Praesent euismod nunc eu purus. Donec bibendum quam in tellus. Nullam cursus pulvinar lectus. Donec et mi. Nam vulputate metus eu enim. Vestibulum pellentesque felis eu massa.

Quisque ullamcorper placerat ipsum. Cras nibh. Morbi vel justo vitae lacus tincidunt ultrices. Lorem ipsum dolor sit amet, consectetur adipiscing elit. In hac habitasse platea dictumst. Integer tempus convallis augue. Etiam facilisis. Nunc elementum fermentum wisi. Aenean placerat. Ut imperdiet, enim sed gravida sollicitudin, felis odio placerat quam, ac pulvinar elit purus eget enim. Nunc vitae tortor. Proin tempus nibh sit amet nisl. Vivamus quis tortor vitae risus porta vehicula.

Fusce mauris. Vestibulum luctus nibh at lectus. Sed bibendum, nulla a faucibus semper, leo velit ultricies tellus, ac venenatis arcu wisi vel nisl. Vestibulum diam. Aliquam pellentesque, augue quis sagittis posuere, turpis lacus congue quam, in hendrerit risus eros eget felis. Maecenas eget erat in sapien mattis porttitor. Vestibulum porttitor. Nulla facilisi. Sed a turpis eu lacus commodo facilisis. Morbi fringilla, wisi in dignissim interdum, justo lectus sagittis dui, et vehicula libero dui cursus dui. Mauris tempor ligula sed lacus. Duis cursus enim ut augue. Cras ac magna. Cras nulla. Nulla egestas. Curabitur a leo. Quisque egestas wisi eget nunc. Nam feugiat lacus vel est. Curabitur consectetur.

Suspendisse vel felis. Ut lorem lorem, interdum eu, tincidunt sit amet, laoreet vitae, arcu. Aenean faucibus pede eu ante. Praesent enim elit, rutrum at, molestie non, nonummy vel, nisl. Ut lectus eros, malesuada sit amet, fermentum eu, sodales cursus, magna. Donec eu purus. Quisque vehicula, urna sed ultricies auctor, pede lorem egestas dui, et convallis elit erat sed nulla. Donec luctus. Curabitur et nunc. Aliquam dolor odio, commodo pretium, ultricies non, pharetra in, velit. Integer arcu est, nonummy in, fermentum faucibus, egestas vel, odio.

Sed commodo posuere pede. Mauris ut est. Ut quis purus. Sed ac odio. Sed vehicula hendrerit sem. Duis non odio. Morbi ut dui. Sed accumsan risus eget odio. In hac habitasse platea dictumst. Pellentesque non elit. Fusce sed justo eu urna porta tincidunt. Mauris felis odio, sollicitudin sed, volutpat a, ornare ac, erat. Morbi quis dolor. Donec pellentesque, erat ac sagittis semper, nunc dui lobortis purus, quis congue purus metus ultricies tellus. Proin et quam. Class aptent taciti sociosqu ad litora torquent per conubia nostra, per inceptos hymenaeos. Praesent sapien turpis, fermentum vel, eleifend faucibus, vehicula eu, lacus.

Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Donec odio elit, dictum in, hendrerit sit amet, egestas sed, leo. Praesent feugiat sapien aliquet odio. Integer vitae justo. Aliquam vestibulum fringilla lorem. Sed neque lectus, consectetur at, consectetur sed, eleifend ac, lectus. Nulla facilisi. Pellentesque eget lectus. Proin eu metus. Sed porttitor. In hac habitasse platea dictumst. Suspendisse eu lectus. Ut mi mi, lacinia sit amet, placerat et, mollis vitae, dui. Sed ante tellus, tristique ut, iaculis eu, malesuada ac, dui. Mauris nibh leo, facilisis non, adipiscing quis, ultrices a, dui.

Morbi luctus, wisi viverra faucibus pretium, nibh est placerat odio, nec commodo wisi enim eget quam. Quisque libero justo, consectetur a, feugiat vitae, porttitor eu, libero. Suspendisse sed mauris vitae elit sollicitudin malesuada. Maecenas ultricies eros sit amet ante. Ut venenatis velit. Maecenas sed mi eget dui varius euismod. Phasellus aliquet volutpat odio. Vestibulum ante ipsum primis in faucibus orci luctus et ultrices posuere cubilia Curae; Pellentesque sit amet pede ac sem eleifend consectetur. Nullam elementum, urna vel imperdiet sodales, elit ipsum pharetra ligula, ac pretium ante justo a nulla. Curabitur tristique arcu eu metus. Vestibulum lectus. Proin mauris. Proin eu nunc eu urna hendrerit faucibus. Aliquam auctor, pede consequat laoreet varius, eros tellus scelerisque quam, pellentesque hendrerit ipsum dolor sed augue. Nulla nec lacus.

Suspendisse vitae elit. Aliquam arcu neque, ornare in, ullamcorper quis, commodo eu, libero. Fusce sagittis erat at erat tristique mollis. Maecenas sapien libero, molestie et, lobortis in, sodales eget, dui. Morbi ultrices rutrum lorem. Nam elementum ullamcorper leo. Morbi dui. Aliquam sagittis. Nunc placerat. Pellentesque tristique sodales est. Maecenas imperdiet lacinia velit. Cras non urna. Morbi eros pede, suscipit ac, varius vel, egestas non, eros.

Praesent malesuada, diam id pretium elementum, eros sem dictum tortor, vel consectetur odio sem sed wisi.

Sed feugiat. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Ut pellentesque augue sed urna. Vestibulum diam eros, fringilla et, consectetur eu, nonummy id, sapien. Nullam at lectus. In sagittis ultrices mauris. Curabitur malesuada erat sit amet massa. Fusce blandit. Aliquam erat volutpat. Aliquam euismod. Aenean vel lectus. Nunc imperdiet justo nec dolor.

Etiam euismod. Fusce facilisis lacinia dui. Suspendisse potenti. In mi erat, cursus id, nonummy sed, ullamcorper eget, sapien. Praesent pretium, magna in eleifend egestas, pede pede pretium lorem, quis consectetur tortor sapien facilisis magna. Mauris quis magna varius nulla scelerisque imperdiet. Aliquam non quam. Aliquam porttitor quam a lacus. Praesent vel arcu ut tortor cursus volutpat. In vitae pede quis diam bibendum placerat. Fusce elementum convallis neque. Sed dolor orci, scelerisque ac, dapibus nec, ultricies ut, mi. Duis nec dui quis leo sagittis commodo.

```
% \tcboxlibrary{skins}
% \newcounter{example}
\newtcolorbox[use counter=example]{FancyTitle}[3][{}{%
  enhanced,colback=blue!10!white,colframe=orange,top=4mm,
  enlarge top by=\baselineskip/2+1mm,
  enlarge top at break by=0mm,pad at break=2mm,
  fontupper=\normalsize,label={#3},
  overlay unbroken and first={%
    \node[rectangle,rounded corners,draw=black,fill=blue!20!white,
      inner sep=1mm,anchor=west,font=\small]
      at ([xshift=4.5mm]frame.north west)
        {\strut\textbf{Example \thetcbcounter: #2}};},
  #1}%

\begin{FancyTitle}{My fancy title}{fancy:title}
  \lipsum[1]
\end{FancyTitle}
```

Example 3: My fancy title

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

Floating box from `floatplacement`

This floating box is placed at the top of a page.

3.9 Floating Objects

`/tcb/floatplacement=<values>` (no default, initially `htb`)

Sets `<values>` as default values for the usage of `float`. Feasible are the usual parameters for floating objects.

```
\tcbset{enhanced,colback=red!5!white,colframe=red!75!black,
  watermark color=red!15!white}

\begin{tcolorbox}[floatplacement=t,float,
  title=Floating box from |floatplacement|,
  watermark text={I am floating}]
  This floating box is placed at the top of a page.
\end{tcolorbox}
```

`/tcb/float=<values>` (default from `floatplacement`)

Turns the box to a floating object where `<values>` are the usual parameters for such floating objects. If they are not used, the placement uses the default values given by `floatplacement`.

```
\begin{tcolorbox}[float, title=Floating box from |float|,
  enhanced,watermark text={I'm also floating}]
  This box floats to a feasible place automatically. You do not have to
  use a numbering for this floating object.
\end{tcolorbox}
```

Floating box from `float`

This box floats to a feasible place automatically. You do not have to use a numbering for this floating object.

`/tcb/nofloat` (style, initially set)

Turns the floating behavior off.

3.10 Side by Side

Further side by side options for code examples are `/tcb/listing side text`^{→P.168}, `/tcb/text side listing`^{→P.168}, `/tcb/listing outside text`^{→P.168}, and `/tcb/text outside listing`^{→P.168}.

`/tcb/sidebyside=true|false` (default `true`, initially `false`)

Normally, the upper part and the lower part of the box have their positions as their names suggest. If `sidebyside` is set to `true`, the upper part is drawn *left-handed* and the lower part is drawn *right-handed*. Both parts are drawn together with the geometry settings of the upper part but the space is divided horizontally according to the following options. Colors, fonts, and box content additions are used individually. The resulting box is unbreakable.

```
\tcbset{colback=red!5!white,colframe=red!75!black,fonttttitle=\bfseries}

\begin{tcolorbox}[title=My title,sidebyside]
This is the upper (\textit{left-handed}) part.
\tcblower
This is the lower (\textit{right-handed}) part.
\end{tcolorbox}
```

My title

This is the upper (*left-handed*) part.

This is the lower (*right-handed*) part.

`/tcb/sidebyside align=<alignment value>` (no default, initially `center`)

Sets the vertical alignment for the left-handed and right-handed part. Feasible values are `center`, `top`, and `bottom`.

```
\tcbset{colback=red!5!white,colframe=red!75!black,fonttttitle=\bfseries,nobeforeafter,
left=2mm,right=2mm,sidebyside,sidebyside gap=6mm,width=(\linewidth-2mm)/3}

\begin{tcolorbox}[adjusted title=center,sidebyside align=center]
This is a text which is too long for one line.
\tcblower
This is a short text.
\end{tcolorbox}\hfill
\begin{tcolorbox}[adjusted title=top,sidebyside align=top]
This is a text which is too long for one line.
\tcblower
This is a short text.
\end{tcolorbox}\hfill
\begin{tcolorbox}[adjusted title=bottom,sidebyside align=bottom]
This is a text which is too long for one line.
\tcblower
This is a short text.
\end{tcolorbox}
```

center

This is a text which is too long for one line.

This is a short text.

top

This is a text which is too long for one line.

This is a short text.

bottom

This is a text which is too long for one line.

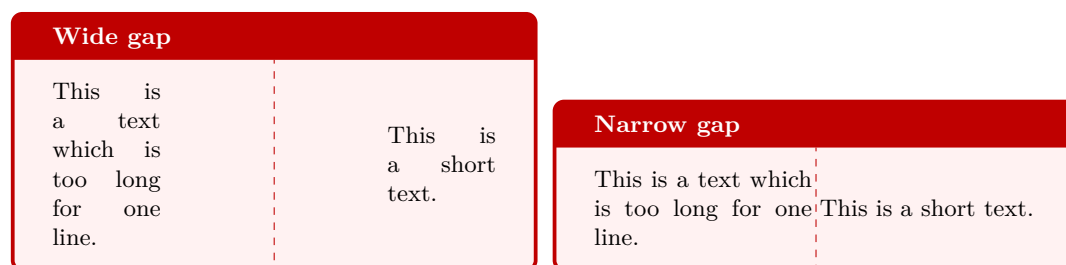
This is a short text.

`/tcb/sidebyside gap=<length>` (no default, initially 10mm)

Sets the horizontal distance between the left-handed and right-handed part to $\langle length \rangle$.

```
\tcbset{colback=red!5!white,colframe=red!75!black,fonttttitle=\bfseries,nobeforeafter,
sidebyside,width=(\linewidth-2mm)/2}

\begin{tcolorbox}[adjusted title=Wide gap,sidebyside gap=30mm]
This is a text which is too long for one line.
\tcblower
This is a short text.
\end{tcolorbox}\hfill
\begin{tcolorbox}[adjusted title=Narrow gap,sidebyside gap=1mm]
This is a text which is too long for one line.
\tcblower
This is a short text.
\end{tcolorbox}
```

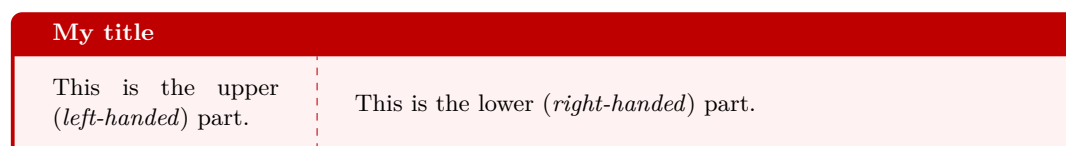


`/tcb/lefthand width=<length>` (no default, initially unset)

Sets the width of the left-handed part to the given $\langle length \rangle$.

```
\tcbset{colback=red!5!white,colframe=red!75!black,fonttttitle=\bfseries}

\begin{tcolorbox}[title=My title,sidebyside,lefthand width=3cm]
This is the upper (\textit{left-handed}) part.
\tcblower
This is the lower (\textit{right-handed}) part.
\end{tcolorbox}
```



`/tcb/righthand width=<length>` (no default, initially unset)

Sets the width of the right-handed part to the given $\langle length \rangle$.

```
\tcbset{colback=red!5!white,colframe=red!75!black,fonttttitle=\bfseries}

\begin{tcolorbox}[title=My title,sidebyside,righthand width=3cm]
This is the upper (\textit{left-handed}) part.
\tcblower
This is the lower (\textit{right-handed}) part.
\end{tcolorbox}
```

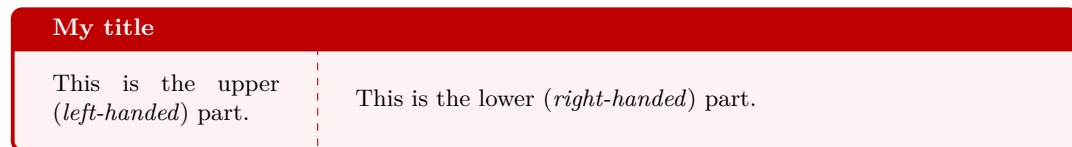


`/tcb/lefthand ratio=<fraction>` (no default, initially 0.5)

Sets the width of the left-handed part to the given $\langle fraction \rangle$ of the available space. $\langle fraction \rangle$ is a value between 0 and 1.

```
\tcbset{colback=red!5!white,colframe=red!75!black,fonttttitle=\bfseries}

\begin{tcolorbox}[title=My title,sidebyside,lefthand ratio=0.25]
This is the upper (\textit{left-handed}) part.
\tcblower
This is the lower (\textit{right-handed}) part.
\end{tcolorbox}
```



`/tcb/righthand ratio=<fraction>` (no default, initially 0.5)

Sets the width of the right-handed part to the given $\langle fraction \rangle$ of the available space. $\langle fraction \rangle$ is a value between 0 and 1.

```
\tcbset{colback=red!5!white,colframe=red!75!black,fonttttitle=\bfseries}

\begin{tcolorbox}[title=My title,sidebyside,righthand ratio=0.25]
This is the upper (\textit{left-handed}) part.
\tcblower
This is the lower (\textit{right-handed}) part.
\end{tcolorbox}
```



3.11 Embedding into the Surroundings

Typically, but not necessarily, a `tcolorbox` is put inside a separate paragraph and has some vertical space before and after it. This behavior is controlled by the keys `before` and `after`.

`/tcb/before=<code>` (no default, initially see `/tcb/autoparskip`)
Sets the `<code>` which is executed before the colored box. It is not used for floating boxes.

`/tcb/after=<code>` (no default, initially see `/tcb/autoparskip`)
Sets the `<code>` which is executed after the colored box. It is not used for floating boxes.

`/tcb/parskip` (style, no value)
Sets the keys `before` and `after` to values which are recommended, if the package `parskip` is used and there is no better idea for `before` and `after`.

```
\tcbset{parskip/.style={before={\par\pagebreak[0]\noindent},
                        after={\par}}}
```

`/tcb/noparskip` (style, no value)
Sets the keys `before` and `after` to values which are recommended, if the package `parskip` is *not* used and there is no better idea for `before` and `after`.

```
\tcbset{noparskip/.style={before={\par\smallskip\pagebreak[0]\noindent},
                        after={\par\smallskip}}}
```

`/tcb/autoparskip` (style, no value, initially set)
Tries to detect the usage of the package `parskip` and sets the keys `before` and `after` accordingly. Actually, the following is done:

- If the length of `\parskip` is greater than `0pt` at the beginning of the document, `/tcb/parskip` is executed. Here, the usage of package `parskip` is *assumed*.
- Otherwise, if the length of `\parskip` is not greater than `0pt` at the beginning of the document, `/tcb/noparskip` is executed. Here, the absence of package `parskip` is *assumed*.

`autoparskip` is the default for the package `tcolorbox`, if `before` or `after` are not changed otherwise.

`/tcb/nobeforeafter` (style, no value)
Abbreviation for clearing the keys `before` and `after`. The colored box is not put into a paragraph and there is no space before or after the box.

```
\tcbset{myone/.style={colback=LightGreen,colframe=DarkGreen,
    equal height group=nobefaf,width=\linewidth/4,nobeforeafter}}
\begin{tcolorbox}[myone,title=Box 1]Box 1\end{tcolorbox}%
\begin{tcolorbox}[myone,title=Box 2]Box 2\end{tcolorbox}%
\begin{tcolorbox}[myone,title=Box 3]Box 3\end{tcolorbox}%
\begin{tcolorbox}[myone,title=Box 4]Box 4\end{tcolorbox}
```

Box 1	Box 2	Box 3	Box 4
Box 1	Box 2	Box 3	Box 4

`/tcb/baseline=<length>` (no default, initially `0pt`)
Used to set the `\pgfsetbaseline` value of the resulting `tcolorbox`.

3.12 Bounding Box

Normally, every `tcolorbox` has a bounding box which fits exactly to the dimensions of the outer frame. Therefore, \LaTeX reserves exactly the space needed for the box. This behavior can be changed by enlarging (or shrinking) the bounding box. If the bounding box is enlarged, the `tcolorbox` will get some clearance around it. If the bounding box is shrunk, i. e. enlarged with negative values, the `tcolorbox` will overlap to other parts of the page. For example, the `tcolorbox` could be stretched into the page margin.

The following examples use `/tcb/show bounding box`^{→P.103} to display the actual bounding box. For this, the library `skins` has to be included and `/tcb/enhanced`^{→P.119} has to be set.

`/tcb/enlarge top by=<length>` (no default, initially 0mm)

Enlarges the bounding box distance to the top of the box by `<length>`.

```
\tcbset{colframe=blue!75!black,colback=white}

\begin{tcolorbox}[enlarge top by=-5mm]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
\begin{tcolorbox}[enlarge top by=5mm,enhanced,show bounding box]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
```

This is a **tcolorbox**.

This is a **tcolorbox**.

`/tcb/enlarge bottom by=<length>` (no default, initially 0mm)

Enlarges the bounding box distance to the bottom of the box by `<length>`.

```
\tcbset{colframe=blue!75!black,colback=white}

\begin{tcolorbox}[enlarge bottom by=5mm]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
\begin{tcolorbox}[enlarge bottom by=-5mm,enhanced,show bounding box]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
```

This is a **tcolorbox**.

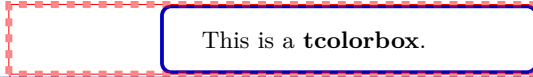
This is a **tcolorbox**.

`/tcb/enlarge left by=<length>` (no default, initially 0mm)

Enlarges the bounding box distance to the left side of the box by $\langle length \rangle$.

```
\tcbset{colframe=blue!75!black,colback=white}

\begin{tcolorbox}[enlarge left by=2cm,width=5cm,enhanced,show bounding box]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
\begin{tcolorbox}[enlarge left by=-2cm,width=\linewidth+2cm]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
```



This is a **tcolorbox**.

This is a **tcolorbox**.

`/tcb/enlarge right by=<length>` (no default, initially 0mm)

Enlarges the bounding box distance to the right side of the box by $\langle length \rangle$.

```
\tcbset{colframe=blue!75!black,colback=white}

\begin{tcolorbox}[enlarge right by=-2cm,width=\linewidth+2cm,
enhanced,show bounding box]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
\begin{tcolorbox}[enlarge right by=2cm,width=\linewidth-2cm]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
```



This is a **tcolorbox**.



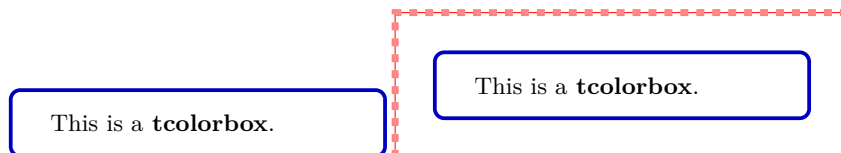
This is a **tcolorbox**.

`/tcb/enlarge by=<length>` (no default, initially 0mm)

Enlarges the bounding box distance to all sides of the box by $\langle length \rangle$.

```
\tcbset{colframe=blue!75!black,colback=white,width=5cm,nobeforeafter}

\begin{tcolorbox}
This is a \textbf{tcolorbox}.
\end{tcolorbox}
\begin{tcolorbox}[enlarge by=5mm,enhanced,show bounding box]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
```



This is a **tcolorbox**.

`/tcb/grow to left by=<length>` (no default, initially 0mm)

Enlarges the current box size by $\langle length \rangle$ and enlarges (shrinks) the bounding box distance to the left side of the box by $-\langle length \rangle$.

```
\tcbset{colframe=blue!75!black,colback=white}

\begin{tcolorbox}[width=5cm,grow to left by=2cm,enhanced,show bounding box]
This is a \textbf{tcolorbox} with a width of 7cm.
\end{tcolorbox}
```

This is a **tcolorbox** with a width of 7cm.

`/tcb/grow to right by=<length>` (no default, initially 0mm)

Enlarges the current box size by $\langle length \rangle$ and enlarges (shrinks) the bounding box distance to the right side of the box by $-\langle length \rangle$.

```
\tcbset{colframe=blue!75!black,colback=white}

\begin{tcolorbox}[grow to right by=2cm,enhanced,show bounding box]
This is a \textbf{tcolorbox}.
\end{tcolorbox}

\bigskip

\begin{tcolorbox}[grow to right by=2cm,grow to left by=1cm,
enhanced,show bounding box]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
```

This is a **tcolorbox**.

This is a **tcolorbox**.

Floating box from toggle enlargement

This page is an odd page. Therefore, the left and right enlargements are not toggled (with some luck; otherwise use `forced`). This box stretches to the right margin on odd pages and to the left margin on even pages. The current document is one-sided – this feature makes sense for two-sided documents only.

`/tcb/toggle enlargement=<toggle preset>` (default `evenpage`, initially `none`)

According to the `<toggle preset>`, the left and the right enlargements of the bounding box are switched or not. Feasible values are:

- **none**: no switching.
- **forced**: the values of the left and right enlargement are switched.
- **evenpage**: if the page is an even page, the values of the left and right enlargement are switched. It is recommended that one use this setting in conjunction with `/tcb/check odd page`^{P. 71}.

```
% \usepackage{changepage} for 'check odd page'
\tcbset{colframe=blue!75!black,colback=white,
grow to left by=20mm,grow to right by=-5mm}

\begin{tcolorbox}[toggle enlargement=none,enhanced,show bounding box]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
\begin{tcolorbox}[toggle enlargement=forced]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
\begin{tcolorbox}[toggle enlargement=evenpage,check odd page]
This page is an \ifthenelse{\isodd{\thepage}}{odd}{even} page.
Therefore, the left and right enlargements
\ifthenelse{\isodd{\thepage}}{are not}{are} toggled.
\end{tcolorbox}
```

This is a **tcolorbox**.

This is a **tcolorbox**.

This page is an odd page. Therefore, the left and right enlargements are not toggled.

```
% \usepackage{changepage} for 'check odd page'
\begin{tcolorbox}[colframe=red!60!black,colback=red!15!white,check odd page,
fonttitle=\bfseries,title=Floating box from \texttt{toggle enlargement},
width=\textwidth,grow to right by=2cm,toggle enlargement=evenpage,float=t]
This page is an \ifthenelse{\isodd{\thepage}}{odd}{even} page.
Therefore, the left and right enlargements
\ifthenelse{\isodd{\thepage}}{are not}{are} toggled (with some luck; otherwise
use |forced|). This box stretches to the right margin on odd pages and to the left
margin on even pages. The current document is one-sided -- this feature makes
sense for two-sided documents only.
\end{tcolorbox}
```

/tcb/shrink tight (style, no value, initially unset)

The total colored box is shrunk to the dimensions of the upper part. There should be no lower part and no title. This style sets the `/tcb/boxsep`^{P. 24} to 0pt and other geometry keys to fitting values. This option is likely to be used with the following extrusion keys.

```
\tcbset{colframe=blue!75!black,colback=white,arc=0mm,boxrule=0.4pt,
nobeeforeafter,tcbbox raise base,shrink tight}
```

```
\begin{tcolorbox}
This is a \textbf{tcolorbox}.
\end{tcolorbox}
```

Lorem `\tcbbox`{ipsum} dolor sit amet, consectetur adipiscing elit.

This is a **tcolorbox**.

Lorem ipsum dolor sit amet, consectetur adipiscing elit.

/tcb/extrude left by=<length> (style, no default, initially unset)

The (upper part of the) colored box is extruded by the given *<length>* to the left side. The inner width and the bounding box is kept unchanged and the operation is additive!

```
\tcbset{enhanced,colframe=red,colback=yellow!25!white,
frame style={opacity=0.25},interior style={opacity=0.5},
nobeeforeafter,tcbbox raise base,shrink tight,extrude by=2mm}
```

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis.

`\tcbbox`[extrude left by=1cm]{Curabitur} dictum gravida mauris.

Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna.

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna.

/tcb/extrude right by=<length> (style, no default, initially unset)

The (upper part of the) colored box is extruded by the given *<length>* to the right side. The inner width and the bounding box is kept unchanged and the operation is additive!

```
\tcbset{enhanced,colframe=red,colback=yellow!25!white,
frame style={opacity=0.25},interior style={opacity=0.5},
nobeeforeafter,tcbbox raise base,shrink tight,extrude by=2mm}
```

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis.

`\tcbbox`[extrude right by=1cm]{Curabitur} dictum gravida mauris.

Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna.

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna.

`/tcb/extrude top by=<length>` (style, no default, initially unset)

The (upper part of the) colored box is extruded by the given *<length>* to the top side. The inner width and the bounding box is kept unchanged and the operation is additiv!

```
\tcbset{enhanced,colframe=red,colback=yellow!25!white,
  frame style={opacity=0.25},interior style={opacity=0.5},
  nobeforeafter,tcbbox raise base,shrink tight,extrude by=2mm}
```

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis.

`\tcbbox[extrude top by=1cm]{Curabitur}` dictum gravida mauris.

Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna.

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna.

`/tcb/extrude bottom by=<length>` (style, no default, initially unset)

The (upper part of the) colored box is extruded by the given *<length>* to the bottom side. The inner width and the bounding box is kept unchanged and the operation is additiv!

```
\tcbset{enhanced,colframe=red,colback=yellow!25!white,
  frame style={opacity=0.25},interior style={opacity=0.5},
  nobeforeafter,tcbbox raise base,shrink tight,extrude by=2mm}
```

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis.

`\tcbbox[extrude bottom by=1cm]{Curabitur}` dictum gravida mauris.

Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna.

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna.

`/tcb/extrude by=<length>` (style, no default, initially unset)

The (upper part of the) colored box is extruded by the given *<length>* to all sides. The inner width and the bounding box is kept unchanged and the operation is additiv!

```
\tcbset{enhanced,colframe=red,colback=yellow!25!white,
  frame style={opacity=0.25},interior style={opacity=0.5},
  nobeforeafter,tcbbox raise base,shrink tight,extrude by=2mm}
```

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. `\tcbbox{Curabitur}` dictum gravida mauris. `\tcbbox[colframe=Green,interior style={opacity=0.0}]{Nam}` arcu libero, nonummy eget, consectetur id, `\tcbbox{vulputate}` a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. `\tcbbox{Mauris ut leo.}`

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo.

3.13 Layered Boxes and Every Box Settings

A `tcolorbox` may contain another `tcolorbox` and so on. The package takes track of the nesting level using a counter `tcblayer`. Counter values may be used for doing some fancy things, but you should never change the counter value yourself.

The package takes special care for the first four layers or nesting levels, called managed layers. Here, footnote texts are administrated to find their intended place and specific layer dependent options may be set by changing `/tcb/every box on layer n`^{→P.65}. If needed, the number of managed layers can be increased by setting `\tcbsetmanagedlayer`^{→P.65} to a higher value than 4.

The following styles have a considerable influence on how layered boxes are processed. Note especially that nested boxes are getting a `/tcb/reset`^{→P.72} by default. You can change this, but be prepared for surprises if you do.

If the defaults are *not changed*, a `tcolorbox` gets its options in the following order. Following options overwrite preceding options.

1. On package load, all options are set to default values.
2. Every `\tcbset`^{→P.10} command adds or changes options for the following boxes inside the current \TeX group.
3. While entering a `tcolorbox`, a `/tcb/every box on layer n`^{→P.65} or `/tcb/every box on higher layers`^{→P.65} option list is applied. With default settings this means:
 - For layer 1 (lowest layer), the `/tcb/every box` option list is applied. Not overwritten options given by a preceding `\tcbset`^{→P.10} survive.
 - For layer 2 and above (nested boxes), a `/tcb/reset`^{→P.72} followed by `/tcb/every box` option list is applied. Every resettable options given by a preceding `\tcbset`^{→P.10} and by the surrounding box(es) are reset.
4. The `\options` given to the `tcolorbox` are applied. Or, if the box was generated by `\newtcolorbox`^{→P.12} or friends, the `\options` given there are applied.
5. If the box was generated by `\newtcolorbox`^{→P.12} or friends, some automated options are applied.

`/tcb/every box` (style)

By default, this style is empty.

```
% default setting:  
\tcbset{every box/.style={}}
```

It may be changed by redefining this style.

```
% setting all boxes to be enhanced:  
\tcbset{every box/.style={enhanced}}
```

The alternative for setting something for every box (on every layer) is `\tcbsetforeverylayer`^{→P.10}:

```
% setting all boxes to be enhanced:  
\tcbsetforeverylayer{enhanced}
```


`/tcb/every box on layer n` (style)

Here, n has to be replaced by a number ranging from 1 to the highest managed layer number (4 by default).

```
% default settings:
\tcbset{
  every box on layer 1/.style={every box},
  every box on layer 2/.style={reset,every box},
  every box on layer 3/.style={reset,every box},
  every box on layer 4/.style={reset,every box},
}
```

`/tcb/every box on higher layers` (style)

Higher layers are layers above the highest managed layer number (4 by default).

```
\tcbset{every box on higher layers/.style={reset,every box}}
```

`\tcbsetmanagedlayer{<number>}`

Replaces the highest managed layer number by $\langle number \rangle$ where 4 is the default. This macro can only be used inside the preamble. Using a $\langle number \rangle$ lower than 4 typically makes no sense, but is not forbidden.

```
% \usepackage{lipsum}
% \tcbuselibrary{skins,breakable}
\tcbset{enhanced jigsaw,breakable,colframe=red!75!black,fonttitle=\bfseries,
  colback=red!5!white,
  every box/.style={enhanced,watermark text=\thetcbbox,
    before=\par\smallskip,after=\par\smallskip},
  every box on layer 2/.style={reset,every box,colback=yellow!10!white,
    drop fuzzy shadow}}
\begin{tcolorbox}[title=Layer 1 Box]
Here comes a footnote\footnote{Footnote from layer 1 box}.
\lipsum[2]
\begin{tcolorbox}[title=Layer 2 Box]
abc\footnote{The footnote of abc}
\end{tcolorbox}
\begin{tcolorbox}[title=Another Box,ams equation]
\tcbhighmath{\sum\limits_{n=1}^{\infty} \frac{1}{n}} = \infty.
\end{tcolorbox}
Some text\footnote{Footnote from some text}.
\begin{tcolorbox}[title=Yet Another Box]
\tcbboxfit[height=2cm]{\lipsum[1]}
My text.
\begin{tcolorbox}
Another lipsum text\footnote{A lipsum text}. \lipsum[3]
\begin{tcolorbox}[title=Layer 4,colframe=blue,colback=white]
Layer 4\footnote{Layer 4 footnote}
\end{tcolorbox}
The End\footnote{Last footnote}.
\end{tcolorbox}
\end{tcolorbox}
\end{tcolorbox}
```

Layer 1 Box

Here comes a footnote^a. Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies

et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

Layer 2 Box

abc^a

^aThe footnote of abc

2

Another Box

$$\sum_{n=1}^{\infty} \frac{1}{n} = \infty.$$

(1)

Some text^b.

Yet Another Box

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

My text.

Another lipsum text^a. Nulla malesuada porttitor diam. Donec felis erat, congue non, volutpat at, tincidunt tristique, libero. Vivamus viverra fermentum felis. Donec nonummy pellentesque ante. Phasellus adipiscing semper elit. Proin fermentum massa ac quam. Sed diam turpis, molestie vitae, placerat a, molestie nec, leo. Maecenas lacinia. Nam ipsum ligula, eleifend at, accumsan nec, suscipit a, ipsum. Morbi blandit ligula feugiat magna. Nunc eleifend consequat lorem. Sed lacinia nulla vitae enim. Pellentesque tincidunt purus vel magna. Integer non enim. Praesent euismod nunc eu purus. Donec bibendum quam in tellus. Nullam cursus pulvinar lectus. Donec et mi. Nam vulputate metus eu enim. Vestibulum pellentesque felis eu massa.

Layer 4

Layer 4^a

^aLayer 4 footnote

4

The End^b.

^aA lipsum text

^bLast footnote

^aFootnote from layer 1 box

^bFootnote from some text

3.14 Capture Mode

`/tcb/capture=<mode>` (no default, initially minipage)

The capture $\langle mode \rangle$ defines how the box content is processed.

Feasible values for $\langle mode \rangle$ are:

- **minipage:**
This is the default $\langle mode \rangle$ for `tcolorbox`^{P.9}. The content may have an upper and a lower part. Optionally, the box can be `/tcb/breakable`^{P.208}. The box content is put into a minipage or into something similar to a minipage.
- **hbox:**
This is the default $\langle mode \rangle$ for `\tcbox`^{P.11}. The content cannot have a lower part and cannot be broken. The colored box is sized according to the dimensions of the content. A shortcut to set this mode is `/tcb/hbox`.
- **fitbox:** (needs the `fitting` library)
This is the default $\langle mode \rangle$ for `\tcboxfit`^{P.220}. The content cannot have a lower part and cannot be broken. The content is sized according to the dimensions of the colored box. A shortcut to set this mode is `/tcb/fit`^{P.222}.

```
\tcbset{colframe=blue!75!black,colback=white}

\begin{tcolorbox}[capture=minipage]
This is a tcolorbox.
\end{tcolorbox}

\begin{tcolorbox}[capture=hbox]
This is a tcolorbox.
\end{tcolorbox}

\begin{tcolorbox}[capture=fitbox,height=9mm]% needs the 'fitting' library
This is a tcolorbox.
\end{tcolorbox}
```

This is a tcolorbox.

This is a tcolorbox.

This is a tcolorbox.

`/tcb/hbox` (style, no default)

Shortcut for `capture=hbox`.

```
\tcbset{colframe=blue!75!black,colback=white}

\begin{tcolorbox}[hbox]
This is a tcolorbox.
\end{tcolorbox}
```

This is a tcolorbox.

`/tcb/minipage` (style, no default)

Shortcut for `capture=minipage`.

3.15 Text Characteristics

`/tcb/parbox=true|false` (default `true`, initially `true`)

The text inside a `tcolorbox` is formatted using a `LaTeX minipage` if the box is unbreakable. If breakable, the box tries a mimicry of a `minipage`. In a `minipage` or `parbox`, paragraphs are formatted slightly different as the main text. If the key value is set to `false`, the normal main text behavior is restored. In some situations, this has some unwanted side effects. It is recommended that one use this experimental setting only where you really want to have this feature.

```
% \usepackage{lipsum} % preamble
\tcbset{width=(\linewidth-2mm)/2,nobeforeafter,arc=1mm,
  colframe=blue!75!black,colback=white,fonttitle=\bfseries,fontupper=\small,
  left=2mm,right=2mm,top=1mm,bottom=1mm,equal height group=parbox}

\begin{tcolorbox}[parbox,adjusted title={parbox=true (normal)}]
  \lipsum[1-2]
\end{tcolorbox}\hfill%
\begin{tcolorbox}[parbox=false,adjusted title={parbox=false}]
  \lipsum[1-2]
\end{tcolorbox}%
```

parbox=true (normal)

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum. Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

parbox=false

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

`/tcb/hyphenationfix=true|false` (default `true`, initially `false`)

Long words at the beginning of paragraphs in very narrow boxes will not be hyphenated using `pdflatex`. This problem is circumvented by applying the `hyphenationfix` option.

```
\tcbset{colframe=blue!75!black,
fontupper=\normalsize,
colback=blue!5!white,width=4cm}

\begin{tcolorbox}
Rechnungsadjunktentochter.\par
Statthaltereikonzipist.
\end{tcolorbox}

\begin{tcolorbox}[hyphenationfix]
Rechnungsadjunktentochter.\par
Statthaltereikonzipist.
\end{tcolorbox}
```

Rechnungsadjunktentochter.
Statthaltereikonzipist.

Rechnungsad-
junktentochter.
Statthal-
tereikonzipist.

`parbox=false` and `hyphenationfix` should not be used together. They are targeting different box types and they do not blend very well.

3.16 Files

`/tcb/tempfile=<file name>` (no default, initially `\jobname.tcbtemp`)

Sets `<file name>` as name for the temporary file which is used inside `tcbwritetemp`^{→ P. 78} and `\tcbusetemp`^{→ P. 78} implicitly.

3.17 \tcbbox Specials

The following options are applicable for `\tcbbox`^{→ P. 11} and `\tcbboxmath`^{→ P. 187} only.

`/tcb/tcbox raise=<length>` (no default, initially `0pt`)

Raises the `\tcbbox`^{→ P. 11} by the given `<length>`.

```
\tcbset{colframe=blue!50!black,colback=white,colupper=red!50!black,
fonttitle=\bfseries,before=,after=,center title}

Test\dotfill
\tcbbox[tcbox raise base]{Hello World 1}\dotfill
\tcbbox{Hello World 2}\dotfill
\tcbbox[tcbox raise=5mm]{Hello World 3}
```

Test Hello World 1 Hello World 2 Hello World 3

`/tcb/tcbox raise base` (style, no value, initially unset)

Raises the `\tcbbox`^{→ P. 11} such that the base of its content matches the base of the environmental line; see example above.

3.18 Skins

There are additional option keys which change the appearance of a `tcolorbox`. If only the core package is used, there is only one *skin* and these keys are meaningless. The library `skins` adds more skins. The appropriate option keys for skins of the core package are therefore described in Section 6.1 on page 79 from page 79.

3.19 Counters, Labels and References

/tcb/phantom=*<code>* (no default, initially unset)

The *<code>* is put in a box at the upper left corner of the `tcolorbox`. If the `tcolorbox` is breakable, the *<code>* is executed for the first box of the break sequence only. If there already was some phantom code given, the new *<code>* is appended.

The *<code>* is intended to be used for counter stepping, labelling, and related operations which do not produce visible text.

- The *<code>* is executed before the title and box content, i. e. counter values are ensured to be increased before usage.
- Labels are ensured to reference the correct page number.
- The *<code>* is executed only once even during fitting operations for title and box content.
- In combination with the `hyperref` package, the hyper anchor is set to the upper left corner of the `tcolorbox`, i. e. links inside the pdf document will jump to the box pleasantly.
- Since the *<code>* is executed inside a \TeX group, only global operations can survive this group.

Examples for the `phantom` usage are given in Section 7.8 from page 179, e. g. Example 7.1 on page 180.

/tcb/nophantom (no value, initially set)

Removes the phantom code if set before.

/tcb/label=*<marker>* (no default, initially unset)

The *<marker>* is set as label text for a reference with the `\ref` macro. Typically, this option is used for numbered boxes, see Subsection 4.1 from page 73, e. g. `/tcb/new/autocounter`^{→ P. 73}.

/tcb/label type=*<type>* (no default, initially unset)

This option key can be used only in conjunction with the `cleveref` package [4] which has to be loaded separately. *<type>* has to be a cross-reference type *known* to `cleveref` like `theorem`, `algorithm`, `result`, etc. References made with `cleveref` will use this type. Note that using `label type` will result in compilation errors, if `cleveref` is not loaded. For an example, see Theorem 8.3.5 on page 203.

/tcb/no label type (no value, initially set)

Removes a `/tcb/label type`, if set before.

/tcb/step=*<counter>* (no default, initially unset)

Shortcut for `phantom={\refstepcounter{#1}}`. The given *<counter>* is increased and ready for labelling. This option is not needed when using the convenient automated numbering introduced with version 2.40, see Subsection 4.1 from page 73.

/tcb/step and label={*<counter>*}{*<marker>*} (no default, initially unset)

Shortcut for using `/tcb/step` and `/tcb/label`. This option is not needed when using the convenient automated numbering introduced with version 2.40, see Subsection 4.1 from page 73.

`/tcb/list entry=<text>` (no default, initially unset)

If the «list of tcolorbox(es)» feature described in Subsection 4.2 from page 77 is used, this key describes the `<text>` for an entry into the generated list, e.g.

```
list entry={\protect\numberline{\thetcbcounter}My beautiful Example}
```

See Section 7.8 from page 179 for a complete example.

`/tcb/add to list={<list>}{<type>}` (no default, initially unset)

If the «list of tcolorbox(es)» feature described in Subsection 4.2 from page 77 is used, list entries are generated automatically. With this key, you can enforce an entry to the given `<list>` with the given `<type>`. This issues:

```
\addcontentsline{<list>}{<type>}{<entry text>}
```

`/tcb/check odd page=true|false` (default `true`, initially `false`)

If set to `true`, the even/odd page testing from the package `changepage` is applied. The `/tcb/toggle enlargement`^{→ P. 61} check and the `/tcb/toggle left and right`^{→ P. 30} check will use the `\ifoddpage` macro from this package. This options is independent from `/tcb/phantom`^{→ P. 70}. Note that you have to include the package `changepage` by hand²:

```
\usepackage{changepage}  
\strictpagecheck
```

The macro `\ifoddpage` can be used inside overlay or watermark code to test if the box is on an odd page. This will work also for boxes in a break sequence. Note that you cannot use the test inside the normal box content.

```
% \usepackage{changepage}  
\tcbset{colframe=blue!75!black,colback=white}  
  
\begin{tcolorbox}[enhanced,check odd page,  
  watermark text={\ifoddpage Odd\else Even\fi\ page!}]  
\lipsum[1]  
\end{tcolorbox}
```

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

²If `changepage` is not included, a compilation error will arise.

3.20 Externalization

If the *externalization* library of the *tikz* package is used and `/tcb/graphical environment`^{→P.80} is set to `tikzpicture`, a `tcolorbox` could trigger the externalization process which will arise a compilation error.

To avoid this, there are two possible strategies:

- Ensure, that `\tikzexternaldisable` is set before a `tcolorbox` is used. If you typically use the pattern `\tikzexternalenable some picture \tikzexternaldisable`, there is nothing to care about.
- If *externalization* is enabled globally, use `/tcb/shield externalize` to shield any `tcolorbox`. The preamble code could look like this:

```
\usetikzlibrary{external}  
\tikzexternalize  
\tcbset{shield externalize}
```

`/tcb/shield externalize=true|false` (default `true`, initially `false`)

If set to `true`, the drawing part of the `tcolorbox` is not being externalized which is a good thing at the current state of art. Nevertheless, if the `tcolorbox` contains a `tikzpicture`, this picture is still externalized. Pictures drawn with help of `/tcb/tikz upper`^{→P.46} or alike are *not* externalized.

If a `tcolorbox` is used inside a node of an encircling `tikzpicture` which is externalized, do *not* use `\tikzexternaldisable` in front of the `tcolorbox`. `/tcb/shield externalize` is deactivated automatically inside a `tikzpicture`.

`/tcb/external=<file name>` (no default, initially unset)

Convenience option which calls `\tikzsetnextfilename{<file name>}`. Typically, it may be used inside the option list of a `tcolorbox` to set the externalization `<file name>` for the first `tikzpicture` which is discovered *inside* the box content. The package `tikz` [17] or the library `skins` has to be loaded to use this option. Additionally, `\usetikzlibrary{external}` has to be used.

`/tcb/remake=true|false` (default `true`, initially `false`)

Convenience option which calls `/tikz/external/remake next`. Typically, it may be used inside the option list of a `tcolorbox` to force the remake of the first `tikzpicture` which is discovered *inside* the box content. The package `tikz` [17] or the library `skins` has to be loaded to use this option. Additionally, `\usetikzlibrary{external}` has to be used.

3.21 Miscellaneous

`/tcb/reset` (no value, initially set)

Sets (nearly) all `tcolorbox` settings (including loaded libraries) back to their default values *plus* any settings given by `\tcbsetforeverylayer`^{→P.10}. `/tcb/savedelimiter`^{→P.18} and `/tcb/capture`^{→P.67} keep their values. This option is useful for boxes in boxes where the inner box should not inherit the settings of the outer box. Note that for boxes inside boxes the `reset` is done automatically, if the standard settings of the package are used (v2.40 and above), see Section 3.13 from page 64.

4 Initialization Option Keys

The *initialization* options are only applicable for the generation of new environments and commands based on `tcolorbox` and friends. Particularly, they can be used for

- `\newtcolorbox`^{→ P. 12},
- `\newtcbox`^{→ P. 13},
- `\newtcblisting`^{→ P. 159},
- `\newtcbinputlisting`^{→ P. 161},
- `\newtcbtheorem`^{→ P. 185}, and
- `\newtcbboxfit`^{→ P. 221}.

Typically, these options may generate counters and alike. It is **strongly** recommended that one use initialization options inside the preamble only. Otherwise, you may get trouble when using L^AT_EX's `\include` features.

4.1 Numbered Boxes

Counters assigned using the initialization options are administrated automatically. Especially, they are increased for each new box. Independent from the real counter name, the counter value can be referenced by `\thetcbcounter`, e.g. inside the title of the box. The real counter name is stored inside `\tcbcounter`.

`/tcb/new/auto counter` (no value, initially unset)

Creates a new counter automatically. With `/tcb/new/number format`^{→ P. 75} and `/tcb/new/number within`^{→ P. 75}, the appearance and behavior of the counter can be changed. The counter value is referenced by `\thetcbcounter`.

Definition in the preamble:

```
\newtcolorbox[auto counter,number within=section]{pabox}[2][]{%
  colback=red!5!white,colframe=red!75!black,fonttitle=\bfseries,
  title=Examp.~\thetcbcounter: #2,#1}
```

```
\begin{pabox}[label={myautocounter}]{Title with number}
This box is automatically numbered with \ref{myautocounter} on page
\pageref{myautocounter}. Inside the box, the \thetcbcounter\ can
also be referenced by |\thetcbcounter|.
The real counter name is \texttt{\tcbcounter}.
\end{pabox}
```

Examp. 4.1: Title with number

This box is automatically numbered with 4.1 on page 73. Inside the box, the 4.1 can also be referenced by `\thetcbcounter`. The real counter name is `tcb@cnt@pabox`.

`/tcb/new/use counter from=<tclobox>` (no default, initially unset)

Here, a counter from another `<tclobox>` is reused. Note that the setting for `/tcb/new/number format`^{→ P. 75} and `/tcb/new/number within`^{→ P. 75} are inherited and cannot be changed. The counter value is referenced by `\thetcbcounter`.

```
\newtcolorbox[use counter from=pabox]{mybox}[2][]{%
colback=blue!5!white,colframe=blue!75!black,fonttitle=\bfseries,
title=Some Box \thetcbcounter: #2,#1}

\begin{mybox}[label={myusecounterfrom}]{Title with continued number}
This box is automatically numbered with \ref{myusecounterfrom} on page
\pageref{myusecounterfrom}. Inside the box, the \thetcbcounter\ can
also be referenced by |\thetcbcounter|.
The real counter name is \texttt{\tcbcounter}.
\end{mybox}
```

Some Box 4.2: Title with continued number

This box is automatically numbered with 4.2 on page 74. Inside the box, the 4.2 can also be referenced by `\thetcbcounter`. The real counter name is `tcb@cnt@pabox`.

`/tcb/new/use counter=<counter>` (no default, initially unset)

Here, an ordinary existing L^AT_EX counter is used for numbering. With `/tcb/new/number format`^{→ P. 75} and `/tcb/new/number within`^{→ P. 75}, the appearance and behavior of the counter can be changed. The counter value is referenced by `\thetcbcounter`.

```
% \newcounter{myexample}% preamble
\newtcolorbox[use counter=myexample,number format=\Alph]{mybox}[2][]{%
colback=green!5!white,colframe=green!55!black,fonttitle=\bfseries,
title=Some Box \thetcbcounter: #2,#1}

\begin{mybox}[label={myusecounter}]{Title with \LaTeX\ number}
This box is automatically numbered with \ref{myusecounter} on page
\pageref{myusecounter}. Inside the box, the \thetcbcounter\ can
also be referenced by |\thetcbcounter|.
The real counter name is \texttt{\tcbcounter}.
\end{mybox}
```

Some Box A: Title with L^AT_EX number

This box is automatically numbered with A on page 74. Inside the box, the A can also be referenced by `\thetcbcounter`. The real counter name is `myexample`.

`/tcb/new/no counter` (no value, initially set)

The created boxes are not numbered. This is the default. The option may be used to overrule a previous option.

`/tcb/new/number within=<counter>` (no default, initially unset)

The automatic counter is set to zero, if `<counter>` is increased. Additionally, during output, the value of `<counter>` is prepended to the value of the automatic counter.

To prepend the automatic counter with the chapter number and to reset it with every new chapter, use:

```
number within=chapter
```

See `/tcb/new/use counter`^{→ P. 74} for a complete example.

`/tcb/new/number format=<format macro>` (no default, initially `\arabic`)

Declares the format of the automatic counter. The `<format macro>` can be any valid L^AT_EX number formatting macro like `\arabic`, `\roman`, etc.

To display the counter value in large roman numbers, use:

```
number format=\Roman
```

See `/tcb/new/auto counter`^{→ P. 73} for a complete example.

`/tcb/new/number freestyle=<code>` (no default, initially unset)

Allows advanced control over the complete number format. This option overrules the format given by `/tcb/new/number within` and `/tcb/new/number format`. Nevertheless, you can combine it with `/tcb/new/number within` to get the desired reset property.

The `<code>` is some formatting code which should contain `\tcbcounter` to reference the automated counter. Since this `<code>` is expanded, you have to secure each macro with `\noexpand` with exception of `\tcbcounter`.

Definition in the preamble:

```
\newcolorbox[auto counter,number within=section,
  number freestyle={(Q/\noexpand\thesection/\noexpand\Alph{\tcbcounter})},
  ]{phbox}[2][]{%
  colback=yellow!15!white,colframe=blue!75!black,fonttitle=\bfseries,
  title=Question~\thetcbcounter: #2,#1}
```

```
\begin{phbox}[label={myfreestyle}]{Title with freestyle number}
This box is automatically numbered with \ref{myfreestyle} on page
\pageref{myfreestyle}. Inside the box, the \thetcbcounter\ can
also be referenced by |\thetcbcounter|.
The real counter name is \texttt{\tcbcounter}.
\end{phbox}
```

Question (Q/4/A): Title with freestyle number

This box is automatically numbered with (Q/4/A) on page 75. Inside the box, the (Q/4/A) can also be referenced by `\thetcbcounter`. The real counter name is `tcb@cnt@phbox`.

The following options `/tcb/new/crefname` and `/tcb/new/Crefname` need to be set inside the preamble.

`/tcb/new/crefname={⟨singular⟩}{⟨plural⟩}` (no default, initially unset)

This option key can be used only in conjunction with the `cleveref` package [4] which has to be loaded separately. It creates a cross-reference type for the new `tcolorbox`'es, where the lowercase `⟨singular⟩` and `⟨plural⟩` forms of the cross-reference are given. See `/tcb/label type`^{→ P. 70} and [4] for more information.

`/tcb/new/Crefname={⟨singular⟩}{⟨plural⟩}` (no default, initially unset)

This option key can be used only in conjunction with the `cleveref` package [4] which has to be loaded separately. It creates a cross-reference type for the new `tcolorbox`'es, where the uppercase `⟨singular⟩` and `⟨plural⟩` forms of the cross-reference are given. See `/tcb/label type`^{→ P. 70} and [4] for more information.

Definition in the preamble:

```
% \usepackage{cleveref}
\newtcolorbox[auto counter,number within=section,
  Crefname={Bluebox}{Blueboxes},crefname={bluebox}{blueboxes}]%
{mybluebox}[2][colback=blue!5!white,colframe=blue!75!black,fonttitle=\bfseries,
  title=Bluebox \thetcbcounter: #2,#1]
```

```
% \usepackage{cleveref}
% \usepackage{varioref}
\begin{mybluebox}[label={myreference}]{My title}
This is an example.
\end{mybluebox}

\Cref{myreference}, \cref{myreference}.\
\Cpageref{myreference}, \cpageref{myreference}.\
\nameCref{myreference}, \namecref{myreference}.\
\labelcref{myreference}, \labelcpageref{myreference}.\
With \texttt{varioref}:\
\Vref{myreference}, \vref{myreference}.\
\Vref*{myreference}, \vref*{myreference}.
```

Bluebox 4.1: My title

This is an example.

Bluebox 4.1, bluebox 4.1.

Page 76, page 76.

Bluebox, bluebox.

4.1, 76.

With `varioref`:

Bluebox 4.1, bluebox 4.1.

Bluebox 4.1, bluebox 4.1.

4.2 Lists of tcolorboxes

For figures and tables, L^AT_EX provides the `\listoffigures` and `\listoftables` commands to create lists of these numbered entities. Also, a `tcolorbox` can be part of such a kind of list.

1. Assign a list $\langle name \rangle$ by the *initialization* option `/tcb/new/list inside`.
2. Optionally, a new $\langle type \rangle$ for list entries may be assigned by the *initialization* option `/tcb/new/list type`.
3. List entries are generated automatically within each new `tcolorbox` using the above initialization.
 - If `/tcb/list entry`^{→ P.71} is set, the entry is generated with it.
 - Otherwise, if `/tcb/title`^{→ P.14} is set, the entry is generated with it.
 - Otherwise, the entry is generated with the current number and the environment name.
4. The generated list is displayed by `\tcblstof`.

`/tcb/new/list inside= $\langle name \rangle$` (no default, initially unset)

Assigns a list or contents file to the generated `tcolorboxes`. Entries to this list are saved to a file which gets the $\langle name \rangle$ as file name extension. The list is referenced by this name in `\tcblstof`. For example:

```
list inside=exam
```

See Section 7.8 from page 179 for a complete example.

`/tcb/new/list type= $\langle type \rangle$` (no default, initially `tcolorbox`)

Optionally, some $\langle type \rangle$ can be assigned to the list entries. For a new $\langle type \rangle$, a macro `\l@ $\langle type \rangle$` has to exist which controls the format of the list entry. The default type is defined by

```
\newcommand*\l@tcolorbox{\@dottedtocline{1}{1.5em}{2.3em}}
```

This is identical to the `\l@section` setting of L^AT_EX. `\l@tcolorbox` can be redefined or a new $\langle type \rangle$ can be assigned.

`\tcblstof[$\langle macro \rangle$]{ $\langle name \rangle$ }{ $\langle title text \rangle$ }`

Displays the generated list of `tcolorboxes` with the given $\langle name \rangle$. The heading is generated by $\langle macro \rangle$ { $\langle title text \rangle$ } where `\section` is the default setting for $\langle macro \rangle$.

To display the list inside a subsection, use for example:

```
\tcblstof[\subsection]{exam}{List of Exercises}
```

The result of the example is found as Subsection 7.9 on page 182.

The core of the list is generated by `\@starttoc{ $\langle name \rangle$ }` which can be wrapped into an own macro.

5 Saving and Loading of Verbatim Texts

The following macros are slightly modified versions of the original macros from the known packages `moreverb` and `verbatim`. They are used implicitly inside of a `tcolorbox` environment, but they can be used outside also.

```
\begin{tcbverbatimwrite}{\file name}  
  \environment content  
\end{tcbverbatimwrite}
```

Saves the `\environment content` to a file named by `\file name`. \TeX macros inside the environment are not expanded.

```
\begin{tcbverbatimwrite}{\jobname_verbexp.tex}  
  This text is saved \textit{as is}.  
\end{tcbverbatimwrite}
```

```
Now, we are using the file:\par  
\input{\jobname_verbexp.tex}
```

Now, we are using the file:
This text is saved *as is*.

This environment may be used inside an own environment. Note, that inside the environment definition `\tcbverbatimwrite` has to be used instead of `\begin{tcbverbatimwrite}` and `\end{tcbverbatimwrite}` instead of `\end{tcbverbatimwrite}`.

```
\newenvironment{myverbatim}{%  
  \begin{group}\tcbverbatimwrite{\jobname_myverb.tex}}%  
  {\end{tcbverbatimwrite}\end{group}}  
  
\begin{myverbatim}  
  This is the text which is saved by my own environment.  
\end{myverbatim}
```

```
Now, we are using the file:\par  
\input{\jobname_myverb.tex}
```

Now, we are using the file:
This is the text which is saved by my own environment.

```
\begin{tcbwritetemp}  
  \environment content  
\end{tcbwritetemp}
```

Has the same function as `tcbverbatimwrite`, but uses the key value of `tempfile` for the file name.

```
\begin{tcbwritetemp}  
  This text is saved \textit{as is}.  
\end{tcbwritetemp}
```

```
Now, we are using the file:\par  
\tcbusetemp
```

Now, we are using the file:
This text is saved *as is*.

```
\tcbusetemp
```

Loads the current temporary file which was saved by `tcbwritetemp`.


6 Library

The library is loaded by a package option or inside the preamble by:

```
\tcbuselibrary{skins}
```

This also loads the package `tikz` [17]. Typically but not necessarily, the following skins use `tikz` instead of `pgf`.

6.1 Technical Overview and Core Package Option Keys

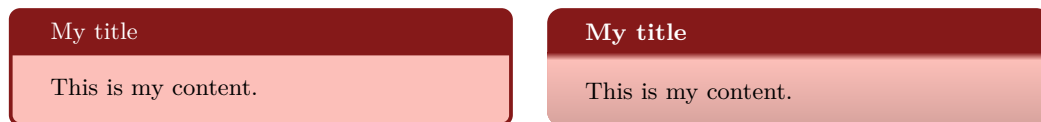
From a technical point of view, a *skin* is a style definition for the appearance of a `tcolorbox`. The core package provides some additional option keys for skins but only a single skin called `standard`^{P.117}. The  library adds several more skins. To change a skin, only one option from the core package has to be set.

/tcb/skin=*<name>* (style, no default, initially `standard`)

Sets the current skin to *<name>*. This is a style definition which sets all the following keys, i.e. for many use cases there is nothing more to do.

```
\tcbset{colback=Salmon!50!white,colframe=FireBrick!75!black,
width=(\linewidth-8mm)/2,before=,after=\hfill,equal height group=ske}

\begin{tcolorbox}[adjusted title=My title]
  This is my content.
\end{tcolorbox}
\begin{tcolorbox}[skin=beamer,beamer,adjusted title=My title]
  This is my content.
\end{tcolorbox}
```



On first read, you may skip the rest of this subsection and proceed to Subsection 6.2 on page 83. All following keys in this subsection are automatically set by the selected skin and you may never have to temper with them. Nevertheless, they can be used after a skin was selected to modify this skin.

/tcb/skin first=*<name>* (style, no default, initially `standard`)

If the box is set to be `/tcb/breakable`^{P.208} and *is* broken actually, then the skin for the *first* part of the break sequence is set to *<name>*, see Subsection 9.5 on page 212. Typically, this key is set by a `/tcb/skin`.

/tcb/skin middle=*<name>* (style, no default, initially `standard`)

If the box is set to be `/tcb/breakable`^{P.208} and *is* broken actually, then the skin for the *middle* parts (if any) of the break sequence is set to *<name>*, see Subsection 9.5 on page 212. Typically, this key is set by a `/tcb/skin`.

/tcb/skin last=*<name>* (style, no default, initially `standard`)

If the box is set to be `/tcb/breakable`^{P.208} and *is* broken actually, then the skin for the *last* part of the break sequence is set to *<name>*, see Subsection 9.5 on page 212. Typically, this key is set by a `/tcb/skin`.

/tcb/graphical environment= $\langle name \rangle$ (no default, initially **pgfpicture**)

Sets the graphical environment for the **tcolorbox** to $\langle name \rangle$. Feasible values are **pgfpicture** and **tikzpicture** or environments which inherit from one of these two. This key is set by a **/tcb/skin**^{→P. 79} and may seldom be used directly.

The skin of a **tcolorbox** is drawn by up to four *engines*. Afterwards, the text content is drawn which is not part of a skin. The four steps are:

1. The *frame* of the box.
2. The *interior* of the box. The interior of a box with title is drawn differently from a box without title.
3. The *segmentation* (line) of the box, if there is a lower part.
4. The *title area* of the box, if there is a title.

Every engine for the up to four steps can be set to one of the following types:

1. **standard**: the original code from the core package.
2. **path**: a **tikz** path which can be controlled by options.
3. **pathfirst**: a **tikz** path which can be controlled by options.
4. **pathmiddle**: a **tikz** path which can be controlled by options.
5. **pathlast**: a **tikz** path which can be controlled by options.
6. **freelance**: arbitrary user code.
7. **spartan**: a quite spartan code.

/tcb/frame engine= $\langle name \rangle$ (no default, initially **standard**)

Sets the *frame* drawing engine for a box to $\langle name \rangle$. Typically, this key is set by a **/tcb/skin**^{→P. 79}. Feasible values for $\langle name \rangle$ are:

- **standard**: the original code from the core package,
- **path**: a **tikz** path which is controlled by **/tcb/frame style**^{→P. 83},
- **pathjigsaw**: a **tikz** path which is controlled by **/tcb/frame style**^{→P. 83},
- **pathfirst**: a **tikz** path which is controlled by **/tcb/frame style**^{→P. 83},
- **pathfirstjigsaw**: a **tikz** path which is controlled by **/tcb/frame style**^{→P. 83},
- **pathmiddle**: a **tikz** path which is controlled by **/tcb/frame style**^{→P. 83},
- **pathmiddlejigsaw**: a **tikz** path which is controlled by **/tcb/frame style**^{→P. 83},
- **pathlast**: a **tikz** path which is controlled by **/tcb/frame style**^{→P. 83},
- **pathlastjigsaw**: a **tikz** path which is controlled by **/tcb/frame style**^{→P. 83},
- **freelance**: arbitrary user code which is given by **/tcb/frame code**^{→P. 86}.
- **spartan**: a quite spartan code.

/tcb/interior titled engine= $\langle name \rangle$ (no default, initially **standard**)

Sets the *interior* drawing engine for a titled box to $\langle name \rangle$. Typically, this key is set by a **/tcb/skin**^{→P. 79}. Feasible values for $\langle name \rangle$ are:

- **standard**: the original code from the core package,
- **path**: a **tikz** path which is controlled by **/tcb/interior style**^{→P. 83},
- **pathfirst**: a **tikz** path which is controlled by **/tcb/interior style**^{→P. 83},
- **pathmiddle**: a **tikz** path which is controlled by **/tcb/interior style**^{→P. 83},
- **pathlast**: a **tikz** path which is controlled by **/tcb/interior style**^{→P. 83},
- **freelance**: arbitrary user code which is given by **/tcb/interior titled code**^{→P. 86}.
- **spartan**: a quite spartan code.

`/tcb/interior engine=<name>` (no default, initially **standard**)

Sets the *interior* drawing engine for an untitled box to `<name>`. Typically, this key is set by a `/tcb/skin`^{→ P. 79}. Feasible values for `<name>` are:

- **standard**: the original code from the core package,
- **path**: a tikz path which is controlled by `/tcb/interior style`^{→ P. 83},
- **pathfirst**: a tikz path which is controlled by `/tcb/interior style`^{→ P. 83},
- **pathmiddle**: a tikz path which is controlled by `/tcb/interior style`^{→ P. 83},
- **pathlast**: a tikz path which is controlled by `/tcb/interior style`^{→ P. 83},
- **freelance**: arbitrary user code which is given by `/tcb/interior code`^{→ P. 87}.
- **spartan**: a quite spartan code.

`/tcb/segmentation engine=<name>` (no default, initially **standard**)

Sets the *segmentation* (line) drawing engine for a box to `<name>`. Typically, this key is set by a `/tcb/skin`^{→ P. 79}. Feasible values for `<name>` are:

- **standard**: the original code from the core package,
- **path**: a tikz path which is controlled by `/tcb/segmentation style`^{→ P. 84},
- **freelance**: arbitrary user code which is given by `/tcb/segmentation code`^{→ P. 87}.
- **spartan**: a quite spartan code.

`/tcb/title engine=<name>` (no default, initially **standard**)

Sets the *title area* drawing engine for a titled box to `<name>`. Typically, this key is set by a `/tcb/skin`^{→ P. 79}. Feasible values for `<name>` are:

- **standard**: the original code from the core package,
- **path**: a tikz path which is controlled by `/tcb/title style`^{→ P. 85},
- **pathfirst**: a tikz path which is controlled by `/tcb/title style`^{→ P. 85},
- **pathmiddle**: a tikz path which is controlled by `/tcb/title style`^{→ P. 85},
- **pathlast**: a tikz path which is controlled by `/tcb/title style`^{→ P. 85},
- **freelance**: arbitrary user code which is given by `/tcb/title code`^{→ P. 88}.
- **spartan**: a quite spartan code.

`/tcb/geometry nodes=true|false` (default **true**, initially **false**)

If set to **true**, up to four tikz nodes are defined for a **tcolorbox** which are named **frame**, **interior**, **segmentation**, and **title**. These nodes describe the boundaries of the equally named parts of a **tcolorbox**. They are used by all engines of type **path** and they may be used by engines of type **freelance**. Typically, this key is set by a `/tcb/skin`^{→ P. 79}.

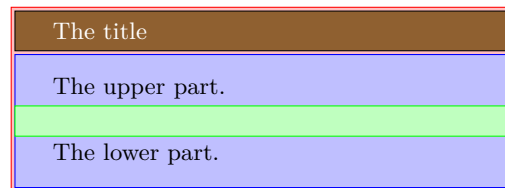
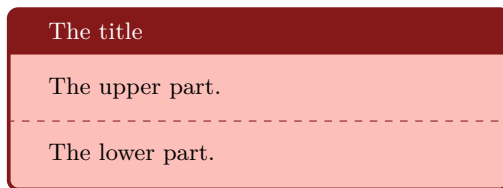
```

\tcbset{colback=Salmon!50!white,colframe=FireBrick!75!black,
width=(\linewidth-8mm)/2,before=,after=\hfill,equal height group=geon}

\begin{tcolorbox}[adjusted title=The title]
The upper part.\tcblower The lower part.
\end{tcolorbox}

\begin{tcolorbox}[adjusted title=The title,skin=freelance,
frame code={\path[draw=red,fill=red!25]
(frame.south west) rectangle (frame.north east);},
interior titled code={\path[draw=blue,fill=blue!25]
(interior.south west) rectangle (interior.north east);},
segmentation code={\path[draw=green,fill=green!25]
(segmentation.south west) rectangle (segmentation.north east);},
title code={\path[draw=black,fill=brown!75!black]
(title.south west) rectangle (title.north east);}]
The upper part.\tcblower The lower part.
\end{tcolorbox}

```



6.2 Style Option Keys

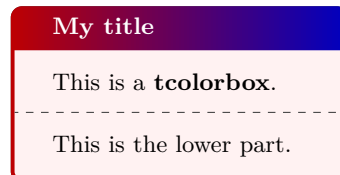
The following style options are applicable for all skins which use engines of type `path`, `pathfirst`, `pathmiddle`, or `pathlast`. Especially, the skin `enhanced`^{→P.119} supports *all* of them and `standard`^{→P.117} *none*.

`/tcb/frame style=<tikz keys>` (style, no default)

The `<tikz keys>` are used inside the `tikz` path command for drawing the *frame* of the box. This option is available if the `/tcb/frame engine`^{→P.80} is set to `path`, `pathfirst`, `pathmiddle`, or `pathlast`. It is *not* available for `standard` and it *may* be applicable for `freelance`.

```
\tcbset{colback=red!5!white,fonttitle=\bfseries}

\begin{tcolorbox}[enhanced,title=My title,
  frame style={left color=red!75!black,
              right color=blue!75!black}]
This is a \textbf{tcolorbox}.
\tcblower
This is the lower part.
\end{tcolorbox}
```



`/tcb/frame hidden` (style, no value)

This is a shortcut for `frame style={draw=none,fill=none}`. Depending on the skin, this option switches off the drawing of the frame.

```
\tcbset{colback=red!5!white,colframe=red!75!black,
  fonttitle=\bfseries,coltitle=black}

\begin{tcolorbox}[enhanced,title=My title,
  frame hidden]
This is a \textbf{tcolorbox}.
\tcblower
This is the lower part.
\end{tcolorbox}
```

My title

This is a **tcolorbox**.

This is the lower part.

`/tcb/interior style=<tikz keys>` (style, no default)

The `<tikz keys>` are used inside the `tikz` path command for drawing the *interior* of the box. They are used for the titled and for the untitled version as well.

This option is available if the `/tcb/interior titled engine`^{→P.80} or `/tcb/interior engine`^{→P.81} is set to `path`, `pathfirst`, `pathmiddle`, or `pathlast`. It is *not* available for `standard` and it *may* be applicable for `freelance`.

```
\tcbset{colframe=red!75!black,fonttitle=\bfseries}

\begin{tcolorbox}[enhanced,title=My title,
  interior style={left color=red!20!white,
                 right color=yellow!50!white}]
This is a \textbf{tcolorbox}.
\tcblower
This is the lower part.
\end{tcolorbox}
```

My title

This is a **tcolorbox**.

This is the lower part.

`/tcb/interior hidden` (style, no value)

This is a shortcut for `interior style={draw=none,fill=none}`. Depending on the skin, this option switches off the drawing of the interior.

```
\tcbset{frame style={top color=red!20!white,
  bottom color=red!20!white!75!black},
  fonttitle=\bfseries,coltitle=black}

\begin{tcolorbox}[enhanced,title=My title,
  interior hidden]
This is a \textbf{tcolorbox}.
\tcblower
This is the lower part.
\end{tcolorbox}
```

My title

This is a **tcolorbox**.

This is the lower part.

`/tcb/segmentation style=<tikz keys>` (style, no default)

The `<tikz keys>` are used inside the `tikz` path command for drawing the *segmentation* line of the box.

This option is available if the `/tcb/segmentation engine`^{→P.81} is set to `path`. It is *not* available for `standard` and it *may* be applicable for `freelance`.

```
\tcbset{colback=red!5!white,colframe=red!75!black,
  fonttitle=\bfseries}

\begin{tcolorbox}[enhanced,title=My title,
  segmentation style={double=white,draw=blue,
    double distance=1pt,solid}]
This is a \textbf{tcolorbox}.
\tcblower
This is the lower part.
\end{tcolorbox}
```

My title

This is a **tcolorbox**.

This is the lower part.

`/tcb/segmentation hidden` (style, no value)

This is a shortcut for `segmentation style={draw=none,fill=none}`. Depending on the skin, this option switches off the drawing of the segmentation line. See also `/tcb/lower separated`^{→P.17} which has the same effect for most skins.

```
\tcbset{colback=red!5!white,colframe=red!75!black,
  fonttitle=\bfseries}

\begin{tcolorbox}[title=My title,
  enhanced,segmentation hidden]
This is a \textbf{tcolorbox}.
\tcblower
This is the lower part.
\end{tcolorbox}
```

My title

This is a **tcolorbox**.

This is the lower part.

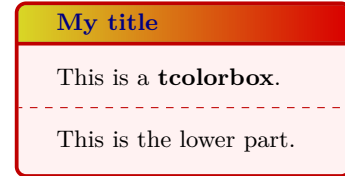
`/tcb/title style=<tikz keys>` (style, no default)

The `<tikz keys>` are used inside the `tikz` path command for drawing the *title area* of the box.

This option is available if the `/tcb/title engine`^{P.81} is set to `path`, `pathfirst`, `pathmiddle`, or `pathlast`. It is *not* available for `standard` and it *may* be applicable for `freelance`.

```
\tcbset{colback=red!5!white,colframe=red!75!black,
  coltitle=blue!50!black,fonttitle=\bfseries}

\begin{tcolorbox}[enhanced,title=My title,
  title style={left color=blue!15!yellow,
    right color=red!85!black}]
This is a \textbf{tcolorbox}.
\tcblower
This is the lower part.
\end{tcolorbox}
```

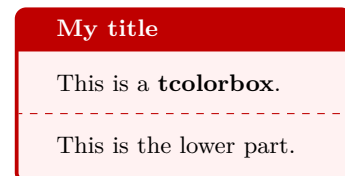


`/tcb/title hidden` (style, no value)

This is a shortcut for `title style={draw=none,fill=none}`. Depending on the skin, this option switches off the drawing of the title background. See also `/tcb/title filled`^{P.19} for a similar effect.

```
\tcbset{colback=red!5!white,colframe=red!75!black,
  fonttitle=\bfseries}

\begin{tcolorbox}[title=My title,
  enhanced,title hidden]
This is a \textbf{tcolorbox}.
\tcblower
This is the lower part.
\end{tcolorbox}
```



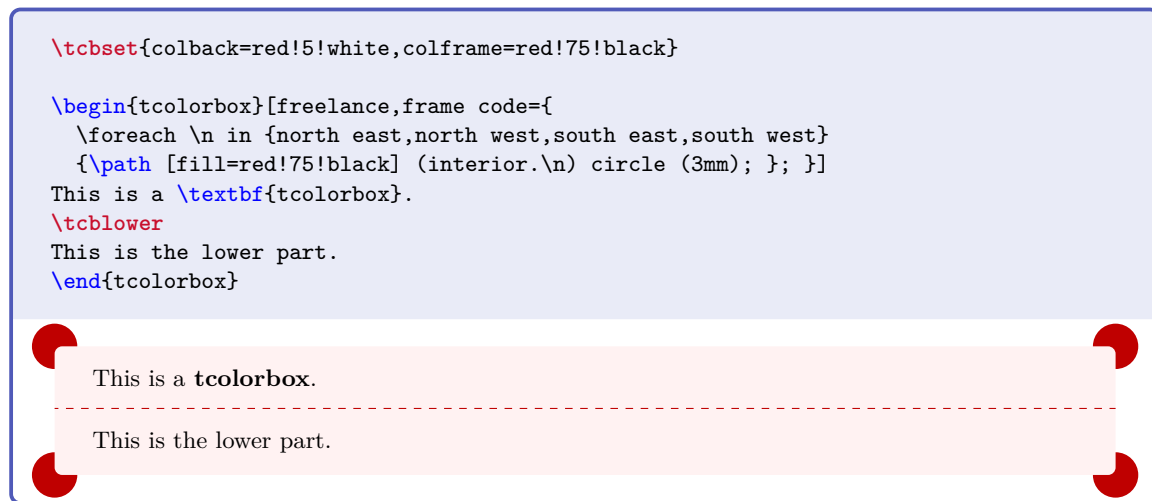
6.3 Code Option Keys

The following code options are applicable for all skins which use engines of type **freelance**. Especially, the skin **freelance**^{→ P. 132} supports *all* of them, **standard**^{→ P. 117} and **enhanced**^{→ P. 119} *none* of them.

/tcb/frame code=*<graphical code>* (code, default from **standard**)

The given *<graphical code>* is used for drawing the *frame* of the box.

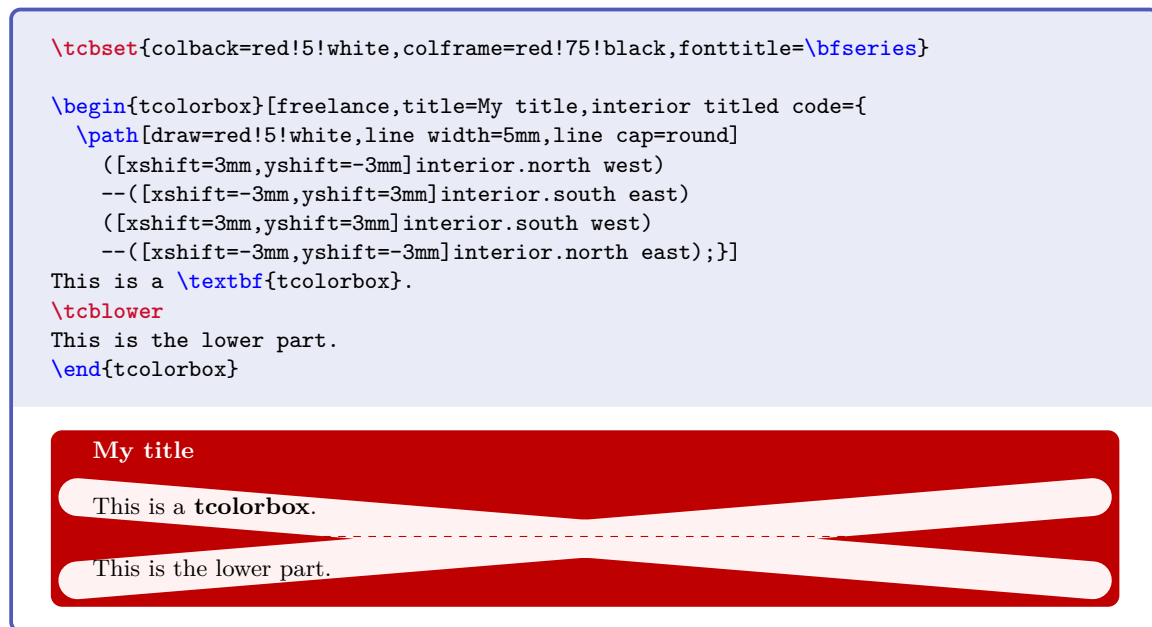
This option is available only if the **/tcb/frame engine**^{→ P. 80} is set to **freelance**.



/tcb/interior titled code=*<graphical code>* (code, default from **standard**)

The given *<graphical code>* is used for drawing the *interior* of the box, if the box comes with a title.

This option is available only if the **/tcb/interior titled engine**^{→ P. 80} is set to **freelance**.



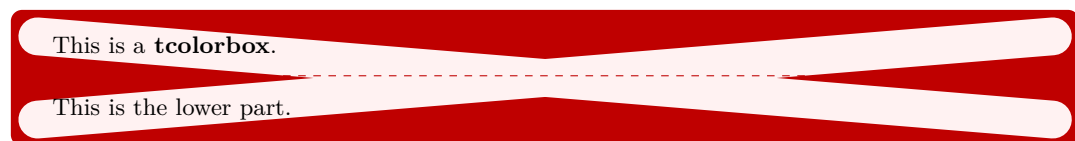
`/tcb/interior code=<graphical code>` (code, default from `standard`)

The given `<graphical code>` is used for drawing the *interior* of the box, if the box is without a title.

This option is available only if the `/tcb/interior engine`^{P.81} is set to `freelance`.

```
\tcbset{colback=red!5!white,colframe=red!75!black}

\begin{tcolorbox}[freelance,interior code={
  \path[draw=red!5!white,line width=5mm,line cap=round]
    ([xshift=3mm,yshift=-3mm]interior.north west)
    --([xshift=-3mm,yshift=3mm]interior.south east)
    ([xshift=3mm,yshift=3mm]interior.south west)
    --([xshift=-3mm,yshift=-3mm]interior.north east);}]
This is a \textbf{tcolorbox}.
\tcblower
This is the lower part.
\end{tcolorbox}
```



`/tcb/segmentation code=<graphical code>` (code, default from `standard`)

The given `<graphical code>` is used for drawing the *segmentation* area of the box.

This option is available only if the `/tcb/segmentation engine`^{P.81} is set to `freelance`.

```
\tcbset{colback=red!5!white,colframe=red!75!black,fonttitle=\bfseries}

\begin{tcolorbox}[freelance,title=My title,segmentation code={
  \path[top color=red!5!white,bottom color=red!5!white,middle color=blue]
    (segmentation.south west) rectangle (segmentation.north east);}]
This is a \textbf{tcolorbox}.
\tcblower
This is the lower part.
\end{tcolorbox}
```



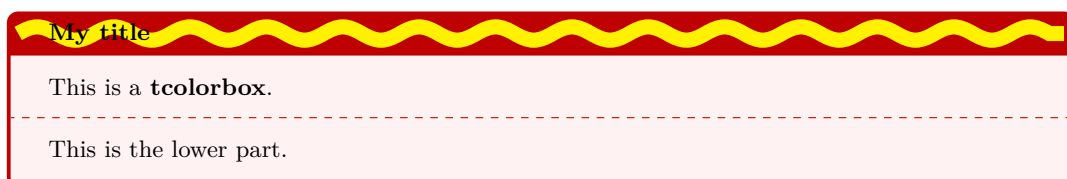
`/tcb/title code=<graphical code>` (code, default from `standard`)

The given `<graphical code>` is used for drawing the *title* area of the box.

This option is available only if the `/tcb/title engine`^{→P.81} is set to `freelance`.

```
\tcbset{colback=red!5!white,colframe=red!75!black,fonttitle=\bfseries,
coltitle=black}

\begin{tcolorbox}[freelance,title=My title,title code={
  \path[draw=yellow,solid,decorate,line width=2mm,
    decoration={coil,aspect=0,segment length=10.1mm}]
    ([xshift=1mm]title.west) -- ([xshift=-1mm]title.east);}]
  This is a \textbf{tcolorbox}.
\tcblower
This is the lower part.
\end{tcolorbox}
```



6.4 Watermark Option Keys

The following watermark options are applicable for all skins which use `tikzpicture` as `/tcb/graphical environment`^{→ P. 80}. Therefore, the skin `standard`^{→ P. 117} does not support these watermarks, but all other skins, e. g. `enhanced`^{→ P. 119}.

The watermark options rely on the more general overlay options described in Section 3.8 from page 48. Therefore, *watermarks* and *overlays* cannot be used mixed. But a mixture is possible with the `hooks` library, see Section 11.

`/tcb/watermark text=<text>` (no default, initially unset)

Writes some *<text>* in the center of the interior region of a `tcolorbox`. This *<text>* is written *after* the frame and interior are drawn and *before* the text content is drawn. It is zoomed or stretched according the values of `/tcb/watermark zoom`^{→ P. 92} or `/tcb/watermark stretch`^{→ P. 94}.

```
\tcbset{colback=red!5!white,colframe=red!75!black,fonttitle=\bfseries}

\begin{tcolorbox}[enhanced,title=My title,watermark text=My Watermark]
\lipsum[1]
\tcblower
\lipsum[2]
\end{tcolorbox}
```

My title

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

`/tcb/watermark text on=<part> is <text>` (no default, initially unset)

This option writes some *<text>* in the center of the interior region of a `tcolorbox` as described for `/tcb/watermark text`. But this is done only for boxes named *<part>* of a break sequence, see `/tcb/breakable`^{→ P. 208}.

Feasible values for *<part>* are:

- **broken**: all broken box parts,
- **unbroken**: unbroken boxes only,
- **first**: first parts of a break sequence,
- **middle**: middle parts of a break sequence,
- **last**: last parts of a break sequence,
- **unbroken and first**: unbroken boxes and first parts of a break sequence,
- **middle and last**: middle and last parts of a break sequence.

`/tcb/watermark graphics=<file name>` (no default, initially unset)

Draws an external picture referenced by `<file name>` in the center of the interior region of a `tcolorbox`. The picture is drawn *after* the frame and interior are drawn and *before* the text content is drawn. It is zoomed or stretched according the values of `/tcb/watermark zoom`^{→ P. 92} or `/tcb/watermark stretch`^{→ P. 94}.

```
\tcbset{colback=red!5!white,colframe=red!75!black,fonttttitle=\bfseries}

\begin{tcolorbox}[enhanced,title=My title,watermark graphics=Basilica_5.png,
  watermark opacity=0.15]
\lipsum[1-2]
\tcblower
This example uses a public domain picture from\
\url{http://commons.wikimedia.org/wiki/File:Basilica_5.png}
\end{tcolorbox}
```

My title

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

This example uses a public domain picture from
http://commons.wikimedia.org/wiki/File:Basilica_5.png

`/tcb/watermark graphics on=<part> is <file name>` (no default, initially unset)

This option draws a picture referenced by `<file name>` in the center of the interior region of a `tcolorbox` as described for `/tcb/watermark graphics`. But this is done only for boxes named `<part>` of a break sequence, see `/tcb/breakable`^{→ P. 208}.

Feasible values for `<part>` are:

- **broken**: all broken box parts,
- **unbroken**: unbroken boxes only,
- **first**: first parts of a break sequence,
- **middle**: middle parts of a break sequence,
- **last**: last parts of a break sequence,
- **unbroken and first**: unbroken boxes and first parts of a break sequence,
- **middle and last**: middle and last parts of a break sequence.

/tcb/watermark tikz=*<graphical code>* (no default, initially unset)

Draws the given **tikz** *<graphical code>* in the center of the interior region of a **tcolorbox**. The code is executed *after* the frame and interior are drawn and *before* the text content is drawn. The result is zoomed or stretched according the values of **/tcb/watermark zoom**^{→ P. 92} or **/tcb/watermark stretch**^{→ P. 94}.

```
\tcbset{colback=red!5!white,colframe=red!75!black,fonttitle=\bfseries}

\begin{tcolorbox}[enhanced,title=My title,
  watermark tikz={\draw[line width=2mm] circle (1cm)
    node{\fontfamily{ptm}\fontseries{b}\fontsize{20mm}{20mm}\selectfont ?};}]
\lipsum[1]
\tcblower
\lipsum[2]
\end{tcolorbox}
```

My title

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

/tcb/watermark tikz on=*<part>* is *<graphical code>* (no default, initially unset)

This option draws the given **tikz** *<graphical code>* in the center of the interior region of a **tcolorbox** as described for **/tcb/watermark tikz**. But this is done only for boxes named *<part>* of a break sequence, see **/tcb/breakable**^{→ P. 208}.

Feasible values for *<part>* are:

- **broken**: all broken box parts,
- **unbroken**: unbroken boxes only,
- **first**: first parts of a break sequence,
- **middle**: middle parts of a break sequence,
- **last**: last parts of a break sequence,
- **unbroken and first**: unbroken boxes and first parts of a break sequence,
- **middle and last**: middle and last parts of a break sequence.

/tcb/no watermark (style, no default, initially set)

Removes the watermark if set before. This is an alias for **/tcb/no overlay**^{→ P. 49}.

`/tcb/watermark opacity=<fraction>` (no default, initially 1.00)

Sets the opacity value $\in [0, 1]$ for a watermark.

```
\tcbset{enhanced,colback=red!5!white,colframe=red!75!black,fonttitle=\bfseries,
watermark text=Watermark,nobeforeafter,width=(\linewidth-2mm)/2}

\begin{tcolorbox}[title=Opacity 1.00,watermark opacity=1.00]
\lipsum[2]
\end{tcolorbox}\hfill%
\begin{tcolorbox}[title=Opacity 0.50,watermark opacity=0.50]
\lipsum[2]
\end{tcolorbox}%
```

Opacity 1.00

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

Opacity 0.50

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

`/tcb/watermark zoom=<fraction>` (no default, initially 0.75)

Sets the zoom value for a watermark. The zoom respects the aspect ratio. The value 1.0 means to fill the whole box until the watermark touches the frame.

```
\tcbset{enhanced,colback=red!5!white,colframe=red!75!black,fonttitle=\bfseries,
watermark text=Watermark,nobeforeafter,width=(\linewidth-2mm)/2}

\begin{tcolorbox}[title=Zoom 1.0,watermark zoom=1.0]
\lipsum[2]
\end{tcolorbox}\hfill%
\begin{tcolorbox}[title=Zoom 0.5,watermark zoom=0.5]
\lipsum[2]
\end{tcolorbox}%
```

Zoom 1.0

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

Zoom 0.5

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

`/tcb/watermark overzoom=<fraction>` (no default, initially unset)

Sets the overzoom value for a watermark. The overzoom respects the aspect ratio. The value 1.0 means to fill the whole box until the watermark touches all four sides of the frame.

```
\tcbset{enhanced,colback=white,colframe=blue!50!black,fonttitle=\bfseries,
watermark opacity=0.5,
watermark graphics=lichtspiel.jpg,nobeforeafter,width=(\linewidth-2mm)/2}

\begin{tcolorbox}[title=Zoom 1.0,watermark zoom=1.0]
\lipsum[1]
\end{tcolorbox}\hfill%
\begin{tcolorbox}[title=Overzoom 1.0,watermark overzoom=1.0]
\lipsum[1]
\end{tcolorbox}%
```

Zoom 1.0

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

Overzoom 1.0

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

If a `/tcb/watermark overzoom` value of 1.0 is used in connection with invisible top and bottom rules which still have a thickness greater than 0pt, the space of these invisible rules may not be covered by the watermark. For example, this situation may occur during the breaking of `/tcb/enhanced`^{P.119} boxes. To avoid this optical glitch, just set `/tcb/pad at break`^{P.210} to any desired value.

`/tcb/watermark stretch=<fraction>` (no default, initially unset)

Sets the stretch value for a watermark. The stretch value is applied to width and height in relation to the box dimensions. It does not respect the aspect ratio. The value 1.0 means to fill the whole box.

```
\tcbset{enhanced,colback=white,colframe=blue!50!black,fonttttitle=\bfseries,
  watermark graphics=lichtspiel.jpg,watermark opacity=0.5,
  nobeforeafter,width=(\linewidth-2mm)/2}

\begin{tcolorbox}[title=Stretch 1.00,watermark stretch=1.00]
\lipsum[2]
\end{tcolorbox}\hfill%
\begin{tcolorbox}[title=Stretch 0.50,watermark stretch=0.50]
\lipsum[2]
\end{tcolorbox}%
```

Stretch 1.00

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

Stretch 0.50

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

`/tcb/watermark color=<color>` (no default, initially mixed background and frame color)

Sets the color for the watermark.

```
\tcbset{colback=red!5!white,colframe=red!75!black,fonttttitle=\bfseries}

\begin{tcolorbox}[enhanced,title=My title,watermark text=My Watermark,
  watermark color=yellow!50!red]
\lipsum[1]
\end{tcolorbox}
```

My title

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

`/tcb/clip watermark=true|false` (default true, initially true)

Sets the watermark to be clipped to the interior area.

```
\tcbset{enhanced,colback=white,colframe=blue!50!white,fonttitle=\bfseries,
watermark opacity=0.5,watermark stretch=1.00,arc=3mm,
watermark graphics=lichtspiel.jpg}

\begin{tcolorbox}[title=Clip (default),clip watermark]
\lipsum[1]
\end{tcolorbox}

\begin{tcolorbox}[title=No clip,clip watermark=false]
\lipsum[1]
\end{tcolorbox}%
```

Clip (default)

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

No clip

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

6.5 Clip Environments

The following clip environments are applicable for all skins which use engines of type `path`, `pathfirst`, `pathmiddle`, or `pathlast`. Especially, the skin `enhanced`^{P.119} supports *all* of them and `standard`^{P.117} *none*. The typical area of application is inside overlay code, see Section 3.8 from page 48.

```
\begin{tcbclipframe}  
  <environment content>  
\end{tcbclipframe}
```

Defines a Tikz scope which clips to the frame area path.

```
\makeatletter  
\newtcolorbox{picturebox}[2][]{%  
  enhanced,frame hidden,interior hidden,fonttitle=\bfseries,  
  overlay={\begin{tcbclipframe}\node at (frame)  
    {\includegraphics[width=\tcb@width,height=\tcb@height]{#2}};\end{tcbclipframe}}%  
  \begin{tcbclipinterior}\fill[white,opacity=0.75]  
    (frame.south west) rectangle (frame.north east);\end{tcbclipinterior}},#1}  
\makeatother  
  
\begin{picturebox}[title=My Picture Box]{lichtspiel.jpg}  
\lipsum[1]  
\end{picturebox}
```

My Picture Box

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.


```
\begin{tcbinvclipframe}
  <environment content>
\end{tcbinvclipframe}
```

Defines a Tikz scope which clips to the *outside* of the frame area path.

```
\tcbset{enhanced jigsaw,fonttitle=\bfseries,opacityback=0.35,colback=blue!5!white,
  frame style={left color=red!75!black,right color=red!10!yellow}}

\begin{tikzpicture}% draw two balls
  \path[use as bounding box] (0,0.8) rectangle +(0.1,0.1);
  \shadedraw [shading=ball] (0,0) circle (1cm);
  \shadedraw [ball color=red] (3,-2.2) circle (1cm);
\end{tikzpicture}

\begin{tcolorbox}[title=A translucent box,
  overlay={\begin{tcbinvclipframe}
    \draw[red,line width=1cm] ([xshift=-2mm,yshift=2mm]frame.north west)
      --([xshift=2mm,yshift=-2mm]frame.south east);
    \draw[red,line width=1cm] ([xshift=-2mm,yshift=-2mm]frame.south west)
      --([xshift=2mm,yshift=2mm]frame.north east);
  \end{tcbinvclipframe}}]
  \lipsum[2]
\end{tcolorbox}
```

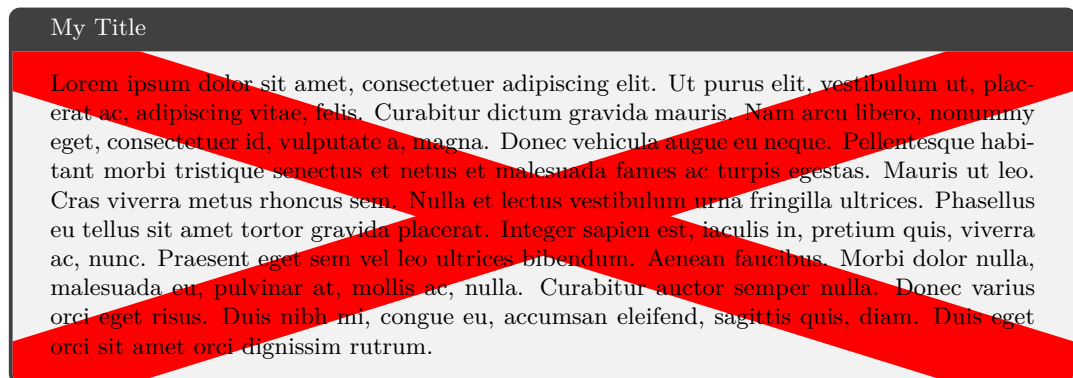
A translucent box

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

```
\begin{tcbclipinterior}
  <environment content>
\end{tcbclipinterior}
```

Defines a Tikz scope which clips to the interior area path.

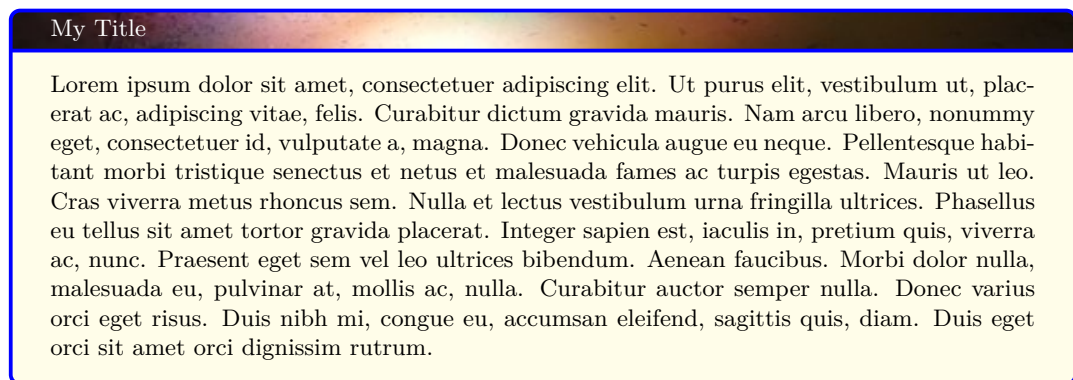
```
\begin{tcolorbox}[enhanced,title=My Title,
  overlay={\begin{tcbclipinterior}
    \draw[red,line width=1cm] (interior.north west)--(interior.south east);
    \draw[red,line width=1cm] (interior.south west)--(interior.north east);
  \end{tcbclipinterior}}]
\lipsum[1]
\end{tcolorbox}
```



```
\begin{tcbcliptitle}
  <environment content>
\end{tcbcliptitle}
```

Defines a Tikz scope which clips to the title area path.

```
\begin{tcolorbox}[enhanced,title=My Title,colframe=blue,colback=yellow!10!white,
  overlay={\begin{tcbcliptitle}\node at (title)
    {\includegraphics[width=\linewidth]{lichtspiel.jpg}};\end{tcbcliptitle}}]
\lipsum[1]
\end{tcolorbox}
```



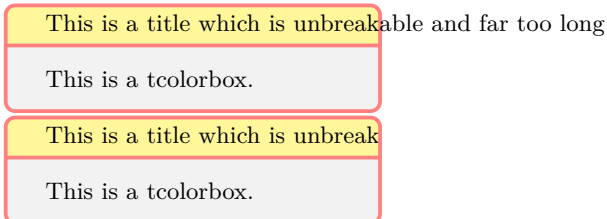
`/tcb/clip title=true|false` (default true, initially false)

Sets the title to be clipped to the title area.

```
\tcbset{enhanced,width=5cm,colframe=red!50!white,coltitle=black,
colbacktitle=yellow!50!white}

\begin{tcolorbox}[title=\mbox{This is a title which is unbreakable and far too long}]
This is a tcolorbox.
\end{tcolorbox}

\begin{tcolorbox}[title=\mbox{This is a title which is unbreakable and far too long},
clip title]
This is a tcolorbox.
\end{tcolorbox}
```

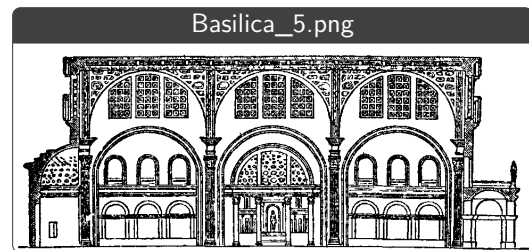
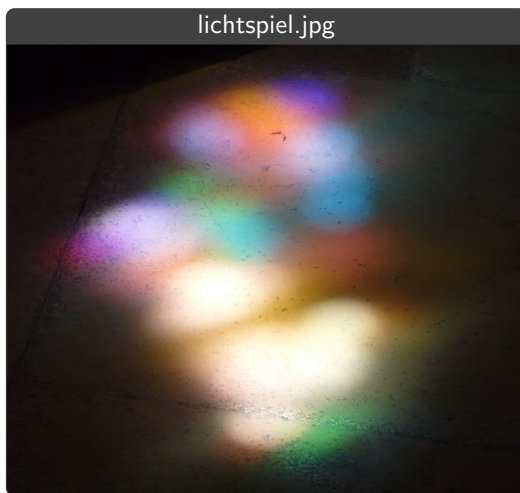


`/tcb/clip upper=true|false` (default true, initially false)

Sets the upper part to be clipped to the interior area.

```
\newcommand{\mygraphics}[2][\]{%
\tcbbox[enhanced,boxsep=0pt,top=0pt,bottom=0pt,left=0pt,
right=0pt,boxrule=0.4pt,drop fuzzy shadow,clip upper,
colback=black!75!white,toptitle=2pt,bottomtitle=2pt,nobeforeafter,
center title,fonttitle=\small\sffamily,title=\detokenize{#2}]
{\includegraphics[width=\the\dimexpr(\linewidth-4mm)/2\relax]{#2}}}%

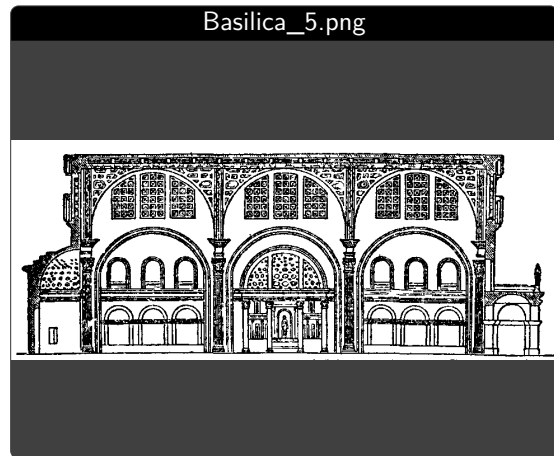
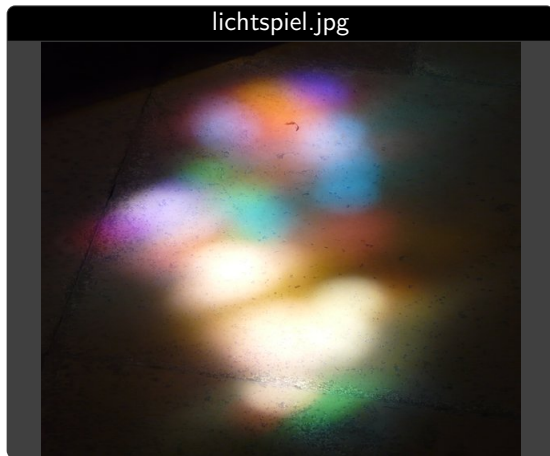
\mygraphics{lichtspiel.jpg}\hfill
\mygraphics{Basilica_5.png}
```



The example for `/tcb/clip upper`^{→ P.99} sizes the box according to the dimensions of the picture. To do it the other way around, the watermark options provide an easy solution.

```
\newcommand{\mygraphics}[2][\%
\tcbbox[enhanced,capture=minipage,boxsep=0pt,top=0pt,bottom=0pt,left=0pt,
right=0pt,boxrule=0.4pt,drop fuzzy shadow,nobeforeafter,
colback=black!75!white,toptitle=2pt,bottomtitle=2pt,
center title,fonttitle=\small\sffamily,title=\detokenize{#2},
width=(\linewidth-4mm)/2,height=6cm,colbacktitle={black},
watermark zoom=1.0,watermark graphics={#2}]{%}

\mygraphics{lichtspiel.jpg}\hfill
\mygraphics{Basilica_5.png}
```



`/tcb/clip lower=true|false` (default true, initially false)
Sets the lower part to be clipped to the interior area.

```
\tcbset{enhanced,width=5cm,colframe=red!50!black,text and listing}

\begin{tcblisting}{}
Donau\~dampf\~schiff\~fahrts\~ka\~pi\~t"ans\~m"ut\~zen\~fran\~sen
\end{tcblisting}

\begin{tcblisting}{clip lower}
Donau\~dampf\~schiff\~fahrts\~ka\~pi\~t"ans\~m"ut\~zen\~fran\~sen
\end{tcblisting}
```

Donaudampfschifffahrtska-
pitänsmützenfransen

Donau\~dampf\~schiff\~fahrts\~ka\~pi\~t"ans\~m"ut\~zen\~fran\~sen

Donaudampfschifffahrtska-
pitänsmützenfransen

Donau\~dampf\~schiff\~fa

6.6 Border Line Option Keys

The following border line options are applicable for most skins which use `tikzpicture` as `/tcb/graphical environment`^{P.80}. Therefore, the skin `standard`^{P.117} does not support these border lines, but most other skins, e.g. `enhanced`^{P.119}.

The border lines are independent from the normal `tcolorbox` rules. They may be used with or without the `/tcb/segmentation engine`^{P.81}.

The border lines are stackable, i.e. several different border lines can be used on the same `tcolorbox`. They are drawn *after* the box frame and box interior and *before* overlays or watermarks.

Technically, the normal `tcolorbox` rules result from a TikZ *filling* process. The border lines are created by a TikZ *drawing* process. This can be used to apply different effects.

`/tcb/borderline={⟨width⟩}{⟨offset⟩}{⟨options⟩}` (no default, initially unset)

Adds a new border line to the stack of border lines. This border line is drawn with the given `⟨width⟩` and gets a `⟨offset⟩` computed from the frame outline. A positive `⟨offset⟩` value moves the borderline inside the `tcolorbox` and a negative `⟨offset⟩` value moves it outside without changing the bounding box.

The border line is drawn along a TikZ path with the given TikZ `⟨options⟩`. Note that the TikZ `line width` option should not be used here.

The border lines adapt to the rounded corners of the `tcolorbox`. An inside border line will switch to sharp corners if necessary, an outside border line will always be rounded if not set to `sharp corners`.

```
\begin{tcolorbox}[enhanced,title=Rounded corners,fonttitle=\bfseries,boxsep=5pt,
  arc=8pt,
  borderline={0.5pt}{0pt}{red},
  borderline={0.5pt}{5pt}{blue,dotted},
  borderline={0.5pt}{-5pt}{green,dashed} ]
This is a tcolorbox.
\end{tcolorbox}
\bigskip
\begin{tcolorbox}[enhanced,title=Sharp corners,fonttitle=\bfseries,boxsep=5pt,
  arc=0pt,outer arc=0pt,
  borderline={0.5pt}{0pt}{red},
  borderline={0.5pt}{5pt}{blue,dotted},
  borderline={0.5pt}{-5pt}{green,dashed,sharp corners} ]
This is a tcolorbox.
\end{tcolorbox}
```

Rounded corners

This is a tcolorbox.

Sharp corners

This is a tcolorbox.

```
% \usepackage{lipsum}
\begin{tcolorbox}[enhanced,arc=3mm,boxrule=1.5mm,boxsep=1.5mm,
colback=yellow!20!white,
colframe=blue,
borderline={1mm}{1mm}{white},
borderline={1mm}{2mm}{red} ]
\lipsum[1]
\end{tcolorbox}
```

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

```
% \usepackage{lipsum}
\begin{tcolorbox}[enhanced,arc=3mm,boxrule=1.5mm,
frame hidden,colback=blue!10!white,
borderline={1mm}{0mm}{blue,dotted} ]
\lipsum[2]
\end{tcolorbox}
```

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

```
% \usepackage{lipsum}
\begin{tcolorbox}[enhanced,skin=enhancedmiddle,
frame hidden,interior hidden,top=0mm,bottom=0mm,boxsep=0mm,
borderline={0.75mm}{0mm}{red},
borderline={0.75mm}{0.75mm}{red!50!yellow},
borderline={0.75mm}{1.5mm}{yellow}, ]
\lipsum[3]
\end{tcolorbox}
```

Nulla malesuada porttitor diam. Donec felis erat, congue non, volutpat at, tincidunt tristique, libero. Vivamus viverra fermentum felis. Donec nonummy pellentesque ante. Phasellus adipiscing semper elit. Proin fermentum massa ac quam. Sed diam turpis, molestie vitae, placerat a, molestie nec, leo. Maecenas lacinia. Nam ipsum ligula, eleifend at, accumsan nec, suscipit a, ipsum. Morbi blandit ligula feugiat magna. Nunc eleifend consequat lorem. Sed lacinia nulla vitae enim. Pellentesque tincidunt purus vel magna. Integer non enim. Praesent euismod nunc eu purus. Donec bibendum quam in tellus. Nullam cursus pulvinar lectus. Donec et mi. Nam vulputate metus eu enim. Vestibulum pellentesque felis eu massa.

```
% \usepackage{lipsum}
\newtcolorbox{mygreenbox}[2][]{%
  enhanced,width=\linewidth-6pt,
  enlarge top by=3pt,enlarge bottom by=3pt,
  enlarge left by=3pt,enlarge right by=3pt,
  title={#2},frame hidden,boxrule=0pt,top=1mm,bottom=1mm,
  colframe=green!30!black, colbacktitle=green!50!yellow,
  coltitle=black, colback=green!25!white,
  borderline={0.5pt}{-0.5pt}{green!75!blue},
  borderline={1pt}{-3pt}{green!50!blue},#1}

\begin{mygreenbox}{My title}
  \lipsum[4]
\end{mygreenbox}
```

My title

Quisque ullamcorper placerat ipsum. Cras nibh. Morbi vel justo vitae lacus tincidunt ultrices. Lorem ipsum dolor sit amet, consectetur adipiscing elit. In hac habitasse platea dictumst. Integer tempus convallis augue. Etiam facilisis. Nunc elementum fermentum wisi. Aenean placerat. Ut imperdiet, enim sed gravida sollicitudin, felis odio placerat quam, ac pulvinar elit purus eget enim. Nunc vitae tortor. Proin tempus nibh sit amet nisl. Vivamus quis tortor vitae risus porta vehicula.

/tcb/no borderline (no default, initially set)

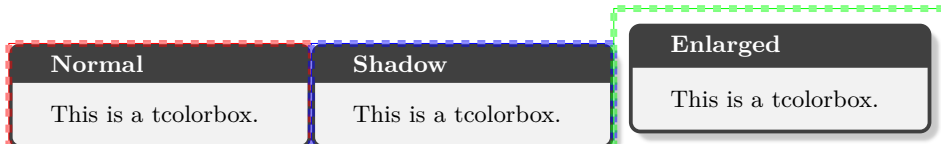
Removes all border lines if set before.

/tcb/show bounding box=⟨color⟩ (default red, initially unset)

Technically, this option is no borderline option but an overlay option, see Section 3.8 on page 48. It is documented here, because it needs a `tikzpicture` environment and it displays the bounding box borderline of a `tcolorbox`. Its intended use is debugging and fine tuning. The optional `⟨color⟩` is the base color for the bounding box borderline.

```
\tcbset{enhanced,nobeforeafter,width=4cm,fonttitle=\bfseries}

\begin{tcolorbox}[show bounding box,title=Normal]
This is a tcolorbox.
\end{tcolorbox}%
\begin{tcolorbox}[show bounding box=blue,title=Shadow,drop fuzzy shadow]
This is a tcolorbox.
\end{tcolorbox}%
\begin{tcolorbox}[show bounding box=green,title=Enlarged,drop fuzzy shadow,
  enlarge by=2mm]
This is a tcolorbox.
\end{tcolorbox}
```



6.7 Shadow Option Keys

The following shadow options are applicable for most skins which use `tikzpicture` as `/tcb/graphical environment`^{→ P.80}. Therefore, the skin `standard`^{→ P.117} does not support these shadows, but most other skins, e.g. `enhanced`^{→ P.119}.

The shadows are stackable, i.e. several different shadows can be used on the same `tcolorbox`. They are drawn *before* the box frame is drawn.

`/tcb/no shadow` (no default)

Removes all shadows if set before.

`/tcb/shadow={⟨xshift⟩}{⟨yshift⟩}{⟨offset⟩}{⟨options⟩}` (no default)

Adds a new shadow to the stack of shadows. This shadow follows the outline of the `tcolorbox` but is shifted by `⟨xshift⟩` and `⟨yshift⟩`. The `⟨offset⟩` value is a distance value from the frame outline. A positive `⟨offset⟩` value shrinks the shadow and a negative `⟨offset⟩` value enlarges the shadow. The shadow is filled along a TikZ path with the given TikZ `⟨options⟩`.

The shadows adapt to the rounded corners of the `tcolorbox`. An shrunk shadow will switch to sharp corners if necessary, an enlarged shadow may become more rounded depending on several factors.

Shadows are not considered for the bounding box computation by default. Large shadows may be overlapped by the following content. But, the bounding box can be adapted if necessary.

```
\tcbset{enhanced,colback=red!5!white,
  colframe=red!75!black,fonttitle=\bfseries}

\begin{tcolorbox}[title=My own shadow,
  shadow={2mm}{-1mm}{0mm}{black!50!white}]
This is a tcolorbox.
\end{tcolorbox}
\par\bigskip
\begin{tcolorbox}[title=Another shadow,
  shadow={-1mm}{-2mm}{0mm}{fill=blue,
  opacity=0.5}]
This is a tcolorbox.
\end{tcolorbox}
\par\bigskip
\begin{tcolorbox}[title=Double shadow,
  shadow={-1.5mm}{-1.5mm}{0mm}{fill=blue,
  opacity=0.25},
  shadow={1.5mm}{-1.5mm}{0mm}{fill=red,
  opacity=0.25}]
This is a tcolorbox.
\end{tcolorbox}
\par\bigskip
\begin{tcolorbox}[title=Far shadow,
  shadow={5.5mm}{-3.5mm}{2mm}{fill=black,
  opacity=0.25}]
This is a tcolorbox.
\end{tcolorbox}
\par\bigskip\bigskip
\begin{tcolorbox}[title=Halo shadow,
  shadow={0mm}{0mm}{-1.5mm}%
  {fill=yellow!75!red,opacity=0.5}]
This is a tcolorbox.
\end{tcolorbox}
```

My own shadow

This is a tcolorbox.

Another shadow

This is a tcolorbox.

Double shadow

This is a tcolorbox.

Far shadow

This is a tcolorbox.

Halo shadow

This is a tcolorbox.

/tcb/fuzzy shadow={ $\langle xshift \rangle$ }{ $\langle yshift \rangle$ }{ $\langle offset \rangle$ }{ $\langle step \rangle$ }{ $\langle options \rangle$ } (no default)

Adds a new fuzzy shadow to the stack of shadows. Actually, this option adds several shadows which appear like a shadow with a fuzzy border. This fuzzy shadow follows the outline of the `tcolorbox` but is shifted by $\langle xshift \rangle$ and $\langle yshift \rangle$. The $\langle offset \rangle$ value is a distance value from the frame outline. A positive $\langle offset \rangle$ value shrinks the shadow and a negative $\langle offset \rangle$ value enlarges the shadow. The $\langle step \rangle$ value describes a shrink offset used for the combination of the partial shadows. The shadow is filled along a TikZ path with the given TikZ $\langle options \rangle$ but any `opacity` value will be ignored.

```
\tcbset{enhanced,colback=red!5!white,
  colframe=red!75!black,fonttttitle=\bfseries}

\begin{tcolorbox}[title=My own shadow,
  fuzzy shadow={2mm}{-1mm}{0mm}{0.1mm}%
    {black!50!white}]
This is a tcolorbox.
\end{tcolorbox}
\par\bigskip
\begin{tcolorbox}[title=Another shadow,
  fuzzy shadow={-1mm}{-2mm}{0mm}{0.2mm}%
    {fill=blue}]
This is a tcolorbox.
\end{tcolorbox}
\par\bigskip
\begin{tcolorbox}[title=Double shadow,
  fuzzy shadow={-1.5mm}{-1.5mm}{0mm}{0.1mm}%
    {blue},
  fuzzy shadow={1.5mm}{-1.5mm}{0mm}{0.1mm}%
    {red}]
This is a tcolorbox.
\end{tcolorbox}
\par\bigskip
\begin{tcolorbox}[title=Far shadow,
  fuzzy shadow={5.5mm}{-3.5mm}{0mm}{0.3mm}%
    {black}]
This is a tcolorbox.
\end{tcolorbox}
\par\bigskip\bigskip
\begin{tcolorbox}[title=Glow shadow,
  fuzzy shadow={0mm}{0mm}{-1.5mm}{0.15mm}%
    {yellow!75!red}]
This is a tcolorbox.
\end{tcolorbox}
```

My own shadow

This is a tcolorbox.

Another shadow

This is a tcolorbox.

Double shadow

This is a tcolorbox.

Far shadow

This is a tcolorbox.

Glow shadow

This is a tcolorbox.

```
\newtcolorbox{mybox}[1][\tcbset{enhanced,
  fuzzy shadow={1.0mm}{-1.0mm}{0.12mm}{0mm}{blue!50!white},
  fuzzy shadow={-1.0mm}{-1.0mm}{0.12mm}{0mm}{red!50!white},
  fuzzy shadow={-1.0mm}{1.0mm}{0.12mm}{0mm}{green!50!white},
  fuzzy shadow={1.0mm}{1.0mm}{0.12mm}{0mm}{yellow!50!white},#1
}]

\begin{mybox}[title=A multi shadow box]
This is a tcolorbox.
\end{mybox}
```

A multi shadow box

This is a tcolorbox.

`/tcb/drop shadow=<color>` (style, default black!50!white)

Adds a new shadow with standard dimensions to the stack of shadows. Optionally, the `<color>` for the shadow can be changed.

```
\tcbset{enhanced,colback=red!5!white,
  colframe=red!75!black,fonttttitle=\bfseries}

\begin{tcolorbox}[drop shadow]
This is a tcolorbox.
\end{tcolorbox}\par\bigskip
\begin{tcolorbox}[title=Another shadow,
  drop shadow=blue]
This is a tcolorbox.
\end{tcolorbox}
```

This is a tcolorbox.

Another shadow

This is a tcolorbox.

`/tcb/drop fuzzy shadow=<color>` (style, default black!50!white)

Adds a new fuzzy shadow with standard dimensions to the stack of shadows. Optionally, the `<color>` for the shadow can be changed.

```
\tcbset{enhanced,colback=red!5!white,
  colframe=red!75!black,fonttttitle=\bfseries}

\begin{tcolorbox}[drop fuzzy shadow]
This is a tcolorbox.
\end{tcolorbox}\par\bigskip
\begin{tcolorbox}[title=Another shadow,
  drop fuzzy shadow=blue]
This is a tcolorbox.
\end{tcolorbox}
```

This is a tcolorbox.

Another shadow

This is a tcolorbox.

`/tcb/drop midday shadow=<color>` (style, default black!50!white)

Adds a new shadow with standard dimensions to the stack of shadows. Optionally, the `<color>` for the shadow can be changed.

```
\tcbset{enhanced,colback=red!5!white,
  colframe=red!75!black,fonttttitle=\bfseries}

\begin{tcolorbox}[drop midday shadow]
This is a tcolorbox.
\end{tcolorbox}\par\bigskip
\begin{tcolorbox}[title=Another shadow,
  drop midday shadow=blue]
This is a tcolorbox.
\end{tcolorbox}
```

This is a tcolorbox.

Another shadow

This is a tcolorbox.

`/tcb/drop fuzzy midday shadow=<color>` (style, default black!50!white)

Adds a new fuzzy shadow with standard dimensions to the stack of shadows. Optionally, the `<color>` for the shadow can be changed.

```
\tcbset{enhanced,colback=red!5!white,
  colframe=red!75!black,fonttttitle=\bfseries}

\begin{tcolorbox}[drop fuzzy midday shadow]
This is a tcolorbox.
\end{tcolorbox}\par\bigskip
\begin{tcolorbox}[title=Another shadow,
  drop fuzzy midday shadow=blue]
This is a tcolorbox.
\end{tcolorbox}
```

This is a tcolorbox.

Another shadow

This is a tcolorbox.

`/tcb/halo=<size> with <color>` (style, default 0.9mm with yellow)

Adds a new halo shadow with the given `<color>` which overlaps the colorbox an all sides by `<size>`.

```
\tcbset{enhanced,colback=red!5!white,
  colframe=red!75!black,fonttttitle=\bfseries}

\begin{tcolorbox}[title=My own halo,halo]
This is a tcolorbox.
\end{tcolorbox}
\par\bigskip\bigskip
\begin{tcolorbox}[title=Another halo,
  halo=2mm with green]
This is a tcolorbox.
\end{tcolorbox}
```

My own halo

This is a tcolorbox.

Another halo

This is a tcolorbox.

`/tcb/fuzzy halo=<size> with <color>` (style, default 0.9mm with yellow)

Adds a new fuzzy halo shadow with the given `<color>` which overlaps the colorbox an all sides by `<size>` plus 0.48mm.

```
\tcbset{enhanced,colback=red!5!white,
  colframe=red!75!black,fonttttitle=\bfseries}

\begin{tcolorbox}[title=My own halo,fuzzy halo]
This is a tcolorbox.
\end{tcolorbox}
\par\bigskip\bigskip
\begin{tcolorbox}[title=Another halo,
  fuzzy halo=2mm with green]
This is a tcolorbox.
\end{tcolorbox}
```

My own halo

This is a tcolorbox.

Another halo

This is a tcolorbox.

```
\begin{tcolorbox}[blank,enhanced jigsaw,boxsep=2pt,arc=2pt,
  fuzzy halo=2mm with red!50!white,
  fuzzy halo=1mm with white]
\lipsum[1]
\end{tcolorbox}
```

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

For all following shadows, the optionally given $\langle color \rangle$ for the shadow can be changed equivalent to the preceding examples.

/tcb/drop shadow southeast= $\langle color \rangle$ (style, default **black!50!white**)

Adds a new shadow with standard dimensions to the stack of shadows. This shadow is identical to `/tcb/drop shadow`^{→ P. 106}.

```
\begin{tcolorbox}[drop shadow southeast,
  enhanced,colback=red!5!white,colframe=red!75!black]
  This is a tcolorbox.
\end{tcolorbox}
```

This is a tcolorbox.

/tcb/drop shadow south= $\langle color \rangle$ (style, default **black!50!white**)

Adds a new shadow with standard dimensions to the stack of shadows. This shadow is identical to `/tcb/drop midday shadow`^{→ P. 106}.

```
\begin{tcolorbox}[drop shadow south,
  enhanced,colback=red!5!white,colframe=red!75!black]
  This is a tcolorbox.
\end{tcolorbox}
```

This is a tcolorbox.

/tcb/drop shadow southwest= $\langle color \rangle$ (style, default **black!50!white**)

Adds a new shadow with standard dimensions to the stack of shadows.

```
\begin{tcolorbox}[drop shadow southwest,
  enhanced,colback=red!5!white,colframe=red!75!black]
  This is a tcolorbox.
\end{tcolorbox}
```

This is a tcolorbox.

/tcb/drop shadow west= $\langle color \rangle$ (style, default **black!50!white**)

Adds a new shadow with standard dimensions to the stack of shadows.

```
\begin{tcolorbox}[drop shadow west,
  enhanced,colback=red!5!white,colframe=red!75!black]
  This is a tcolorbox.
\end{tcolorbox}
```

This is a tcolorbox.

/tcb/drop shadow northwest= $\langle color \rangle$ (style, default **black!50!white**)

Adds a new shadow with standard dimensions to the stack of shadows.

```
\begin{tcolorbox}[drop shadow northwest,
  enhanced,colback=red!5!white,colframe=red!75!black]
  This is a tcolorbox.
\end{tcolorbox}
```

This is a tcolorbox.

/tcb/drop shadow north= $\langle color \rangle$ (style, default **black!50!white**)

Adds a new shadow with standard dimensions to the stack of shadows.

```
\begin{tcolorbox}[drop shadow north,
  enhanced,colback=red!5!white,colframe=red!75!black]
  This is a tcolorbox.
\end{tcolorbox}
```

This is a tcolorbox.

`/tcb/drop shadow northeast=<color>` (style, default black!50!white)

Adds a new shadow with standard dimensions to the stack of shadows.

```
\begin{tcolorbox}[drop shadow northeast,
  enhanced,colback=red!5!white,colframe=red!75!black]
  This is a tcolorbox.
\end{tcolorbox}
```

This is a tcolorbox.

`/tcb/drop shadow east=<color>` (style, default black!50!white)

Adds a new shadow with standard dimensions to the stack of shadows.

```
\begin{tcolorbox}[drop shadow east,
  enhanced,colback=red!5!white,colframe=red!75!black]
  This is a tcolorbox.
\end{tcolorbox}
```

This is a tcolorbox.

`/tcb/drop fuzzy shadow southeast=<color>` (style, default black!50!white)

Adds a new fuzzy shadow with standard dimensions to the stack of shadows. This shadow is identical to `/tcb/drop fuzzy shadow`^{→ P. 106}.

```
\begin{tcolorbox}[drop fuzzy shadow southeast,
  enhanced,colback=red!5!white,colframe=red!75!black]
  This is a tcolorbox.
\end{tcolorbox}
```

This is a tcolorbox.

`/tcb/drop fuzzy shadow south=<color>` (style, default black!50!white)

Adds a new fuzzy shadow with standard dimensions to the stack of shadows. This shadow is identical to `/tcb/drop fuzzy midday shadow`^{→ P. 106}.

```
\begin{tcolorbox}[drop fuzzy shadow south,
  enhanced,colback=red!5!white,colframe=red!75!black]
  This is a tcolorbox.
\end{tcolorbox}
```

This is a tcolorbox.

`/tcb/drop fuzzy shadow southwest=<color>` (style, default black!50!white)

Adds a new fuzzy shadow with standard dimensions to the stack of shadows.

```
\begin{tcolorbox}[drop fuzzy shadow southwest,
  enhanced,colback=red!5!white,colframe=red!75!black]
  This is a tcolorbox.
\end{tcolorbox}
```

This is a tcolorbox.

`/tcb/drop fuzzy shadow west=<color>` (style, default black!50!white)

Adds a new fuzzy shadow with standard dimensions to the stack of shadows.

```
\begin{tcolorbox}[drop fuzzy shadow west,
  enhanced,colback=red!5!white,colframe=red!75!black]
  This is a tcolorbox.
\end{tcolorbox}
```

This is a tcolorbox.

`/tcb/drop fuzzy shadow northwest=<color>` (style, default `black!50!white`)

Adds a new fuzzy shadow with standard dimensions to the stack of shadows.

```
\begin{tcolorbox}[drop fuzzy shadow northwest,
  enhanced,colback=red!5!white,colframe=red!75!black]
  This is a tcolorbox.
\end{tcolorbox}
```

This is a tcolorbox.

`/tcb/drop fuzzy shadow north=<color>` (style, default `black!50!white`)

Adds a new fuzzy shadow with standard dimensions to the stack of shadows.

```
\begin{tcolorbox}[drop fuzzy shadow north,
  enhanced,colback=red!5!white,colframe=red!75!black]
  This is a tcolorbox.
\end{tcolorbox}
```

This is a tcolorbox.

`/tcb/drop fuzzy shadow northeast=<color>` (style, default `black!50!white`)

Adds a new fuzzy shadow with standard dimensions to the stack of shadows.

```
\begin{tcolorbox}[drop fuzzy shadow northeast,
  enhanced,colback=red!5!white,colframe=red!75!black]
  This is a tcolorbox.
\end{tcolorbox}
```

This is a tcolorbox.

`/tcb/drop fuzzy shadow east=<color>` (style, default `black!50!white`)

Adds a new fuzzy shadow with standard dimensions to the stack of shadows.

```
\begin{tcolorbox}[drop fuzzy shadow east,
  enhanced,colback=red!5!white,colframe=red!75!black]
  This is a tcolorbox.
\end{tcolorbox}
```

This is a tcolorbox.

6.8 TikZ Picture Option Keys

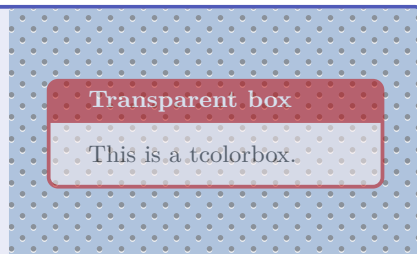
The following general options are applicable for skins which use `tikzpicture` as `/tcb/graphical environment`^{→ P.80}. Therefore, the skin `standard`^{→ P.117} does not support these options, but most other skins, e.g. `enhanced`^{→ P.119}.

`/tcb/tikz=<tikz option list>` (no default, initially empty)

Adds the given *<tikz option list>* to the main `tikzpicture` environment used to draw the color box, see [17]. If this option is applied a second time, the new *<tikz option list>* is appended to the current option list.

```
\tcbset{enhanced,colback=red!5!white,
colframe=red!75!black,fonttitle=\bfseries}

\begin{tcolorbox}[title=Transparent box,
tikz={opacity=0.5,transparency group}]
This is a tcolorbox.
\end{tcolorbox}
```



```
\tcbset{enhanced,colback=red!5!white,
colframe=red!75!black,fonttitle=\bfseries,
fontupper=\bfseries\Huge,
center title,center upper}

\begin{tcolorbox}[title=Rotated box,
tikz={rotate=30}]
Sold!
\end{tcolorbox}
```



`/tcb/tikz reset` (initially set)

Removes all options given by `/tcb/tikz`.

`/tcb/at begin tikz=<tikz code>` (no default, initially empty)

The given *<tikz code>* is executed at the beginning of the `tikzpicture` environment after the TikZ option `execute at begin picture` was applied. If this option is applied a second time, the new *<tikz code>* is appended to the current code.

`/tcb/at begin tikz reset` (initially set)

Removes all code given by `/tcb/at begin tikz`.

`/tcb/at end tikz=<tikz code>` (no default, initially empty)

The given *<tikz code>* is executed at the ending of the `tikzpicture` environment before the TikZ option `execute at end picture` was applied. If this option is applied a second time, the new *<tikz code>* is appended to the current code.

`/tcb/at end tikz reset` (initially set)

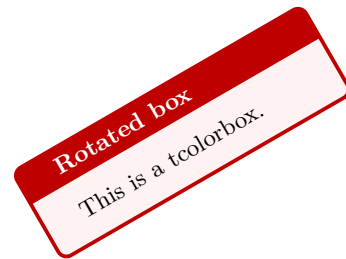
Removes all code given by `/tcb/at end tikz`.

/tcb/rotate= $\langle angle \rangle$ (no default, initially unset)

Rotates the `tcolorbox` by the given $\langle angle \rangle$. Note that this is a TikZ coordinate transformation i.e. not all graphical elements like shadings will really be rotated.

```
\tcbset{enhanced,colback=red!5!white,
colframe=red!75!black,fonttttitle=\bfseries}

\begin{tcolorbox}[title=Rotated box,rotate=30]
This is a tcolorbox.
\end{tcolorbox}
```

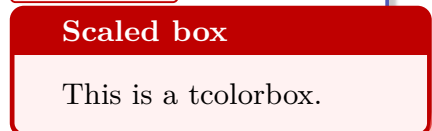
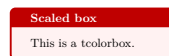


/tcb/scale= $\langle fraction \rangle$ (no default, initially unset)

Scales the `tcolorbox` by the given $\langle fraction \rangle$. Note that this is a TikZ coordinate transformation i.e. not all graphical elements like line widths will really be scaled.

```
\tcbset{enhanced,colback=red!5!white,
colframe=red!75!black,fonttttitle=\bfseries}

\begin{tcolorbox}[title=Scaled box,scale=0.5]
This is a tcolorbox.
\end{tcolorbox}
\begin{tcolorbox}[title=Scaled box,scale=1.25]
This is a tcolorbox.
\end{tcolorbox}
```



/tcb/remember (style, initially unset)

Shortcut for `tikz={remember picture}`. This allows one to reference nodes in other TikZ pictures.

```
\begin{tcolorbox}[enhanced,remember,colback=red!5!white,colframe=red!75!black,
fonttttitle=\bfseries,title=The four corners of a paper,
overlay={\draw[red!50!white,line width=1mm,opacity=0.5,shorten >=3mm]
(frame.north west) edge[->] (current page.north west)
(frame.north east) edge[->] (current page.north east)
(frame.south west) edge[->] (current page.south west)
(frame.south east) edge[->] (current page.south east);}]
This is a tcolorbox.
\end{tcolorbox}
```

The four corners of a paper

This is a tcolorbox.

`/tcb/remember as=<name>` (style, no default, initially unset)

The `frame` node will be remembered by the given `<name>` to be referenced in other TikZ pictures.

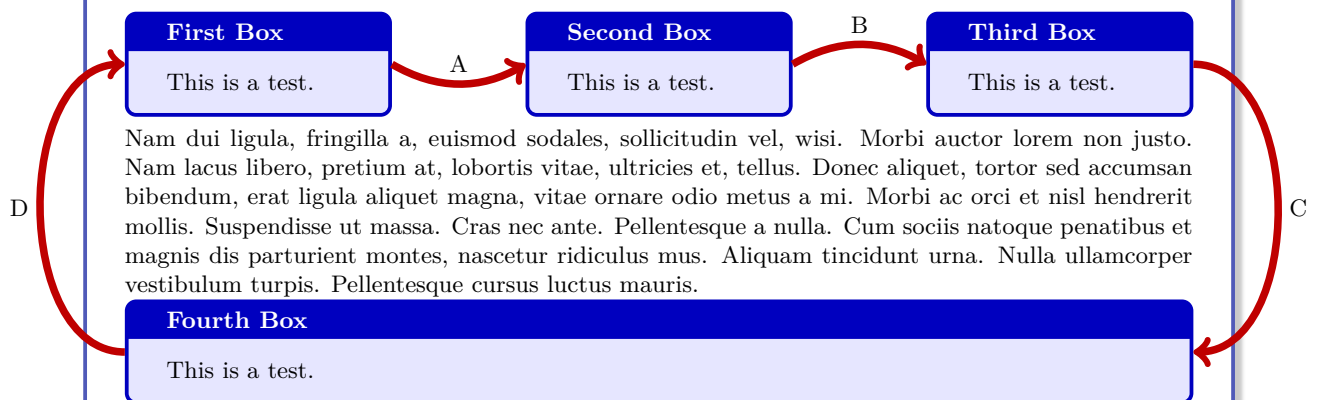
```
% \usepackage{lipsum}
\newtcolorbox{mybox}[1][]{enhanced,colframe=blue!75!black,colback=blue!10!white,
fonttitle=\bfseries,#1}

\begin{mybox}[title=First Box,nobeforeafter,width=\linewidth/4,remember as=one]
This is a test.
\end{mybox}
\hfill
\begin{mybox}[title=Second Box,nobeforeafter,width=\linewidth/4,remember as=two]
This is a test.
\end{mybox}
\hfill
\begin{mybox}[title=Third Box,nobeforeafter,width=\linewidth/4,remember as=three]
This is a test.
\end{mybox}

\lipsum[2]

\begin{mybox}[title=Fourth Box,remember as=four]
This is a test.
\end{mybox}

\begin{tikzpicture}[overlay,remember picture,line width=1mm,draw=red!75!black]
\draw[->] (one.east) to[bend right] node[above] {A} (two.west);
\draw[->] (two.east) to[bend left] node[above] {B} (three.west);
\draw[->] (three.east) to[bend left=90] node[right] {C} (four.east);
\draw[->] (four.west) to[bend left=90] node[left] {D} (one.west);
\end{tikzpicture}
```



6.9 Jigsaw Skin Variants

As described in Section 6.1 on page 79, a `tcolorbox` is drawn by up to four *engines*. Typically, the *frame* engine fills the complete box area with color and the other engines fill certain areas with other colors. Finally, only the area which you see as *frame* of the box will display the frame color. For most applications, this is a good approach.

For certain boxes, a more delicate procedure is needed. E.g., if the box should be translucent, an already painted area cannot be made unpainted. Therefore, more elaborate frame engines saw holes into the frame where the interior area and optionally the title area will be painted. The resulting skins are called *jigsaw* skins. For `standard`^{P.117} and `enhanced`^{P.119}, there are variants called `standard jigsaw`^{P.118} and `enhanced jigsaw`^{P.126}.

```
\newcommand{\ballexample}{\begin{tikzpicture}
  \path[use as bounding box] (0,0.8) rectangle +(0.1,0.1);
  \shadedraw [shading=ball] (0,0) circle (1cm);
  \shadedraw [ball color=red] (3,-2.2) circle (1cm);
\end{tikzpicture}}

\tcbset{enhanced,colback=blue!5!white,
  frame style={left color=red!75!black,right color=red!10!yellow},
  fonttitle=\bfseries }

\ballexample

\begin{tcolorbox}[title=A normal box]
  \lipsum[2]
\end{tcolorbox}

\ballexample

\begin{tcolorbox}[title=A translucent jigsaw box,
  enhanced jigsaw,opacityback=0.35]
  \lipsum[2]
\end{tcolorbox}
```

A normal box

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

A translucent jigsaw box

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

```

\tcbset{enhanced,colback=red!10!white,coltitle=black,
  frame style={left color=red!75!black,right color=red!10!yellow},
  fonttitle=\bfseries,interior hidden,title hidden}

\begin{tcolorbox}[title=A normal box with hidden interior and title]
  This is a tcolorbox.
\end{tcolorbox}

\begin{tcolorbox}[enhanced jigsaw,
  title=A jigsaw box with hidden interior and title]
  This is a tcolorbox.
\end{tcolorbox}

```

A normal box with hidden interior and title

This is a tcolorbox.

A jigsaw box with hidden interior and title

This is a tcolorbox.

```

\newtcolorbox{mybox}{skin=enhancedmiddle jigsaw,leftrule=5mm,rightrule=5mm,
  boxsep=0mm,top=0mm,bottom=0mm,
  frame style={top color=blue,bottom color=red},interior hidden}

\begin{mybox}
  \lipsum[2]
\end{mybox}

```

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

6.10 Draft Mode

To reduce the compilation time while drafting a document, the *draft mode* can be applied. Basically, it changes all skins to `spartan`^{→P.152} and sets the `/tcb/fit algorithm`^{→P.228} to `squeeze`. Especially, when fuzzy shadows are used, the speedup will be considerable high.

It is strongly recommended that the draft mode is *not* used for the final document. Use `spartan`^{→P.152} directly, if you want to stay with it. The draft mode implementation may change in future.

Normally, switching to the draft mode should not alter the geometry of your document. Since overlays are deactivated, any code placed there (e.g. counter changes) is not executed anymore! Also, `/tcb/remember as`^{→P.113} will not have any effect. You may exclude critical code with `\tcbinterruptdraftmode` / `\tcbcontinuedraftmode` from converting to draft mode.

`\tcbstartdraftmode`

Any following `tcolorbox` code is put into *draft mode*. All skin settings are overruled with `spartan`^{→P.152}. Overlays, watermarks, shadows, borderlines, and rounded corners are deactivated for all `tcolorbox` layers.

`\tcbstopdraftmode`

The *draft mode* is deactivated for the following code.

`\tcbinterruptdraftmode`

If the compilation is in *draft mode*, the *draft mode* is deactivated until a following `\tcbcontinuedraftmode` is detected.

If the compilation is not in *draft mode*, no happens and a following `\tcbcontinuedraftmode` will not start the *draft mode*.

The pair `\tcbinterruptdraftmode` and `\tcbcontinuedraftmode` cannot be used nested.

`\tcbcontinuedraftmode`

Continues the *draft mode* which was suspended by a preceding `\tcbinterruptdraftmode`. Nothing happens, if there was no draft mode before `\tcbinterruptdraftmode`.

Code, which is place between `\tcbinterruptdraftmode` and `\tcbcontinuedraftmode` is shielded from *draft mode*.

`/tcb/draftmode=true|false` (default `true`, initially `false`)

If set to `true`, the *draft mode* is started. If set to `false`, the *draft mode* is stopped.

```
\newtcolorbox{mybeamer}[2][\beamer,colback=Salmon!50!white,
colframe=FireBrick!75!black,adjusted title={#2},#1]

\begin{mybeamer}{Beamer box}
This box looks like a box provided by the \texttt{beamer} class.
\end{mybeamer}\par\medskip
\begin{mybeamer}[draftmode]{Beamer box}
This box looks like a box provided by the \texttt{beamer} class.
\end{mybeamer}
```

Beamer box

This box looks like a box provided by the `beamer` class.

Beamer box

This box looks like a box provided by the `beamer` class.

6.11 Skin Family 'standard'

Note that the option keys `/tcb/frame style`^{→P.83}, `/tcb/interior style`^{→P.83}, `/tcb/segmentation style`^{→P.84}, and `/tcb/title style`^{→P.85} are not applicable to the standard skin. Also, watermarks (see Subsection 6.4) are not usable with the standard skin.

`/tcb/skin=standard` (skin)

This is the standard skin from the core package. All drawing engines are set to type standard. The drawing is based on pgf commands and does not need the tikz package.

Environment and engines for the skin 'standard'

```
/tcb/graphical environment→P.80: pgfpicture
/tcb/frame engine→P.80: standard
/tcb/interior titled engine→P.80: standard
/tcb/interior engine→P.81: standard
/tcb/segmentation engine→P.81: standard
/tcb/title engine→P.81: standard
```

`/tcb/standard` (style, no value)

This is an abbreviation for setting `skin=standard`.

```
\tcbset{standard,equal height group=standard,
colback=LightGreen,colframe=DarkGreen,colbacklower=LimeGreen!75!LightGreen,
colbacktitle=LimeGreen!75!DarkGreen,width=(\linewidth-6mm)/4,nobeforeafter,
left=1mm,right=1mm,top=1mm,bottom=1mm,middle=1mm}
%
\begin{tcolorbox}
  This is my content.
\end{tcolorbox}\hfill
\begin{tcolorbox}
  This is my content.
  \tcblower
  More content.
\end{tcolorbox}\hfill
\begin{tcolorbox}[adjusted title=My title]
  This is my content.
\end{tcolorbox}\hfill
\begin{tcolorbox}[adjusted title=My title]
  This is my content.
  \tcblower
  More content.
\end{tcolorbox}
```

This is my content.

This is my content.

More content.

My title

This is my content.

My title

This is my content.

More content.

`/tcb/skin=standard jigsaw` (skin)

This is the standard jigsaw skin from the core package. It differs from the skin `standard`^{→P.117} by its frame engine, see Section 6.9 on page 114.

Environment and engines for the skin 'standard jigsaw'

```
/tcb/graphical environment→P.80: pgfpicture
/tcb/frame engine→P.80: standardjigsaw
/tcb/interior titled engine→P.80: standard
/tcb/interior engine→P.81: standard
/tcb/segmentation engine→P.81: standard
/tcb/title engine→P.81: standard
```

`/tcb/standard jigsaw` (style, no value)

This is an abbreviation for setting `skin=standard jigsaw`.

```
\tcbset{standard jigsaw,equal height group=standardjigsaw,
colback=LightGreen,colframe=DarkGreen,colbacklower=LimeGreen!75!LightGreen,
colbacktitle=LimeGreen!75!DarkGreen,width=(\linewidth-6mm)/4,nobeforeafter,
opacityframe=0.5,opacityback=0.5,opacitybacktitle=0.5,
left=1mm,right=1mm,top=1mm,bottom=1mm,middle=1mm}
%
\begin{tcolorbox}
  This is my content.
\end{tcolorbox}\hfill
\begin{tcolorbox}
  This is my content.
  \tcblower
  More content.
\end{tcolorbox}\hfill
\begin{tcolorbox}[adjusted title=My title]
  This is my content.
\end{tcolorbox}\hfill
\begin{tcolorbox}[adjusted title=My title]
  This is my content.
  \tcblower
  More content.
\end{tcolorbox}
```

This is my content.

This is my content.

More content.

My title

This is my content.

My title

This is my content.

More content.

6.12 Skin Family 'enhanced'

If you like the standard appearance of a `tcolorbox` but you want to have some 'enhanced' features, the `enhanced` skin is what you are looking for.

`/tcb/skin=enhanced` (skin)

This skin translates the drawing commands of the core package into `tikz` path commands. Therefore, it allows all `tikz` high level options for these paths and has more flexibility compared to the `standard`^{→P.117} skin. You pay for this with some prolonged compilation time. The `tikz` path options can be given with the option keys `/tcb/frame style`^{→P.83}, `/tcb/interior style`^{→P.83}, `/tcb/segmentation style`^{→P.84}, and `/tcb/title style`^{→P.85}.

Environment and engines for the skin 'enhanced'

```
/tcb/graphical environment→P.80: tikzpicture
/tcb/frame engine→P.80: path
/tcb/interior titled engine→P.80: path
/tcb/interior engine→P.81: path
/tcb/segmentation engine→P.81: path
/tcb/title engine→P.81: path
```

`/tcb/enhanced` (style, no value)

This is an abbreviation for setting `skin=enhanced`.

```
\tcbset{enhanced,equal height group=enhanced,
colback=LightGreen,colframe=DarkGreen,colbacklower=LimeGreen!75!LightGreen,
width=(\linewidth-6mm)/4,nobeforeafter,
left=1mm,right=1mm,top=1mm,bottom=1mm,middle=1mm}
%
\begin{tcolorbox}
This is my content.
\end{tcolorbox}\hfill
\begin{tcolorbox}
This is my content.
\tcblower
More content.
\end{tcolorbox}\hfill
\begin{tcolorbox}[adjusted title=My title]
This is my content.
\end{tcolorbox}\hfill
\begin{tcolorbox}[adjusted title=My title]
This is my content.
\tcblower
More content.
\end{tcolorbox}
```

This is my content.

This is my content.

My title

My title

More content.

This is my content.

This is my content.

More content.

```
% \usetikzlibrary{shadings} % preamble
\tcbset{skin=enhanced,fonttitle=\bfseries,
  frame style={upper left=blue,upper right=red,lower left=yellow,lower right=green},
  interior style={white,opacity=0.5},
  segmentation style={black,solid,opacity=0.2,line width=1pt}}

\begin{tcolorbox}[title=Nice box in rainbow colors]
  With the 'enhanced' skin, it is quite easy to produce fancy looking effects.
  \tcblower
  Note that this is still a \texttt{tcolorbox}.
\end{tcolorbox}
```

Nice box in rainbow colors

With the 'enhanced' skin, it is quite easy to produce fancy looking effects.

Note that this is still a `tcolorbox`.

```
% \usetikzlibrary{decorations.pathmorphing} % preamble
\tcbset{skin=enhanced,fonttitle=\bfseries,boxrule=1mm,
  frame style={draw=FireBrick,fill=Salmon},drop fuzzy shadow,
  interior style={draw=FireBrick,top color=Salmon!10,bottom color=Salmon!20},
  segmentation style={draw=FireBrick,solid,decorate,
    decoration={coil,aspect=0,segment length=10.1mm}}}}

\begin{tcblisting}{title=A listing box with shadow and some specials}
Of course, skins can be used for listings also.
\begin{equation}
\int\limits_1^2 \frac{1}{x} dx = \ln(2).
\end{equation}
\end{tcblisting}
```

A listing box with shadow and some specials

Of course, skins can be used for listings also.

```
\begin{equation}
\int\limits_1^2 \frac{1}{x} dx = \ln(2).
\end{equation}
```

Of course, skins can be used for listings also.

$$\int_1^2 \frac{1}{x} dx = \ln(2). \quad (2)$$

`/tcb/enhanced standard`

(style, no value)

For unbreakable boxes, this is identical to using `/tcb/enhanced`^{P. 119}. But, for breakable boxes, the *break sequence* is identical to the `standard`^{P. 117} skin, see Section 9.5 from page 212.

This style relies on the skin `enhanced`^{→P.119}. All drawing operations are disabled and all margins are set to 0pt.

```
\begin{tcolorbox}[blank,watermark text=A blank box]
\lipsum[1]
\end{tcolorbox}
```

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

```
% \tcbuselibrary{fitting}
\newtcbboxfit{\mybox}[1]{blank,width=4cm,height=7cm,top=4pt,
  watermark text=#1}

\begin{tabular}{|c|c|c|}\hline
A & B & C\\\hline
\mybox{A}{\lipsum[1]} & \mybox{B}{\lipsum[2]} & \mybox{C}{\lipsum[3]}\\\hline
\end{tabular}
```

A	B	C
<p>Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.</p>	<p>Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.</p>	<p>Nulla malesuada porttitor diam. Donec felis erat, congue non, volutpat at, tincidunt tristique, libero. Vivamus viverra fermentum felis. Donec nonummy pellentesque ante. Phasellus adipiscing semper elit. Proin fermentum massa ac quam. Sed diam turpis, molestie vitae, placerat a, molestie nec, leo. Maecenas lacinia. Nam ipsum ligula, eleifend at, accumsan nec, suscipit a, ipsum. Morbi blandit ligula feugiat magna. Nunc eleifend consequat lorem. Sed lacinia nulla vitae enim. Pellentesque tincidunt purus vel magna. Integer non enim. Praesent euismod nunc eu purus. Donec bibendum quam in tellus. Nullam cursus pulvinar lectus. Donec et mi. Nam vulputate metus eu enim. Vestibulum pellentesque felis eu massa.</p>

`\tcbline`

Sometimes, a line is only a line. With `\tcblower`^{→P.9} you separate the box content into two functional units. `\tcbline` draws only a line which looks like the segmentation line between upper and lower part. Furthermore, you can use `\tcbline` more than just once. `\tcbline` always uses the `path` drawing engine. Therefore, the `/tcb/segmentation` style^{→P.84} can be applied.

```
\tcbset{enhanced,colframe=blue!50!black,colback=white}  
  
\begin{tcolorbox}[colupper=red!50!black,collower=green!50!black]  
  \lipsum[1]  
  \tcbline  
  \lipsum[2]  
  \tcblower  
  \lipsum[3]  
  \tcbline  
  \lipsum[4]  
\end{tcolorbox}
```

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

Nulla malesuada porttitor diam. Donec felis erat, congue non, volutpat at, tincidunt tristique, libero. Vivamus viverra fermentum felis. Donec nonummy pellentesque ante. Phasellus adipiscing semper elit. Proin fermentum massa ac quam. Sed diam turpis, molestie vitae, placerat a, molestie nec, leo. Maecenas lacinia. Nam ipsum ligula, eleifend at, accumsan nec, suscipit a, ipsum. Morbi blandit ligula feugiat magna. Nunc eleifend consequat lorem. Sed lacinia nulla vitae enim. Pellentesque tincidunt purus vel magna. Integer non enim. Praesent euismod nunc eu purus. Donec bibendum quam in tellus. Nullam cursus pulvinar lectus. Donec et mi. Nam vulputate metus eu enim. Vestibulum pellentesque felis eu massa.

Quisque ullamcorper placerat ipsum. Cras nibh. Morbi vel justo vitae lacus tincidunt ultrices. Lorem ipsum dolor sit amet, consectetur adipiscing elit. In hac habitasse platea dictumst. Integer tempus convallis augue. Etiam facilisis. Nunc elementum fermentum wisi. Aenean placerat. Ut imperdiet, enim sed gravida sollicitudin, felis odio placerat quam, ac pulvinar elit purus eget enim. Nunc vitae tortor. Proin tempus nibh sit amet nisl. Vivamus quis tortor vitae risus porta vehicula.

/tcb/skin=**enhancedfirst** (skin)

This is a flavor of **enhanced**^{→P.119} which is used as a *first* part in a break sequence for **enhanced**^{→P.119}. Nevertheless, this skin can be applied independently.

Environment and engines for the skin 'enhancedfirst'

```
/tcb/graphical environment→P.80: tikzpicture
/tcb/frame engine→P.80: pathfirst
/tcb/interior titled engine→P.80: pathfirst
/tcb/interior engine→P.81: pathfirst
/tcb/segmentation engine→P.81: path
/tcb/title engine→P.81: pathfirst
```

```
\tcbset{skin=enhancedfirst,equal height group=enhancedfirst,
colback=LightGreen,colframe=DarkGreen,
width=(\linewidth-6mm)/4,nobeforeafter,
left=1mm,right=1mm,top=1mm,bottom=1mm,middle=1mm}
%
\begin{tcolorbox}
This is my content.
\end{tcolorbox}\hfill
\begin{tcolorbox}
This is my content.
\tcbblower
More content.
\end{tcolorbox}\hfill
\begin{tcolorbox}[adjusted title=My title]
This is my content.
\end{tcolorbox}\hfill
\begin{tcolorbox}[adjusted title=My title]
This is my content.
\tcbblower
More content.
\end{tcolorbox}
```

This is my content.

This is my content.

More content.

My title

This is my content.

My title

This is my content.

More content.

/tcb/skin=**enhancedmiddle** (skin)

This is a flavor of **enhanced**^{→P.119} which is used as a *middle* part in a break sequence for **enhanced**^{→P.119}. Nevertheless, this skin can be applied independently.

Environment and engines for the skin 'enhancedmiddle'

```
/tcb/graphical environment→P.80: tikzpicture
/tcb/frame engine→P.80: pathmiddle
/tcb/interior titled engine→P.80: pathmiddle
/tcb/interior engine→P.81: pathmiddle
/tcb/segmentation engine→P.81: path
/tcb/title engine→P.81: pathmiddle
```

```
\tcbset{skin=enhancedmiddle,equal height group=enhancedmiddle,
colback=LightGreen,colframe=DarkGreen,
width=(\linewidth-6mm)/4,nobeforeafter,
left=1mm,right=1mm,top=1mm,bottom=1mm,middle=1mm}
%
\begin{tcolorbox}
  This is my content.
\end{tcolorbox}\hfill
\begin{tcolorbox}
  This is my content.
  \tcblower
  More content.
\end{tcolorbox}\hfill
\begin{tcolorbox}[adjusted title=My title]
  This is my content.
\end{tcolorbox}\hfill
\begin{tcolorbox}[adjusted title=My title]
  This is my content.
  \tcblower
  More content.
\end{tcolorbox}
```

This is my content.

This is my content.

My title

My title

More content.

This is my content.

This is my content.

More content.

/tcb/skin=**enhancedlast** (skin)

This is a flavor of **enhanced**^{→P.119} which is used as a *last* part in a break sequence for **enhanced**^{→P.119}. Nevertheless, this skin can be applied independently.

Environment and engines for the skin 'enhancedlast'

```
/tcb/graphical environment→P.80: tikzpicture
/tcb/frame engine→P.80: pathlast
/tcb/interior titled engine→P.80: pathlast
/tcb/interior engine→P.81: pathlast
/tcb/segmentation engine→P.81: path
/tcb/title engine→P.81: pathlast
```

```
\tcbset{skin=enhancedlast,equal height group=enhancedlast,
colback=LightGreen,colframe=DarkGreen,
width=(\linewidth-6mm)/4,nobeforeafter,
left=1mm,right=1mm,top=1mm,bottom=1mm,middle=1mm}
%
\begin{tcolorbox}
This is my content.
\end{tcolorbox}\hfill
\begin{tcolorbox}
This is my content.
\tcblower
More content.
\end{tcolorbox}\hfill
\begin{tcolorbox}[adjusted title=My title]
This is my content.
\end{tcolorbox}\hfill
\begin{tcolorbox}[adjusted title=My title]
This is my content.
\tcblower
More content.
\end{tcolorbox}
```

This is my content.

This is my content.

More content.

My title

This is my content.

My title

This is my content.

More content.

`/tcb/skin=enhanced jigsaw` (skin)

This is the jigsaw variant of skin `enhanced`^{→P.119}. It differs by its frame engine, see Section 6.9 on page 114.

Environment and engines for the skin 'enhanced jigsaw'

```
/tcb/graphical environment→P.80: tikzpicture
/tcb/frame engine→P.80: pathjigsaw
/tcb/interior titled engine→P.80: path
/tcb/interior engine→P.81: path
/tcb/segmentation engine→P.81: path
/tcb/title engine→P.81: path
```

`/tcb/enhanced jigsaw` (style, no value)

This is an abbreviation for setting `skin=enhanced jigsaw`.

```
\tcbset{enhanced jigsaw,equal height group=enhancedjigsaw,
colback=LightGreen,colframe=DarkGreen,colbacklower=LimeGreen!75!LightGreen,
colbacktitle=LimeGreen!75!DarkGreen,width=(\linewidth-6mm)/4,nobeforeafter,
opacityframe=0.5,opacityback=0.5,opacitybacktitle=0.5,
left=1mm,right=1mm,top=1mm,bottom=1mm,middle=1mm}
%
\begin{tcolorbox}
  This is my content.
\end{tcolorbox}\hfill
\begin{tcolorbox}
  This is my content.
  \tcblower
  More content.
\end{tcolorbox}\hfill
\begin{tcolorbox}[adjusted title=My title]
  This is my content.
\end{tcolorbox}\hfill
\begin{tcolorbox}[adjusted title=My title]
  This is my content.
  \tcblower
  More content.
\end{tcolorbox}
```

This is my content.

This is my content.

More content.

My title

This is my content.

My title

This is my content.

More content.

/tcb/skin=**enhancedfirst jigsaw** (skin)

This is the jigsaw variant of skin **enhancedfirst**^{→P.123}. It differs by its frame engine, see Section 6.9 on page 114.

Environment and engines for the skin 'enhancedfirst jigsaw'

```
/tcb/graphical environment→P.80: tikzpicture
/tcb/frame engine→P.80: pathfirstjigsaw
/tcb/interior titled engine→P.80: pathfirst
/tcb/interior engine→P.81: pathfirst
/tcb/segmentation engine→P.81: path
/tcb/title engine→P.81: pathfirst
```

```
\tcbset{skin=enhancedfirst jigsaw,equal height group=enhancedfirstjigsaw,
colback=LightGreen,colframe=DarkGreen,colbacklower=LimeGreen!75!LightGreen,
colbacktitle=LimeGreen!75!DarkGreen,width=(\linewidth-6mm)/4,nobeforeafter,
opacityframe=0.5,opacityback=0.5,opacitybacktitle=0.5,
left=1mm,right=1mm,top=1mm,bottom=1mm,middle=1mm}
%
\begin{tcolorbox}
  This is my content.
\end{tcolorbox}\hfill
\begin{tcolorbox}
  This is my content.
  \tcblower
  More content.
\end{tcolorbox}\hfill
\begin{tcolorbox}[adjusted title=My title]
  This is my content.
\end{tcolorbox}\hfill
\begin{tcolorbox}[adjusted title=My title]
  This is my content.
  \tcblower
  More content.
\end{tcolorbox}
```

This is my content.

This is my content.

My title

My title

More content.

This is my content.

This is my content.

More content.

`/tcb/skin=enhancedmiddle jigsaw` (skin)

This is the jigsaw variant of skin `enhancedmiddle`^{→P.124}. It differs by its frame engine, see Section 6.9 on page 114.

Environment and engines for the skin 'enhancedmiddle jigsaw'

```
/tcb/graphical environment→P.80: tikzpicture
/tcb/frame engine→P.80: pathmiddlejigsaw
/tcb/interior titled engine→P.80: pathmiddle
/tcb/interior engine→P.81: pathmiddle
/tcb/segmentation engine→P.81: path
/tcb/title engine→P.81: pathmiddle
```

```
\tcbset{skin=enhancedmiddle jigsaw,equal height group=enhancedmiddlejigsaw,
colback=LightGreen,colframe=DarkGreen,colbacklower=LimeGreen!75!LightGreen,
colbacktitle=LimeGreen!75!DarkGreen,width=(\linewidth-6mm)/4,nobeforeafter,
opacityframe=0.5,opacityback=0.5,opacitybacktitle=0.5,
left=1mm,right=1mm,top=1mm,bottom=1mm,middle=1mm}
%
\begin{tcolorbox}
  This is my content.
\end{tcolorbox}\hfill
\begin{tcolorbox}
  This is my content.
  \tcblower
  More content.
\end{tcolorbox}\hfill
\begin{tcolorbox}[adjusted title=My title]
  This is my content.
\end{tcolorbox}\hfill
\begin{tcolorbox}[adjusted title=My title]
  This is my content.
  \tcblower
  More content.
\end{tcolorbox}
```

This is my content.

This is my content.

My title

My title

More content.

This is my content.

This is my content.

More content.

`/tcb/marker` (style, no value)

This styles relies on the skin `enhancedmiddle jigsaw`. It is intended to be used as an optical marker like a highlighter pen.

```
\begin{tcolorbox}[marker]
\lipsum[2]
\end{tcolorbox}
```

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

This examples demonstrates the creation of several *text marker* environments based on `enhancedmiddle` → P. 124.

```
\tcbset{textmarker/.style={%
  skin=enhancedmiddle jigsaw,breakable,parbox=false,
  boxrule=0mm,leftrule=5mm,rightrule=5mm,boxsep=0mm,arc=0mm,outer arc=0mm,
  left=3mm,right=3mm,top=1mm,bottom=1mm,toptitle=1mm,bottomtitle=1mm,oversize}}

\newcolorbox{yellow}{textmarker,colback=yellow!5!white,colframe=yellow}
\newcolorbox{orange}{textmarker,colback=DarkOrange!5!white,
  colframe=DarkOrange!75!yellow}
\newcolorbox{red}{textmarker,colback=red!5!white,colframe=red}
\newcolorbox{blue}{textmarker,colback=DeepSkyBlue!5!white,colframe=DeepSkyBlue}
\newcolorbox{green}{textmarker,colback=Chartreuse!5!white,colframe=Chartreuse}
\newcolorbox{rainbow}{textmarker,interior hidden,
  frame style={top color=blue,bottom color=red,middle color=green}}

\begin{yellow}
  \lipsum[1-3]
\end{yellow}

\begin{orange}
  \lipsum[4]
\end{orange}

\begin{red}
  \lipsum[5]
\end{red}

\begin{green}
  \lipsum[6]
\end{green}

\begin{blue}
  \lipsum[7]
\end{blue}

\begin{rainbow}
  \lipsum[8]
\end{rainbow}
```

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

Nulla malesuada porttitor diam. Donec felis erat, congue non, volutpat at, tincidunt tristique, libero. Vivamus viverra fermentum felis. Donec nonummy pellentesque ante. Phasellus adipiscing semper elit. Proin fermentum massa ac quam. Sed diam turpis, molestie vitae, placerat a, molestie nec, leo. Maecenas lacinia. Nam ipsum ligula, eleifend at, accumsan nec, suscipit a, ipsum. Morbi blandit ligula feugiat magna. Nunc eleifend consequat lorem. Sed lacinia nulla vitae enim. Pellentesque tincidunt purus vel magna. Integer non enim. Praesent euismod nunc eu purus. Donec bibendum quam in tellus. Nullam cursus pulvinar lectus. Donec et mi. Nam vulputate metus eu enim. Vestibulum pellentesque felis eu massa.

Quisque ullamcorper placerat ipsum. Cras nibh. Morbi vel justo vitae lacus tincidunt ultrices. Lorem ipsum dolor sit amet, consectetur adipiscing elit. In hac habitasse platea dictumst. Integer tempus convallis augue. Etiam facilisis. Nunc elementum fermentum wisi. Aenean placerat. Ut imperdiet, enim sed gravida sollicitudin, felis odio placerat quam, ac pulvinar elit purus eget enim. Nunc vitae tortor. Proin tempus nibh sit amet nisl. Vivamus quis tortor vitae risus porta vehicula.

Fusce mauris. Vestibulum luctus nibh at lectus. Sed bibendum, nulla a faucibus semper, leo velit ultricies tellus, ac venenatis arcu wisi vel nisl. Vestibulum diam. Aliquam pellentesque, augue quis sagittis posuere, turpis lacus congue quam, in hendrerit risus eros eget felis. Maecenas eget erat in sapien mattis porttitor. Vestibulum porttitor. Nulla facilisi. Sed a turpis eu lacus commodo facilisis. Morbi fringilla, wisi in dignissim interdum, justo lectus sagittis dui, et vehicula libero dui cursus dui. Mauris tempor ligula sed lacus. Duis cursus enim ut augue. Cras ac magna. Cras nulla. Nulla egestas. Curabitur a leo. Quisque egestas wisi eget nunc. Nam feugiat lacus vel est. Curabitur consectetur.

Suspendisse vel felis. Ut lorem lorem, interdum eu, tincidunt sit amet, laoreet vitae, arcu. Aenean faucibus pede eu ante. Praesent enim elit, rutrum at, molestie non, nonummy vel, nisl. Ut lectus eros, malesuada sit amet, fermentum eu, sodales cursus, magna. Donec eu purus. Quisque vehicula, urna sed ultricies auctor, pede lorem egestas dui, et convallis elit erat sed nulla. Donec luctus. Curabitur et nunc. Aliquam dolor odio, commodo pretium, ultricies non, pharetra in, velit. Integer arcu est, nonummy in, fermentum faucibus, egestas vel, odio.

Sed commodo posuere pede. Mauris ut est. Ut quis purus. Sed ac odio. Sed vehicula hendrerit sem. Duis non odio. Morbi ut dui. Sed accumsan risus eget odio. In hac habitasse platea dictumst. Pellentesque non elit. Fusce sed justo eu urna porta tincidunt. Mauris felis odio, sollicitudin sed, volutpat a, ornare ac, erat. Morbi quis dolor. Donec pellentesque, erat ac sagittis semper, nunc dui lobortis purus, quis congue purus metus ultricies tellus. Proin et quam. Class aptent taciti sociosqu ad litora torquent per conubia nostra, per inceptos hymenaeos. Praesent sapien turpis, fermentum vel, eleifend faucibus, vehicula eu, lacus.

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/tcb/skin=**enhancedlast jigsaw** (skin)

This is the jigsaw variant of skin **enhancedlast**^{→P.125}. It differs by its frame engine, see Section 6.9 on page 114.

Environment and engines for the skin 'enhancedlast'

```
/tcb/graphical environment→P.80: tikzpicture
/tcb/frame engine→P.80: pathlastjigsaw
/tcb/interior titled engine→P.80: pathlast
/tcb/interior engine→P.81: pathlast
/tcb/segmentation engine→P.81: path
/tcb/title engine→P.81: pathlast
```

```
\tcbset{skin=enhancedlast jigsaw,equal height group=enhancedlastjigsaw,
colback=LightGreen,colframe=DarkGreen,colbacklower=LimeGreen!75!LightGreen,
colbacktitle=LimeGreen!75!DarkGreen,width=(\linewidth-6mm)/4,nobeforeafter,
opacityframe=0.5,opacityback=0.5,opacitybacktitle=0.5,
left=1mm,right=1mm,top=1mm,bottom=1mm,middle=1mm}
%
\begin{tcolorbox}
  This is my content.
\end{tcolorbox}\hfill
\begin{tcolorbox}
  This is my content.
  \tcblower
  More content.
\end{tcolorbox}\hfill
\begin{tcolorbox}[adjusted title=My title]
  This is my content.
\end{tcolorbox}\hfill
\begin{tcolorbox}[adjusted title=My title]
  This is my content.
  \tcblower
  More content.
\end{tcolorbox}
```

This is my content.

This is my content.

My title

My title

More content.

This is my content.

This is my content.

More content.

6.13 Skin Family 'freelance'

This skin family is intended for the experienced user who looks for special customizations of a `tcolorbox`. It gives full freedom for the appearance, but it requires some `tikz` coding. For small adaptations, you may want to use overlays instead, see Section 3.8 on page 48.

`/tcb/skin=freelance` (skin)

This skin gives full freedom for the appearance of the `tcolorbox`. All drawing engines are set to type `freelance`; they use the `tikz` package and compute the `/tcb/geometry nodes`^{→P.81}. This skin is useful for boxes which should differ much from the normal appearance. Note that this difference has to be programmed by the user. The drawing code can be given with the following option keys. As default value, the code from the `standard` skin is set.

Environment and engines for the skin 'freelance'

```
/tcb/graphical environment→P.80: tikzpicture
/tcb/frame engine→P.80: freelance
/tcb/interior titled engine→P.80: freelance
/tcb/interior engine→P.81: freelance
/tcb/segmentation engine→P.81: freelance
/tcb/title engine→P.81: freelance
```

`/tcb/freelance` (style, no value)

This is an abbreviation for setting `skin=freelance`.

```
\tcbset{freelance,equal height group=freelance,
colback=LightGreen,colframe=DarkGreen,
width=(\linewidth-6mm)/4,nobeforeafter,
left=1mm,right=1mm,top=1mm,bottom=1mm,middle=1mm}
%
\begin{tcolorbox}
This is my content.
\end{tcolorbox}\hfill
\begin{tcolorbox}
This is my content.
\tcblower
More content.
\end{tcolorbox}\hfill
\begin{tcolorbox}[adjusted title=My title]
This is my content.
\end{tcolorbox}\hfill
\begin{tcolorbox}[adjusted title=My title]
This is my content.
\tcblower
More content.
\end{tcolorbox}
```

This is my content.

This is my content.

My title

My title

More content.

This is my content.

This is my content.

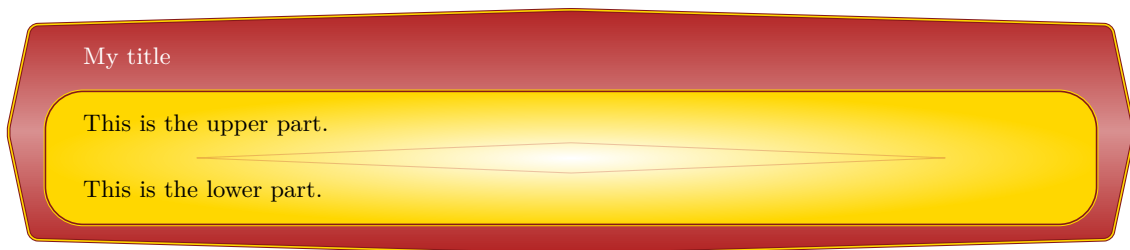
More content.

```

\tcbset{skin=freelance,boxrule=2mm,enlarge top by=2mm,enlarge bottom by=2mm,
  enlarge left by=3mm,enlarge right by=3mm,width=\linewidth-6mm,
  frame code={\path[top color=FireBrick,bottom color=FireBrick,middle color=FireBrick!50,
    draw=FireBrick!75!black,double=Gold,rounded corners=1mm]
    (frame.south west) -- ([xshift=-3mm]frame.west) -- (frame.north west)
    -- ([yshift=2mm]frame.north) -- (frame.north east) -- ([xshift=3mm]frame.east)
    -- (frame.south east) -- ([yshift=-2mm]frame.south) -- cycle;},
  interior titled code={\path[outer color=Gold,inner color=white,draw=Gold,
    double=FireBrick!75!black,rounded corners=5mm]
    (interior.south west) rectangle (interior.north east);},
  segmentation code={\path[draw=FireBrick,opacity=0.25] ([xshift=2cm]segmentation.west)
    -- (segmentation.north) -- ([xshift=-2cm]segmentation.east)
    -- (segmentation.south) -- cycle;}}

\begin{tcolorbox}[title=My title]
  This is the upper part.
  \tcblower
  This is the lower part.
\end{tcolorbox}

```



`/tcb/skin=freelancefirst` (skin)
 This skin equals `freelance`^{→ P. 132} with exception of the break sequence, see Section 9.5 on page 212. It is used as first part of the break sequence of `freelance`^{→ P. 132}. `/tcb/extend freelancefirst` can be used to customize this part.

`/tcb/skin=freelancemiddle` (skin)
 This skin equals `freelance`^{→ P. 132} with exception of the break sequence, see Section 9.5 on page 212. It is used as middle part of the break sequence of `freelance`^{→ P. 132}. `/tcb/extend freelancemiddle` can be used to customize this part.

`/tcb/skin=freelancelast` (skin)
 This skin equals `freelance`^{→ P. 132} with exception of the break sequence, see Section 9.5 on page 212. It is used as last part of the break sequence of `freelance`^{→ P. 132}. `/tcb/extend freelancelast` can be used to customize this part.

`/tcb/extend freelance=<graphical code>` (no default, initially empty)
 The `<graphical code>` is added to the skin definition of `freelance`^{→ P. 132}.

`/tcb/extend freelancefirst=<graphical code>` (no default, initially empty)
 The `<graphical code>` is added to the skin definition of `freelancefirst` which is used as first part of the break sequence of `freelance`^{→ P. 132}. Refer to the following example for usage.

`/tcb/extend freelancemiddle=<graphical code>` (no default, initially empty)
 The `<graphical code>` is added to the skin definition of `freelancemiddle` which is used as middle part of the break sequence of `freelance`^{→ P. 132}. Refer to the following example for usage.

`/tcb/extend freelancelast=<graphical code>` (no default, initially empty)
 The `<graphical code>` is added to the skin definition of `freelancelast` which is used as last part of the break sequence of `freelance`^{→ P. 132}. Refer to the following example for usage.

This example demonstrates a breakable freelance box. Here, we define an environment `freebox`. The first application of `freebox` produces an unbroken `tcolorbox`. The box is drawn by the code given by `/tcb/frame` code^{P.86} and `/tcb/interior` code^{P.87}. The second application of `freebox` is broken into several parts which are drawn by the codes given by `/tcb/extend freelancefirst`, `/tcb/extend freelancemiddle`, and `/tcb/extend freelancelast`.

```
% Preamble:
%\usepackage{tikz,lipsum}
%\tcbuselibrary{skins,breakable}
\tikzset{colframe/.style={fill,top color=red!75!black,bottom color=red!75!black,
middle color=red},
colint/.style={fill=yellow!50!white}, coltria/.style={fill=red!15!white}}

\newtcolorbox{freebox}[1][{}]{freelance,breakable,leftrule=5mm,left=2mm,
watermark color=red!50!yellow!75!white,
watermark text on=unbroken is unbroken box,
watermark text on=first is first part,
watermark text on=middle is middle part,
watermark text on=last is last part,
% code for unbroken boxes:
frame code={\path[colframe] (frame.south west)--(frame.north west)
--([xshift=-5mm]frame.north east)--([yshift=-5mm]frame.north east)
--([yshift=5mm]frame.south east)--([xshift=-5mm]frame.south east)--cycle; },
interior code={\path[colint] (interior.south west)--(interior.north west)
--([xshift=-4.8mm]interior.north east)--([yshift=-4.8mm]interior.north east)
--([yshift=4.8mm]interior.south east)--([xshift=-4.8mm]interior.south east)
--cycle; },
% code for the first part of a break sequence:
extend freelancefirst={%
frame code={\path[colframe] (frame.south west)--(frame.north west)
--([xshift=-5mm]frame.north east)--([yshift=-5mm]frame.north east)
--(frame.south east)--cycle;
\path[coltria] ([xshift=2.5mm,yshift=1mm]frame.south west) -- +(120:2mm)
-- +(60:2mm)-- cycle; },
interior code={\path[colint] (interior.south west|-frame.south)
--(interior.north west)--([xshift=-4.8mm]interior.north east)
--([yshift=-4.8mm]interior.north east)--(interior.south east|-frame.south)
--cycle; },
},%
% code for the middle part of a break sequence:
extend freelancemiddle={%
frame code={\path[colframe] (frame.south west)--(frame.north west)
--(frame.north east)--(frame.south east)--cycle;
\path[coltria] ([xshift=2.5mm,yshift=-1mm]frame.north west) -- +(240:2mm)
-- +(300:2mm) -- cycle;
\path[coltria] ([xshift=2.5mm,yshift=1mm]frame.south west) -- +(120:2mm)
-- +(60:2mm) -- cycle;
},
interior code={\path[colint] (interior.south west|-frame.south)
--(interior.north west|-frame.north)--(interior.north east|-frame.north)
--(interior.south east|-frame.south)--cycle; },
},%
% code for the last part of a break sequence:
extend freelancelast={%
frame code={\path[colframe] (frame.south west)--(frame.north west)
--(frame.north east)--([yshift=5mm]frame.south east)
--([xshift=-5mm]frame.south east)--cycle;
\path[coltria] ([xshift=2.5mm,yshift=-1mm]frame.north west) -- +(240:2mm)
-- +(300:2mm) -- cycle;
},
},%
```

```

interior code={\path[colint] (interior.south west)
--(interior.north west|-frame.north)--(interior.north east|-frame.north)
--([yshift=4.8mm]interior.south east)--([xshift=-4.8mm]interior.south east)
--cycle; },
},
#1}

\begin{freebox}
\lipsum[1]
\end{freebox}

\begin{freebox}
\lipsum[1-12]
\end{freebox}

```

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Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

Nulla malesuada porttitor diam. Donec felis erat, congue non, volutpat at, tincidunt tristique, libero. Vivamus viverra fermentum felis. Donec nonummy pellentesque ante. Phasellus adipiscing semper elit. Proin fermentum massa ac quam. Sed diam turpis, molestie vitae, placerat a, molestie nec, leo. Maecenas lacinia. Nam ipsum ligula, eleifend at, accumsan nec, suscipit a, ipsum. Morbi blandit ligula feugiat magna. Nunc eleifend consequat lorem. Sed lacinia nulla vitae enim. Pellentesque tincidunt purus vel magna. Integer non enim. Praesent euismod nunc eu purus. Donec bibendum quam

in tellus. Nullam cursus pulvinar lectus. Donec et mi. Nam vulputate metus eu enim. Vestibulum pellentesque felis eu massa.

Quisque ullamcorper placerat ipsum. Cras nibh. Morbi vel justo vitae lacus tincidunt ultrices. Lorem ipsum dolor sit amet, consectetur adipiscing elit. In hac habitasse platea dictumst. Integer tempus convallis augue. Etiam facilisis. Nunc elementum fermentum wisi. Aenean placerat. Ut imperdiet, enim sed gravida sollicitudin, felis odio placerat quam, ac pulvinar elit purus eget enim. Nunc vitae tortor. Proin tempus nibh sit amet nisl. Vivamus quis tortor vitae risus porta vehicula.

Fusce mauris. Vestibulum luctus nibh at lectus. Sed bibendum, nulla a faucibus semper, leo velit ultricies tellus, ac venenatis arcu wisi vel nisl. Vestibulum diam. Aliquam pellentesque, augue quis sagittis posuere, turpis lacus congue quam, in hendrerit risus eros eget felis. Maecenas eget erat in sapien mattis porttitor. Vestibulum porttitor. Nulla facilisi. Sed a turpis eu lacus commodo facilisis. Morbi fringilla, wisi in dignissim interdum, justo lectus sagittis dui, et vehicula libero dui cursus dui. Mauris tempor ligula sed lacus. Duis cursus enim ut augue. Cras ac magna. Cras nulla. Nulla egestas. Curabitur a leo. Quisque egestas wisi eget nunc. Nam feugiat lacus vel est. Curabitur consectetur.

Suspendisse vel felis. Ut lorem lorem, interdum eu, tincidunt sit amet, laoreet vitae, arcu. Aenean faucibus pede eu ante. Praesent enim elit, rutrum at, molestie non, nonummy vel, nisl. Ut lectus eros, malesuada sit amet, fermentum eu, sodales cursus, magna. Donec eu purus. Quisque vehicula, urna sed ultricies auctor, pede lorem egestas dui, et convallis elit erat sed nulla. Donec luctus. Curabitur et nunc. Aliquam dolor odio, commodo pretium, ultricies non, pharetra in, velit. Integer arcu est, nonummy in, fermentum faucibus, egestas vel, odio.

Sed commodo posuere pede. Mauris ut est. Ut quis purus. Sed ac odio. Sed vehicula hendrerit sem. Duis non odio. Morbi ut dui. Sed accumsan risus eget odio. In hac habitasse platea dictumst. Pellentesque non elit. Fusce sed justo eu urna porta tincidunt. Mauris felis odio, sollicitudin sed, volutpat a, ornare ac, erat. Morbi quis dolor. Donec pellentesque, erat ac sagittis semper, nunc dui lobortis purus, quis congue purus metus ultricies tellus. Proin et quam. Class aptent taciti sociosqu ad litora torquent per conubia nostra, per inceptos hymenaeos. Praesent sapien turpis, fermentum vel, eleifend faucibus, vehicula eu, lacus.

Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Donec odio elit, dictum in, hendrerit sit amet, egestas sed, leo. Praesent feugiat sapien aliquet odio. Integer vitae justo. Aliquam vestibulum fringilla lorem. Sed neque lectus, consectetur at, consectetur sed, eleifend ac, lectus. Nulla facilisi. Pellentesque eget lectus. Proin eu metus. Sed porttitor. In hac habitasse platea dictumst. Suspendisse eu lectus. Ut mi mi, lacinia sit amet, placerat et, mollis vitae, dui. Sed ante tellus, tristique ut, iaculis eu, malesuada ac, dui. Mauris nibh leo, facilisis non, adipiscing quis, ultrices a, dui.

Morbi luctus, wisi viverra faucibus pretium, nibh est placerat odio, nec commodo wisi enim eget quam. Quisque libero justo, consectetur a, feugiat vitae, porttitor eu, libero. Suspendisse sed mauris vitae elit sollicitudin malesuada. Maecenas ultricies eros sit amet ante. Ut venenatis velit. Maecenas sed mi eget dui varius euismod. Phasellus aliquet volutpat odio. Vestibulum ante ipsum primis in faucibus orci luctus et ultrices posuere cubilia Curae; Pellentesque sit amet pede ac sem eleifend consectetur. Nullam elementum, urna vel imperdiet sodales, elit ipsum pharetra ligula, ac pretium ante justo a nulla. Curabitur tristique arcu eu metus. Vestibulum lectus. Proin mauris. Proin eu nunc eu urna hendrerit faucibus. Aliquam auctor, pede consequat laoreet varius, eros tellus scelerisque quam, pellentesque hendrerit ipsum dolor sed augue. Nulla nec lacus.

▲ Suspendisse vitae elit. Aliquam arcu neque, ornare in, ullamcorper quis, commodo eu, libero. Fusce sagittis erat at erat tristique mollis. Maecenas sapien libero, molestie et, lobortis in, sodales eget, dui. Morbi ultrices rutrum lorem. Nam elementum ullamcorper leo. Morbi dui. Aliquam sagittis. Nunc placerat. Pellentesque tristique sodales est. Maecenas imperdiet lacinia velit. Cras non urna. Morbi eros pede, suscipit ac, varius vel, egestas non, eros. Praesent malesuada, diam id pretium elementum, eros sem dictum tortor, vel consectetur odio sem sed wisi.

Sed feugiat. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Ut pellentesque augue sed urna. Vestibulum diam eros, fringilla et, consectetur eu, nonummy id, sapien. Nullam at lectus. In sagittis ultrices mauris. Curabitur malesuada erat sit amet massa. Fusce blandit. Aliquam erat volutpat. Aliquam euismod. Aenean vel lectus. Nunc imperdiet justo nec dolor.

Etiam euismod. Fusce facilisis lacinia dui. Suspendisse potenti. In mi erat, cursus id, nonummy sed, ullamcorper eget, sapien. Praesent pretium, magna in eleifend egestas, pede pede pretium lorem, quis consectetur tortor sapien facilisis magna. Mauris quis magna varius nulla scelerisque imperdiet. Aliquam non quam. Aliquam porttitor quam a lacus. Praesent vel arcu ut tortor cursus volutpat. In vitae pede quis diam bibendum placerat. Fusce elementum convallis neque. Sed dolor orci, scelerisque ac, dapibus nec, ultricies ut, mi. Duis nec dui quis leo sagittis commodo.

6.14 Skin Family 'bicolor'

`/tcb/skin=bicolor` (skin)

This skin is quite similar to the `standard`^{→P.117} and `enhanced`^{→P.119} skin. But instead of a segmentation line, the optional lower part of the box is filled with a different color or drawn with a different style.

Environment and engines for the skin 'bicolor'

```
/tcb/graphical environment→P.80: tikzpicture
/tcb/frame engine→P.80: path
/tcb/interior titled engine→P.80: freelance
/tcb/interior engine→P.81: freelance
/tcb/segmentation engine→P.81: freelance
/tcb/title engine→P.81: path
```

- The most basic usage of this skin is to set the background color of the lower part by `/tcb/colbacklower`^{→P.139} and all other options like for the `standard`^{→P.117} skin.

```
\begin{tcolorbox}[skin=bicolor,title=The title,
  colframe=FireBrick!75!black,colback=Salmon!50!white,colbacklower=Salmon]
  The upper part.
  \tcblower
  The lower part.
\end{tcolorbox}
```

The title

The upper part.

The lower part.

- The more advanced usage of this skin is to apply the `/tcb/frame style`^{→P.83} and the `/tcb/interior style`^{→P.83} like for the `enhanced`^{→P.119} skin. Also, the `/tcb/segmentation style`^{→P.84} can be used, but it is applied to the whole lower part.

```
\begin{tcolorbox}[skin=bicolor,title=The title,
  frame style={top color=FireBrick,
    bottom color=FireBrick!15!white,draw=black},
  interior style={left color=Salmon,right color=Salmon!50!white},
  segmentation style={right color=Salmon,left color=Salmon!50!white}]
  The upper part.
  \tcblower
  The lower part.
\end{tcolorbox}
```

The title

The upper part.

The lower part.

`/tcb/bicolor` (style, no value)

This is an abbreviation for setting `skin=bicolor`.

```

\tcbset{bicolor,equal height group=bicolor,
  colback=LightGreen,colframe=DarkGreen,colbacklower=LimeGreen!75!LightGreen,
  width=(\linewidth-6mm)/4,nobeforeafter,
  left=1mm,right=1mm,top=1mm,bottom=1mm,middle=1mm}
%
\begin{tcolorbox}
  This is my content.
\end{tcolorbox}\hfill
\begin{tcolorbox}
  This is my content.
  \tcblower
  More content.
\end{tcolorbox}\hfill
\begin{tcolorbox}[adjusted title=My title]
  This is my content.
\end{tcolorbox}\hfill
\begin{tcolorbox}[adjusted title=My title]
  This is my content.
  \tcblower
  More content.
\end{tcolorbox}

```

This is my content.

This is my content.
More content.

My title
This is my content.

My title
This is my content.
More content.

`/tcb/colbacklower=<color>` (no default, initially black!15!white)
Sets the background `<color>` of the lower part. It depends on the skin, if this value is used.

```

\tcbset{gitexample/.style={listing and comment,comment={#1},
  skin=bicolor,boxrule=1mm,fonttitle=\bfseries,coltitle=black,
  frame style={draw=black,left color=Gold,right color=Goldenrod!50!Gold},
  colback=black,colbacklower=Goldenrod!75!Gold,
  colupper=white,collower=black,
  listing options={language={bash},aboveskip=0pt,belowskip=0pt,nolol,
  basicstyle=\ttfamily\bfseries,extendedchars=true}}}

\begin{tcblisting}{title={Snapshot of the staging area},
  gitexample={The option '-a' automatically stages all tracked and modified
    files before the commit.\par
    This can be combined with the message option '-m'
    as seen in the third line.}}

git commit
git commit -a
git commit -am 'changes to my example'
\end{tcblisting}

```

Snapshot of the staging area

```

git commit
git commit -a
git commit -am 'changes to my example'

```

The option '-a' automatically stages all tracked and modified files before the commit.
This can be combined with the message option '-m' as seen in the third line.

/tcb/skin=**bicolorfirst** (skin)

This is a flavor of `bicolor`^{→P.138} which is used as a *first* part in a break sequence for `bicolor`^{→P.138}. Nevertheless, this skin can be applied independently.

Environment and engines for the skin 'bicolorfirst'

```
/tcb/graphical environment→P.80: tikzpicture
/tcb/frame engine→P.80: pathfirst
/tcb/interior titled engine→P.80: freelance
/tcb/interior engine→P.81: freelance
/tcb/segmentation engine→P.81: freelance
/tcb/title engine→P.81: pathfirst
```

```
\tcbset{skin=bicolorfirst,equal height group=bicolorfirst,
colback=LightGreen,colframe=DarkGreen,colbacklower=LimeGreen!75!LightGreen,
width=(\linewidth-6mm)/4,nobeforeafter,
left=1mm,right=1mm,top=1mm,bottom=1mm,middle=1mm}
%
\begin{tcolorbox}
  This is my content.
\end{tcolorbox}\hfill
\begin{tcolorbox}
  This is my content.
  \tcblower
  More content.
\end{tcolorbox}\hfill
\begin{tcolorbox}[adjusted title=My title]
  This is my content.
\end{tcolorbox}\hfill
\begin{tcolorbox}[adjusted title=My title]
  This is my content.
  \tcblower
  More content.
\end{tcolorbox}
```

This is my content.

This is my content.

More content.

My title

This is my content.

My title

This is my content.

More content.

/tcb/skin=**bicolormiddle** (skin)

This is a flavor of **bicolor**^{→P.138} which is used as a *middle* part in a break sequence for **bicolor**^{→P.138}. Nevertheless, this skin can be applied independently.

Environment and engines for the skin 'bicolormiddle'

```
/tcb/graphical environment→P.80: tikzpicture
/tcb/frame engine→P.80: pathmiddle
/tcb/interior titled engine→P.80: freelance
/tcb/interior engine→P.81: freelance
/tcb/segmentation engine→P.81: freelance
/tcb/title engine→P.81: pathmiddle
```

```
\tcbset{skin=bicolormiddle,equal height group=bicolormiddle,
colback=LightGreen,colframe=DarkGreen,colbacklower=LimeGreen!75!LightGreen,
width=(\linewidth-6mm)/4,nobeforeafter,
left=1mm,right=1mm,top=1mm,bottom=1mm,middle=1mm}
%
\begin{tcolorbox}
This is my content.
\end{tcolorbox}\hfill
\begin{tcolorbox}
This is my content.
\tcblower
More content.
\end{tcolorbox}\hfill
\begin{tcolorbox}[adjusted title=My title]
This is my content.
\end{tcolorbox}\hfill
\begin{tcolorbox}[adjusted title=My title]
This is my content.
\tcblower
More content.
\end{tcolorbox}
```

This is my content.

This is my content.

My title

My title

More content.

This is my content.

This is my content.

More content.

/tcb/skin=**bicolorlast** (skin)

This is a flavor of `bicolor`^{→P.138} which is used as a *last* part in a break sequence for `bicolor`^{→P.138}. Nevertheless, this skin can be applied independently.

Environment and engines for the skin 'bicolorlast'

```
/tcb/graphical environment→P.80: tikzpicture
/tcb/frame engine→P.80: pathlast
/tcb/interior titled engine→P.80: freelance
/tcb/interior engine→P.81: freelance
/tcb/segmentation engine→P.81: freelance
/tcb/title engine→P.81: pathlast
```

```
\tcbset{skin=bicolorlast,equal height group=bicolorlast,
colback=LightGreen,colframe=DarkGreen,colbacklower=LimeGreen!75!LightGreen,
width=(\linewidth-6mm)/4,nobeforeafter,
left=1mm,right=1mm,top=1mm,bottom=1mm,middle=1mm}
%
\begin{tcolorbox}
  This is my content.
\end{tcolorbox}\hfill
\begin{tcolorbox}
  This is my content.
  \tcblower
  More content.
\end{tcolorbox}\hfill
\begin{tcolorbox}[adjusted title=My title]
  This is my content.
\end{tcolorbox}\hfill
\begin{tcolorbox}[adjusted title=My title]
  This is my content.
  \tcblower
  More content.
\end{tcolorbox}
```

This is my content.

This is my content.

My title

My title

More content.

This is my content.

This is my content.

More content.

6.15 Skin Family 'beamer'

`/tcb/skin=beamer` (skin)

This skin resembles boxes known from the `beamer` class and therefore is called 'beamer'. It uses the normal colors from the core package but shades them a little bit. To use this skin, the `tikz` library `shadings` has to be included in the preamble by:

```
\usetikzlibrary{shadings}
```

The appearance of the skin can be controlled by `/tcb/frame style`^{→P.83} and `/tcb/interior style`^{→P.83}, if needed. Here, the *segmentation* cannot be controlled by a style.

Environment and engines for the skin 'beamer'

```
/tcb/graphical environment→P.80: tikzpicture
/tcb/frame engine→P.80: path
/tcb/interior titled engine→P.80: freelance
/tcb/interior engine→P.81: freelance
/tcb/segmentation engine→P.81: freelance
/tcb/title engine→P.81: path
```

`/tcb/beamer` (style, no value)

This is an abbreviation for setting `skin=beamer`.

It also changes the geometry and some style options.

```
\tcbset{beamer,equal height group=beamer,
colback=LightGreen,colframe=DarkGreen,
width=(\linewidth-6mm)/4,nobeforeafter,
left=1mm,right=1mm,top=1mm,bottom=1mm,middle=1mm}
%
\begin{tcolorbox}
This is my content.
\end{tcolorbox}\hfill
\begin{tcolorbox}
This is my content.
\tcblower
More content.
\end{tcolorbox}\hfill
\begin{tcolorbox}[adjusted title=My title]
This is my content.
\end{tcolorbox}\hfill
\begin{tcolorbox}[adjusted title=My title]
This is my content.
\tcblower
More content.
\end{tcolorbox}
```

This is my content.

This is my content.

My title

My title

More content.

This is my content.

This is my content.

More content.

```
\begin{tcolorbox}[beamer,colback=Salmon!50!white,colframe=FireBrick!75!black,
adjusted title=A colored box with the 'beamer' skin]
This box looks like a box provided by the \texttt{beamer} class.
\end{tcolorbox}
```

A colored box with the 'beamer' skin

This box looks like a box provided by the `beamer` class.

```
\begin{tcolorbox}[beamer,colframe=blue,colback=black,
watermark graphics=lichtspiel.jpg,
coltext=white,watermark opacity=0.75,watermark stretch=1.0,
title=Beamer Box with background picture]
\lipsum[1]
\end{tcolorbox}
```

Beamer Box with background picture

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

```
\newtcolorbox{myblock}[2][\%
beamer,breakable,colback=LightBlue,colframe=DarkBlue,#1,title=#2]\%

\begin{myblock}{Beamerish \texttt{block}: \texttt{myblock}}
\lipsum[1]
\end{myblock}
```

Beamerish block: myblock

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

/tcb/skin=beamerfirst

(skin)

This is a flavor of `beamer`^{→P.143} which is used as a *first* part in a break sequence for `beamer`^{→P.143}. Nevertheless, this skin can be applied independently.

Environment and engines for the skin 'beamerfirst'

```
/tcb/graphical environment→P.80: tikzpicture
/tcb/frame engine→P.80: pathfirst
/tcb/interior titled engine→P.80: freelance
/tcb/interior engine→P.81: freelance
/tcb/segmentation engine→P.81: freelance
/tcb/title engine→P.81: pathfirst
```

```
\tcbset{beamer,skin=beamerfirst,equal height group=beamerfirst,
colback=LightGreen,colframe=DarkGreen,
width=(\linewidth-6mm)/4,nobeforeafter,
left=1mm,right=1mm,top=1mm,bottom=1mm,middle=1mm}
%
\begin{tcolorbox}
  This is my content.
\end{tcolorbox}\hfill
\begin{tcolorbox}
  This is my content.
  \tcblower
  More content.
\end{tcolorbox}\hfill
\begin{tcolorbox}[adjusted title=My title]
  This is my content.
\end{tcolorbox}\hfill
\begin{tcolorbox}[adjusted title=My title]
  This is my content.
  \tcblower
  More content.
\end{tcolorbox}
```

This is my content.

This is my content.

More content.

My title

This is my content.

My title

This is my content.

More content.

/tcb/skin=**beamermiddle** (skin)

This is a flavor of **beamer**^{→P.143} which is used as a *middle* part in a break sequence for **beamer**^{→P.143}. Nevertheless, this skin can be applied independently.

Environment and engines for the skin 'beamermiddle'

```
/tcb/graphical environment→P.80: tikzpicture
/tcb/frame engine→P.80: pathmiddle
/tcb/interior titled engine→P.80: freelance
/tcb/interior engine→P.81: freelance
/tcb/segmentation engine→P.81: freelance
/tcb/title engine→P.81: pathmiddle
```

```
\tcbset{beamer,skin=beamermiddle,equal height group=beamermiddle,
colback=LightGreen,colframe=DarkGreen,
width=(\linewidth-6mm)/4,nobeforeafter,
left=1mm,right=1mm,top=1mm,bottom=1mm,middle=1mm}
%
\begin{tcolorbox}
  This is my content.
\end{tcolorbox}\hfill
\begin{tcolorbox}
  This is my content.
  \tcblower
  More content.
\end{tcolorbox}\hfill
\begin{tcolorbox}[adjusted title=My title]
  This is my content.
\end{tcolorbox}\hfill
\begin{tcolorbox}[adjusted title=My title]
  This is my content.
  \tcblower
  More content.
\end{tcolorbox}
```

This is my content.

This is my content.

My title

My title

More content.

This is my content.

This is my content.

More content.

/tcb/skin=beamerlast (skin)

This is a flavor of beamer^{→P.143} which is used as a *last* part in a break sequence for beamer^{→P.143}. Nevertheless, this skin can be applied independently.

Environment and engines for the skin 'beamerlast'

```
/tcb/graphical environment→P.80: tikzpicture
/tcb/frame engine→P.80: pathlast
/tcb/interior titled engine→P.80: freelance
/tcb/interior engine→P.81: freelance
/tcb/segmentation engine→P.81: freelance
/tcb/title engine→P.81: pathlast
```

```
\tcbset{beamer,skin=beamerlast,equal height group=beamerlast,
colback=LightGreen,colframe=DarkGreen,
width=(\linewidth-6mm)/4,nobeforeafter,
left=1mm,right=1mm,top=1mm,bottom=1mm,middle=1mm}
%
\begin{tcolorbox}
  This is my content.
\end{tcolorbox}\hfill
\begin{tcolorbox}
  This is my content.
  \tcblower
  More content.
\end{tcolorbox}\hfill
\begin{tcolorbox}[adjusted title=My title]
  This is my content.
\end{tcolorbox}\hfill
\begin{tcolorbox}[adjusted title=My title]
  This is my content.
  \tcblower
  More content.
\end{tcolorbox}
```

This is my content.

This is my content.

My title

My title

More content.

This is my content.

This is my content.

More content.

6.16 Skin Family 'widget'

`/tcb/skin=widget` (skin)

This skin uses the normal colors from the core package but shades them a little bit. To use this skin, the `tikz` library `shadings` has to be included in the preamble by:

```
\usetikzlibrary{shadings}
```

The appearance of the skin can be controlled by `/tcb/frame style`^{P.83}, `/tcb/interior style`^{P.83}, and `/tcb/segmentation style`^{P.84}, if needed.

Environment and engines for the skin 'widget'

```
/tcb/graphical environmentP.80: tikzpicture
/tcb/frame engineP.80: path
/tcb/interior titled engineP.80: path
/tcb/interior engineP.81: path
/tcb/segmentation engineP.81: freelance
/tcb/title engineP.81: freelance
```

`/tcb/widget` (style, no value)

This is an abbreviation for setting `skin=widget`.

It also changes the geometry and some style options.

```
\tcbset{widget,equal height group=widget,
colback=LightGreen,colframe=DarkGreen,
width=(\linewidth-6mm)/4,nobeforeafter,
left=1mm,right=1mm,top=1mm,bottom=1mm,middle=1mm}
%
\begin{tcolorbox}
This is my content.
\end{tcolorbox}\hfill
\begin{tcolorbox}
This is my content.
\tcblower
More content.
\end{tcolorbox}\hfill
\begin{tcolorbox}[adjusted title=My title]
This is my content.
\end{tcolorbox}\hfill
\begin{tcolorbox}[adjusted title=My title]
This is my content.
\tcblower
More content.
\end{tcolorbox}
```

This is my content.

This is my content.

My title

My title

More content.

This is my content.

This is my content.

More content.

```

\begin{tcolorbox}[widget,colback=Salmon!50!white,colframe=FireBrick!75!black,
adjusted title=A colored box with the 'widget' skin]
This is my content.
\end{tcolorbox}

```

A colored box with the 'widget' skin

This is my content.

/tcb/skin=**widgetfirst**

(skin)

This is a flavor of `widget`^{→P.148} which is used as a *first* part in a break sequence for `widget`^{→P.148}. Nevertheless, this skin can be applied independently.

Environment and engines for the skin 'widgetfirst'

```

/tcb/graphical environment→P.80: tikzpicture
/tcb/frame engine→P.80: pathfirst
/tcb/interior titled engine→P.80: pathfirst
/tcb/interior engine→P.81: pathfirst
/tcb/segmentation engine→P.81: freelance
/tcb/title engine→P.81: freelance

```

```

\tcbset{widget,skin=widgetfirst,equal height group=widgetfirst,
colback=LightGreen,colframe=DarkGreen,
width=(\linewidth-6mm)/4,nobeforeafter,
left=1mm,right=1mm,top=1mm,bottom=1mm,middle=1mm}
%
\begin{tcolorbox}
This is my content.
\end{tcolorbox}\hfill
\begin{tcolorbox}
This is my content.
\tcblower
More content.
\end{tcolorbox}\hfill
\begin{tcolorbox}[adjusted title=My title]
This is my content.
\end{tcolorbox}\hfill
\begin{tcolorbox}[adjusted title=My title]
This is my content.
\tcblower
More content.
\end{tcolorbox}

```

This is my content.

This is my content.

My title

My title

More content.

This is my content.

This is my content.

More content.

/tcb/skin=**widgetmiddle** (skin)

This is a flavor of `widget`^{→P.148} which is used as a *middle* part in a break sequence for `widget`^{→P.148}. Nevertheless, this skin can be applied independently.

Environment and engines for the skin 'widgetmiddle'

```
/tcb/graphical environment→P.80: tikzpicture
/tcb/frame engine→P.80: pathmiddle
/tcb/interior titled engine→P.80: pathmiddle
/tcb/interior engine→P.81: pathmiddle
/tcb/segmentation engine→P.81: freelance
/tcb/title engine→P.81: freelance
```

```
\tcbset{widget,skin=widgetmiddle,equal height group=widgetmiddle,
colback=LightGreen,colframe=DarkGreen,
width=(\linewidth-6mm)/4,nobeforeafter,
left=1mm,right=1mm,top=1mm,bottom=1mm,middle=1mm}
%
\begin{tcolorbox}
This is my content.
\end{tcolorbox}\hfill
\begin{tcolorbox}
This is my content.
\tcblower
More content.
\end{tcolorbox}\hfill
\begin{tcolorbox}[adjusted title=My title]
This is my content.
\end{tcolorbox}\hfill
\begin{tcolorbox}[adjusted title=My title]
This is my content.
\tcblower
More content.
\end{tcolorbox}
```

This is my content.

This is my content.

My title

My title

More content.

This is my content.

This is my content.

More content.

/tcb/skin=widgetlast (skin)

This is a flavor of widget^{→P. 148} which is used as a *last* part in a break sequence for widget^{→P. 148}. Nevertheless, this skin can be applied independently.

Environment and engines for the skin 'widgetlast'

```
/tcb/graphical environment→P. 80: tikzpicture
/tcb/frame engine→P. 80: pathlast
/tcb/interior titled engine→P. 80: pathlast
/tcb/interior engine→P. 81: pathlast
/tcb/segmentation engine→P. 81: freelance
/tcb/title engine→P. 81: freelance
```

```
\tcbset{widget,skin=widgetlast,equal height group=widgetlast,
colback=LightGreen,colframe=DarkGreen,
width=(\linewidth-6mm)/4,nobeforeafter,
left=1mm,right=1mm,top=1mm,bottom=1mm,middle=1mm}
%
\begin{tcolorbox}
  This is my content.
\end{tcolorbox}\hfill
\begin{tcolorbox}
  This is my content.
  \tcblower
  More content.
\end{tcolorbox}\hfill
\begin{tcolorbox}[adjusted title=My title]
  This is my content.
\end{tcolorbox}\hfill
\begin{tcolorbox}[adjusted title=My title]
  This is my content.
  \tcblower
  More content.
\end{tcolorbox}
```

This is my content.

This is my content.

My title

My title

More content.

This is my content.

This is my content.

More content.

6.17 Skin 'spartan'

`/tcb/skin=spartan` (skin)

This skin is quite ... spartan. It supports no rounded corners, no overlays, no shadows, no borderlines, and no `/tcb/geometry nodes`^{→P.81}. One cannot do any fancy things with this skin, but it compiles very fast. Therefore, the `spartan` skin is used for the draft mode, see Section 6.10 on page 116. Nevertheless, it can be used as a normal skin.

Environment and engines for the skin 'spartan'

```
/tcb/graphical environment→P.80: tikzpicture
/tcb/frame engine→P.80:          spartan
/tcb/interior titled engine→P.80: spartan
/tcb/interior engine→P.81:       spartan
/tcb/segmentation engine→P.81:   spartan
/tcb/title engine→P.81:          spartan
```

`/tcb/spartan` (style, no value)

This is an abbreviation for setting `skin=spartan`.

```
\tcbset{spartan,equal height group=spartan,
colback=LightGreen,colframe=DarkGreen,colbacklower=LimeGreen!75!LightGreen,
width=(\linewidth-6mm)/4,nobeforeafter,
left=1mm,right=1mm,top=1mm,bottom=1mm,middle=1mm}
%
\begin{tcolorbox}
  This is my content.
\end{tcolorbox}\hfill
\begin{tcolorbox}
  This is my content.
  \tcblower
  More content.
\end{tcolorbox}\hfill
\begin{tcolorbox}[adjusted title=My title]
  This is my content.
\end{tcolorbox}\hfill
\begin{tcolorbox}[adjusted title=My title]
  This is my content.
  \tcblower
  More content.
\end{tcolorbox}
```

This is my content.

This is my content.

My title

My title

More content.

This is my content.

This is my content.

More content.

6.18 Skin 'draft'

`/tcb/skin=draft` (skin)

This skin is intended to be used while drafting new geometric settings for a `tcolorbox`.

Environment and engines for the skin 'draft'

```
/tcb/graphical environment→P.80: tikzpicture
/tcb/frame engine→P.80: freelance
/tcb/interior titled engine→P.80: freelance
/tcb/interior engine→P.81: freelance
/tcb/segmentation engine→P.81: path
/tcb/title engine→P.81: path
```

`/tcb/draft` (style, no value)

This is an abbreviation for setting `skin=draft`.

```
\tcbset{draft,equal height group=draft,
colback=LightGreen,colframe=DarkGreen,
width=(\linewidth-6mm)/4,nobeforeafter,
left=1mm,right=1mm,top=1mm,bottom=1mm,middle=1mm}
%
\begin{tcolorbox}
This is my content.
\end{tcolorbox}\hfill
\begin{tcolorbox}
This is my content.
\tcblower
More content.
\end{tcolorbox}\hfill
\begin{tcolorbox}[adjusted title=My title]
This is my content.
\end{tcolorbox}\hfill
\begin{tcolorbox}[adjusted title=My title]
This is my content.
\tcblower
More content.
\end{tcolorbox}
```

frame: w=101.71863pt, h=56.11296pt, h=56.11296pt, h=56.11296pt, h=56.11296pt, h=56.11296pt, h=56.11296pt, h=56.11296pt

upper: w=87.49234pt, h=7.93pt, h=7.93pt, h=7.93pt, h=7.93pt, h=7.93pt, h=7.93pt, h=7.93pt
lower: w=87.49234pt, h=22.5310pt, h=22.5310pt, h=22.5310pt, h=22.5310pt, h=22.5310pt, h=22.5310pt, h=22.5310pt
interior: w=98.87338pt, h=53.267pt, h=53.267pt, h=53.267pt, h=53.267pt, h=53.267pt, h=53.267pt, h=53.267pt

```

\vspace*{3mm}
\begin{tcolorbox}[draft,title=A colored box with the 'draft' skin]
\lipsum[1-3]
\tcblower
\lipsum[4-6]
\end{tcolorbox}

```

frame: w=423.94617pt, h=506.20157pt

A colored box with the 'draft' skin title: w=392.64822pt, h=6.2pt

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum. Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultrices et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet.

hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris. Nulla malesuada porttitor diam. Donec felis erat, congue non, volutpat at, tincidunt tristique, libero. Vivamus viverra fermentum felis. Donec nonummy pellentesque ante. Phasellus adipiscing semper elit. Proin fermentum massa ac quam. Sed diam turpis, molestie vitae, placerat a, molestie nec, leo. Maecenas lacinia. Nam ipsum ligula, eleifend at, accumsan nec, suscipit a, ipsum. Morbi blandit ligula feugiat magna. Nunc eleifend consequat lorem. Sed lacinia nulla vitae enim. Pellentesque tincidunt purus vel magna. Integer non enim. Praesent euismod nunc eu purus. Donec bibendum quam in tellus. Nullam cursus pulvinar lectus. Donec et mi. Nam vulputate metus eu enim. Vestibulum pellentesque felis eu massa.



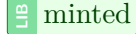

Quisque ullamcorper placerat ipsum. Cras nibh. Morbi vel justo vitae lacus tincidunt ultrices. Lorem ipsum dolor sit amet, consectetur adipiscing elit. In hac habitasse platea dictumst. Integer tempus convallis augue. Etiam facilisis. Nunc elementum fermentum wisi. Aenean placerat. Ut imperdiet, enim sed gravida sollicitudin, felis odio placerat quam, ac pulvinar elit purus eget enim. Nunc vitae tortor. Proin tempus nibh sit amet nisl. Vivamus quis tortor vitae risus porta vehicula. Fusce mauris. Vestibulum luctus nibh at lectus. Sed bibendum, nulla a faucibus semper, leo velit ultrices tellus, ac venenatis arcu wisi vel nisl. Vestibulum diam. Aliquam pellentesque, augue quis sagittis posuere, turpis lacus congue quam, in hendrerit risus eros eget felis. Maecenas eget erat in sapien mattis porttitor. Vestibulum porttitor. Nulla facilisi. Sed a turpis eu lacus commodo facilisis. Morbi fringilla, wisi in dui.

Suspendisse vel felis. Ut lorem lorem, interdum eu, tincidunt sit amet, laoreet vitae, arcu. Aenean faucibus pede eu ante. Praesent enim elit, rutrum at, molestie non, nonummy vel, nisl. Ut lectus eros, malesuada sit amet, fermentum eu, sodales cursus, magna. Donec eu purus. Quisque vehicula, urna sed ultrices auctor, pede lorem egestas dui, et convallis elit erat sed nulla. Donec luctus. Curabitur et nunc. Aliquam dolor odio, commodo pretium, ultrices non, pharetra in, velit. Integer arcu est, nonummy in, fermentum faucibus, egestas vel, odio.

interior: w=421.10092pt, h=490.04318pt

7 Libraries , , and

7.1 Loading the Libraries

In contrast to other `tcolorbox` libraries, the libraries , , and  are concurrent in the sense that they all do the same thing, i. e. displaying listings with or without typesetting the listing in \LaTeX parallel. The difference is the underlying \LaTeX package which does the core job for displaying a listing. So, typically, you need just *one* of these libraries. If you do not have a clue, which one of them you should use, you should take .

The order in which the libraries are included influences the default settings and the `/tcb/reset`^{→ P. 72} behavior. The settings of a later loaded library overwrite the settings of a previous loaded library. A library is never loaded twice.

7.1.1 Loading

This library uses the package `listings` [5] to typeset listings. It is loaded by a package option or inside the preamble by:

```
\tcbuselibrary{listings}
```

This also loads the package `listings` [5].


The `/tcb/listing engine`^{→ P. 165} is set to `listings` by the library. To reactivate this setting, if overwritten by other libraries, use

```
\tcbset{listing engine=listings}
```

7.1.2 Loading

To extend `listings` for UTF-8 encoded sources, you can use the support from the package `listingsutf8` [8] by loading the library variant .

```
\tcbuselibrary{listingsutf8}  
\tcbset{listing utf8=latin1}% optional; 'latin1' is the default.
```

This also loads the library  and the packages `listings` [5] and `listingsutf8` [8].

The `/tcb/listing engine`^{→ P. 165} is set to `listings` by the library. To reactivate this setting, if overwritten by other libraries, use


```
\tcbset{listing engine=listings}
```

7.1.3 Loading **minted**

This library uses the package `minted` [11] to typeset listings. It is loaded by a package option or inside the preamble by:

```
\tcbuselibrary{minted}
```

This also loads the package `minted` [11].

The `minted` package uses the external tool `Pygments` [9] to apply syntax highlighting. It has to be installed and set up, before the library can be used, see [11] and [9]. The `tcolorbox` library  **minted** does not work, if the package `minted` [11] does not work.

The `/tcb/listing engine` ^{→ P. 165} is set to `minted` by the library. To reactivate this setting, if overwritten by other libraries, use

```
\tcbset{listing engine=minted}
```

7.2 Common Macros of the Libraries

```
\begin{tcblisting}{\langle options \rangle}
\langle environment content \rangle
\end{tcblisting}
```

Creates a colored box based on a `tcolorbox` ^{→ P. 9}. Controlled by the given *options*, the environment content is typeset normally and/or as a listing. Furthermore, the *options* control appearance and functions of the `tcolorbox`. By default, the listing is interpreted as a \LaTeX listing.

```
\begin{tcblisting}{colback=red!5!white,colframe=red!75!black}
```

This is a \LaTeX example which displays the text as source code
and in compiled form.

```
\end{tcblisting}
```

This is a \LaTeX example which displays the text as source code
and in compiled form.

This is a \LaTeX example which displays the text as source code and in compiled form.

```
% \usetikzlibrary{listings} /or/ \usetikzlibrary{listingsutf8}
\begin{tcblisting}{colback=yellow!5,colframe=yellow!50!black,listing only,
  title=This is source code in another language (XML), fonttitle=\bfseries,
  listing options={language=XML,columns=fullflexible,keywordstyle=\color{red}}}
<?xml version="1.0"?>
<project name="Package tclobox" default="documentation" basedir=".">
  <description>
    Apache Ant build file (http://ant.apache.org/)
  </description>
</project>
\end{tcblisting}
```

This is source code in another language (XML)

```
<?xml version="1.0"?>
<project name="Package tclobox" default="documentation" basedir=".">
  <description>
    Apache Ant build file (http://ant.apache.org/)
  </description>
</project>
```

```
% \usetikzlibrary{minted}
\begin{tcblisting}{colback=yellow!5,colframe=yellow!50!black,listing only,
  title=This is source code in another language (XML), fonttitle=\bfseries,
  listing engine=minted,minted language=xml}
<?xml version="1.0"?>
<project name="Package tclobox" default="documentation" basedir=".">
  <description>
    Apache Ant build file (http://ant.apache.org/)
  </description>
</project>
\end{tcblisting}
```

This is source code in another language (XML)

```
<?xml version="1.0"?>
<project name="Package tclobox" default="documentation" basedir=".">
  <description>
    Apache Ant build file (http://ant.apache.org/)
  </description>
</project>
```

```
% This box is as wide as needed (listing only !!)
% \usetikzlibrary{skins}
\begin{tcblisting}{colback=green!5!white,colframe=green!50!black,listing only,
  hbox,enhanced,drop fuzzy shadow,before=\begin{center},after=\end{center}}
\begin{tikzpicture}
\fill[red] (0,0) rectangle (1,1);
\end{tikzpicture}
\end{tcblisting}
```

```
\begin{tikzpicture}
\fill[red] (0,0) rectangle (1,1);
\end{tikzpicture}
```

```
\begin{tcboutputlisting}
  <environment content>
\end{tcboutputlisting}
```

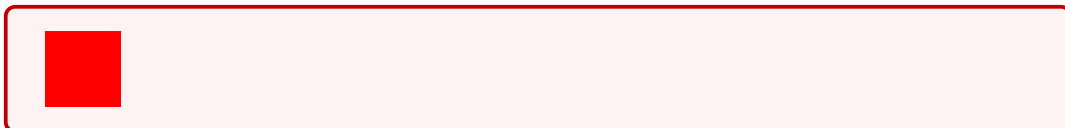
Saves the environment content to a file which is named by the key value of `listing` file. Later, this file can be loaded by `\tcbinputlisting` or `\tcbuselistingtext` or `\tcbuselistinglisting`.

```
\begin{tcboutputlisting}
This \textbf{text} is written to a standardized file for later usage.
\end{tcboutputlisting}
```

`\tcbinputlisting{<options>}`

Creates a colored boxed based on a `tcolorbox`. The text content is read from a file named by the key value of `listing` file. Apart from that, the function is equal to that of `tcblisting` ^{→ P. 156}.

```
\tcbinputlisting{colback=red!5!white,colframe=red!75!black,text only}
\tcbinputlisting{colback=green!5,colframe=green!75!black,listing only}
```



```
\begin{tikzpicture}
\fill[red] (0,0) rectangle (1,1);
\end{tikzpicture}
```

`\tcbuselistingtext`

Loads text from a file named by the key value of `listing` file.

```
\tcbuselistingtext
```



`\tcbuselistinglisting`

Typesets text as listing from a file named by the key value of `listing` file.

```
\tcbuselistinglisting
```

```
\begin{tikzpicture}
\fill[red] (0,0) rectangle (1,1);
\end{tikzpicture}
```

`\tcbusetemplisting`

Typesets text as listing from a temporary file which was written by `tcbwritetemp` ^{→ P. 78}.

It is not recommended that a new sort of `tcblisting` environment is created with one optional argument only. If there is just one argument, it should be made mandatory to avoid content scanning problems.

`\newtcblisting` [*init options*] {*name*} [*number*] [*default*] {*options*}

Creates a new environment *name* based on `tcblisting`^{→P.156}. Basically, `\newtcblisting` operates like `\newenvironment`. This means, the new environment *name* optionally takes *number* arguments, where *default* is the default value for the optional first argument. The *options* are given to the underlying `tcblisting`. Note that `/tcb/savedelimiter`^{→P.18} is set to the given *name* automatically. The *init options* allow setting up automatic numbering, see Section 4 from page 73.

```
\newtcblisting{mybox}{%
  colback=red!5!white,
  colframe=red!75!black}
```

```
\begin{mybox}
This is my \LaTeX\ box.
\end{mybox}
```

This is my \LaTeX\ box.

This is my L^AT_EX box.

```
\newtcblisting{mybox}[1]{%
  colback=red!5!white,
  colframe=red!75!black,
  fonttitle=\bfseries,
  title=#1}
```

```
\begin{mybox}[Listing Box]
This is my \LaTeX\ box.
\end{mybox}
```

Listing Box

This is my \LaTeX\ box.

This is my L^AT_EX box.

```
\newtcblisting{mybox}[2][{}]{%
  colback=red!5!white,
  colframe=red!75!black,
  fonttitle=\bfseries,
  title=#2,#1}
```

```
\begin{mybox}[listing only]
{Listing Box}
This is my \LaTeX\ box.
\end{mybox}
\bigskip

\begin{mybox}[listing side text]
{Listing Box}
This is my
\LaTeX\ box.
\end{mybox}
```

Listing Box

This is my \LaTeX\ box.

Listing Box

This is my
\LaTeX\ box.

This is my
L^AT_EX box.

Definition in the preamble:

```
\newcblisting[auto counter]{mycbox}[1]{%  
  colback=red!5!white,colframe=red!75!black,fonttitle=\bfseries,  
  title=Listing \thetcbcounter: #1}
```

```
\begin{mycbox}{Listing Box}  
This is my \LaTeX\ box.  
\end{mycbox}
```

Listing 1: Listing Box

This is my \LaTeX\ box.

This is my L^AT_EX box.

\renewcblisting [*<init options>*] {<name>} [*<number>*] [*<default>*] {<options>}

Operates like `\newcblisting`^{→ P. 159}, but based on `\renewenvironment` instead of `\newenvironment`. An existing environment is redefined.

`\newtcbinputlisting` [*init options*] {\<name>} [*number*] [*default*] {\<options>}

Creates a new macro \<name> based on \tcbinputlisting^{P. 158}. Basically, \newtcbinputlisting operates like \newcommand. The new macro \<name> optionally takes <number>+1 arguments, where <default> is the default value for the optional first argument. The <options> are given to the underlying tcbinputlisting. The <init options> allow setting up automatic numbering, see Section 4 from page 73.

```
\newtcbinputlisting[use counter from=mycbox]{\mylisting}[2] []{%
  listing file={#2},
  title=Listing (\thetcbcounter) of \texttt{#2},
  colback=red!5!white,colframe=red!75!black,fonttitle=\bfseries,
  listing only,breakable,#1}

\mylisting[before upper=\textit{This is the included file content:}]
  {\jobname.tcbtemp}
```

Listing (2) of tcolorbox.tcbtemp

This is the included file content:

```
\newtcbinputlisting[use counter from=mycbox]{\mylisting}[2] []{%
  listing file={#2},
  title=Listing (\thetcbcounter) of \texttt{#2},
  colback=red!5!white,colframe=red!75!black,fonttitle=\bfseries,
  listing only,breakable,#1}

\mylisting[before upper=\textit{This is the included file content:}]
  {\jobname.tcbtemp}
```

```
\newtcbinputlisting[use counter from=mycbox]{\mylisting}[2] []{%
  listing engine=minted,minted language=latex,minted style=colorful,
  listing file={#2},
  title=Listing (\thetcbcounter) of \texttt{#2},
  colback=red!5!white,colframe=red!75!black,fonttitle=\bfseries,
  listing only,breakable,#1}

\mylisting[before upper=\textit{This is the included file content:}]
  {\jobname.tcbtemp}
```

Listing (3) of tcolorbox.tcbtemp

This is the included file content:

```
\newtcbinputlisting[use counter from=mycbox]{\mylisting}[2] []{%
  listing engine=minted,minted language=latex,minted style=colorful,
  listing file={#2},
  title=Listing (\thetcbcounter) of \texttt{#2},
  colback=red!5!white,colframe=red!75!black,fonttitle=\bfseries,
  listing only,breakable,#1}

\mylisting[before upper=\textit{This is the included file content:}]
  {\jobname.tcbtemp}
```

`\renewtcbinputlisting` [*init options*] {\<name>} [*number*] [*default*] {\<options>}

Operates like \newtcbinputlisting, but based on \renewcommand instead of \newcommand. An existing macro is redefined.

7.3 Option Keys of the `listings` Library

`/tcb/listing options=<key list>` (no default, initially `style=tcblatex`)

Sets the options from the package `listings` [5] which are used during typesetting of the listing. For \LaTeX listings, there is a predefined `listings` style named `tcblatex` which can be used.

```
\begin{tcblisting}{colback=red!5!white,colframe=red!25,left=6mm,
listing options={style=tcblatex,numbers=left,numberstyle=\tiny\color{red!75!black}}}
This is a \LaTeX\ example which displays the text as source code
and in compiled form. Additionally, we use line numbers here.
\end{tcblisting}
```

```
1 This is a \LaTeX\ example which displays the text as source code
2 and in compiled form. Additionally, we use line numbers here.
```

This is a \LaTeX example which displays the text as source code and in compiled form.
Additionally, we use line numbers here.

`/tcb/no listing options` (no value, initially unset)

Abbreviation for `listing options={}`. This removes all options for the `listings` package. This includes the `tcblisting` standard style `tcblatex` and the encoding presets. Use this option, if you want to set the `listings` options outside of `tcblisting`, e.g. globally in the preamble.

```
\begin{tcblisting}{no listing options}
All \textit{listings} options removed.
\end{tcblisting}
```

All `\textit{listings}` options removed.

All *listings* options removed.

`/tcb/listing style=<style>` (no default, initially `tcblatex`)

Abbreviation for `listing options={style=...}`. This key sets a `<style>` for the `listings` package, see [5]. For \LaTeX , there is a predefined style named `tcblatex`.

```
\begin{tcblisting}{colback=red!5!white,colframe=red!75!black,
listing style=tcblatex}
Here, we use the predefined style.
\end{tcblisting}
```

Here, we use the predefined style.

Here, we use the predefined style.

`/tcb/listing inputencoding=<encoding>` (no default, initially `\inputencodingname`)
 Sets the input encoding value for the predefined listing style `tcb-latex` and `tcb-documentation` from the library `documentation`. The initial value is derived from the package `inputenc` if used.

`/tcb/listing remove caption=true|false` (default `true`, initially `true`)
 If set to `true`, some part of the caption building code of the `listings` package is silenced to prevent some unwanted interaction with the `hyperref` package resulting in additional vertical space. If set to `false`, the `listings` package code is kept unchanged. Note that listings outside `tcb-listing`^{→ P. 156} and `\tcbinputlisting`^{→ P. 158} are always processed normally. Typically, a user is not expected to use this key at all.

See further options in Section 7.6 on page 165.

7.4 Option Keys of the `listingsutf8` Library

The `listingsutf8` library is an extension of the `listings` library, so all options from Section 7.3 on page 162 are applicable.

`/tcb/listing utf8=<one-byte-encoding>` (style, no default, initially `latin1`)
 Abbreviation for using `/tcb/listing inputencoding` together with UTF-8 support from the package `listingsutf8` [8]. This option is available only for the library variant `listingsutf8`. The `<one-byte-encoding>` is one of the applicable encodings from [8], e.g. `latin1`.

See further options in Section 7.6 on page 165.

7.5 Option Keys of the `minted` Library

`/tcb/minted language=<programming language>` (no default, initially `latex`)
 Sets a `<programming language>` known to Pygments [9].

```
\begin{tcblisting}{listing engine=minted,minted style=trac,
  minted language=java,
  colback=red!5!white,colframe=red!75!black,listing only}
public class HelloWorld {
  // A 'Hello World' in Java
  public static void main(String[] args) {
    System.out.println("Hello World!");
  }
}
\end{tcblisting}
```

```
public class HelloWorld {
  // A 'Hello World' in Java
  public static void main(String[] args) {
    System.out.println("Hello World!");
  }
}
```

`/tcb/minted options=<key list>` (no default, initially `tabsize=2,fontsize=\small`)

Sets the options from the package `minted` [11] which are used during typesetting of the listing.

```
% \tcbuselibrary{skins}
\newtcblisting{myjava}{listing engine=minted,minted style=colorful,
  minted language=java,minted options={fontsize=\small,linenos,numbersep=3mm},
  colback=blue!5!white,colframe=blue!75!black,listing only,
  left=5mm,enhanced,
  overlay={\begin{tcbclipinterior}\fill[red!20!blue!20!white] (frame.south west)
    rectangle ([xshift=5mm]frame.north west);\end{tcbclipinterior}}}}

\begin{myjava}
public class HelloWorld {
  // A 'Hello World' in Java
  public static void main(String[] args) {
    System.out.println("Hello World!");
  }
}
\end{myjava}
```

```
1 public class HelloWorld {
2   // A 'Hello World' in Java
3   public static void main(String[] args) {
4     System.out.println("Hello World!");
5   }
6 }
```

`/tcb/minted style=<style>` (no default, initially unset)

Sets a `<style>` known to Pygments [9]. This is independent from `/tcb/minted options`. Note that styles are always applied globally; all following examples will be set in the given `<style>` until a new style is set. Also note that setting `\usemintedstyle{<style>}` only once per document is more economic, if all styles in a document are the same. For examples of different styles, see `/tcb/minted language`^{→P. 163} and `/tcb/minted options`.

See further options in Section 7.6 on the next page.

7.6 Common Option Keys of all Libraries

For the $\langle options \rangle$ in `tcblisting`^{→ P. 156} respectively `\tcbinputlisting`^{→ P. 158} the following `pgf` keys can be applied. The key tree path `/tcb/` is not to be used inside these macros.

`/tcb/listing engine= $\langle engine \rangle$` (no default)

Sets the $\langle engine \rangle$ which typesets the listings. Feasible values are

- `listings`, if library `\lib listings` or `\lib listingsutf8` is loaded.
- `minted`, if library `\lib minted` is loaded.

`/tcb/listing file= $\langle file name \rangle$` (no default, initially `\jobname.listing`)

Sets the $\langle file name \rangle$ of the file which is used to save listings.

`/tcb/listing and text` (no value, initially set)

Typesets the environment content as listing in the upper part and as compiled text in the lower part.

```
\begin{tcblisting}{colback=red!5!white,colframe=red!75!black,listing and text}
This is a \LaTeX\ example.
\end{tcblisting}
```

This is a \LaTeX\ example.

This is a L^AT_EX example.

`/tcb/text and listing` (no value)

Typesets the environment content as compiled text in the upper part and as listing in the lower part.

```
\begin{tcblisting}{colback=red!5!white,colframe=red!75!black,text and listing}
This is a \LaTeX\ example.
\end{tcblisting}
```

This is a L^AT_EX example.

This is a \LaTeX\ example.

`/tcb/listing only` (no value)

Typesets the environment content as listing.

```
\begin{tcblisting}{colback=red!5!white,colframe=red!75!black,listing only}
This is a \LaTeX\ example.
\end{tcblisting}
```

This is a \LaTeX\ example.

/tcb/text only (no value)

Typesets the environment content as compiled text.

```
\begin{tcblisting}{colback=red!5!white,colframe=red!75!black,text only}
This is a \LaTeX\ example.
\end{tcblisting}
```

This is a L^AT_EX example.

/tcb/comment=*<text>* (no default, initially empty)

Records a comment with *<text>* as content. The comment is displayed e.g. in conjunction with `/tcb/listing and comment`^{→ P.167} and `/tcb/comment and listing`^{→ P.167}.

```
\begin{tcblisting}{comment={This comment is really only a comment},
colback=red!5!white,colframe=red!75!black}
This is a \textbf{tcolorbox}.
\end{tcblisting}
```

This is a `\textbf{tcolorbox}`.

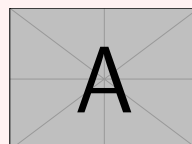
This is a `tcolorbox`.

/tcb/image comment=*<options>*{*<filename>*} (style, no default, initially unset)

Uses an image denoted by *<filename>* as *comment* for the listing. The image is included by the standard `\includegraphics` macro with given *<options>*.

```
\begin{tcblisting}{colback=red!5!white,colframe=red!75!black,listing side comment,
image comment={width=2.5cm}{example-image-a.pdf},center lower}
This is a \LaTeX\ example.
\end{tcblisting}
```

This is a \LaTeX\ example.



/tcb/listing and comment

(no value)

Typesets the environment content as listing in the upper part and a given comment in the lower part.

```
\begin{tcblisting}{colback=red!5!white,colframe=red!75!black,listing and comment,
comment={This is my comment. It may contain line breaks.\par
It can even use the environment content
\flqq\ignorespaces\tcbuselistingtext\unskip\frqq}}
This is a \LaTeX\ example.
\end{tcblisting}
```

This is a \LaTeX\ example.

This is my comment. It may contain line breaks.
It can even use the environment content «This is a \LaTeX example.»

/tcb/comment and listing

(no value)

Typesets a given comment in the upper part and the environment content as listing in the lower part.

```
\begin{tcblisting}{colback=red!5!white,colframe=red!75!black,comment and listing,
comment={This is my comment.}}
This is a \LaTeX\ example.
\end{tcblisting}
```

This is my comment.

This is a \LaTeX\ example.

`/tcb/listing side text` (no value)

Typesets the environment content side by side as listing in the left (upper) part and as compiled text in the right (lower) part.

```
\begin{tcblisting}{colback=red!5!white,colframe=red!75!black,listing side text}
This is a \LaTeX\ example.
\end{tcblisting}
```

This is a \LaTeX\ example.

This is a L^AT_EX example.

`/tcb/text side listing` (no value)

Typesets the environment content side by side as compiled text in the left (upper) part and as listing in the right (lower) part.

```
\begin{tcblisting}{colback=red!5!white,colframe=red!75!black,text side listing}
This is a \LaTeX\ example.
\end{tcblisting}
```

This is a L^AT_EX example.

This is a \LaTeX\ example.

`/tcb/listing outside text` (no value)

Typesets the environment content side by side as listing in a `tcolorbox` and as compiled text outside the box in the right part of the page. Nevertheless, the outside text is treated as *lower* part of the `tcolorbox` and can be formatted with all lower part options. The space partitioning is done with the side by side options from Section 3.10, see page 54.

```
\begin{tcblisting}{colback=red!5!white,colframe=red!75!black,listing outside text}
This is a \LaTeX\ example.
\end{tcblisting}
```

This is a \LaTeX\ example.

This is a L^AT_EX example.

`/tcb/text outside listing` (no value)

Typesets the environment content side by side as listing in a `tcolorbox` and as compiled text outside the box in the left part of the page. Nevertheless, the outside text is treated as *lower* part of the `tcolorbox` and can be formatted with all lower part options. The space partitioning is done with the side by side options from Section 3.10, see page 54.

```
\begin{tcblisting}{colback=red!5!white,colframe=red!75!black,text outside listing}
This is a \LaTeX\ example.
\end{tcblisting}
```

This is a L^AT_EX example.

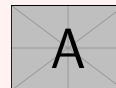
This is a \LaTeX\ example.

`/tcb/listing side comment` (no value)

Typesets the environment content side by side as listing in the left (upper) part and a given comment in the right (lower) part.

```
\begin{tcblisting}{colback=red!5!white,colframe=red!75!black,listing side comment,
  righthand width=1.5cm,image comment={width=1.5cm}{example-image-a.pdf}}
This is a \LaTeX\ example.
\end{tcblisting}
```

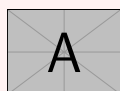
This is a \LaTeX\ example.



`/tcb/comment side listing` (no value)

Typesets the environment content side by side with a given comment in the left (upper) part and as listing in the right (lower) part.

```
\begin{tcblisting}{colback=red!5!white,colframe=red!75!black,comment side listing,
  lefthand width=1.5cm,image comment={width=1.5cm}{example-image-a.pdf}}
This is a \LaTeX\ example.
\end{tcblisting}
```



This is a \LaTeX\ example.

`/tcb/listing outside comment` (no value)

Typesets the environment content side by side as listing in a `tcolorbox` and a given comment outside the box in the right part of the page. Nevertheless, the outside text is treated as *lower* part of the `tcolorbox` and can be formatted with all lower part options. The space partitioning is done with the side by side options from Section 3.10, see page 54.

```
\begin{tcblisting}{colback=red!5!white,colframe=red!75!black,listing outside comment,
  righthand width=1.5cm,image comment={width=1.5cm}{example-image-a.pdf}}
This is a \LaTeX\ example.
\end{tcblisting}
```

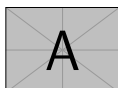
This is a \LaTeX\ example.



`/tcb/comment outside listing` (no value)

Typesets the environment content side by side as listing in a `tcolorbox` and a given comment outside the box in the left part of the page. Nevertheless, the outside text is treated as *lower* part of the `tcolorbox` and can be formatted with all lower part options. The space partitioning is done with the side by side options from Section 3.10, see page 54.

```
\begin{tcblisting}{colback=red!5!white,colframe=red!75!black,comment outside listing,
  lefthand width=1.5cm,image comment={width=1.5cm}{example-image-a.pdf}}
This is a \LaTeX\ example.
\end{tcblisting}
```



This is a \LaTeX\ example.

/tcb/listing above text

(no value)

Typesets the environment content as listing in a `tcolorbox` and as compiled text outside and below the box. The outside text is treated as *lower* part of the `tcolorbox` and can be formatted with all lower part options. The distance between box and text is controlled by `/tcb/middle`^{→ P. 28}.

```
\begin{tcblisting}{colback=red!5!white,colframe=red!75!black,listing above text}
This is a \LaTeX\ example.
\end{tcblisting}
```

This is a \LaTeX\ example.

This is a \LaTeX example.

/tcb/text above listing

(no value)

Typesets the environment content as listing in a `tcolorbox` and as compiled text outside and above the box. The outside text is treated as *lower* part of the `tcolorbox` and can be formatted with all lower part options. The distance between box and text is controlled by `/tcb/middle`^{→ P. 28}.

```
\begin{tcblisting}{colback=red!5!white,colframe=red!75!black,text above listing}
This is a \LaTeX\ example.
\end{tcblisting}
```

This is a \LaTeX example.

This is a \LaTeX\ example.

`/tcb/listing above comment` (no value)

Typesets the environment content as listing in a `tcolorbox` and a given comment outside and below the box. The outside text is treated as *lower* part of the `tcolorbox` and can be formatted with all lower part options. The distance between box and comment is controlled by `/tcb/middle` → P. 28.

```
\begin{tcblisting}{colback=red!5!white,colframe=red!75!black,listing above comment,
  center lower,image comment={width=3cm}{example-image-a.pdf}}
This is a \LaTeX\ example.
\end{tcblisting}
```

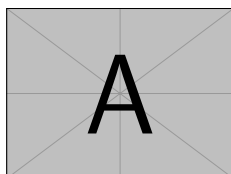
This is a \LaTeX\ example.



`/tcb/comment above listing` (no value)

Typesets the environment content as listing in a `tcolorbox` and a given comment outside and above the box. The outside text is treated as *lower* part of the `tcolorbox` and can be formatted with all lower part options. The distance between box and comment is controlled by `/tcb/middle` → P. 28.

```
\begin{tcblisting}{colback=red!5!white,colframe=red!75!black,comment above listing,
  center lower,image comment={width=3cm}{example-image-a.pdf}}
This is a \LaTeX\ example.
\end{tcblisting}
```



This is a \LaTeX\ example.

7.7 Creation of L^AT_EX Tutorials

The following source code gives a guideline for the creation of L^AT_EX tutorials. In the next section, a framework for L^AT_EX exercises is described. All examples shall be numbered optionally.

Firstly, some additional tcb keys are defined for the appearance. For the examples, three environments `texexp`, `texexptitled`, and `texexptitledspec` are defined with automatic numbering.

- `texexp` is used for untitled examles,
- `texexptitled` is used for titled examles,
- `texexptitledspec` is used for titled examles with special treatment.

Definition in the preamble:

```
\tcbset{
  texexp/.style={colframe=red!50!yellow!50!black, colback=red!50!yellow!5!white,
    coltitle=red!50!yellow!3!white,
    fonttitle=\small\sffamily\bfseries, fontupper=\small, fontlower=\small},
  example/.style 2 args={texexp,
    title={Example \thetcbcounter: #1},label={#2}},
}

\newtcblisting{texexp}[1]{texexp,#1}
\newtcblisting[auto counter,number within=section]{texexptitled}[3][]{%
  example={#2}{#3},#1}
\newtcolorbox[use counter from=texexptitled]{texexptitledspec}[3][]{%
  example={#2}{#3},#1}
```

```
\begin{tcblisting}{texexp}
This is a \LaTeX\ example which displays the text as source code
and in compiled form.
\end{tcblisting}
```

This is a \LaTeX\ example which displays the text as source code
and in compiled form.

This is a L^AT_EX example which displays the text as source code and in compiled form.

```
\begin{texexptitled}{First example with a title line}{firstExample}
Here, we use Example \ref{firstExample} with a title line.
\end{texexptitled}
```

Example 7.1: First example with a title line

Here, we use Example \ref{firstExample} with a title line.

Here, we use Example 7.1 with a title line.

```
\begin{texexp}{}  
This is a \LaTeX\ example which displays the text as source code  
and in compiled form.  
\end{texexp}
```

This is a \LaTeX\ example which displays the text as source code
and in compiled form.

This is a L^AT_EX example which displays the text as source code and in compiled form.

```
\begin{texexp}{text and listing}  
This is a \LaTeX\ example which displays the text as source code  
and in compiled form.  
\end{texexp}
```

This is a L^AT_EX example which displays the text as source code and in compiled form.

This is a \LaTeX\ example which displays the text as source code
and in compiled form.

```
\begin{texexp}{listing only}  
This is a \LaTeX\ example which displays the text as source code only.  
\end{texexp}
```

This is a \LaTeX\ example which displays the text as source code only.

```
\begin{texexp}{text only}  
This is a \LaTeX\ example which displays the text in compiled form only.  
\end{texexp}
```

This is a L^AT_EX example which displays the text in compiled form only.

```
\begin{texeptitled}{An Example with a Heading}{heading1}
This is a \LaTeX\ example with a numbered heading line
which can be referred to.
\end{texeptitled}
Here, we see Example \ref{heading1}.
```

Example 7.2: An Example with a Heading

This is a \LaTeX\ example with a numbered heading line
which can be referred to.

This is a L^AT_EX example with a numbered heading line which can be referred to.

Here, we see Example 7.2.

```
\begin{texeptitled}[listing only]{Another Example with a Heading}{heading2}
The keys can be used in combination. Here, an example with a heading line
and source code only is given.
\end{texeptitled}
Here, we see Example \ref{heading2}.
```

Example 7.3: Another Example with a Heading

The keys can be used in combination. Here, an example with a heading line
and source code only is given.

Here, we see Example 7.3.

```
\begin{texeptitled}[float]{A floating Example with a Heading}{heading3}
This is another \LaTeX\ example with numbered heading line.
But now, the box is a floating object.
\end{texeptitled}
```

Example 7.4: A floating Example with a Heading

This is another \LaTeX\ example with numbered heading line.
But now, the box is a floating object.

This is another L^AT_EX example with numbered heading line. But now, the box is a floating object.

The floating box of the last example is seen as Example \ref{heading3}
on page \pageref{heading3}.

The floating box of the last example is seen as Example 7.4 on page 174.

```

\begin{texeptitledspec}{Special application}{texexpbox1}
\begin{lstlisting}[style=tcblatex]
Some \LaTeX\ source code.
\end{lstlisting}
\tcblower

```

For special cases, the environment `texeptitledspec` with style `example` can be used directly. As one can see, the upper and the lower part of the box can be used uncoupled also.

```

\end{texeptitledspec}

```

Example 7.5: Special application

Some `\LaTeX` source code.

For special cases, the environment `texeptitledspec` with style `example` can be used directly. As one can see, the upper and the lower part of the box can be used uncoupled also.

The following series of examples demonstrate the application of `tcolorbox`^{→P.9} options for diversification.

```

\begin{texeptitled}{How to use options (1):\par The basic example}{options1}
\begin{tikzpicture}
\path[fill=yellow!50!white] (0,0) circle (11mm);
\path[fill=white] (0,0) circle (9mm);
\foreach \w/\c in {90/red,210/green,330/blue}
{\path[shading=ball,ball color=\c] (\w:1cm) circle (7mm);}
\end{tikzpicture}
\end{texeptitled}

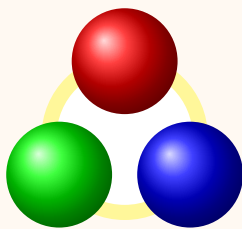
```

Example 7.6: How to use options (1): The basic example

```

\begin{tikzpicture}
\path[fill=yellow!50!white] (0,0) circle (11mm);
\path[fill=white] (0,0) circle (9mm);
\foreach \w/\c in {90/red,210/green,330/blue}
{\path[shading=ball,ball color=\c] (\w:1cm) circle (7mm);}
\end{tikzpicture}

```



```

\begin{texeptitled}[center lower,enhanced,segmentation hidden,middle=0mm]
{How to use options (2):\par The text output is centered and the
segmentation line has vanished.}{options2}
\begin{tikzpicture}
\path[fill=yellow!50!white] (0,0) circle (11mm);
\path[fill=white] (0,0) circle (9mm);
\foreach \w/\c in {90/red,210/green,330/blue}
{\path[shading=ball,ball color=\c] (\w:1cm) circle (7mm);}
\end{tikzpicture}
\end{texeptitled}

```

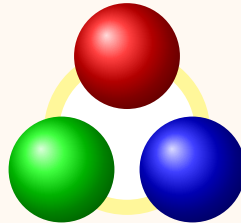
Example 7.7: How to use options (2):

The text output is centered and the segmentation line has vanished.

```

\begin{tikzpicture}
\path[fill=yellow!50!white] (0,0) circle (11mm);
\path[fill=white] (0,0) circle (9mm);
\foreach \w/\c in {90/red,210/green,330/blue}
{\path[shading=ball,ball color=\c] (\w:1cm) circle (7mm);}
\end{tikzpicture}

```



```

\begin{texeptitled}[tikz lower,bicolor,colbacklower=white]
{How to use options (3):\par Here, the |tikzpicture| is totally hidden.
The |bicolor| skin highlights the output.}{options3}
\path[fill=yellow!50!white] (0,0) circle (11mm);
\path[fill=white] (0,0) circle (9mm);
\foreach \w/\c in {90/red,210/green,330/blue}
{\path[shading=ball,ball color=\c] (\w:1cm) circle (7mm);}
\end{texeptitled}

```

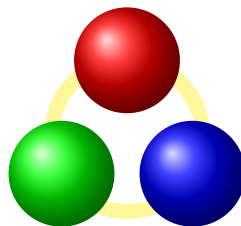
Example 7.8: How to use options (3):

Here, the tikzpicture is totally hidden. The bicolor skin highlights the output.

```

\path[fill=yellow!50!white] (0,0) circle (11mm);
\path[fill=white] (0,0) circle (9mm);
\foreach \w/\c in {90/red,210/green,330/blue}
{\path[shading=ball,ball color=\c] (\w:1cm) circle (7mm);}

```




```

\begin{texexptitled}[center lower,listing side text,righthand width=3.5cm,
  bicolor,colbacklower=white]
{How to use options (4):\par The |bicolor| skin also works with side
  by side mode}{options4}
\begin{tikzpicture}
\path[fill=yellow!50!white] (0,0) circle (11mm);
\path[fill=white] (0,0) circle (9mm);
\foreach \w/\c in {90/red,210/green,330/blue}
{\path[shading=ball,ball color=\c]
  (\w:1cm) circle (7mm);}
\end{tikzpicture}
\end{texexptitled}

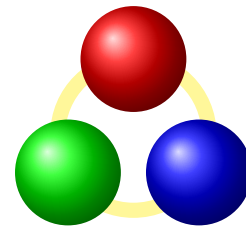
```

Example 7.9: How to use options (4):
The bicolor skin also works with side by side mode

```

\begin{tikzpicture}
\path[fill=yellow!50!white] (0,0) circle (11mm);
\path[fill=white] (0,0) circle (9mm);
\foreach \w/\c in {90/red,210/green,330/blue}
{\path[shading=ball,ball color=\c]
  (\w:1cm) circle (7mm);}
\end{tikzpicture}

```



```

\begin{texexptitled}[center lower,listing outside text,righthand width=3.5cm]
{How to use options (5):\par Putting our picture outside is just
  a matter of one word.}{options5}
\begin{tikzpicture}
\path[fill=yellow!50!white] (0,0) circle (11mm);
\path[fill=white] (0,0) circle (9mm);
\foreach \w/\c in {90/red,210/green,330/blue}
{\path[shading=ball,ball color=\c]
  (\w:1cm) circle (7mm);}
\end{tikzpicture}
\end{texexptitled}

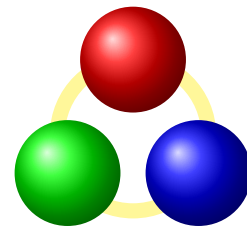
```

Example 7.10: How to use options (5):
Putting our picture outside is just a matter of one word.

```

\begin{tikzpicture}
\path[fill=yellow!50!white] (0,0) circle (11mm);
\path[fill=white] (0,0) circle (9mm);
\foreach \w/\c in {90/red,210/green,330/blue}
{\path[shading=ball,ball color=\c]
  (\w:1cm) circle (7mm);}
\end{tikzpicture}

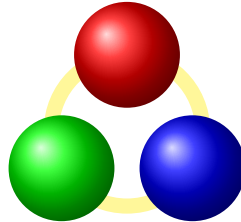
```



```

\begin{texexptitled}[center lower,text above listing]
{How to use options (6):\par The picture may also be put above
the listing box.}{options6}
\begin{tikzpicture}
\path[fill=yellow!50!white] (0,0) circle (11mm);
\path[fill=white] (0,0) circle (9mm);
\foreach \w/\c in {90/red,210/green,330/blue}
{\path[shading=ball,ball color=\c]
(\w:1cm) circle (7mm);}
\end{tikzpicture}
\end{texexptitled}

```



Example 7.11: How to use options (6):
The picture may also be put above the listing box.

```

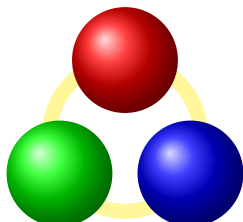
\begin{tikzpicture}
\path[fill=yellow!50!white] (0,0) circle (11mm);
\path[fill=white] (0,0) circle (9mm);
\foreach \w/\c in {90/red,210/green,330/blue}
{\path[shading=ball,ball color=\c]
(\w:1cm) circle (7mm);}
\end{tikzpicture}

```

```

\begin{texexptitled}[beamer,center lower,text outside listing,lefthand width=3.5cm]
{How to use options (7):\par Our style is easily transformed into
a beamerish one.}{options7}
\begin{tikzpicture}
\path[fill=yellow!50!white] (0,0) circle (11mm);
\path[fill=white] (0,0) circle (9mm);
\foreach \w/\c in {90/red,210/green,330/blue}
{\path[shading=ball,ball color=\c]
(\w:1cm) circle (7mm);}
\end{tikzpicture}
\end{texexptitled}

```



Example 7.12: How to use options (7):
Our style is easily transformed into a beamerish one.

```

\begin{tikzpicture}
\path[fill=yellow!50!white] (0,0) circle (11mm);
\path[fill=white] (0,0) circle (9mm);
\foreach \w/\c in {90/red,210/green,330/blue}
{\path[shading=ball,ball color=\c]
(\w:1cm) circle (7mm);}
\end{tikzpicture}

```

7.8 Creation of L^AT_EX Exercises

In the following, a guideline is given for the creation of L^AT_EX exercises with solutions. These solutions are saved to disk for application at a place of choice. Therefore, all used exercises are logged to a file `\jobname.sol` for automatic processing. The solution contents themselves are saved to a subdirectory named `solutions`.

```
%\newcounter{texercise} % preamble

\newwrite\solout
\def\openoutsol{\immediate\openout\solout\jobname.sol}
\def\solfile#1{solutions/texercise#1.tex}
\def\writesol#1{\immediate\write\solout{\noexpand\processsol{\thetcbcounter}{#1}}}%
\def\closeoutsol{\immediate\closeout\solout}
\def\inputsol{\IfFileExists{\jobname.sol}{\input{\jobname.sol}}{}}
```

- Before the first exercise is given, `\openoutsol` has to be called to start logging.
- The solution is given as content of a `tcboutputlisting`^{→ P. 158} environment. Note, that you can use this content also inside the exercise with `\tcbuselistingtext`^{→ P. 158} in compiled form.
- After the last exercise is given (and before using the solutions), `\closeoutsol` has to be called to stop logging.
- The solutions are loaded by `\inputsol`.

Inside the exercise text, there may be text parts which are needed as L^AT_EX source code and as compiled text as well. These parts can be saved by `tcbwritetemp`^{→ P. 78} and used in compiled form by `\tcbusetemp`^{→ P. 78} or as source code by `\tcbusetemplisting`^{→ P. 158}.

At first, we generate some a common style for the exercises and the solutions. Further, since exercises and solutions should be numbered, we force to use a label `<marker>`. Automatically, the label `exe:<marker>` is used to mark the exercise and the label `sol:<marker>` is used to mark the solution.

```
\tcbset{texercisestyle/.style={arc=0.5mm, colframe=blue!25!yellow!90!white,
colback=blue!25!yellow!5!white, coltitle=blue!25!yellow!40!black,
fonttitle=\small\sffamily\bfseries, fontupper=\small, fontlower=\small}}
```

With these preparations, the kernel environment `texercise` for our exercises is created quickly:

Definition in the preamble:

```
\newtcolorbox[auto counter,number within=section,list inside=exam]%
{texercise}[2][\texercisestyle,
listing file={\solfile\thetcbcounter},label={exe:#2},
phantom={\writesol{#2}},
title={Exercise \thetcbcounter\hfill\mdseries Solution on page \pageref{sol:#2}},
list entry={\protect\numberline{\thetcbcounter}Exercise with solution on
page \pageref{sol:#2}},#1}
```

```
\newtcolorbox{texercise}[2][\texercisestyle,
listing file={\solfile\thetexercise},
phantom={\refstepcounter{texercise}\label{exe:#2}\writesol{#2}},
title={Exercise \arabic{texercise}%
\hfill\mdseries Solution on page \pageref{sol:#2}},#1}
```

The following examples demonstrate the application.

```
\begin{texercise}{tabular_example}
\textit{Create the following table:}\par\smallskip%
\begin{tcboutputlisting}
\begin{tabular}{|p{3cm}|p{3cm}|p{3cm}|p{3cm}|}\hline
\multicolumn{4}{|c|}{\bfseries\itshape Das alte Italien}\hline
\multicolumn{2}{|c|}{\bfseries Antike} & & \\
\multicolumn{2}{|c|}{\bfseries Mittelalter}\hline
\multicolumn{1}{|c|}{\itshape Republik}& & & \\
\multicolumn{1}{|c|}{\itshape Kaiserreich}& & & \\
\multicolumn{1}{|c|}{\itshape Franken}& & & \\
\multicolumn{1}{|c|}{\itshape Teilstaaten}\hline
In den Zeiten der r"\{o}mischen Republik standen dem Staat jeweils zwei
Konsuln vor, deren Machtbefugnisse identisch waren. &
Das r"\{o}mische Kaiserreich wurde von einem Alleinherrscher, dem Kaiser,
regiert.
& In der V"\{o}lkerwanderungszeit "\{u}bernahmen die Goten und sp"\{a}ter die
Franken die Vorherrschaft.
& Im sp"\{a}teren Mittelalter regierten F"\{u}rsten einen Fleckenteppich
von Einzelstaaten.\hline
\end{tabular}
\end{tcboutputlisting}
\tcbuselistingtext%
\end{texercise}
```

Exercise 7.1

Solution on page 183

Create the following table:

<i>Das alte Italien</i>			
Antike		Mittelalter	
<i>Republik</i>	<i>Kaiserreich</i>	<i>Franken</i>	<i>Teilstaaten</i>
In den Zeiten der römischen Republik standen dem Staat jeweils zwei Konsuln vor, deren Machtbefugnisse identisch waren.	Das römische Kaiserreich wurde von einem Alleinherrscher, dem Kaiser, regiert.	In der Völkerwanderungszeit übernahmen die Goten und später die Franken die Vorherrschaft.	Im späteren Mittelalter regierten Fürsten einen Fleckenteppich von Einzelstaaten.

```

\begin{texercise}{macro_oneparam}
\begin{tcboutputlisting}
\newcommand{\headingline}[1]{%
  \begin{center}\Large\bfseries #1\end{center}}
\end{tcboutputlisting}
\tcbuselistingtext%

```

Create a new macro `\verb+\headingline+` which produces the following output: `\par\smallskip`

```

\begin{tcbwritetemp}
\headingline{Very important heading}
\end{tcbwritetemp}
\tcbusetemplisting\tcbusetemp%
\end{texercise}

```

Exercise 7.2

Solution on page 183

Create a new macro `\headingline` which produces the following output:

```
\headingline{Very important heading}
```

Very important heading

```

\begin{texercise}{macro_twoparam}
\begin{tcboutputlisting}
\newcommand{\minitable}[2]{%
  \begin{center}\begin{tabular}{p{10cm}}\hline%
    \multicolumn{1}{c}{\bfseries#1}\hline%
    #2\hline%
  \end{tabular}\end{center}}
\end{tcboutputlisting}
\tcbuselistingtext%

```

Create a new macro `\verb+\minitable+` which produces the following output: `\par\smallskip`

```

\begin{tcbwritetemp}
\minitable{My heading}{In this tiny tabular, there is only a heading
  and some text below which has a width of ten centimeters.}
\end{tcbwritetemp}
\tcbusetemplisting\par\smallskip\tcbusetemp%
\end{texercise}

```

Exercise 7.3

Solution on page 183

Create a new macro `\minitable` which produces the following output:

```
\minitable{My heading}{In this tiny tabular, there is only a heading
  and some text below which has a width of ten centimeters.}
```

My heading

In this tiny tabular, there is only a heading and some text below
which has a width of ten centimeters.

```

\begin{texercise}{macro_threeparam}
\begin{tcboutputlisting}
\newcommand{\synop}[3]{%
  \begin{tabular}{@{}p{(\linewidth-\tabcolsep*2-\arrayrulewidth)/2}|%
    p{(\linewidth-\tabcolsep*2-\arrayrulewidth)/2}@{}}\hline
    \multicolumn{2}{c}{\bfseries #1}\\ \hline
    \multicolumn{1}{c|}{\itshape English}&
    \multicolumn{1}{c}{\itshape German}\\ \hline
    #2 & #3
  \end{tabular}}
\end{tcboutputlisting}
\tcbuselistingtext%
Create a new macro \verb+\synop+ which typesets a synoptic text according
to the following example. Base your macro on a tabular which takes the
total line width. \par\smallskip
\begin{tcbwritetemp}
\synop{Neil Armstrong}%
{That's one small step for a man, one giant leap for mankind.}%
{Das ist ein kleiner Schritt f\"{u}r einen Mann,
  ein riesiger Sprung f\"{u}r die Menschheit.}
\end{tcbwritetemp}
\tcbusetemplisting\par\smallskip\tcbusetemp%
\end{texercise}

```

Exercise 7.4

Solution on page 184

Create a new macro `\synop` which typesets a synoptic text according to the following example. Base your macro on a tabular which takes the total line width.

```

\synop{Neil Armstrong}%
{That's one small step for a man, one giant leap for mankind.}%
{Das ist ein kleiner Schritt f\"{u}r einen Mann,
  ein riesiger Sprung f\"{u}r die Menschheit.}

```

Neil Armstrong	
<i>English</i>	<i>German</i>
That's one small step for a man, one giant leap for mankind.	Das ist ein kleiner Schritt für einen Mann, ein riesiger Sprung für die Menschheit.

Now, we give a list of all exercises with:

```

\tcblistof[\subsection]{exam}{List of Exercises%
  \label{listofexercises}}

```

7.9 List of Exercises

7.1	Exercise with solution on page 183	180
7.2	Exercise with solution on page 183	181
7.3	Exercise with solution on page 183	181
7.4	Exercise with solution on page 184	182

7.10 Solutions for the given L^AT_EX Exercises

For all solutions, a macro `\processsol` was written to the file `\jobname.sol`. Now, we need a definition for this macro to use the solutions.

```
% \usepackage{hyperref} % for \phantomsection
\newcommand{\processsol}[2]{%
  \tcbinputlisting{texercisestyle,listing only,
    phantom={\phantomsection\label{sol:#2}},%
    title={Solution for Exercise \ref{exe:#2} on page \pageref{exe:#2}},
    listing file={\solfile{#1}}}}
```

The loading of all solutions is done by:

```
\inputsol
```

With this, we get:

Solution for Exercise 7.1 on page 180

```
\begin{tabular}{|p{3cm}|p{3cm}|p{3cm}|p{3cm}|}\hline
\multicolumn{4}{|c|}{\bfseries\itshape Das alte Italien}\hline
\multicolumn{2}{|c|}{\bfseries Antike} &
\multicolumn{2}{c|}{\bfseries Mittelalter}\hline
\multicolumn{1}{|c|}{\itshape Republik}&
\multicolumn{1}{c|}{\itshape Kaiserreich}&
\multicolumn{1}{c|}{\itshape Franken}&
\multicolumn{1}{c|}{\itshape Teilstaaten}\hline
In den Zeiten der r"\{o\}mischen Republik standen dem Staat jeweils zwei
Konsuln vor, deren Machtbefugnisse identisch waren. &
Das r"\{o\}mische Kaiserreich wurde von einem Alleinherrscher, dem Kaiser,
regiert.
& In der V"\{o\}lkerwanderungszeit "\{u\}bernahmen die Goten und sp"\{a\}ter die
Franken die Vorherrschaft.
& Im sp"\{a\}teren Mittelalter regierten F"\{u\}rsten einen Fleckenteppich
von Einzelstaaten.\hline
\end{tabular}
```

Solution for Exercise 7.2 on page 181

```
\newcommand{\headingline}[1]{%
  \begin{center}\Large\bfseries #1\end{center}}
```

Solution for Exercise 7.3 on page 181

```
\newcommand{\minitable}[2]{%
  \begin{center}\begin{tabular}{p{10cm}}\hline%
  \multicolumn{1}{c}{\bfseries#1}\hline%
  #2\hline%
  \end{tabular}\end{center}}
```

Solution for Exercise 7.4 on page 182

```
\newcommand{\synop}[3]{%
  \begin{tabular}{@{}p{(\linewidth-\tabcolsep*2-\arrayrulewidth)/2}|%
    p{(\linewidth-\tabcolsep*2-\arrayrulewidth)/2}@{}}\hline
  \multicolumn{2}{c}{\bfseries #1}\\\hline
  \multicolumn{1}{c|}{\itshape English}&
  \multicolumn{1}{c}{\itshape German}\\\hline
  #2 & #3
  \end{tabular}}
```


8 Library LIB theorems

The library is loaded by a package option or inside the preamble by:

```
\tcbuselibrary{theorems}
```

This also loads the package `amsmath`.

8.1 Macros of the Library

\newtcbtheorem[\init options]{\name}{\display name}{\options}{\prefix}

Creates new environments $\langle name \rangle$ and $\langle name \rangle^*$ based on `tcolorbox` to frame a (mathematical) theorem. The $\langle display name \rangle$ is used in the title line with a number, e.g. «Theorem 5.1». The $\langle options \rangle$ are given to the underlying `tcolorbox` to control the appearance. The $\langle init options \rangle$ allow setting up automatic numbering, see Section 4 on page 73. The new environment $\langle name \rangle$ takes one optional and two mandatory parameters. The optional parameter supplements the options and should be used only in rare cases. The first mandatory parameter is the title text for the theorem and the second mandatory parameter is a $\langle marker \rangle$. The theorem is automatically labeled with $\langle prefix \rangle : \langle marker \rangle$. The new environment $\langle name \rangle^*$ takes one optional and one mandatory parameter and represents an unnumbered variant of the environment $\langle name \rangle$. This variant is not labeled and not listed in lists of theorems.

Definition in the preamble:

```
\newtcbtheorem[number within=section]{mytheo}{My Theorem}%
{colback=green!5,colframe=green!35!black,fonttitle=\bfseries}{th}
```

```
\begin{mytheo}{This is my title}{theoexample}
This is the text of the theorem. The counter is automatically assigned and,
in this example, prefixed with the section number. This theorem is numbered with
\ref{th:theoexample} and is given on page \pageref{th:theoexample}.
\end{mytheo}
```

My Theorem 8.1: This is my title

This is the text of the theorem. The counter is automatically assigned and, in this example, prefixed with the section number. This theorem is numbered with 8.1 and is given on page 185.

```
\begin{mytheo}[label=myownlabel]{This is my title}{}
The label parameter can be left empty without \LaTeX error.
Or you may use an own label to reference Theorem \ref{myownlabel}.
\end{mytheo}
```

My Theorem 8.2: This is my title

The label parameter can be left empty without \LaTeX error. Or you may use an own label to reference Theorem 8.2.

```
\begin{mytheo}{}{}
  The title can also be left empty without problem. Note that the ':'
  vanished magically.
\end{mytheo}
```

My Theorem 8.3

The title can also be left empty without problem. Note that the ':' vanished magically.

```
\begin{mytheo*}{Unnumbered Theorem}
  This theorem is not numbered.
\end{mytheo*}
```

My Theorem: Unnumbered Theorem

This theorem is not numbered.

```
\begin{mytheo*}{}{}
  This theorem has no number and no title.
\end{mytheo*}
```

My Theorem

This theorem has no number and no title.

`\renewtcbtheorem`[*`<init options>`*]{*`<name>`*}{*`<display name>`*}{*`<options>`*}{*`<prefix>`*}

Operates like `\newtcbtheorem`^{P. 185}, but based on `\renewenvironment` instead of `\newenvironment`. An existing environment is redefined.

`\tcbmaketheorem`{*`<name>`*}{*`<display name>`*}{*`<options>`*}{*`<counter>`*}{*`<prefix>`*}

`\newtcbtheorem`^{P. 185} supersedes this macro.

Creates a new environment *`<name>`* based on `tcolorbox` to frame a (mathematical) theorem. The *`<display name>`* is used in the title line with a number, e.g. «Theorem 5.1». The *`<options>`* are given to the underlying `tcolorbox` to control the appearance. The *`<counter>`* is used for automatic numbering. The new environment *`<name>`* takes one optional and two mandatory parameters. The optional parameter supplements the options and should be used only in rare cases. The first mandatory parameter is the title text for the theorem and the second mandatory parameter is a *`<marker>`*. The theorem is automatically labeled with *`<prefix>`*:*`<marker>`*.

\tcboxmath[*\langle options \rangle*]{*\langle mathematical box content \rangle*}

Creates a `\tcolorbox`^{→P.9} which is fitted to the width of the given *\langle mathematical box content \rangle*. This box is intended to be applied as part of a larger formula and may be used as replacement for the `\boxed` macro of `amsmath`.

```
\begin{equation}
\tcbset{fonttitle=\scriptsize}
\tcbboxmath[colback=LightBlue!25!white,colframe=blue]{ a^2 = 16 }
\quad \Rightarrow \quad
\tcbboxmath[colback=Salmon!25!white,colframe=red,title=Implication]{
  { a = 4 ~\vee~ a=-4. }
}
\end{equation}
```

$$\boxed{a^2 = 16} \Rightarrow \boxed{\text{Implication} \quad a = 4 \vee a = -4.} \quad (3)$$

\tcbhighmath[*\langle options \rangle*]{*\langle mathematical box content \rangle*}

This is a special case of the `\tcboxmath` macro which uses the style `/tcb/highlight math`^{→P.193}. It is intended to provide context sensitive highlighting of formula parts. The color settings via `/tcb/highlight math style`^{→P.193} may be different inside theorems or other colored areas and outside.

```
\tcbset{myformula/.style={colback=yellow!10!white,colframe=red!50!black,
every box/.style={highlight math style={colback=LightBlue!50!white,colframe=Navy}}}

\begin{align}
\tcbhighmath{\sum_{n=1}^{\infty} \frac{1}{n}} &= \infty. \\
\int x^2 \, dx &= \frac{1}{3} x^3 + c.
\end{align}

\begin{tcolorbox}[ams align,myformula]
\tcbhighmath{\sum_{n=1}^{\infty} \frac{1}{n}} &= \infty. \\
\int x^2 \, dx &= \frac{1}{3} x^3 + c.
\end{tcolorbox}
```

$$\boxed{\sum_{n=1}^{\infty} \frac{1}{n}} = \infty. \quad (4)$$

$$\int x^2 \, dx = \frac{1}{3} x^3 + c. \quad (5)$$

$$\boxed{\sum_{n=1}^{\infty} \frac{1}{n}} = \infty. \quad (6)$$

$$\int x^2 \, dx = \frac{1}{3} x^3 + c. \quad (7)$$

`\tcbhighmath`^{→ P. 187} can be used in symbiosis with the `empheq` package which allows to specify own boxing commands to mark multiline formulas.

```
% \usepackage{empheq}
\begin{empheq}[box=\tcbhighmath]{align}
a&=\sin(z)\\
E&=mc^2 + \int_a^b x\, dx
\end{empheq}

\tcbset{highlight math style={enhanced,
colframe=red!60!black,colback=yellow!50!white,arc=4pt,boxrule=1pt,
drop fuzzy shadow}}

\begin{empheq}[box=\tcbhighmath]{align}
a&=\sin(z)\\
E&=mc^2 + \int_a^b x\, dx
\end{empheq}
```

$$a = \sin(z) \tag{8}$$

$$E = mc^2 + \int_a^b x \, dx \tag{9}$$

$$a = \sin(z) \tag{10}$$

$$E = mc^2 + \int_a^b x \, dx \tag{11}$$

Besides `\tcbhighmath`^{→ P. 187}, one can easily define an independent new box based on `\tcbox`^{→ P. 11} which acts like `\tcbhighmath`^{→ P. 187}:

```
% \usepackage{empheq}
\newtcbox{\otherbox}[1][\nobeforeafter,math upper,tcbbox raise base,
enhanced,frame hidden,boxrule=0pt,interior style={top color=green!10!white,
bottom color=green!10!white,middle color=green!50!yellow},
fuzzy halo=1pt with green,#1]

\begin{empheq}[box=\otherbox]{align}
a&=\sin(z)\\
E&=mc^2 + \int_a^b x\, dx
\end{empheq}

\begin{equation}
\tcbhighmath{E} = \otherbox{mc^2}
\end{equation}
```

$$a = \sin(z) \tag{12}$$

$$E = mc^2 + \int_a^b x \, dx \tag{13}$$

$$E = mc^2 \tag{14}$$

8.2 Option Keys of the Library

`/tcb/separator sign=<sign>` (no default, initially :)

The given `<sign>` is used inside the title text of a theorem as separator between display name combined with number and the specific title text. It is omitted, if there is no specific title text.

```
% \usepackage{amssymb}
\newtcbtheorem[use counter from=mytheo]{sometheorem}{Theorem}%
{colback=white,colframe=red!50!black,fonttitle=\bfseries,
 separator sign={\ $\blacktriangleright$}}{theo}
\begin{sometheorem}{My example}{}
My theorem text.
\end{sometheorem}
```

Theorem 8.4 ▶ My example

My theorem text.

`/tcb/separator sign colon` (style, no value, initially set)

Sets `/tcb/separator sign` to the default colon : sign.

`/tcb/separator sign dash` (style, no value)

Sets `/tcb/separator sign` to an en-dash sign.

```
\newtcbtheorem[use counter from=mytheo]{sometheorem}{Theorem}%
{colback=white,colframe=red!50!black,fonttitle=\bfseries,
 separator sign dash}{theo}
\begin{sometheorem}{My example}{}
My theorem text.
\end{sometheorem}
```

Theorem 8.5 – My example

My theorem text.

`/tcb/separator sign none` (style, no value)

Sets `/tcb/separator sign` to empty.

```
\newtcbtheorem[use counter from=mytheo]{sometheorem}{Theorem}%
{colback=white,colframe=red!50!black,fonttitle=\bfseries,
 separator sign none}{theo}
\begin{sometheorem}{My example}{}
My theorem text.
\end{sometheorem}
```

Theorem 8.6 My example

My theorem text.

`/tcb/description delimiters= $\langle left \rangle \langle right \rangle$` (no default, initially empty)

The given $\langle left \rangle$ and $\langle right \rangle$ delimiter signs are used to frame the descriptive title text of a theorem.

```
% \usepackage{amssymb}
\newtcbtheorem[use counter from=mytheo]{sometheorem}{Theorem}%
{colback=white,colframe=red!50!black,fonttitle=\bfseries,
description delimiters={\flqq}{\frqq}}{theo}
\begin{sometheorem}{My example}{}
My theorem text.
\end{sometheorem}
```

Theorem 8.7: «My example»

My theorem text.

`/tcb/description delimiters parenthesis` (style, no value)

Sets `/tcb/description delimiters` to (and).

```
\newtcbtheorem[use counter from=mytheo]{sometheorem}{Theorem}%
{colback=white,colframe=red!50!black,fonttitle=\bfseries,
description delimiters parenthesis}{theo}
\begin{sometheorem}{My example}{}
My theorem text.
\end{sometheorem}
```

Theorem 8.8: (My example)

My theorem text.

`/tcb/description delimiters none` (style, no value, initially set)

Sets `/tcb/description delimiters` to the default empty texts.

`/tcb/terminator sign= $\langle sign \rangle$` (no default, initially empty)

The given $\langle sign \rangle$ is used as terminator at the end of the title text of a theorem.

```
\newtcbtheorem[use counter from=mytheo]{sometheorem}{Theorem}%
{colback=white,colframe=red!50!black,fonttitle=\bfseries,
terminator sign={.}}{theo}
\begin{sometheorem}{My example}{}
My theorem text.
\end{sometheorem}
```

Theorem 8.9: My example.

My theorem text.

`/tcb/terminator sign colon` (style, no value, initially set)

Sets `/tcb/terminator sign` ^{→ P. 190} to the colon : sign.

```
\newtcbtheorem[use counter from=mytheo]{sometheorem}{Theorem}%  
  {colback=white,colframe=red!50!black,fonttttitle=\bfseries,  
    separator sign dash,terminator sign colon}{theo}  
\begin{sometheorem}{My example}{}  
My theorem text.  
\end{sometheorem}
```

Theorem 8.10 – My example:

My theorem text.

`/tcb/terminator sign dash` (style, no value)

Sets `/tcb/terminator sign` ^{→ P. 190} to an en-dash sign.

```
\newtcbtheorem[use counter from=mytheo]{sometheorem}{Theorem}%  
  {colback=white,colframe=red!50!black,fonttttitle=\bfseries,  
    terminator sign dash}{theo}  
\begin{sometheorem}{My example}{}  
My theorem text.  
\end{sometheorem}
```

Theorem 8.11: My example –

My theorem text.

`/tcb/terminator sign none` (style, no value)

Sets `/tcb/terminator sign` ^{→ P. 190} to the default empty text.

`/tcb/theorem name and number` (style, no value, initially set)

Prints theorem name followed by theorem number inside the title.

```
\newtcbtheorem[use counter from=mytheo]{sometheorem}{Theorem}%  
  {colback=white,colframe=red!50!black,fonttttitle=\bfseries,  
    theorem name and number}{theo}  
\begin{sometheorem}{My example}{}  
My theorem text.  
\end{sometheorem}
```

Theorem 8.12: My example

My theorem text.

`/tcb/theorem number and name` (style, no value)

Prints theorem number followed by theorem name inside the title.

```
\newtcbtheorem[use counter from=mytheo]{sometheorem}{Theorem}%
{colback=white,colframe=red!50!black,fonttitle=\bfseries,
theorem number and name}{theo}
\begin{sometheorem}{My example}{}
My theorem text.
\end{sometheorem}
```

8.13 Theorem: My example

My theorem text.

`/tcb/theorem name` (style, no value)

Prints theorem name without number inside the title.

```
\newtcbtheorem[use counter from=mytheo]{sometheorem}{Theorem}%
{colback=white,colframe=red!50!black,fonttitle=\bfseries,
theorem name,enhanced,watermark text={\thetcbcounter}}{theo}
\begin{sometheorem}{My example}{}
My theorem text.
\end{sometheorem}
```

Theorem: My example

My theorem text.

8.14

`/tcb/theorem={\langle display name \rangle}{\langle counter \rangle}{\langle title \rangle}{\langle marker \rangle}` (no default)

This key is internally used by `\tcbmaketheorem`^{→ P. 186}, but can be used directly in a `tcolorbox` for a more flexible approach. The `\langle display name \rangle` is used together with the increased `\langle counter \rangle` value and the `\langle title \rangle` for the title line of the box. Additionally, a `\label` with the given `\langle marker \rangle` is created.

```
% \newcounter{texercise}% preamble
\begin{tcolorbox}[colback=green!10,colframe=green!50!black,arc=4mm,
theorem={Test}{texercise}{Direct usage}{myMarker}]
Here, we see the test \ref{myMarker}.
\end{tcolorbox}
```

Test 1: Direct usage

Here, we see the test 1.

For a common appearance inside the document, the key `theorem` should not be used directly as in the example above, but as part of a new environment created by hand or using `\tcbmaketheorem`^{→ P. 186} or using its successor `\newtcbtheorem`^{→ P. 185}.

`/tcb/highlight math` (style, no value)

Predefined style which is used for `\tcbhighmath` ^{→ P.187}. It can be changed comfortably with `/tcb/highlight math style`.

`/tcb/highlight math style=<style definition>` (style, no default)

Changes the definition for `/tcb/highlight math` to the given *<style definition>*. See `\tcbhighmath` ^{→ P.187} for another example.

```
% \tcbuselibrary{skins}
\tcbset{highlight math style={enhanced,%<-- needed for the 'remember' options
  colframe=red,colback=red!10!white,boxsep=0pt}}
\begin{align*}
\tcbhighmath[remember as=fx]{f(x)}
&= \int\limits_{-1}^x \frac{1}{t^2} dt \\
&= \left[ -\frac{1}{t} \right]_{-1}^x \\
&= -\frac{1}{x} + \frac{1}{1} \\
&= 1 - \frac{1}{x}
\tcbhighmath[remember,overlay={%
  \draw[blue,very thick,->] (fx.south) to[bend right] ([yshift=2mm]frame.west);}]
{1-\frac{1}{x}.}
\end{align*}
```

$$\begin{aligned}
 f(x) &= \int_{-1}^x \frac{1}{t^2} dt = \left[-\frac{1}{t} \right]_{-1}^x \\
 &= -\frac{1}{x} + \frac{1}{1} \\
 &= 1 - \frac{1}{x}
 \end{aligned}$$

`/tcb/math upper` (style, no value)

Sets the upper part to mathematical mode with font `\displaystyle`.

`/tcb/math lower` (style, no value)

Sets the lower part to mathematical mode with font `\displaystyle`.

`/tcb/math` (style, no value)

Sets the upper part *and* lower part to mathematical mode with font `\displaystyle`.

```
\begin{tcolorbox}[math,colback=yellow!10!white,colframe=red!50!black]
\sum\limits_{n=1}^{\infty} \frac{1}{n} = \infty.
\end{tcolorbox}
```

$$\sum_{n=1}^{\infty} \frac{1}{n} = \infty.$$

The following styles are only tested to work with the original `amsmath` environments. If e.g. the `equation` environment is redefined as `gather`, then `/tcb/ams equation` should / could not be used. Obviously, you are encouraged to use `/tcb/ams gather`^{→ P. 196} in this case.

`/tcb/ams equation upper` (style, no value)

Adds an `amsmath equation` environment to the start and end of the upper part.

`/tcb/ams equation lower` (style, no value)

Adds an `amsmath equation` environment to the start and end of the lower part.

`/tcb/ams equation` (style, no value)

Adds an `amsmath equation` environment to the start and end of the upper *and* lower part.

```
\begin{tcolorbox}[ams equation,colback=yellow!10!white,colframe=red!50!black]
\sum\limits_{n=1}^{\infty} \frac{1}{n} = \infty.
\end{tcolorbox}
```

$$\sum_{n=1}^{\infty} \frac{1}{n} = \infty. \quad (15)$$

`/tcb/ams equation* upper` (style, no value)

Adds an `amsmath equation*` environment to the start and end of the upper part.

`/tcb/ams equation* lower` (style, no value)

Adds an `amsmath equation*` environment to the start and end of the lower part.

`/tcb/ams equation*` (style, no value)

Adds an `amsmath equation*` environment to the start and end of the upper *and* lower part.

```
\begin{tcolorbox}[ams equation*,colback=yellow!10!white,colframe=red!50!black]
\sum\limits_{n=1}^{\infty} \frac{1}{n} = \infty.
\end{tcolorbox}
```

$$\sum_{n=1}^{\infty} \frac{1}{n} = \infty.$$

`/tcb/ams align upper` (style, no value)

Adds an `amsmath align` environment to the start and end of the upper part.

`/tcb/ams align lower` (style, no value)

Adds an `amsmath align` environment to the start and end of the lower part.

`/tcb/ams align` (style, no value)

Adds an `amsmath align` environment to the start and end of the upper *and* lower part.

```
\begin{tcolorbox}[ams align,colback=yellow!10!white,colframe=red!50!black]
  \sum\limits_{n=1}^{\infty} \frac{1}{n} &= \infty.\\
  \int x^2 \, dx &= \frac{1}{3} x^3 + c.
\end{tcolorbox}
```

$$\sum_{n=1}^{\infty} \frac{1}{n} = \infty. \quad (16)$$

$$\int x^2 \, dx = \frac{1}{3} x^3 + c. \quad (17)$$

`/tcb/ams align* upper` (style, no value)

Adds an `amsmath align*` environment to the start and end of the upper part.

`/tcb/ams align* lower` (style, no value)

Adds an `amsmath align*` environment to the start and end of the lower part.

`/tcb/ams align*` (style, no value)

Adds an `amsmath align*` environment to the start and end of the upper *and* lower part.

```
\begin{tcolorbox}[ams align*,colback=yellow!10!white,colframe=red!50!black]
  \sum\limits_{n=1}^{\infty} \frac{1}{n} &= \infty.\\
  \int x^2 \, dx &= \frac{1}{3} x^3 + c.
\end{tcolorbox}
```

$$\sum_{n=1}^{\infty} \frac{1}{n} = \infty.$$

$$\int x^2 \, dx = \frac{1}{3} x^3 + c.$$

`/tcb/ams gather upper` (style, no value)

Adds an `amsmath gather` environment to the start and end of the upper part.

`/tcb/ams gather lower` (style, no value)

Adds an `amsmath gather` environment to the start and end of the lower part.

`/tcb/ams gather` (style, no value)

Adds an `amsmath gather` environment to the start and end of the upper *and* lower part.

```
\begin{tcolorbox}[ams gather,colback=yellow!10!white,colframe=red!50!black]
  \sum\limits_{n=1}^{\infty} \frac{1}{n} = \infty.\\
  \int x^2 \, dx = \frac{1}{3} x^3 + c.
\end{tcolorbox}
```

$$\sum_{n=1}^{\infty} \frac{1}{n} = \infty. \quad (18)$$

$$\int x^2 \, dx = \frac{1}{3} x^3 + c. \quad (19)$$

`/tcb/ams gather* upper` (style, no value)

Adds an `amsmath gather*` environment to the start and end of the upper part.

`/tcb/ams gather* lower` (style, no value)

Adds an `amsmath gather*` environment to the start and end of the lower part.

`/tcb/ams gather*` (style, no value)

Adds an `amsmath gather*` environment to the start and end of the upper *and* lower part.

```
\begin{tcolorbox}[ams gather*,colback=yellow!10!white,colframe=red!50!black]
  \sum\limits_{n=1}^{\infty} \frac{1}{n} = \infty.\\
  \int x^2 \, dx = \frac{1}{3} x^3 + c.
\end{tcolorbox}
```

$$\sum_{n=1}^{\infty} \frac{1}{n} = \infty.$$

$$\int x^2 \, dx = \frac{1}{3} x^3 + c.$$

`/tcb/ams nodisplayskip upper` (style, no value)

Neutralizes the `\abovedisplayskip` of a following `align` or `gather` environment for the upper part. Note that the text content has to start with such a formula.

`/tcb/ams nodisplayskip lower` (style, no value)

Neutralizes the `\abovedisplayskip` of a following `align` or `gather` environment for the lower part. Note that the text content has to start with such a formula.

`/tcb/ams nodisplayskip` (style, no value)

Neutralizes the `\abovedisplayskip` of a following `align` or `gather` environment for the upper part *and* lower part. Note that the text content has to start with such a formula.

```
\begin{tcolorbox}[ams nodisplayskip,colback=yellow!10!white,colframe=red!50!black]
\begin{gather}
\sum\limits_{n=1}^{\infty} \frac{1}{n} = \infty.\\
\int x^2 \sim \text{d}x = \frac{1}{3} x^3 + c.
\end{gather}
And now for something completely different.
\end{tcolorbox}
```

$$\sum_{n=1}^{\infty} \frac{1}{n} = \infty. \quad (20)$$

$$\int x^2 \, dx = \frac{1}{3} x^3 + c. \quad (21)$$

And now for something completely different.

New colored mathematical environments are easily created using `\newtcolorbox`^{→ P. 12}:

```
\newtcolorbox{mymath}[ams gather*,colback=yellow!10!white,colframe=red!50!black]

\begin{mymath}
\sum\limits_{n=1}^{\infty} \frac{1}{n} = \infty.\\
\int x^2 \sim \text{d}x = \frac{1}{3} x^3 + c.
\end{mymath}
```

$$\sum_{n=1}^{\infty} \frac{1}{n} = \infty.$$

$$\int x^2 \, dx = \frac{1}{3} x^3 + c.$$

All described options like `/tcb/ams gather upper`^{→ P. 196}, `/tcb/ams gather lower`^{→ P. 196}, `/tcb/ams gather`^{→ P. 196} are (partially) setting (overwriting) the keys `/tcb/before upper`^{→ P. 40}, `/tcb/after upper`^{→ P. 41}, `/tcb/before lower`^{→ P. 41}, `/tcb/after lower`^{→ P. 41}.

Therefore, e.g. `\tcbset{ams gather,before upper={\text{Pythagoras:}}}` produces an invalid result. For this case, you are invited to use

`\tcbset{ams gather,before upper app={\text{Pythagoras:}}}`,
see `/tcb/before upper app`^{→ P. 231}.

`/tcb/theorem style=<name>` (no default, initially **standard**)

Applies a predefined style `<name>` to the theorem environment. Some of the feasible `<name>` values resemble style names from the packages **theorem** and **ntheorem** to give convenient access to known patterns.

The styles alter `/tcb/separator sign`^{→P.189}, `/tcb/description delimiters`^{→P.190}, `/tcb/terminator sign`^{→P.190}, and more. Therefore, one should apply such keys *after* a theorem style.

For the following examples, we use:

Definition in the preamble:

```
\newtcbtheorem[use counter from=mytheo]{theorem}{Theorem}{%
  fonttitle=\bfseries\upshape,fontupper=\itshape,
  colframe=green!50!black,colback=green!10!white,
  colbacktitle=green!20!white,coltitle=blue!75!black}{theo}
```

The predefined styles are:

- **standard**: This is the initial value.

```
\begin{theorem}[theorem style=standard]{standard}{}
This is my theorem. \begin{equation*} a^2 + b^2 = c^2. \end{equation*}
\end{theorem}
```

Theorem 8.15: standard

This is my theorem.

$$a^2 + b^2 = c^2.$$

- **change standard**

```
\begin{theorem}[theorem style=change standard]{change standard}{}
This is my theorem. \begin{equation*} a^2 + b^2 = c^2. \end{equation*}
\end{theorem}
```

8.16 Theorem: change standard

This is my theorem.

$$a^2 + b^2 = c^2.$$

- **plain**

```
\begin{theorem}[theorem style=plain]{plain}{}
This is my theorem. \begin{equation*} a^2 + b^2 = c^2. \end{equation*}
\end{theorem}
```

Theorem 8.17 (plain): *This is my theorem.*

$$a^2 + b^2 = c^2.$$

- **break**

```
\begin{theorem}[theorem style=break]{break}{}
This is my theorem. \begin{equation*} a^2 + b^2 = c^2. \end{equation*}
\end{theorem}
```

Theorem 8.18 (break):

This is my theorem.

$$a^2 + b^2 = c^2.$$

- **plain apart**

```
\begin{theorem}[theorem style=plain apart]{plain apart}{}
This is my theorem. \begin{equation*} a^2 + b^2 = c^2. \end{equation*}
\end{theorem}
```

Theorem 8.19 (plain apart)

This is my theorem.

$$a^2 + b^2 = c^2.$$

- **change**

```
\begin{theorem}[theorem style=change]{change}{}
This is my theorem. \begin{equation*} a^2 + b^2 = c^2. \end{equation*}
\end{theorem}
```

8.20 Theorem (change): *This is my theorem.*

$$a^2 + b^2 = c^2.$$

- **change break**

```
\begin{theorem}[theorem style=change break]{change break}{}
This is my theorem. \begin{equation*} a^2 + b^2 = c^2. \end{equation*}
\end{theorem}
```

8.21 Theorem (change break):

This is my theorem.

$$a^2 + b^2 = c^2.$$

- **change apart**

```
\begin{theorem}[theorem style=change apart]{change apart}{}
This is my theorem. \begin{equation*} a^2 + b^2 = c^2. \end{equation*}
\end{theorem}
```

8.22 Theorem (change apart)

This is my theorem.

$$a^2 + b^2 = c^2.$$

- **margin**

```
\begin{theorem}[theorem style=margin,left=10mm]{margin}{}
This is my theorem. \begin{equation*} a^2 + b^2 = c^2. \end{equation*}
\end{theorem}
\begin{theorem}[theorem style=margin,left=10mm,oversize]{margin}{}
This is my theorem. \begin{equation*} a^2 + b^2 = c^2. \end{equation*}
\end{theorem}
```

8.23 Theorem (margin): *This is my theorem.*

$$a^2 + b^2 = c^2.$$

8.24 Theorem (margin): *This is my theorem.*

$$a^2 + b^2 = c^2.$$

- **margin break**

```
\begin{theorem}[theorem style=margin break,left=10mm]{margin break}{}
This is my theorem. \begin{equation*} a^2 + b^2 = c^2. \end{equation*}
\end{theorem}
\begin{theorem}[theorem style=margin break,left=10mm,oversize]{margin break}{}
This is my theorem. \begin{equation*} a^2 + b^2 = c^2. \end{equation*}
\end{theorem}
```

8.25 Theorem (margin break):

This is my theorem.

$$a^2 + b^2 = c^2.$$

8.26 Theorem (margin break):

This is my theorem.

$$a^2 + b^2 = c^2.$$

- **margin apart**

```
\begin{theorem}[theorem style=margin apart,left=10mm]{margin apart}{}
This is my theorem. \begin{equation*} a^2 + b^2 = c^2. \end{equation*}
\end{theorem}
\begin{theorem}[theorem style=margin apart,left=10mm,oversize]{margin apart}{}
This is my theorem. \begin{equation*} a^2 + b^2 = c^2. \end{equation*}
\end{theorem}
```

8.27 Theorem (margin apart)

This is my theorem.

$$a^2 + b^2 = c^2.$$

8.28 Theorem (margin apart)

This is my theorem.

$$a^2 + b^2 = c^2.$$

8.3 Examples for Definitions and Theorems

In the following, the application of `\tcbmaketheorem`^{→ P. 186} to highlight mathematical definitions, theorems, or the like is demonstrated.

At first, additional `tcb` keys are created for the appearance of the colored boxes. It is assumed that theorems and corollaries should be identically colored. All following environments are numbered with a common counter, but this can be changed easily. Here, the counter output is supplemented by the subsection number.

Definition in the preamble:

```
\tcbset{
  defstyle/.style={fonttitle=\bfseries\upshape, fontupper=\slshape,
    arc=0mm, colback=blue!5!white,colframe=blue!75!black},
  theostyle/.style={fonttitle=\bfseries\upshape, fontupper=\slshape,
    colback=red!10!white,colframe=red!75!black},
}
\newtcbtheorem[number within=subsection]{Definition}{Definition}{defstyle}{def}
\newtcbtheorem[use counter from=Definition]{Theorem}{Theorem}{theostyle}{theo}
\newtcbtheorem[use counter from=Definition]{Corollary}{Corollary}{theostyle}{cor}
```

By `\newtcbtheorem`^{→ P. 185}, commonly numbered theorem environments are created now. `defstyle` and `theostyle` are used for the appearance.

Now, everything is prepared for the following examples.

The following theorem is numbered as Theorem `\ref{theo:diffbarstetig}` and referenced with the marker `\texttt{theo:diffbarstetig}.``\bigskip`

```
\begin{Theorem}{Differenzierbarkeit bedingt Stetigkeit, wobei diese Benennung
zu Testzwecken ungew\u{ohnlich lang ist}{diffbarstetig}%
Eine Funktion $f:I\to\mathbb{R}$ ist in $x_0\in I$ stetig, wenn $f$ in
$x_0$ differenzierbar ist.
\end{Theorem}
```

The following theorem is numbered as Theorem 8.3.1 and referenced with the marker `theo:diffbarstetig`.

Theorem 8.3.1: Differenzierbarkeit bedingt Stetigkeit, wobei diese Benennung zu Testzwecken ungewöhnlich lang ist

Eine Funktion $f : I \rightarrow \mathbb{R}$ ist in $x_0 \in I$ stetig, wenn f in x_0 differenzierbar ist.

The following definition is numbered as Definition `\ref{def:diffbarkeit}` and referenced with the marker `\texttt{def:diffbarkeit}`.
`\bigskip`

```
\begin{Definition}{Differenzierbarkeit}{diffbarkeit}
  Eine Funktion  $f: I \rightarrow \mathbb{R}$  auf einem Intervall  $I$  heit in  $x_0 \in I$  differenzierbar oder linear approximierbar, wenn der Grenzwert
  \begin{equation*}
    \lim_{x \rightarrow x_0} \frac{f(x) - f(x_0)}{x - x_0} = \lim_{h \rightarrow 0} \frac{f(x_0 + h) - f(x_0)}{h}
  \end{equation*}
  existiert. Bei Existenz heit dieser Grenzwert Ableitung oder Differentialquotient von  $f$  in  $x_0$  und man schreibt  $f'(x_0)$  fr ihn
  \begin{equation*}
    f'(x_0) \quad \text{oder} \quad \frac{df}{dx}(x_0).
  \end{equation*}
\end{Definition}
```

The following definition is numbered as Definition 8.3.2 and referenced with the marker `def:diffbarkeit`.

Definition 8.3.2: Differenzierbarkeit

Eine Funktion $f : I \rightarrow \mathbb{R}$ auf einem Intervall I heit in $x_0 \in I$ differenzierbar oder linear approximierbar, wenn der Grenzwert

$$\lim_{x \rightarrow x_0} \frac{f(x) - f(x_0)}{x - x_0} = \lim_{h \rightarrow 0} \frac{f(x_0 + h) - f(x_0)}{h}$$

existiert. Bei Existenz heit dieser Grenzwert Ableitung oder Differentialquotient von f in x_0 und man schreibt fr ihn

$$f'(x_0) \quad \text{oder} \quad \frac{df}{dx}(x_0).$$

The following corollary is numbered as Corollary `\ref{cor:nullstellen}` and referenced with the marker `\texttt{cor:nullstellen}`.
`\bigskip`

```
\begin{Corollary}{Nullstellenexistenz}{nullstellen}
  Ist  $f: [a, b] \rightarrow \mathbb{R}$  stetig und haben  $f(a)$  und  $f(b)$  entgegengesetzte Vorzeichen, also  $f(a)f(b) < 0$ , so besitzt  $f$  eine Nullstelle  $x_0 \in ]a, b[$ , also  $f(x_0) = 0$ .
\end{Corollary}
```

The following corollary is numbered as Corollary 8.3.3 and referenced with the marker `cor:nullstellen`.

Corollary 8.3.3: Nullstellenexistenz

Ist $f : [a, b] \rightarrow \mathbb{R}$ stetig und haben $f(a)$ und $f(b)$ entgegengesetzte Vorzeichen, also $f(a)f(b) < 0$, so besitzt f eine Nullstelle $x_0 \in]a, b[$, also $f(x_0) = 0$.

```
\begin{Theorem}[boxrule=2mm,toptitle=-1.5mm,bottomtitle=-1.5mm]{%
  Hinreichende Bedingung f\"{u}r Wendepunkte}{wendehinreichend}%
  $$$ sei eine auf einem Intervall $]a,b[$ dreimal stetig differenzierbare Funktion.
  Ist $f''(x_0)=0$ in $x_0\in]a,b[$ und $f'''(x_0)\neq 0$, so ist
  $(x_0,f(x_0))$ ein Wendepunkt von $f$.
}\end{Theorem}
```

Theorem 8.3.4: Hinreichende Bedingung für Wendepunkte

f sei eine auf einem Intervall $]a,b[$ dreimal stetig differenzierbare Funktion. Ist $f''(x_0) = 0$ in $x_0 \in]a,b[$ und $f'''(x_0) \neq 0$, so ist $(x_0, f(x_0))$ ein Wendepunkt von f .

```
% \usepackage{varioref}
% \usepackage{cleveref}
% \tcbuselibrary{skins}
\newtcbtheorem[use counter from=Definition]{YetAnotherTheorem}{Theorem}%
{theorem style=plain apart,label type=theorem,enhanced,frame hidden,
boxrule=2mm,titlerule=0mm,toptitle=1mm,bottomtitle=1mm,
fonttitle=\bfseries\large,fonttupper=\normalsize,
coltitle=green!35!black,colbacktitle=green!15!white,
colback=green!50!yellow!15!white,borderline={1pt}{0pt}{green!25!blue},
}{theo}

\begin{YetAnotherTheorem}{Mittelwertsatz f\"{u}r $n$ Variable}{meanvaluetheorem}%
  Es sei $n\in\mathbb{N}$, $D\subseteq\mathbb{R}^n$ eine offene Menge und
  $f\in C^1(D,\mathbb{R})$. Dann gibt es auf jeder Strecke
  $[x_0,x]\subseteq D$ einen Punkt $\xi\in[x_0,x]$, so dass gilt
  \begin{equation*}
    f(x)-f(x_0) = \operatorname{grad} f(\xi)^\top(x-x_0)
  \end{equation*}
\end{YetAnotherTheorem}

\medskip
Here, |cleveref| support is used to reference \Cref{theo:meanvaluetheorem}
on \Cpageref{theo:meanvaluetheorem}. This \namecref{theo:meanvaluetheorem}
can also be referenced by |\Vref| resulting in \Vref{theo:meanvaluetheorem}.
```

Theorem 8.3.5 (Mittelwertsatz für n Variable)

Es sei $n \in \mathbb{N}$, $D \subseteq \mathbb{R}^n$ eine offene Menge und $f \in C^1(D, \mathbb{R})$. Dann gibt es auf jeder Strecke $[x_0, x] \subset D$ einen Punkt $\xi \in [x_0, x]$, so dass gilt

$$f(x) - f(x_0) = \operatorname{grad} f(\xi)^\top (x - x_0)$$

Here, `cleveref` support is used to reference Theorem 8.3.5 on Page 203. This theorem can also be referenced by `\Vref` resulting in Theorem 8.3.5.

Note that `/tcb/label type→ P. 70` was used in the example above to feed `cleveref` [4] with the needed name information.

Here, using `\Vref` resulting in `\Vref{theo:meanvaluetheorem}` is more interesting`\ldots`

Here, using `\Vref` resulting in Theorem 8.3.5 on page 203 is more interesting...

```
% \tcbuselibrary{skins}
\newtcbtheorem[use counter from=Definition]{YetAnotherTheorem}{Theorem}%
{theorem style=change apart,enhanced,arc=0mm,outer arc=0mm,
boxrule=0mm,toprule=1mm,bottomrule=1mm,left=1mm,right=1mm,
titlerule=0mm,temptitle=0mm,bottomtitle=1mm,top=0mm,
colframe=red!50!black,colback=red!5!white,coltitle=red!50!black,
title style={top color=yellow!50!white,bottom color=red!5!white,
middle color=yellow!50!white},
fonttitle=\bfseries\sffamily\normalsize,fontupper=\normalsize\itshape,
}{theo}

\begin{YetAnotherTheorem}{Mittelwertsatz f\"{u}r $n$ Variable}{mittelwertsatz_n2}%
Es sei $n\in\mathbb{N}$, $D\subseteq\mathbb{R}^n$ eine offene Menge und
$f\in C^1(D,\mathbb{R})$. Dann gibt es auf jeder Strecke
$[x_0,x]\subseteq D$ einen Punkt $\xi\in[x_0,x]$, so dass gilt
\begin{equation*}
f(x)-f(x_0) = \operatorname{grad} f(\xi)^{\top}(x-x_0)
\end{equation*}
\end{YetAnotherTheorem}
```

8.3.6 Theorem (Mittelwertsatz für n Variable)

Es sei $n \in \mathbb{N}$, $D \subseteq \mathbb{R}^n$ eine offene Menge und $f \in C^1(D, \mathbb{R})$. Dann gibt es auf jeder Strecke $[x_0, x] \subset D$ einen Punkt $\xi \in [x_0, x]$, so dass gilt

$$f(x) - f(x_0) = \operatorname{grad} f(\xi)^{\top}(x - x_0)$$

You need more attention for your theorems? Here, you are ...

```
% tcbuselibrary{skins} % preamble
\begin{Theorem}[enhanced,
  fuzzy halo=3mm with yellow,
  fuzzy halo=2mm with red,
  fuzzy halo=1mm with yellow,
  watermark color=red!35!white,
  watermark text={Overacting\\Fundamental Theorem}]%
{Fundamental Theorem of Theorems}{fundamental}%
\lipsum[1-2]
\end{Theorem}
```

Theorem 8.3.7: Fundamental Theorem of Theorems

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Let's try a more conservative approach:

```
% \tcbuselibrary{skins}
\newtcbtheorem[use counter from=Definition]{YetAnotherTheorem}{Theorem}%
{theorem style=plain,enhanced,colframe=blue!50!black,colback=yellow!20!white,
 coltitle=red!50!black,fonttitle=\upshape\bfseries,fontupper=\itshape,
 drop fuzzy shadow=blue!50!black!50!white,boxrule=0.4pt}{theo}

\begin{YetAnotherTheorem}{Mittelwertsatz f\"{u}r $n$ Variable}{mittelwertsatz_n3}%
Es sei $n \in \mathbb{N}$, $D \subseteq \mathbb{R}^n$ eine offene Menge und
$f \in C^1(D, \mathbb{R})$. Dann gibt es auf jeder Strecke
$[x_0, x] \subseteq D$ einen Punkt $\xi \in [x_0, x]$, so dass gilt
\begin{equation*}
f(x) - f(x_0) = \operatorname{grad} f(\xi)^{\top} (x - x_0)
\end{equation*}
\end{YetAnotherTheorem}
```

Theorem 8.3.8 (Mittelwertsatz für n Variable): Es sei $n \in \mathbb{N}$, $D \subseteq \mathbb{R}^n$ eine offene Menge und $f \in C^1(D, \mathbb{R})$. Dann gibt es auf jeder Strecke $[x_0, x] \subset D$ einen Punkt $\xi \in [x_0, x]$, so dass gilt

$$f(x) - f(x_0) = \operatorname{grad} f(\xi)^{\top} (x - x_0)$$

9 Library LIB breakable

The library is loaded by a package option or inside the preamble by:

```
\tcbuselibrary{breakable}
```

9.1 Technical Overview

The library LIB breakable supports the automatic breaking of a `tcolorbox`. This feature is enabled by `/tcb/breakable`^{→ P. 208} and disabled by `/tcb/unbreakable`^{→ P. 209}.

If a `tcolorbox` is set to be `/tcb/breakable`^{→ P. 208}, then the following algorithm is executed:

1. The box content is read to a box register similar but not identical to the unbreakable case.
2. If the total box fits into the current page, it is shipped out visibly unbroken and the algorithm stops.

Unbroken Box

The box.

unbroken

3. Otherwise, it is checked if at least `/tcb/lines before break`^{→ P. 209} of the upper box can be placed on the current page. If not, a page break is inserted and the algorithm goes back to Step 2.
4. Now, the *break sequence* starts. The upper box part or the lower box part is split such that it fits into the current page. The fitting part is named *first part* of the *break sequence* and shipped out.

Broken Box

The box.

first

5. If the remaining content of the total box fits into the current page, the algorithm continues with Step 7, else with Step 6.
6. The upper box part or the lower box part is split such that it fits into the current page. The fitting part is named *middle part* of the *break sequence* and shipped out. Then, the algorithm goes back to Step 5.

The box.

middle

7. The remaining part is named *last part* of the *break sequence* and shipped out. The algorithm stops.

The box.

last

The algorithm takes care that the optional segmentation line never appears at the end of a box. The optional lower box part is also checked to have at least `/tcb/lines before break`^{→ P. 209}.

In principal, all boxes of the *break sequence* share the same geometric parameters. The differences are:

- The given `/tcb/before→P.57` and `/tcb/after→P.57` values are used only before the *first* and after the *last* part of the *break sequence*.
- A special behavior between the parts of the *break sequence* can be given by `/tcb/toprule at break→P.210`, `/tcb/bottomrule at break→P.210`, `/tcb/enlarge top at break by→P.211`, and `/tcb/enlarge bottom at break by→P.211`.
- The `/tcb/skin→P.79` decides *how* the *first*, *middle*, and *last* part look like. Actually, every part type has its own skin given by the options `/tcb/skin first→P.79`, `/tcb/skin middle→P.79`, and `/tcb/skin last→P.79`. Typically, these options are set automatically by the main skin, see Subsection 9.5 from page 212.

9.2 Limitations and Known Bugs

- The box content is a \TeX `\vbox` register which has a restricted capacity. Therefore, you cannot place hundreds of pages inside a `tcolorbox`.
- You can nest an unbreakable `tcolorbox` inside another `tcolorbox`, even inside a breakable one. But you should not nest a breakable box inside a breakable box since this will give a mess. Inside a breakable box, the further breaking is disabled by default. If you really want to or have to use the keys `/tcb/breakable→P.208` or `/tcb/unbreakable→P.209` inside the content of an outer `tcolorbox`, you have to guard this with a \TeX group.
- If your text content contains some text color changing commands, your color will not survive the break to the next box.

9.3 Main Option Keys

/tcb/breakable (no value)

Allows the `tcolorbox` to be breakable. If the box is larger than the available space at the current page, the box is automatically broken and continued to the next next page. All sorts of `tcolorbox` can be made breakable. It depends on the skin how the breaking looks like. If you do not know better, use `/tcb/enhanced`^{P.119} for breaking a box. The parts of the *break sequence* are numbered by the counter `tcbbreakpart`.

```
% \usepackage{lipsum} % preamble
\tcbset{enhanced jigsaw,colback=red!5!white,colframe=red!75!black,
  watermark color=yellow!25!white,watermark text=\arabic{tcbbreakpart},
  fonttitle=\bfseries}

\begin{tcolorbox}[breakable,title=My breakable box]
\lipsum[1-6]
\end{tcolorbox}
```

My breakable box

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/tcb/unbreakable (no value, initially set)

Sets the `tcolorbox` to be unbreakable.

/tcb/title after break= $\langle text \rangle$ (no default, initially empty)

The `/tcb/title`^{P.14} is used only for the *first* part of a *break sequence*. Use `title after break` to create a heading line with $\langle text \rangle$ as content for all following parts.

/tcb/notitle after break (no value, initially set)

Removes the title line or following parts in a *break sequence* if set before.

/tcb/adjusted title after break= $\langle text \rangle$ (style, no default, initially unset)

Works like `/tcb/adjusted title`^{P.14} but applied to `/tcb/title after break`.

/tcb/lines before break= $\langle number \rangle$ (no default, initially 2)

Assures that the given $\langle number \rangle$ of lines of the upper box part or the lower box part are placed before a break happens.

/tcb/enlargepage= $\langle length \rangle / \langle length \rangle \dots / \langle length \rangle$ (no default, initially 0pt)

Inserts a `\enlargethispage{\langle length \rangle}` to the pages of the break sequence, i.e. allows one to enlarge (or shrink) partial boxes. The first $\langle length \rangle$ is applied to the first partial box, the second $\langle length \rangle$ is applied to the second partial box, and so on. The last $\langle length \rangle$ value is applied to all following partial boxes if any. Note that floating boxes will not be enlarged.

```
\begin{tcolorbox}[breakable,enlargepage=0mm/\baselineskip/2\baselineskip/0mm,...
```

The example code enlarged the second partial box by one line, the third partial box by two lines, and all following parts are not enlarged.

If an automated page break occurs before the first partial box, the page enlargement is applied to the page before the first partial box *and* again to the page of the first partial box. Insert a manual break to prevent this.

In general, `enlargepage` should be used at the final stage of a document for fine-tuning only.

/tcb/shrink break goal= $\langle length \rangle$ (no default, initially 0pt)

This is an emergency parameter if the break algorithm produces unpleasant breaks. It shrinks the goal height of the current box part by $\langle length \rangle$ which may result in smaller boxes. Never use negative values.

9.4 Option Keys for the Break Appearance

/tcb/toprule at break= $\langle length \rangle$ (no default, initially 0.5mm)

Sets the line width of the top rule to $\langle length \rangle$ if the box is **/tcb/breakable**^{→ P. 208}.

In this case, it is applied to *middle* and *last* parts in a break sequence. Note that **/tcb/toprule**^{→ P. 22} overwrites this value if used afterwards.

/tcb/bottomrule at break= $\langle length \rangle$ (no default, initially 0.5mm)

Sets the line width of the bottom rule to $\langle length \rangle$ if the box is **/tcb/breakable**^{→ P. 208}.

In this case, it is applied to *first* and *middle* parts in a break sequence. Note that **/tcb/bottomrule**^{→ P. 22} overwrites this value if used afterwards.

/tcb/topsep at break= $\langle length \rangle$ (no default, initially 0mm)

Additional vertical space of $\langle length \rangle$ which is added at the top of *middle* and *last* parts in a break sequence. In general, it is not advisable to change this value if these parts start with a rule or a title.

/tcb/bottomsep at break= $\langle length \rangle$ (no default, initially 0mm)

Additional vertical space of $\langle length \rangle$ which is added at the bottom of *first* and *middle* parts in a break sequence. In general, it is not advisable to change this value if these parts end with a rule.

/tcb/pad before break= $\langle length \rangle$ (style, no default, initially 3.5mm)

Sets the total amount of vertical space after the text content and before the break point to $\langle length \rangle$. This style sets **/tcb/toprule at break** to 0pt and changes **/tcb/topsep at break** as required. In general, it is not advisable to change this value if the *middle* and *last* parts in a break sequence start with a rule or a title.

/tcb/pad after break= $\langle length \rangle$ (style, no default, initially 3.5mm)

Sets the total amount of vertical space after the break point and before the text content to $\langle length \rangle$. This style sets **/tcb/bottomrule at break** to 0pt and changes **/tcb/bottomsep at break** as required. In general, it is not advisable to change this value if the *first* and *middle* parts in a break sequence end with a rule.

/tcb/pad at break= $\langle length \rangle$ (style, no default, initially 3.5mm)

Abbreviation for setting $\langle length \rangle$ to **/tcb/pad before break** and **/tcb/pad after break**.

```
% \usepackage{lipsum} % preamble
\tcbset{colback=red!5!white,colframe=red!75!black,fonttitle=\bfseries}

\begin{tcolorbox}[enhanced jigsaw,breakable,pad at break=0mm,
  title={For this box, the pad space at the break point is set to 0mm}]
  \lipsum[1-2]
\end{tcolorbox}
```

For this box, the pad space at the break point is set to 0mm

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`/tcb/enlarge top at break by=<length>` (no default, initially 0mm)

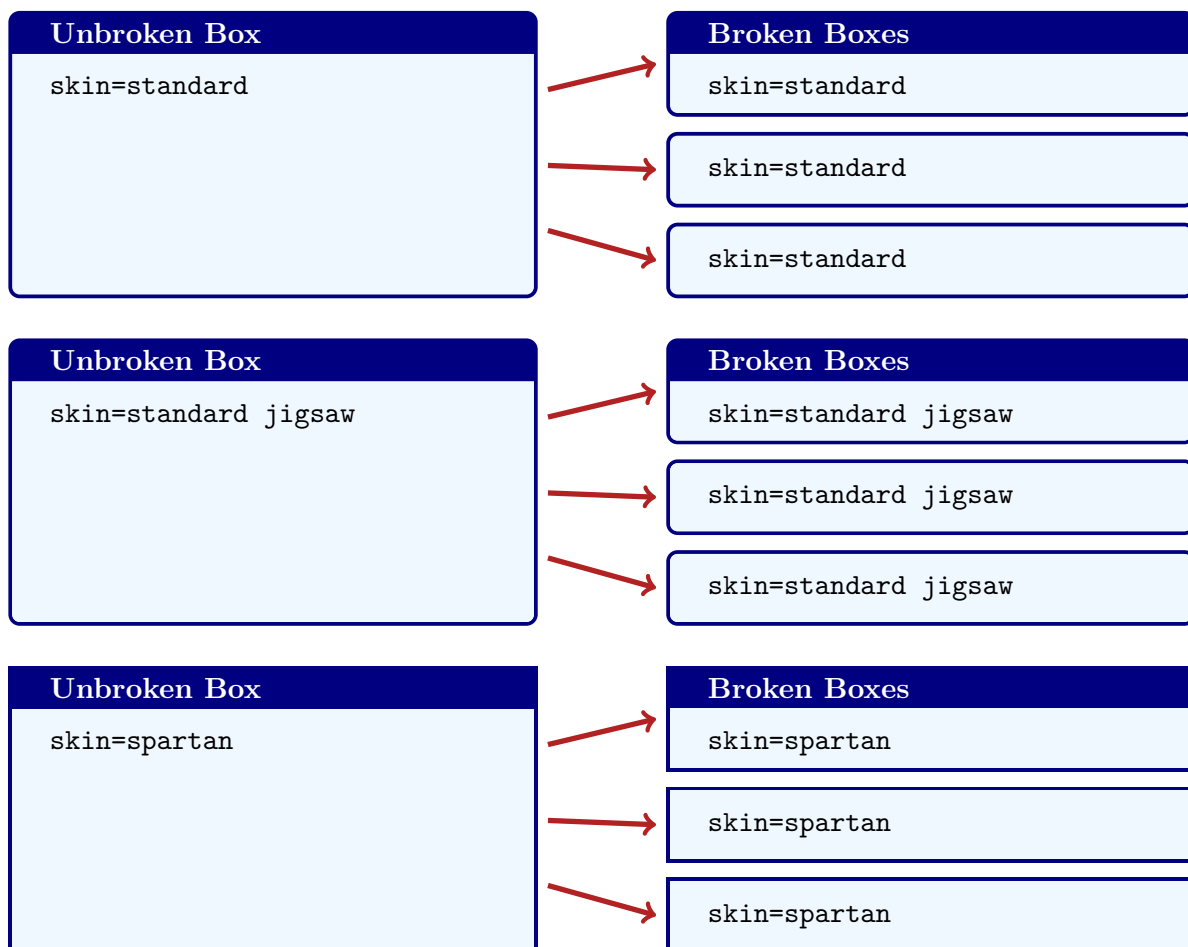
Enlarges the bounding box distance to the top of the box by $\langle length \rangle$ if the box is `/tcb/breakable`^{→P.208}. In this case, it is applied to *middle* and *last* parts in a break sequence. `/tcb/enlarge top by`^{→P.58} overwrites this key.

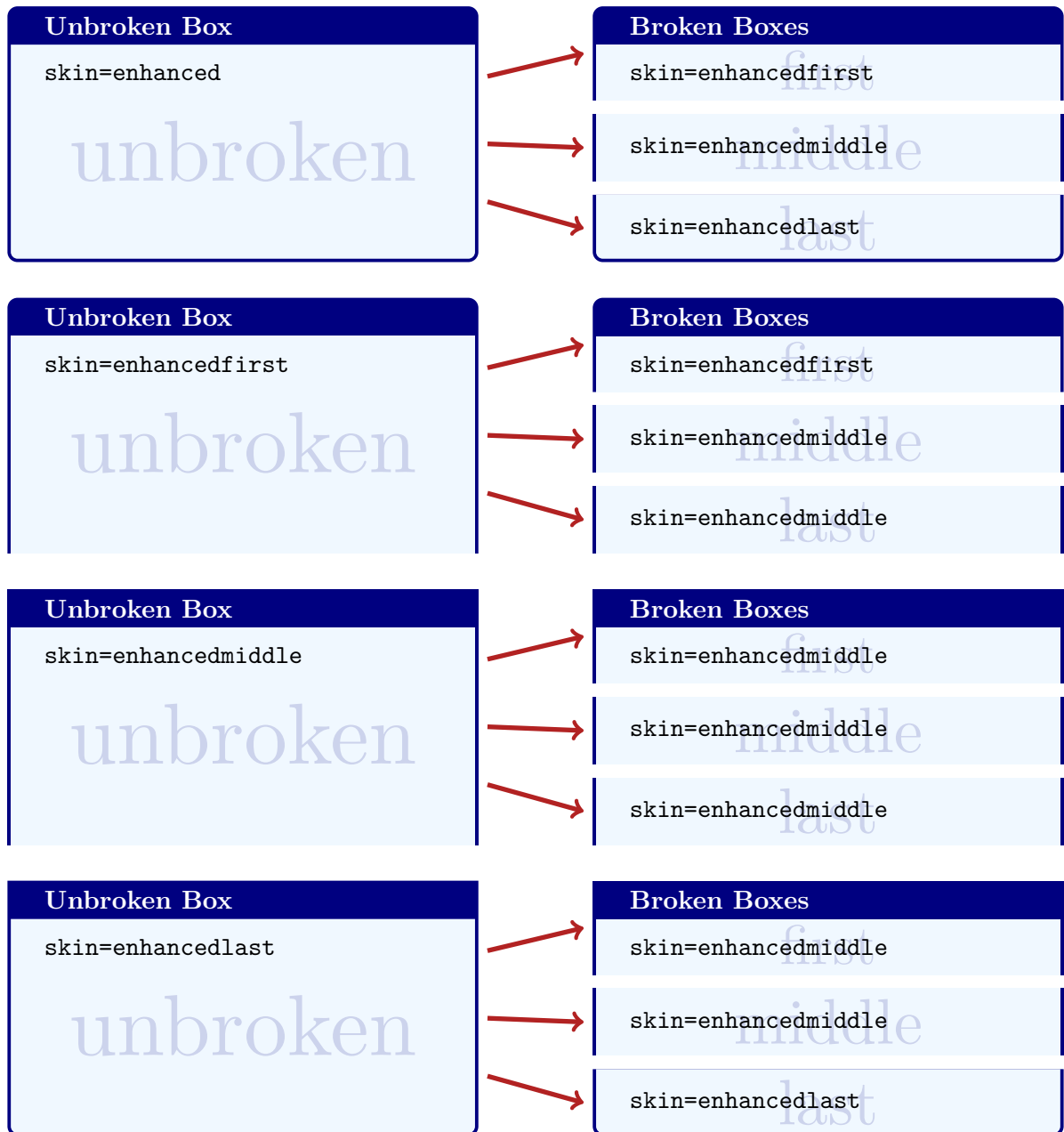
`/tcb/enlarge bottom at break by=<length>` (no default, initially 0mm)

Enlarges the bounding box distance to the bottom of the box by $\langle length \rangle$ if the box is `/tcb/breakable`^{→P.208}. In this case, it is applied to *first* and *middle* parts in a break sequence. `/tcb/enlarge bottom by`^{→P.58} overwrites this key.

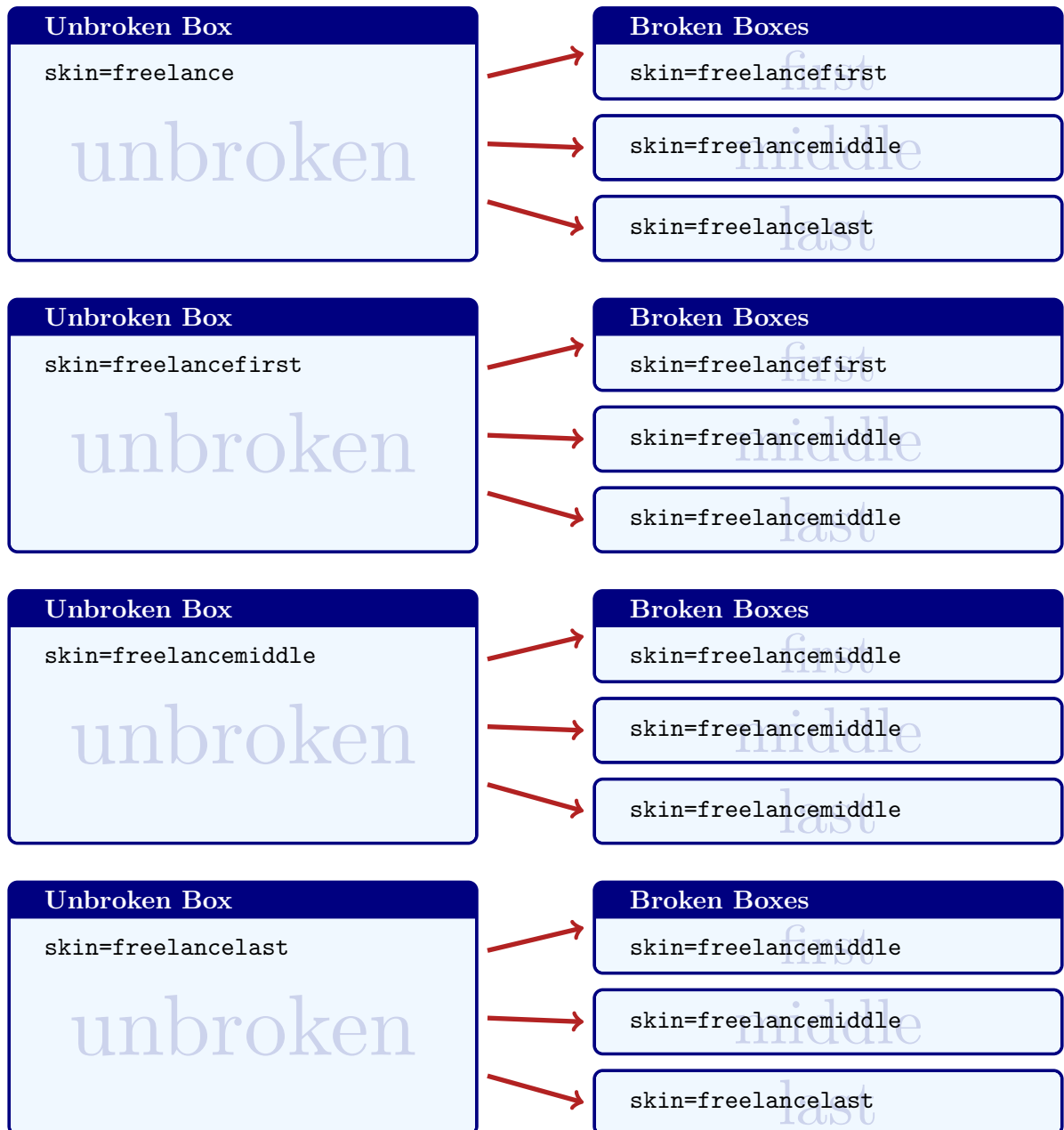
9.5 Break Sequence for the Skins

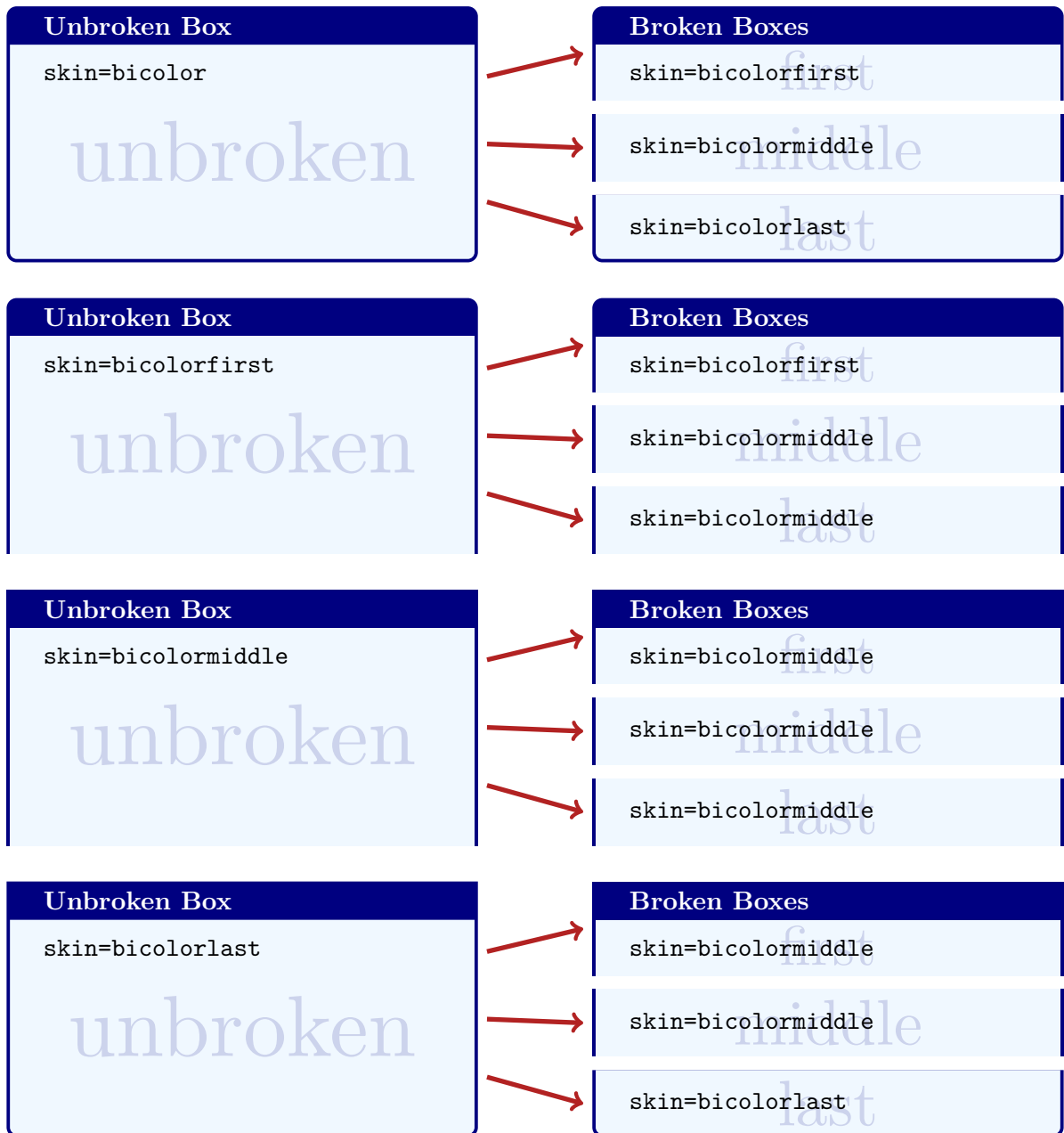
The following diagrams document the *break sequence* for different skins. Depending on the main skin of a `tcolorbox`, the actual skins of the *break sequence* parts are displayed.



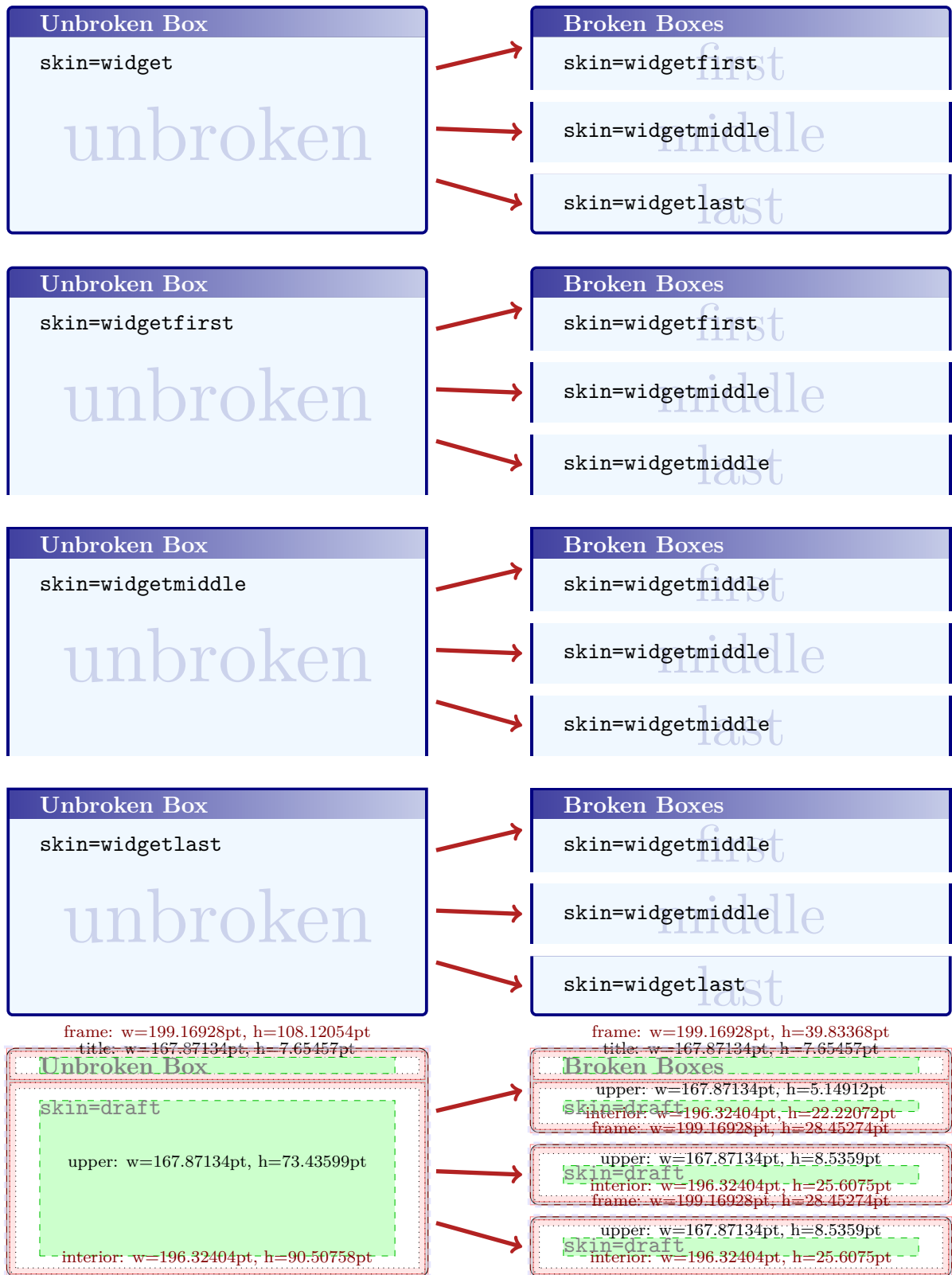












9.6 Break by Hand (Faked Break)

Since the appearance of broken boxes is done by skins, it is quite easy to 'fake a break'. For this, you actually don't need the `\usepackage{breakable}` library at all.

```
\tcbset{enhanced,equal height group=fakedbreak,
  colback=LightGreen,colframe=DarkGreen,
  width=(\linewidth-6mm)/3,nobeforeafter,
  left=1mm,right=1mm,top=1mm,bottom=1mm,middle=1mm}
%
\begin{tcolorbox}[title=My broken box,skin=enhancedfirst]
This is a box which breaks from one column to another
\end{tcolorbox}\hfill
\begin{tcolorbox}[skin=enhancedmiddle]
column. I am sorry to say that this is a trick.
Nevertheless, you may use this trick for your
\end{tcolorbox}\hfill
\begin{tcolorbox}[skin=enhancedlast]
own purposes.
\end{tcolorbox}
```

My broken box

This is a box which breaks
from one column to another

column. I am sorry to say that
this is a trick. Nevertheless,
you may use this trick for your

own purposes.

10 Library

The library is loaded by a package option or inside the preamble by:

```
\tcbuselibrary{fitting}
```

10.1 Macros of the Library

\tcbboxfit[*<options>*]{*<box content>*}

Creates a colored box where the given *<box content>* is fitted to the width and height of the box. A `tcbboxfit` has to have a fixed height. If no fixed height is given, a square box is constructed. In principal, most *<options>* for a `tcolorbox`^{→P.9} can be used for `\tcbboxfit` with some restrictions. A `\tcbboxfit` cannot have a lower part and cannot be broken.

```
% \usepackage{lipsum}
\tcbset{colframe=blue!50!black,colback=red!10!white,
        boxsep=0pt,top=1mm,bottom=1mm,left=1mm,right=1mm,
        nobeforeafter,width=(\linewidth-2mm)/3}

\tcbboxfit[height=8cm]{\lipsum[1]}\hfill
\tcbboxfit[height=4cm]{\lipsum[1]}\hfill
\tcbboxfit[height=2cm]{\lipsum[1]}

\medskip
\tcbset{width=(\linewidth-2mm)/2,colback=green!10!white,boxsep=1mm}
\tcbboxfit[height=4cm]{\lipsum[2]}\hfill
\tcbboxfit[height=4cm,title=With a title]{\lipsum[2]}
```

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Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

With a title

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

\newtcboxfit [*<init options>*] {\<name>} [*<number>*] [*<default>*] {\<options>}

Creates a new macro \<name> based on \tcboxfit^{P. 220}. Basically, \newtcboxfit operates like \newcommand. The new macro \<name> optionally takes <number>+1 arguments, where <default> is the default value for the optional first argument. The <options> are given to the underlying tcboxfit. The <init options> allow setting up automatic numbering, see Section 4 from page 73.

```
\newtcboxfit{\mybox}{colback=red!5!white,
colframe=red!75!black,width=4cm,
height=1.5cm,center upper}
```

```
\mybox{This is my own box.}\par
\mybox{This is my own box with more text
to be written.}
```

This is my own
box.

This is my own box
with more text to be
written.

```
% \usepackage{lipsum}
\newtcboxfit{\mybox}[2]{colback=red!5!white,
colframe=red!75!black,fonttitle=\bfseries,
boxsep=1mm,left=0mm,right=0mm,top=0mm,
bottom=0mm,center upper,valign=center,
nobeeforeafter,width=#1,height=#2}
```

```
\mybox{2.5cm}{1cm}{First box}%
\mybox{2.5cm}{1cm}{Second box with more text}\\
\mybox{5cm}{2cm}{Third box with text}\\
\mybox{5cm}{3cm}{\lipsum[1]}
```

First box

Second box
with more text

Third box with text

Lorem ipsum dolor sit amet, consectetur adipiscing elit.
 Ut purus elit, vestibulum ut, placerat ac, adipiscing
 vitae, felis. Curabitur dictum gravida mauris. Nam arcu
 libero, nonummy eget, consectetur id, vulputate a,
 magna. Donec vehicula augue eu neque. Pellentesque
 habitant morbi tristique senectus et netus et malesuada
 fames ac turpis egestas. Mauris ut leo. Cras viverra
 metus rhoncus sem. Nulla et lectus vestibulum urna
 fringilla ultrices. Phasellus eu tellus sit amet tortor
 gravida placerat. Integer sapien est, iaculis in, pretium
 quis, viverra ac, nunc. Praesent eget sem vel leo ultrices
 bibendum. Aenean faucibus. Morbi dolor nulla,
 malesuada eu, pulvinar at, mollis ac, nulla. Curabitur
 auctor semper nulla. Donec varius orci eget risus. Duis
 nibh mi, congue eu, accumsan eleifend, sagittis quis,
 diam. Duis eget orci sit amet orci dignissim rutrum.

```
% \usepackage{lipsum}
\newtcboxfit{\mybox}[2][\colback=red!5!white,
colframe=red!75!black,
width=#2,height=#2/3*2,#1]
```

```
\mybox[colback=yellow]{5cm}%
{\lipsum[2]}
```

Nam dui ligula, fringilla a, euismod so-
 dales, sollicitudin vel, wisi. Morbi auc-
 tor lorem non justo. Nam lacus libero,
 pretium at, lobortis vitae, ultricies et, tel-
 lus. Donec aliquet, tortor sed accumsan
 bibendum, erat ligula aliquet magna, vi-
 tae ornare odio metus a mi. Morbi ac
 orci et nisl hendrerit mollis. Suspendisse
 ut massa. Cras nec ante. Pellentesque
 a nulla. Cum sociis natoque penatibus
 et magnis dis parturient montes, nascetur
 ridiculus mus. Aliquam tincidunt urna.
 Nulla ullamcorper vestibulum turpis. Pel-
 lentesque cursus luctus mauris.

\renewtcboxfit [*<init options>*] {\<name>} [*<number>*] [*<default>*] {\<options>}

Operates like \newtcboxfit, but based on \renewcommand instead of \newcommand. An existing macro is redefined.

\tcbfontsize {\<factor>}

Selects a font size inside a tcolorbox which is scaled with the given <factor> relative to \tcbfitdim.

```
\tcbset{colback=red!5!white,colframe=red!75!black}
\begin{tcolorbox}[fit basedim=10pt]
{\tcbfontsize{0.25} Very tiny,}\\
{\tcbfontsize{0.5} Small,}\\
{\tcbfontsize{1} Normal,}\\
{\tcbfontsize{2} Large,}\\
{\tcbfontsize{4} Huge.}
\end{tcolorbox}
```

Very tiny,

Small,

Normal,

Large,

Huge.

10.2 Option Keys of the Library

The font size for the content of a box with fixed width and fixed height can be adjusted automatically. This is called the *fitbox capture mode*. Note that the fit control algorithm constructs a series of versions for the box and selects the 'best'. Therefore, the compilation time is quite longer than for a normal box. The algorithm will fail, if a different selected font size does not change the overall size of the box content. The `\tcboxfit`^{→ P. 220} macro uses this algorithm by default.

The fit control keys are only applicable to unbreakable boxes without a lower part. The box content should not change counters.

/tcb/fit

(style, initially unset)

Sets the `/tcb/capture`^{→ P. 67} mode to `fitbox`, i.e. enables the font size adjustment algorithm. Thereby, a `tcolorbox`^{→ P. 9} acts like `\tcboxfit`^{→ P. 220} where the given *box content* is fitted to the width and height of the box. Therefore, the box has to have a fixed height. If no fixed height is given, a square box is constructed. The font dimension `\tcbfitdim` can also be used to adjust the margins of the box since a box with a tiny font may not need large margins. The number of constructed boxes is saved to the macro `\tcbfitsteps` for analysis.

```
% \usepackage{lipsum}
% \tcbuselibrary{skins}
\newtcolorbox{fitting}[2][]{fit,height=#2,boxsep=1pt,valign=center,opacityupper=0.5,
top=0.4\tcbfitdim,bottom=0.4\tcbfitdim,left=0.75\tcbfitdim,right=0.75\tcbfitdim,
enhanced,watermark text={\tcbfitsteps},colframe=blue!75!black,colback=white,#1}

\begin{fitting}{4cm}
\lipsum[1]
\end{fitting}

\begin{fitting}{2cm}
\lipsum[2]
\end{fitting}

\begin{fitting}{1cm}
\lipsum[3]
\end{fitting}
```

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

Nulla malesuada porttitor diam. Donec felis erat, congue non, volutpat at, tincidunt tristique, libero. Vivamus viverra fermentum felis. Donec nonummy pellentesque ante. Phasellus adipiscing semper elit. Proin fermentum massa ac quam. Sed diam turpis, molestie vitae, placerat a, molestie nec, leo. Maecenas lacinia. Nam ipsum ligula, eleifend at, accumsan nec, suscipit a, ipsum. Morbi blandit ligula feugiat magna. Nunc eleifend consequat lorem. Sed lacinia nulla vitae enim. Pellentesque tincidunt purus vel magna. Integer non enim. Praesent euismod nunc eu purus. Donec bibendum quam in tellus. Nullam cursus pulvinar lectus. Donec et mi. Nam vulputate metus eu enim. Vestibulum pellentesque felis eu massa.

`/tcb/fit to=<width> and <height>` (style, initially unset)
 Shortcut for using `/tcb/fit`^{P. 222} and setting the `<width>` and `<height>` values separately.

```
\tcbset{colback=red!5!white,colframe=red!75!black}

\begin{tcolorbox}[fit to=3cm and 2cm]
  This box content is fitted to the given
  dimensions.
\end{tcolorbox}
```

This box content is fitted to the given dimensions.

`/tcb/fit to height=<height>` (style, initially unset)
 Shortcut for using `/tcb/fit`^{P. 222} and setting the `<height>` value separately.

```
\tcbset{colback=red!5!white,colframe=red!75!black}

\begin{tcolorbox}[fit to height=2cm]
  This box content is fitted to the given
  height.
\end{tcolorbox}
```

This box content is fitted to the given height.

`/tcb/fit basedim=<length>` (no default, initially 10pt)
 Sets the starting font dimension for the font size adjustment algorithm to `<length>`. The algorithm never enlarges this dimension.

```
\tcbset{colback=red!5!white,colframe=red!75!black}

\begin{tcolorbox}[fit to=4cm and 2cm]
  Too few words for the box.
\end{tcolorbox}

\begin{tcolorbox}[fit to=4cm and 2cm,
  fit basedim=50pt]
  Enough words for the box.
\end{tcolorbox}
```

Too few words for the box.

Enough words for the box.

`/tcb/fit skip=<real value>` (no default, initially 1.2)
 Sets the skip value of the selected font to `<real value>` times `\tcbfitdim`.

```
% \usepackage{lipsum}
\tcbset{colback=red!5!white,
  colframe=red!75!black,left=1mm,
  right=1mm,boxsep=0mm}

\begin{tcolorbox}[fit to=5cm and 4cm,
  fit skip=1.0 ]
  \lipsum[1]
\end{tcolorbox}
```

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

Redefines the standard L^AT_EX font size macros `\tiny`, `\scriptsize`, `\footnotesize`, `\small`, `\normalsize`, `\large`, `\Large`, `\LARGE`, `\huge`, and `\Huge`, to set font sizes relative to the current `\tcbfitdim`. Note that the display skip values for mathematical formulas are respected by the redefined macros.

```
% \usepackage{lipsum}
\tcbset{colback=red!5!white,
  colframe=red!75!black,left=1mm,
  right=1mm,boxsep=0mm}

\begin{tcolorbox}[fit to height=4cm]
  {\Large\bfseries This text is
    not adapted:\par}

  \lipsum[2]
\end{tcolorbox}

\begin{tcolorbox}[fit to height=4cm,
  fit fontsize macros ]
  {\Large\bfseries This text is adapted:\par}
  \lipsum[2]
\end{tcolorbox}
```

This text is not adapted:

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

This text is adapted:

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

```
\tcbset{colback=red!5!white,
  colframe=red!75!black,left=1mm,
  right=1mm,boxsep=0mm}

\let\realHuge=\Huge

\begin{tcolorbox}[fit basedim=7pt,
  fontupper=\normalsize,
  fit fontsize macros]
  The relative relative font size macros
  are also usable without the
  \textit{fit} algorithm.\par
  {\Huge Adapted Huge} ---
  {\realHuge Original Huge}
\end{tcolorbox}
```

The relative relative font size macros are also usable without the *fit* algorithm.

Adapted Huge –
Original Huge

`/tcb/fit height plus=<dimension>` (no default, initially 0pt)

The box is allowed to enlarge the fixed height up to the given *<dimension>*, before a font size fit is applied. An optional `/tcb/fit width plus` is tried after the height adaption.

```
% \usepackage{lipsum}
\tcbset{colback=red!5!white,colframe=red!75!black,left=1mm,top=1mm,bottom=1mm,
right=1mm,boxsep=0mm,width=3cm,height=3cm,nobeforeafter}

\begin{tcolorbox}[fit]
This is a tcolorbox.
\end{tcolorbox}
\begin{tcolorbox}[fit,fit height plus=1cm]
This is a tcolorbox.
\end{tcolorbox}
\begin{tcolorbox}[fit]
\lipsum[2]
\end{tcolorbox}
\begin{tcolorbox}[fit,fit height plus=1cm]
\lipsum[2]
\end{tcolorbox}
```

This is a tcolorbox.

This is a tcolorbox.

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

`/tcb/fit width plus=<dimension>` (no default, initially 0pt)

The box is allowed to enlarge the fixed width up to the given *<dimension>*, before a font size fit is applied. An optional `/tcb/fit height plus` is tried before the width adaption.

```
% \usepackage{lipsum}
\tcbset{colback=red!5!white,colframe=red!75!black,left=1mm,top=1mm,bottom=1mm,
right=1mm,boxsep=0mm,width=3cm,height=3cm,nobeforeafter}

\begin{tcolorbox}[fit]
This is a tcolorbox.
\end{tcolorbox}
\begin{tcolorbox}[fit,fit width plus=1cm]
This is a tcolorbox.
\end{tcolorbox}
\begin{tcolorbox}[fit]
\lipsum[2]
\end{tcolorbox}
\begin{tcolorbox}[fit,fit width plus=1cm]
\lipsum[2]
\end{tcolorbox}
```

This is a tcolorbox.

This is a tcolorbox.

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

Typically, the optional title of a `tcolorbox` is not part of the fit operation. If a `/tcb/fit width plus` is applied, the title is also adapted to the new width. If counters are increased inside the title text, they may be increased more than one time. To avoid this, you are encouraged to use `/tcb/phantom`^{→ P. 70} or `/tcb/step and label`^{→ P. 70} to set counters or use automatic numbering, see Subsection 4.1 from page 73.

`/tcb/fit width from=<min> to <max>` (style, no default)
Sets the box width to `<min>` and allows the width to grow up to `<max>`.

```
% \usepackage{lipsum}
\tcbset{colback=red!5!white,colframe=red!75!black,left=1mm,top=1mm,bottom=1mm,
right=1mm,boxsep=0mm,height=4cm}

\begin{tcolorbox}[fit,width=\linewidth/2]
\lipsum[2]
\end{tcolorbox}\par
\begin{tcolorbox}[fit width from=\linewidth/2 to \linewidth]
\lipsum[2]
\end{tcolorbox}\par
```

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

`/tcb/fit height from= $\langle min \rangle$ to $\langle max \rangle$` (style, no default)

Sets the box height to $\langle min \rangle$ and allows the height to grow up to $\langle max \rangle$.

```
% \usepackage{lipsum}
\newtcolorbox{mybox}{colback=red!5!white,colframe=red!75!black,left=1mm,top=1mm,
  bottom=1mm,right=1mm,boxsep=0mm,width=4cm,nobeforeafter,
  fit height from=1cm to 8cm}

\begin{mybox}
This is a tcolorbox.
\end{mybox}
\begin{mybox}
This is a tcolorbox. This is a tcolorbox. This is a tcolorbox.
\end{mybox}
\begin{mybox}
\lipsum[2]
\end{mybox}
```

This is a tcolorbox.

This is a tcolorbox. This is a tcolorbox. This is a tcolorbox.

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

`/tcb/fit algorithm=<name>` (no default, initially `fontsize`)

Sets the algorithm for the fitting process *after* optionally width and height are adapted.

Feasible values for `<name>` are:

- **fontsize** (initial): The algorithm is a bisection method that adapts the font size until certain stop conditions are fulfilled. This is the most time-consuming method but it is robust and gives pleasant results.

The used font has to be freely scalable for this method! Other content than text is not scaled down. The aspect ratio is fully guaranteed.

- **areaseize**: The algorithm calculates the area size for the text without scaling the font. The text box is shaped for the needed aspect ratio in one or two steps. Finally, it is scaled down with a standard `\resizebox` macro.

The used font has not to be scalable. Every box content is scaled down. The aspect ratio cannot be fully guaranteed.

- **hybrid**: First, this algorithm estimates the needed font size in one or two steps. Then an **areaseize** fitting as above is applied.

The used font has to be freely scalable for this method! Other content than text may be slightly rescaled. The aspect ratio cannot be fully guaranteed.





- **squeeze**: The text box is brutally scaled down to fit.

The aspect ratio is very likely to be horrible. You should not use this method for final documents.

```
% \usepackage{lipsum}
\newtcbboxfit[mybox][1]{colback=red!5!white,colframe=red!75!black,left=1mm,top=1mm,
  bottom=1mm,right=1mm,boxsep=0mm,width=3.5cm,height=7cm,nobeforeafter,
  before upper=\textcolor{blue}{\rule{5mm}{5mm}}\ ,
  enhanced,watermark text={\tcbfitsteps},
  fonttitle=\bfseries,adjusted title=#1,fit algorithm=#1}
```

```
\mybox{fontsize}{\lipsum[2]}\hfill
\mybox{hybrid}{\lipsum[2]}\hfill
\mybox{areaseize}{\lipsum[2]}\hfill
\mybox{squeeze}{\lipsum[2]}
```

Quality `\dotfill` versus `\dotfill` Speed

fontsize	hybrid	areaseize	squeeze
 Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.	 Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.	 Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.	 Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

Quality versus Speed

The following options set control parameters for the fit algorithm. Mainly, they apply to the `fontsize` variant, see [/tcb/fit algorithm](#) ^{P. 228}. The options should be seen as experimental and are likely to change in future versions, if necessary.

`/tcb/fit maxstep=<number>` (no default, initially 20)

Sets the maximal step size for the font size adjustment algorithm. In normal situations, the algorithm stops before reaching the initial value of 20 steps. If the box content does not shrink, this value prevents an endless loop.

`/tcb/fit maxfontdiff=<dimension>` (no default, initially 0.1pt)

The algorithm stops, if the font size is determined within a deviation of *<dimension>*.

`/tcb/fit maxfontdiffgap=<dimension>` (no default, initially 1pt)

The algorithm stops, if the number of lines is determined and the font size is determined within a deviation of *<dimension>*.

`/tcb/fit maxwidthdiff=<dimension>` (no default, initially 1pt)

The algorithm stops, if the (optionally) flexible box width is determined within a deviation of *<dimension>*.

`/tcb/fit maxwidthdiffgap=<dimension>` (no default, initially 10pt)

The algorithm stops, if the number of lines is determined and the (optionally) flexible box width is determined within a deviation of *<dimension>*.

`/tcb/fit warning=<value>` (no default, initially off)

Typically, the fit control algorithm constructs several auxiliary boxes to determine the optimal one. If not switched off, the construction of the auxiliary boxes may produce many hbox warnings. This option key changes the `\hbadness` value.

- **off**: Most of 'Underfull \hbox' and 'Overfull \hbox' warnings are switched off (including the ones for the finally used box).
- **on**: All warnings for all auxiliary boxes are displayed.
- **final**: Only warnings for the finally used box are displayed. Note that an additional box has to be constructed for these messages.

11 Library LIB hooks

The library is loaded by a package option or inside the preamble by:

```
\tcbuselibrary{hooks}
```

For the skin related options, the library LIB skins has to be loaded separately.

11.1 Concept of Hooks

A hook is a placeholder in some L^AT_EX code where additional code can be added. For example, the L^AT_EX macro `\AtBeginDocument` adds code to a hook which is placed at the beginning of every document.

Several option keys of `tcolorbox` allow providing some code which is added to specific places of a colored box. For example, `/tcb/before upper`^{→ P. 40} places code before the content of the upper part. A following usage of this key overwrites any prior settings.

The library LIB hooks extends `/tcb/before upper`^{→ P. 40} and several more existing keys to 'hookable' versions, e.g. `/tcb/before upper app`^{→ P. 231} and `/tcb/before upper pre`^{→ P. 231}. The 'hookable' keys don't overwrite prior settings but either *append* or *prepend* the newly given code to the existing code.

The general naming convention (with some small exceptions) is:

- `<option key> app`: works like `<option key>` but *appends* its code to the existing code.
- `<option key> pre`: works like `<option key>` but *prepends* its code to the existing code.

If the original `<option key>` is used (again), all code will be overwritten. Therefore, the order of the option key usage is crucial.

```
% \usepackage{array, tabularx}
\newcolumntype{Y}{>\raggedleft\arraybackslash}X}% see tabularx
\tcbset{enhanced,fonttitle=\bfseries\large,fontupper=\normalsize\sfamily,
colback=yellow!10!white,colframe=red!50!black,colbacktitle=Salmon!30!white,
coltitle=black,center title,
tabularx={X||Y|Y|Y|Y|Y},% this sets 'before upper' and 'after upper'
before upper app={Group & One & Two & Three & Four & Sum\\hline\hline} }

\begin{tcolorbox}[title=My table]
Red   & 1000.00 & 2000.00 & 3000.00 & 4000.00 & 10000.00\\hline
Green & 2000.00 & 3000.00 & 4000.00 & 5000.00 & 14000.00\\hline
Blue  & 3000.00 & 4000.00 & 5000.00 & 6000.00 & 18000.00\\hline\hline
Sum   & 6000.00 & 9000.00 & 12000.00 & 15000.00 & 42000.00
\end{tcolorbox}
```

My table					
Group	One	Two	Three	Four	Sum
Red	1000.00	2000.00	3000.00	4000.00	10000.00
Green	2000.00	3000.00	4000.00	5000.00	14000.00
Blue	3000.00	4000.00	5000.00	6000.00	18000.00
Sum	6000.00	9000.00	12000.00	15000.00	42000.00

11.2 Box Content Additions

The following option keys extend the options given in Subsection 3.7 from page 40.

`/tcb/before title app=<code>` (no default)

Appends the given $\langle code \rangle$ to `/tcb/before title`^{→P.40} *after* the color and font settings and *before* the content of the title.

`/tcb/before title pre=<code>` (no default)

Prepends the given $\langle code \rangle$ to `/tcb/before title`^{→P.40} *after* the color and font settings and *before* the content of the title.

`/tcb/after title app=<code>` (no default)

Appends the given $\langle code \rangle$ to `/tcb/after title`^{→P.40} *after* the content of the title.

`/tcb/after title pre=<code>` (no default)

Prepends the given $\langle code \rangle$ to `/tcb/after title`^{→P.40} *after* the content of the title.

`/tcb/before upper app=<code>` (no default)

Appends the given $\langle code \rangle$ to `/tcb/before upper`^{→P.40} *after* the color and font settings and *before* the content of the upper part.

`/tcb/before upper pre=<code>` (no default)

Prepends the given $\langle code \rangle$ to `/tcb/before upper`^{→P.40} *after* the color and font settings and *before* the content of the upper part.

`/tcb/after upper app=<code>` (no default)

Appends the given $\langle code \rangle$ to `/tcb/after upper`^{→P.41} *after* the content of the upper part.

`/tcb/after upper pre=<code>` (no default)

Prepends the given $\langle code \rangle$ to `/tcb/after upper`^{→P.41} *after* the content of the upper part.

```
% \tcbuselibrary{theorems}
\tcbset{ams align,% this sets 'before upper' and 'after upper'
  colback=yellow!10!white,colframe=red!50!black,
  before upper app={\frac{2}{\sqrt{2}}&=\sqrt{2}.\\},
  after upper pre={\\sin\left(\frac{\pi}{2}\right)&=1.},
}

\begin{tcolorbox}
  \sum\limits_{n=1}^{\infty} \frac{1}{n} &= \infty.\\
  \int x^2 \sim \text{d}x &= \frac{1}{3} x^3 + c.
\end{tcolorbox}
```

$$\frac{2}{\sqrt{2}} = \sqrt{2}. \quad (22)$$

$$\sum_{n=1}^{\infty} \frac{1}{n} = \infty. \quad (23)$$

$$\int x^2 \, dx = \frac{1}{3} x^3 + c. \quad (24)$$

$$\sin\left(\frac{\pi}{2}\right) = 1. \quad (25)$$

`/tcb/before lower app=<code>` (no default)

Appends the given `<code>` to `/tcb/before lower`^{→ P. 41} *after* the color and font settings and *before* the content of the lower part.

`/tcb/before lower pre=<code>` (no default)

Prepends the given `<code>` to `/tcb/before lower`^{→ P. 41} *after* the color and font settings and *before* the content of the lower part.

`/tcb/after lower app=<code>` (no default)

Appends the given `<code>` to `/tcb/after lower`^{→ P. 41} *after* the content of the lower part.

`/tcb/after lower pre=<code>` (no default)

Prepends the given `<code>` to `/tcb/after lower`^{→ P. 41} *after* the content of the lower part.

11.3 Embedding into the Surroundings

The following option keys extend the options given in Subsection 3.11 from page 57.

The 'hookable' versions are usable inside the document. In the preamble, they can only be used after explicit setting of `/tcb/before`^{→ P. 57} and `/tcb/after`^{→ P. 57} or by e. g. `/tcb/parskip`^{→ P. 57}.

`/tcb/before app=<code>` (no default)

Appends the given `<code>` to `/tcb/before`^{→ P. 57} before the colored box.

`/tcb/before pre=<code>` (no default)

Prepends the given `<code>` to `/tcb/before`^{→ P. 57} before the colored box.

`/tcb/after app=<code>` (no default)

Appends the given `<code>` to `/tcb/after`^{→ P. 57} after the colored box.

`/tcb/after pre=<code>` (no default)

Prepends the given `<code>` to `/tcb/after`^{→ P. 57} after the colored box.

```
\tcbset{colback=red!5!white,colframe=red!75!black,fonttitle=\bfseries}

\begin{tcolorbox}[title=My title,before app={The box follows:\\[4pt]},
  after app={This is the end.}]
This is a \textbf{tcolorbox}.
\end{tcolorbox}
```

The box follows:

My title

This is a **tcolorbox**.

This is the end.

11.4 Overlays

The following option keys extend the options given in Subsection 3.8 from page 48.

/tcb/overlay app=*<graphical code>* (no default)

Appends the given *<graphical code>* to `/tcb/overlay` ^{→ P. 48}.

```
% \usetikzlibrary{patterns} % preamble
% \tcbuselibrary{skins} % preamble
\tcbset{frogbox/.style={enhanced,colback=green!10,colframe=green!65!black,
  enlarge top by=5.5mm,
  overlay={\foreach \x in {2cm,3.5cm} {
    \begin{scope}[shift={([xshift=\x]frame.north west)}]
      \path[draw=green!65!black,fill=green!10,line width=1mm] (0,0) arc (0:180:5mm);
      \path[fill=black] (-0.2,0) arc (0:180:1mm);
    \end{scope}}}}
\tcbset{ribbon/.style={overlay app={%
  \path[fill=blue!75!white,draw=blue,double=white!85!blue,
    preaction={opacity=0.6,fill=blue!75!white},
    line width=0.1mm,double distance=0.2mm,
    pattern=fivepointed stars,pattern color=white!75!blue]
    ([xshift=-0.2mm,yshift=-1.02cm]frame.north east)
    -- ++(-1,1) -- ++(-0.5,0) -- ++(1.5,-1.5) -- cycle;}}}

\begin{tcolorbox}[frogbox,title=My title]
This is a \textbf{tcolorbox}.
\end{tcolorbox}

\begin{tcolorbox}[frogbox,ribbon,title=My title]
This is a \textbf{tcolorbox}.\par
Here, we apply a second overlay.
\end{tcolorbox}
```



/tcb/overlay pre=*<graphical code>* (no default)

Prepends the given *<graphical code>* to `/tcb/overlay` ^{→ P. 48}.

/tcb/overlay unbroken app=*<graphical code>* (no default)

Appends the given *<graphical code>* to `/tcb/overlay unbroken` ^{→ P. 49}.

/tcb/overlay unbroken pre=*<graphical code>* (no default)

Prepends the given *<graphical code>* to `/tcb/overlay unbroken` ^{→ P. 49}.

/tcb/overlay first app=*<graphical code>* (no default)

Appends the given *<graphical code>* to `/tcb/overlay first` ^{→ P. 49}.

/tcb/overlay first pre=*<graphical code>* (no default)

Prepends the given *<graphical code>* to `/tcb/overlay first` ^{→ P. 49}.

<code>/tcb/overlay middle app=<graphical code></code>	(no default)
Appends the given <i><graphical code></i> to <code>/tcb/overlay middle</code> ^{→ P. 49} .	
<code>/tcb/overlay middle pre=<graphical code></code>	(no default)
Prepends the given <i><graphical code></i> to <code>/tcb/overlay middle</code> ^{→ P. 49} .	
<code>/tcb/overlay last app=<graphical code></code>	(no default)
Appends the given <i><graphical code></i> to <code>/tcb/overlay last</code> ^{→ P. 49} .	
<code>/tcb/overlay last pre=<graphical code></code>	(no default)
Prepends the given <i><graphical code></i> to <code>/tcb/overlay last</code> ^{→ P. 49} .	
<code>/tcb/overlay broken app=<graphical code></code>	(no default)
Appends the given <i><graphical code></i> to <code>/tcb/overlay broken</code> ^{→ P. 49} .	
<code>/tcb/overlay broken pre=<graphical code></code>	(no default)
Prepends the given <i><graphical code></i> to <code>/tcb/overlay broken</code> ^{→ P. 49} .	
<code>/tcb/overlay unbroken and first app=<graphical code></code>	(no default)
Appends the given <i><graphical code></i> to <code>/tcb/overlay unbroken and first</code> ^{→ P. 49} .	
<code>/tcb/overlay unbroken and first pre=<graphical code></code>	(no default)
Prepends the given <i><graphical code></i> to <code>/tcb/overlay unbroken and first</code> ^{→ P. 49} .	
<code>/tcb/overlay middle and last app=<graphical code></code>	(no default)
Appends the given <i><graphical code></i> to <code>/tcb/overlay middle and last</code> ^{→ P. 49} .	
<code>/tcb/overlay middle and last pre=<graphical code></code>	(no default)
Prepends the given <i><graphical code></i> to <code>/tcb/overlay middle and last</code> ^{→ P. 49} .	

11.5 Watermarks

The following option keys extend the options given in Subsection 6.4 from page 89.

Watermarks are special overlays. The `\tcb` hooks library allows the combination of several watermarks and overlays.

`/tcb/watermark text app=<text>` (no default)

Appends a `/tcb/watermark text` ^{→ P. 89} to the colored box.

```
\tcbset{colback=red!5!white,colframe=red!75!black,fonttttitle=\bfseries}

\begin{tcolorbox}[enhanced,title=My title,watermark graphics=Basilica_5.png,
  watermark opacity=0.25,
  watermark text app=Basilica,watermark color=Navy
]
\lipsum[1-2]
\tcblower
This example uses a public domain picture from\
\url{http://commons.wikimedia.org/wiki/File:Basilica_5.png}
\end{tcolorbox}
```

My title

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

This example uses a public domain picture from
http://commons.wikimedia.org/wiki/File:Basilica_5.png

`/tcb/watermark text pre=<text>` (no default)

Prepends a `/tcb/watermark text` ^{→ P. 89} to the colored box.

`/tcb/watermark text app on=<part> is <text>` (no default)

Appends a `/tcb/watermark text on` ^{→ P. 89} the named `<part>` of a break sequence.

`/tcb/watermark text pre on=<part> is <text>` (no default)

Prepends a `/tcb/watermark text on` ^{→ P. 89} the named `<part>` of a break sequence.

`/tcb/watermark graphics app=<file name>` (no default)

Appends a `/tcb/watermark graphics` ^{→ P.90} referenced by `<file name>` to the colored box.

`/tcb/watermark graphics pre=<file name>` (no default)

Prepends a `/tcb/watermark graphics` ^{→ P.90} referenced by `<file name>` to the colored box.

`/tcb/watermark graphics app on=<part> is <file name>` (no default)

Appends a `/tcb/watermark graphics on` ^{→ P.90} the named `<part>` of a break sequence. The picture is referenced by `<file name>`.

`/tcb/watermark graphics pre on=<part> is <file name>` (no default)

Prepends a `/tcb/watermark graphics on` ^{→ P.90} the named `<part>` of a break sequence. The picture is referenced by `<file name>`.

`/tcb/watermark tikz app=<graphical code>` (no default)

Appends a `/tcb/watermark tikz` ^{→ P.91} with the given `tikz <graphical code>` to the colored box.

`/tcb/watermark tikz pre=<graphical code>` (no default)

Prepends a `/tcb/watermark tikz` ^{→ P.91} with the given `tikz <graphical code>` to the colored box.

```
% \usepackage{tikz}
\tcbset{colback=red!5!white,colframe=red!75!black,fonttttitle=\bfseries,
watermark color=Navy,watermark opacity=0.25,
smiley/.style={watermark tikz pre={%
\path[fill=yellow,draw=yellow!75!red] (0,0) circle (1cm);
\fill[red] (45:5mm) circle (1mm);
\fill[red] (135:5mm) circle (1mm);
\draw[line width=1mm,red] (215:5mm) arc (215:325:5mm);}}}

\begin{tcolorbox}[enhanced,title=My title, watermark text=Watermark,
smiley]
\lipsum[1-2]
\end{tcolorbox}
```

My title

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

`/tcb/watermark tikz app on=<part> is <graphical code>` (no default)

Appends a `/tcb/watermark tikz on` ^{→ P.91} the named `<part>` of a break sequence.

`/tcb/watermark tikz pre on=<part> is <graphical code>` (no default)

Prepends a `/tcb/watermark tikz on` ^{→ P.91} the named `<part>` of a break sequence.

11.6 Skin Code

The following option keys extend the options given in Subsection 6.3 from page 86.

The following code options are applicable only for skins which use engines of type **freelance**. If you intend to add only a few things to an existing skin, you should consider using overlays instead.

/tcb/frame code app=*<graphical code>* (no default)

Appends the given *<graphical code>* to `/tcb/frame code`^{→P. 86}.

/tcb/frame code pre=*<graphical code>* (no default)

Prepends the given *<graphical code>* to `/tcb/frame code`^{→P. 86}.

/tcb/interior titled code app=*<graphical code>* (no default)

Appends the given *<graphical code>* to `/tcb/interior titled code`^{→P. 86}.

```
\begin{tcolorbox}[title=My title,freelance,colframe=Navy,
  frame code app={\draw[yellow,line width=1cm] (
    frame.south west)--(frame.north east);},
  interior titled code app={\draw[red,line width=1cm]
    (frame.north west)--(frame.south east);},
]
\lipsum[1]
\end{tcolorbox}
```

My title

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetur id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

/tcb/interior titled code pre=*<graphical code>* (no default)

Prepends the given *<graphical code>* to `/tcb/interior titled code`^{→P. 86}.

/tcb/interior code app=*<graphical code>* (no default)

Appends the given *<graphical code>* to `/tcb/interior code`^{→P. 87}.

/tcb/interior code pre=*<graphical code>* (no default)

Prepends the given *<graphical code>* to `/tcb/interior code`^{→P. 87}.

/tcb/segmentation code app=*<graphical code>* (no default)

Appends the given *<graphical code>* to `/tcb/segmentation code`^{→P. 87}.

/tcb/segmentation code pre=*<graphical code>* (no default)

Prepends the given *<graphical code>* to `/tcb/segmentation code`^{→P. 87}.

/tcb/title code app=*<graphical code>* (no default)

Appends the given *<graphical code>* to `/tcb/title code`^{→P. 88}.

/tcb/title code pre=*<graphical code>* (no default)



Prepends the given *<graphical code>* to `/tcb/title code`^{→P. 88}.

12 Library documentation

This library has the single purpose to support L^AT_EX package documentations like this one. Actually, the visual nature follows the approach from Till Tantau's `pgf` [17] documentation. Typically, this library is assumed to be used in conjunction with the class `ltxdoc` or alike.

The library is loaded by a package option or inside the preamble by:

```
\tcbuselibrary{documentation}
```

This also loads the library  `listings`, see Section 7 on page 155, the library  `skins`, see Section 6 on page 79, and a bunch of packages, namely `doc`, `pifont`, `marvosym`, `makeidx`, `refcount`, and `hyperref`.

The package `makeidx` is loaded only, if `\printindex` is *not* already defined. Therefore, one can include an alternative to `makeidx` like `imakeidx` *before* the library documentation is used.

For UTF-8 support, load:

```
\tcbuselibrary{listingsutf8,documentation}
```

For `minted` [11] support, load:

```
\tcbuselibrary{documentation,minted}  
\tcbset{listing engine=minted}
```

12.1 Macros of the Library

```
\begin{docCommand}[<options>]{<name>}{<parameters>}  
  <command description>  
\end{docCommand}
```

Documents a L^AT_EX macro with given `<name>` where `<name>` is written without backslash. The given `<options>` are set with `\tcbset`^{P.10}. This macro takes mandatory or optional `<parameters>`. It is automatically indexed and can be referenced with `\refCom`^{P.244}{`<name>`}.

```
\begin{docCommand}{foomakedocSubKey}{\marg{name}\marg{key path}}  
  Creates a new environment \meta{name} based on \refEnv{docKey} for the  
  documentation of keys with the given \meta{key path}.  
\end{docCommand}
```

```
\foomakedocSubKey{<name>}{<key path>}  
  Creates a new environment <name> based on docKeyP.239 for the documentation of keys with  
  the given <key path>.
```

```
\begin{docCommand}[color definition=blue]{foomakedocSubKey*}%  
  {\marg{name}\marg{key path}}  
  Creates a new environment \meta{name} based on \refEnv{docKey} for the  
  documentation of keys with the given \meta{key path}.  
\end{docCommand}
```

```
\foomakedocSubKey*{<name>}{<key path>}  
  Creates a new environment <name> based on docKeyP.239 for the documentation of keys with  
  the given <key path>.
```

```
\begin{docCommand*}[\langle options \rangle]{\langle name \rangle}{\langle parameters \rangle}
  \langle command description \rangle
\end{docCommand*}
```

Identical to `docCommand`^{→ P. 238}, but without index entry.

```
\begin{docEnvironment}[\langle options \rangle]{\langle name \rangle}{\langle parameters \rangle}
  \langle environment description \rangle
\end{docEnvironment}
```

Documents a L^AT_EX environment with given $\langle name \rangle$. The given $\langle options \rangle$ are set with `\tcbsset`^{→ P. 10}. This environment takes mandatory or optional $\langle parameters \rangle$. It is automatically indexed and can be referenced with `\refEnv`^{→ P. 244} $\{\langle name \rangle\}$.

```
\begin{docEnvironment}{foocolorbox}{\oarg{options}}
  This is the main environment to create an accentuated colored text box with
  rounded corners and, optionally, two parts.
\end{docEnvironment}
```

```
\begin{foocolorbox}[\langle options \rangle]
  \langle environment content \rangle
\end{foocolorbox}
```

This is the main environment to create an accentuated colored text box with rounded corners and, optionally, two parts.

```
\begin{docEnvironment}%
  [doclang/environment content=My content text]%
  {foocolorbox*}{\oarg{options}}
  This is the main environment to create an accentuated colored text box with
  rounded corners and, optionally, two parts.
\end{docEnvironment}
```

```
\begin{foocolorbox*}[\langle options \rangle]
  \langle My content text \rangle
\end{foocolorbox*}
```

This is the main environment to create an accentuated colored text box with rounded corners and, optionally, two parts.

```
\begin{docEnvironment*}[\langle options \rangle]{\langle name \rangle}{\langle parameters \rangle}
  \langle environment description \rangle
\end{docEnvironment*}
```

Identical to `docEnvironment`, but without index entry.

```
\begin{docKey}[\langle key path \rangle]{\langle name \rangle}{\langle parameters \rangle}{\langle description \rangle}
  \langle key description \rangle
\end{docKey}
```

Documents a key with given $\langle name \rangle$ and an optional $\langle key path \rangle$. This key takes mandatory or optional $\langle parameters \rangle$ as value with a short $\langle description \rangle$. It is automatically indexed and can be referenced with `\refKey`^{→ P. 245} $\{\langle name \rangle\}$.

```
\begin{docKey}[foo]{footitle}{=\meta{text}}{no default, initially empty}
  Creates a heading line with \meta{text} as content.
\end{docKey}
```

```
/foo/footitle=\langle text \rangle (no default, initially empty)
  Creates a heading line with  $\langle text \rangle$  as content.
```



```
\begin{docKey*}[\langle key path \rangle]{\langle name \rangle}{\langle parameters \rangle}{\langle description \rangle}
\end{docKey*}
```

Identical to `\docKey`^{P. 239}, but without index entry.

```
\docValue{\langle name \rangle}
```

Documents a value with given $\langle name \rangle$. Typically, this is a value for a key. This value is automatically indexed.

A feasible value for `\refKey{/foo/footitle}` is `\docValue{foovalue}`.

A feasible value for `/foo/footitle`^{P. 239} is `foovalue`.

```
\docValue*{\langle name \rangle}
```

Identical to `\docValue`, but without index entry.

```
\docAuxCommand{\langle name \rangle}
```

Documents an auxiliary or minor L^AT_EX macro with given $\langle name \rangle$ where $\langle name \rangle$ is written without backslash. This macro is automatically indexed.

The macro `\docAuxCommand{fooaux}` holds some interesting data.

The macro `\fooaux` holds some interesting data.

```
\docAuxCommand*{\langle name \rangle}
```

Identical to `\docAuxCommand`, but without index entry.

```
\docAuxEnvironment{\langle name \rangle}
```

Documents an auxiliary or minor L^AT_EX environment with given $\langle name \rangle$. This macro is automatically indexed.

The environment `\docAuxEnvironment{fooauxenv}` holds some interesting data.

The environment `fooauxenv` holds some interesting data.

```
\docAuxEnvironment*[\langle key path \rangle]{\langle name \rangle}
```

Identical to `\docAuxEnvironment`, but without index entry.

```
\docAuxKey[\langle key path \rangle]{\langle name \rangle}
```

Documents an auxiliary key with given $\langle name \rangle$ and an optional $\langle key path \rangle$. It is automatically indexed.

The key `\docAuxKey[foo]{fooaux}` holds some interesting data.

The key `/foo/fooaux` holds some interesting data.

```
\docAuxKey*[\langle key path \rangle]{\langle name \rangle}
```

Identical to `\docAuxKey`, but without index entry.

`\docColor{⟨name⟩}`

Documents a color with given $\langle name \rangle$. The color is automatically indexed.

The color `\docColor{foocolor}` is available.

The color `foocolor` is available.

`\docColor*{⟨name⟩}`

Identical to `\docColor`, but without index entry.

`\cs{⟨name⟩}`

Macro from `ltxdoc` [3] to typeset a command word $\langle name \rangle$ where the backslash is prefixed. The library overwrites the original macro.

This is a `\cs{foocommand}`.

This is a `\foocommand`.

`\meta{⟨text⟩}`

Macro from `doc` [7] to typeset a meta $\langle text \rangle$. The library overwrites the original macro.

This is a `\meta{text}`.

This is a $\langle text \rangle$.

`\marg{⟨text⟩}`

Macro from `ltxdoc` [3] to typeset a $\langle text \rangle$ with curly brackets as a mandatory argument. The library overwrites the original macro.

This is a mandatory `\marg{argument}`.

This is a mandatory $\{ \langle argument \rangle \}$.

`\oarg{⟨text⟩}`

Macro from `ltxdoc` [3] to typeset a $\langle text \rangle$ with square brackets as an optional argument. The library overwrites the original macro.

This is an optional `\oarg{argument}`.

This is an optional $[\langle argument \rangle]$.

`\brackets{⟨text⟩}`

Sets the given $\langle text \rangle$ with curly brackets.

Here we use `\brackets{some text}`.

Here we use $\{ \text{some text} \}$.

```
\begin{dispExample}
  <environment content>
\end{dispExample}
```

Creates a colored box based on a `tcolorbox`^{→P.9}. It displays the environment content as source code in the upper part and as compiled text in the lower part of the box. The appearance is controlled by `/tcb/documentation listing style`^{→P.246} and the style `/tcb/docexample`^{→P.246}. It may be changed by redefining this style.

```
\begin{dispExample}
This is a \LaTeX\ example.
\end{dispExample}
```

This is a \LaTeX\ example.

This is a L^AT_EX example.

```
\begin{dispExample*}[<options>]
  <environment content>
\end{dispExample*}
```

The starred version of `dispExample` takes `tcolorbox`^{→P.9} `<options>` as parameter. These `<options>` are executed after `/tcb/docexample`^{→P.246}.

```
\begin{dispExample*}[sidebyside]
This is a \LaTeX\ example.
\end{dispExample*}
```

This is a \LaTeX\ example.

This is a L^AT_EX example.

```
\begin{displisting}
  <environment content>
\end{displisting}
```

Creates a colored box based on a `tcolorbox`^{→P.9}. It displays the environment content as source code. The appearance is controlled by `/tcb/documentation listing style`^{→P.246} and the style `/tcb/docexample`^{→P.246}. It may be changed by redefining this style.

```
\begin{displisting}
This is a \LaTeX\ example.
\end{displisting}
```

This is a `\LaTeX` example.

```
\begin{displisting*}{<options>}
  <environment content>
\end{displisting*}
```

The starred version of `displisting` takes `tcolorbox`^{→P.9} `<options>` as parameter. These `<options>` are executed after `/tcb/docexample`^{→P.246}.

```
\begin{displisting*}{title=My listing}
This is a \LaTeX\ example.
\end{displisting*}
```

My listing

This is a `\LaTeX` example.

```
\begin{absquote}
  <environment content>
\end{absquote}
```

Used to typeset an abstract as quoted and small text.

```
\begin{absquote}
|tcolorbox| provides an environment for colored and framed text boxes with a
heading line. Optionally, such a box can be split in an upper and a lower part.
\end{absquote}
```

`tcolorbox` provides an environment for colored and framed text boxes with a heading line. Optionally, such a box can be split in an upper and a lower part.

`\tcbmakedocSubKey{⟨name⟩}{⟨key path⟩}`

Creates a new environment $\langle name \rangle$ based on `docKey`^{→ P. 239} for the documentation of keys with the given $\langle key path \rangle$ as default. The new environment $\langle name \rangle$ takes the same parameters as `docKey`^{→ P. 239} itself. A second starred environment $\langle name \rangle$ is also created, which is identical to $\langle name \rangle$ but without index entry.

```
\tcbmakedocSubKey{docFooKey}{foo}

\begin{docFooKey}{foodummy}{=\meta{nothing}}{no default, initially empty}
Some key.
\end{docFooKey}

\begin{docFooKey*}{foo another dummy}{=\meta{nothing}}{no default, initially empty}
Some key (not indexed).
\end{docFooKey*}

/foo/foodummy=⟨nothing⟩ (no default, initially empty)
    Some key.
/foo/foo another dummy=⟨nothing⟩ (no default, initially empty)
    Some key (not indexed).
```

`\refCom{⟨name⟩}`

References a documented L^AT_EX macro with given $\langle name \rangle$ where $\langle name \rangle$ is written without backslash. The page reference is suppressed if it links to the same page.

We have created `\refCom{foomakedocSubKey}` as an example.

We have created `\foomakedocSubKey`^{→ P. 238} as an example.

`\refCom*{⟨name⟩}`

References a documented L^AT_EX macro with given $\langle name \rangle$ where $\langle name \rangle$ is written without backslash. There is no page reference.

We have created `\refCom*{foomakedocSubKey}` as an example.

We have created `\foomakedocSubKey` as an example.

`\refEnv{⟨name⟩}`

References a documented L^AT_EX environment with given $\langle name \rangle$. The page reference is suppressed if it links to the same page.

We have created `\refEnv{foocolorbox}` as an example.

We have created `foocolorbox`^{→ P. 239} as an example.

`\refEnv*{⟨name⟩}`

References a documented L^AT_EX environment with given $\langle name \rangle$. There is no page reference.

We have created `\refEnv*{foocolorbox}` as an example.

We have created `foocolorbox` as an example.

`\refKey{⟨name⟩}`

References a documented key with given $\langle name \rangle$ where $\langle name \rangle$ is the full path name of the key. The page reference is suppressed if it links to the same page.

We have created `\refKey{/foo/footitle}` as an example.

We have created `/foo/footitle`^{→ P. 239} as an example.

`\refKey*{⟨name⟩}`

References a documented key with given $\langle name \rangle$ where $\langle name \rangle$ is the full path name of the key. There is no page reference.

We have created `\refKey*{/foo/footitle}` as an example.

We have created `/foo/footitle` as an example.

`\refAux{⟨name⟩}`

References some auxiliary environment, key, value, or color. The hyperlink color is used, but there is no real link.

Some pages back, one can see `\refAux{/foo/footitle}` as an example.

Some pages back, one can see `/foo/footitle` as an example.

`\refAuxcs{⟨name⟩}`

References some auxiliary macro $\langle name \rangle$ where $\langle name \rangle$ is written without backslash. The hyperlink color is used, but there is no real link.

Some pages back, one can see `\refAuxcs{fooaux}` as an example.

Some pages back, one can see `\fooaux` as an example.

`\colDef{⟨text⟩}`

Sets $\langle text \rangle$ with the command color, see `/tcb/color command`^{→ P. 246}.

This is my `\colDef{text}`.

This is my `text`.

`\colOpt{⟨text⟩}`

Sets $\langle text \rangle$ with the option color, see `/tcb/color option`^{→ P. 246}.

This is my `\colOpt{text}`.

This is my `text`.

12.2 Option Keys of the Library

- /tcb/docexample** (style, no value)
Sets the style for `dispExample`^{→ P. 242} and `dispListing`^{→ P. 243} with the colors `ExampleBack` and `ExampleFrame`. To change the appearance of the examples, this style can be redefined.
- /tcb/documentation listing options**=*<key list>* (no default, initially `style=tcbdocumentation`)
Sets the options from the package `listings` [5]. They are used inside `dispExample`^{→ P. 242} and `dispListing`^{→ P. 243} to typeset the listings. Note that this is not identical to the key `/tcb/listing options`^{→ P. 162} which is used for 'normal' listings.
Used for `/tcb/listing engine`^{→ P. 165}=`listings` only.
- /tcb/documentation listing style**=*<listing style>* (no default, initially `tcbdocumentation`)
Abbreviation for `documentation listing options={style=...}`. This key sets a *<style>* for the `listings` package, see [5]. Note that this is not identical to the key `/tcb/listing style`^{→ P. 162} which is used for 'normal' listings.
Used for `/tcb/listing engine`^{→ P. 165}=`listings` only.
- /tcb/documentation minted style**=*<key list>* (no default, initially unset)
Sets a *<style>* known to `Pygments` [9] for the package `minted` [11], if used. Note that this is not identical to the key `/tcb/minted style`^{→ P. 164} which is used for 'normal' listings.
Used for `/tcb/listing engine`^{→ P. 165}=`minted` only.
- /tcb/documentation minted options**=*<minted style>* (no default, initially `tabsize=2, fontsize=\small`)
Sets the options from the package `minted` [11] which are used during typesetting of the listing, if used. Note that this is not identical to the key `/tcb/minted options`^{→ P. 164} which is used for 'normal' listings.
Used for `/tcb/listing engine`^{→ P. 165}=`minted` only.
- /tcb/color command**=*<color>* (no default, initially `Definition`)
Sets the highlight color used by macro definitions.
- /tcb/color environment**=*<color>* (no default, initially `Definition`)
Sets the highlight color used by environment definitions.
- /tcb/color key**=*<color>* (no default, initially `Definition`)
Sets the highlight color used by key definitions.
- /tcb/color value**=*<color>* (no default, initially `Definition`)
Sets the highlight color used by value definitions.
- /tcb/color color**=*<color>* (no default, initially `Definition`)
Sets the highlight color used by color definitions.
- /tcb/color definition**=*<color>* (no default, initially `Definition`)
Sets the highlight color for `/tcb/color command`, `/tcb/color environment`, `/tcb/color key`, `/tcb/color value`, and `/tcb/color color`.
- /tcb/color option**=*<color>* (no default, initially `Option`)
Sets the color used for optional arguments.
- /tcb/color hyperlink**=*<color>* (no default, initially `Hyperlink`)
Sets the color for all hyper-links, i. e. all internal and external links.
- /tcb/before example**=*<macros>* (no default, initially `\par\smallskip`)
Sets the *<macros>* which are executed before `dispExample`^{→ P. 242} and `dispListing`^{→ P. 243} additional to `/tcb/before`^{→ P. 57}.

- /tcb/after example**= $\langle macros \rangle$ (no default, initially empty)
 Sets the $\langle macros \rangle$ which are executed after `dispExample`^{→ P. 242} and `dispListing`^{→ P. 243} additional to `/tcb/after`^{→ P. 57}.
- /tcb/index format**= $\langle format \rangle$ (no default, initially pgf)
 Determines the basic $\langle format \rangle$ of the generated index. Feasible values are:
- **pgfsection**: The index is formatted like in the **pgf** documentation (as a section).
 - **pgfchapter**: The index is formatted like in the **pgf** documentation (as a chapter).
 - **pgf**: Alias for **pgfsection**.
 - **doc**: The index is assumed to be formatted by **doc** or **ltxdoc**. The usage of `makeindex` with `-s gind.ist` is assumed. The package **hypdoc** has to be loaded *before* **tcolorbox**.
 - **off**: The index is not formatted by **tcolorbox**.
- /tcb/index actual**= $\langle character \rangle$ (no default, initially @)
 Sets the character for 'actual' in automatic indexing.
- /tcb/index quote**= $\langle character \rangle$ (no default, initially ")
 Sets the character for 'quote' in automatic indexing.
- /tcb/index level**= $\langle character \rangle$ (no default, initially !)
 Sets the character for 'level' in automatic indexing.
- /tcb/index default settings** (style, no value)
 Sets the `makeindex` default values for `/tcb/index actual`, `/tcb/index quote`, and `/tcb/index level`.
- /tcb/index german settings** (style, no value)
 Sets the `makeindex` values recommended for German language texts. This is identical to setting the following:
- ```
\tcbset{index actual={=},index quote={!},index level={>}}
```
- /tcb/index annotate**=`true|false` (default true, initially true)  
 If set to `true`, the index entries are annotated with short descriptions given by `/tcb/doclang/environment`<sup>→ P. 248</sup>, `/tcb/doclang/key`<sup>→ P. 248</sup>, and others.
- /tcb/index colorize**=`true|false` (default true, initially false)  
 If set to `true`, the index entries colorized according to the color settings given by `/tcb/color environment`<sup>→ P. 246</sup>, `/tcb/color key`<sup>→ P. 246</sup>, and others.

The following keys are provided for language specific settings. The English language is predefined.

|                                                            |                                             |
|------------------------------------------------------------|---------------------------------------------|
| <code>/tcb/english language</code>                         | (style, no value)                           |
| Sets all language specific settings to English.            |                                             |
| <code>/tcb/doclang/color=&lt;text&gt;</code>               | (no default, initially color)               |
| Text used in the index for colors.                         |                                             |
| <code>/tcb/doclang/colors=&lt;text&gt;</code>              | (no default, initially Colors)              |
| Heading text in the index for colors.                      |                                             |
| <code>/tcb/doclang/environment content=&lt;text&gt;</code> | (no default, initially environment content) |
| Text used in docEnvironment <sup>→ P. 239</sup> .          |                                             |
| <code>/tcb/doclang/environment=&lt;text&gt;</code>         | (no default, initially environment)         |
| Text used in the index for environments.                   |                                             |
| <code>/tcb/doclang/environments=&lt;text&gt;</code>        | (no default, initially Environments)        |
| Heading text in the index for environments.                |                                             |
| <code>/tcb/doclang/key=&lt;text&gt;</code>                 | (no default, initially key)                 |
| Text used in the index for keys.                           |                                             |
| <code>/tcb/doclang/keys=&lt;text&gt;</code>                | (no default, initially Keys)                |
| Heading text used in the index for keys.                   |                                             |
| <code>/tcb/doclang/value=&lt;text&gt;</code>               | (no default, initially value)               |
| Text used in the index for values.                         |                                             |
| <code>/tcb/doclang/values=&lt;text&gt;</code>              | (no default, initially Values)              |
| Heading text in the index for values.                      |                                             |
| <code>/tcb/doclang/index=&lt;text&gt;</code>               | (no default, initially Index)               |
| Heading text for the index.                                |                                             |
| <code>/tcb/doclang/pageshort=&lt;text&gt;</code>           | (no default, initially P.)                  |
| Short text for page references.                            |                                             |



`/tcb/doc left=<length>` (no default, initially 2em)

Sets the left hand offset of the documentation texts from `docCommand`<sup>→ P. 238</sup>, `docEnvironment`<sup>→ P. 239</sup>, `docKey`<sup>→ P. 239</sup>, etc, to `<length>`.

```
\begin{docCommand*}[doc left=2cm,doc left indent=-2cm]{myCommandA}{\marg{argument}}
 This is the documentation of \refCom{myCommandA} which takes one \meta{argument}.
 \refCom{myCommandA} does some funny things with its \meta{argument}.
\end{docCommand*}
```

```
\myCommandA{<argument>}
 This is the documentation of \myCommandA which takes one <argument>. \myCommandA
 does some funny things with its <argument>.
```

`/tcb/doc right=<length>` (no default, initially 0em)

Sets the right hand offset of the documentation texts from `docCommand`<sup>→ P. 238</sup>, `docEnvironment`<sup>→ P. 239</sup>, `docKey`<sup>→ P. 239</sup>, etc, to `<length>`.

```
\begin{docCommand*}[doc right=2cm]{myCommandB}{\marg{argument}}
 This is the documentation of \refCom{myCommandB} which takes one \meta{argument}.
 \refCom{myCommandB} does some funny things with its \meta{argument}.
\end{docCommand*}
```

```
\myCommandB{<argument>}
 This is the documentation of \myCommandB which takes one <argument>.
 \myCommandB does some funny things with its <argument>.
```

`/tcb/doc left indent=<length>` (no default, initially -2em)

Sets the left hand indent of documentation heads from `docCommand`<sup>→ P. 238</sup>, `docEnvironment`<sup>→ P. 239</sup>, `docKey`<sup>→ P. 239</sup>, etc, to `<length>`.

```
\begin{docCommand*}[doc left indent=2cm]{myCommandC}{\marg{argument}}
 This is the documentation of \refCom{myCommandC} which takes one \meta{argument}.
 \refCom{myCommandC} does some funny things with its \meta{argument}.
\end{docCommand*}
```

```
\myCommandC{<argument>}
 This is the documentation of \myCommandC which takes one <argument>. \myCommandC does some
 funny things with its <argument>.
```

`/tcb/doc right indent=<length>` (no default, initially 0pt)

Sets the right hand indent of documentation heads from `docCommand`<sup>→ P. 238</sup>, `docEnvironment`<sup>→ P. 239</sup>, `docKey`<sup>→ P. 239</sup>, etc, to `<length>`.

```
\begin{docCommand*}[doc right indent=-10mm,doc right=10mm,
 doc description=test value]{myCommandD}{\marg{argument}}
 This is the documentation of \refCom{myCommandD} which takes one \meta{argument}.
 \refCom{myCommandD} does some funny things with its \meta{argument}.
\end{docCommand*}
```

```
\myCommandD{<argument>} (test value)
 This is the documentation of \myCommandD which takes one <argument>. \myCommandD
 does some funny things with its <argument>.
```

The head lines of the main documentation environments `docCommand`<sup>→ P. 238</sup>, `docEnvironment`<sup>→ P. 239</sup>, `docKey`<sup>→ P. 239</sup>, etc, are set inside `tcolorboxes`. Options to these `tcolorboxes` can be given using the following keys.

**/tcb/doc head command**=*<options>* (no default, initially empty)

Sets *<options>* for the head line of `docCommand`<sup>→ P. 238</sup> and `docCommand*`<sup>→ P. 239</sup>.

```
\tcbset{doc head command={interior style={fill,left color=red!20!white,
right color=blue!20!white}}}
```

```
\begin{docCommand*}{myCommandE}{\marg{argument}}
 This is the documentation of \refCom{myCommandE} which takes one \meta{argument}.
 \refCom{myCommandE} does some funny things with its \meta{argument}.
\end{docCommand*}
```

```
\myCommandE{<argument>}
 This is the documentation of \myCommandE which takes one <argument>. \myCommandE does some
 funny things with its <argument>.
```

**/tcb/doc head environment**=*<options>* (no default, initially empty)

Sets *<options>* for the head line of `docEnvironment`<sup>→ P. 239</sup> and `docEnvironment*`<sup>→ P. 239</sup>.

```
\tcbset{doc head environment={beamer,boxsep=2pt,arc=2pt,colback=green!20!white,
after=\par\smallskip}}
```

```
\begin{docEnvironment*}{myEnvironment}{\marg{argument}}
 This is the documentation of \refEnv{myEnvironment} which
 takes one \meta{argument}.
\end{docEnvironment*}
```

```
\begin{myEnvironment}{<argument>}
 <environment content>
\end{myEnvironment}
```

This is the documentation of `myEnvironment` which takes one *<argument>*.

**/tcb/doc head key**=*<options>* (no default, initially empty)

Sets *<options>* for the head line of `docKey`<sup>→ P. 239</sup> and `docKey*`<sup>→ P. 240</sup>.

```
\tcbset{doc head key={boxsep=4pt,arc=4pt,boxrule=0.6pt,
frame style=fill,interior style=fill,colframe=green!50!black}}
```

```
\begin{docKey*}{/foo/myKey}{}{no value}
 This is the documentation of \refKey{/foo/myKey}.
\end{docKey*}
```

```
/foo/myKey (no value)
```

This is the documentation of `/foo/myKey`.

**/tcb/doc head**=*<options>* (no default, initially empty)

Shortcut for setting the same *<options>* for `/tcb/doc head command`, `/tcb/doc head environment`, and `/tcb/doc head key`.

`/tcb/doc description=<text>` (no default, initially empty)  
 Sets a (short!) additional description *<text>* for `docCommand`<sup>→ P. 238</sup> or `docEnvironment`<sup>→ P. 239</sup>.  
 Such a description is mandatory for `docKey`<sup>→ P. 239</sup>.

```
\begin{docCommand*}[doc description=my description]{myCommandF}{\marg{argument}}
 This is the documentation of \refCom{myCommandF} which takes one \meta{argument}.
 \refCom{myCommandF} does some funny things with its \meta{argument}.
\end{docCommand*}
```

```
\myCommandF{<argument>} (my description)
 This is the documentation of \myCommandF which takes one <argument>. \myCommandF does some
 funny things with its <argument>.
```

Note that the description *<text>* may overlap with the text on the left hand side if too long.  
 Linebreaks can be used inside the *<text>*.

`/tcb/doc into index=true|false` (default `true`, initially `true`)  
 If set to `false`, no index entries are written for the main documentation environments. The  
 same effect is achieved by using e. g. `docCommand*`<sup>→ P. 239</sup> instead of `docCommand`<sup>→ P. 238</sup>.

## 12.3 Predefined Colors of the Library

The following colors are predefined. They are used as default colors in some library commands.

**Option** ■, **Definition** ■, **ExampleFrame** ■, **ExampleBack** ■, **Hyperlink** ■.

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