

# A L<sup>A</sup>T<sub>E</sub>X Style for Typesetting a Three-Dimensional Product Box\*

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Im Lerchelsbühl 5

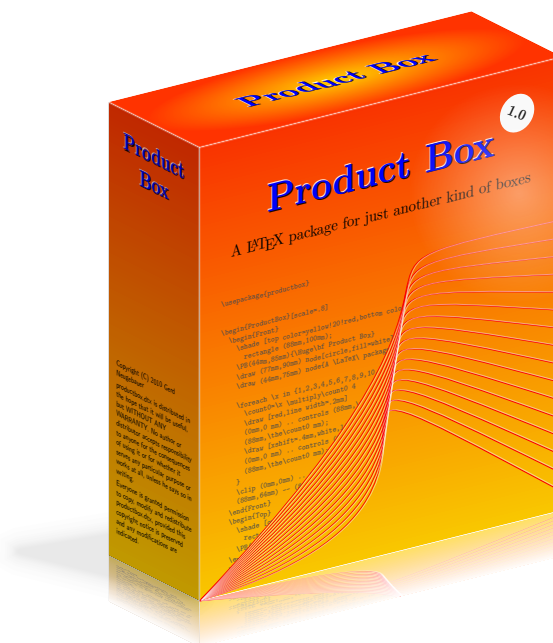
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## Abstract

`productbox.dtx` provides a style file for typesetting a three-dimensional product box. This product box can be rendered as it is standing on a surface and some light is shed onto it. Alternatively it can be typeset as a wireframe to be cut out and glued together. This will lead to a physical product box.



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\*This file documents productbox.dtx version 1.0 as of 2010/12/20.

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# 1 The User Interface

This style is based on TikZ and PGF at least in version 2.0. It is best used with a L<sup>A</sup>T<sub>E</sub>X variant which is able to produce PDF. If no proper tool chain is used then some of the effects should not be used.

**ProductBox** The environment `ProductBox` provides the central means for producing a product box. The contents is used to define the appearance of the faces. Finally the selected type of output is produced.

```
\begin{ProductBox}
  \begin{Front}
    \shade [bottom color=white!30!blue,top color=white]
      (0mm,0mm) rectangle (88mm,100mm);
    \draw (44mm,50mm) node{{\Huge Product Box}};
  \end{Front}
  \begin{Back}
    \shade [top color=yellow!30!red,bottom color=white]
      (0mm,0mm) rectangle (88mm,100mm);
    \draw (44mm,50mm) node{{\large Back}};
  \end{Back}
  \begin{Top}
    \shade [outer color=white!30!red,inner color=white]
      (0mm,0mm) rectangle (88mm,30mm);
    \draw (44mm,15mm) node{{\large Top}};
  \end{Top}
  \begin{Bottom}
    \fill [outer color=red,inner color=black]
      (0mm,0mm) rectangle (88mm,30mm);
    \draw (44mm,15mm) node{{\large Bottom}};
  \end{Bottom}
  \begin{Left}
    \fill [left color=green,right color=yellow]
      (0mm,0mm) rectangle (30mm,100mm);
    \draw (15mm,50mm) node{{\large Left}};
  \end{Left}
  \begin{Right}
    \fill [left color=white,right color=black]
      (0mm,0mm) rectangle (30mm,100mm);
    \draw (15mm,50mm) node{{\large Right}};
  \end{Right}
\end{ProductBox}
```

## 1.1 Content of the Environment

The content of the environment is simply evaluated. It can contain any code you like. Useful for the production of a product box are some inner environments.

They are called **Front**, **Back**, **Left**, **Right**, **Top**, and **Bottom**. They are defined inside the main environment only. Those environments can be used to specify the contents of the respective faces of the box.

Note that in the three-dimensional rendering will show at most three of the faces. It does not hurt to define all of them, even if they are not shown at all.

**Front** The environment **Front** is used to define the content of the front face. The environment processes its contents inside a **tikzpicture** of the default size 88mm×100mm. Usually anything outside of this range is clipped.

```
\begin{Front}
...
\end{Front}
```

**Back** The environment **Back** is used to define the content of the back face. The environment processes its contents inside a **tikzpicture** of the default size 88mm×100mm. Usually anything outside of this range is clipped.

```
\begin{Back}
...
\end{Back}
```

**Left** The environment **Left** is used to define the content of the left face, i.e. the face left to the front page. The environment processes its contents inside a **tikzpicture** of the default size 30mm×100mm. Usually anything outside of this range is clipped.

```
\begin{Left}
...
\end{Left}
```

**Right** The environment **Right** is used to define the content of the right face, i.e. the face right to the front page. The environment processes its contents inside a **tikzpicture** of the default size 30mm×100mm. Usually anything outside of this range is clipped.

```
\begin{Right}
...
\end{Right}
```

**Top** The environment **Top** is used to define the content of the top face. The environment processes its contents inside a **tikzpicture** of the default size 88mm×30mm. Usually anything outside of this range is clipped.

```
\begin{Top}
...
\end{Top}
```

**Bottom** The environment **Bottom** is used to define the content of the bottom face. The environment processes its contents inside a **tikzpicture** of the default size 88mm×30mm. Usually anything outside of this range is clipped.

```
\begin{Bottom}
...
\end{Bottom}
```

## 1.2 Settings and Options of the Environment

The environment `ProductBox` can take some options to influence the appearance of the product box. Those options are comma separated.

```
\begin{ProductBox}[shape=3d]
```

The settings are local to the environment. If an option is not set then the fallback from the global settings are used.

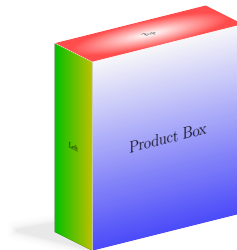
`\ProductBoxSet` The macro `\ProductBoxSet` modify the global setting of the product box style. The arguments are the same like the optional arguments of the environment `ProductBox` – but enclosed in braces instead of brackets.

```
\ProductBoxSet{shape=3d}
```

The following options can be used to influence the result of the product box.

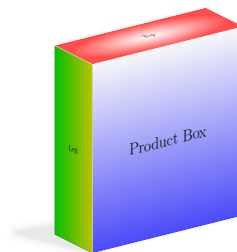
`style` The box style determines, how the box is drawn. Several rendering functions are provided to produce different effects. Any value is accepted. Nevertheless unknown box styles will lead to an error message.

```
\begin{ProductBox}[style=3D]
  \begin{Front}
    ...
  \end{Front}
  \begin{Left}
    ...
  \end{Left}
  ...
\end{ProductBox}
```



`3D` The box style `3D` is the default. It produces a three-dimensional box rendering with a drop shadow. The option `3D` is an abbreviation for `style=3D`. It can also be written as `3d` or `3D`.

```
\begin{ProductBox}
  \begin{Front}
    ...
  \end{Front}
  \begin{Left}
    ...
  \end{Left}
  ...
\end{ProductBox}
```

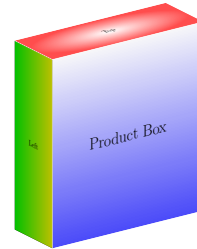


`shadow` The option `shadow` controls the drawing of the drop shadow in the 3D rendering. It is a boolean value taking the values `true` and `false`. The default value is `true`. The option `shadow` is the abbreviation for `shadow=true`.

```

\begin{ProductBox}[shadow=false]
  \begin{Front}
    ...
  \end{Front}
  \begin{Left}
    ...
  \end{Left}
  ...
\end{ProductBox}

```

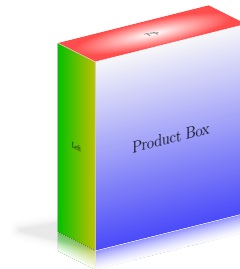


**mirror** The option **mirror** controls the rendering of the mirror effect in the 3D rendering. It is a boolean value taking the values **true** and **false**. The default value is **false**. The option **mirror** is the abbreviation for **mirror=true**.

```

\begin{ProductBox}[mirror=true]
  \begin{Front}
    ...
  \end{Front}
  \begin{Left}
    ...
  \end{Left}
  ...
\end{ProductBox}

```

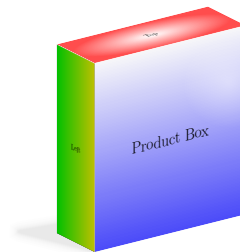


**flare** The option **flare** controls the rendering of the flare effect in the 3D rendering. It is a boolean value taking the values **true** and **false**. The default value is **false**. The option **flare** is the abbreviation for **flare=true**.

```

\begin{ProductBox}[flare=true]
  \begin{Front}
    ...
  \end{Front}
  \begin{Left}
    ...
  \end{Left}
  ...
\end{ProductBox}

```

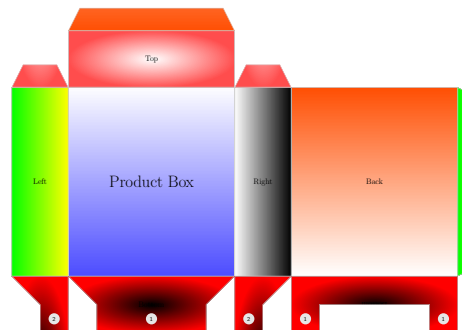


**fold** The option **fold** switches to the box style for rendering a complete wire frame with all faces in place. The option **fold** is an abbreviation for **style=fold**.

```

\begin{ProductBox}[fold]
  \begin{Front}
    ...
  \end{Front}
  \begin{Left}
    ...
  \end{Left}
  ...
\end{ProductBox}

```



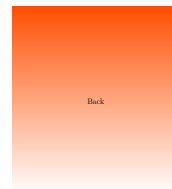
**front** The option **front** switches to the box style for rendering the front face only. The option **front** is an abbreviation for **style=front**.

```
\begin{ProductBox}[front]
  \begin{Front}
    ...
  \end{Front}
  \begin{Left}
    ...
  \end{Left}
  ...
\end{ProductBox}
```



**back** The option **back** switches to the box style for rendering the back face only. The option **back** is an abbreviation for **style=back**.

```
\begin{ProductBox}[back]
  \begin{Front}
    ...
  \end{Front}
  \begin{Left}
    ...
  \end{Left}
  ...
\end{ProductBox}
```



**left** The option **left** switches to the box style for rendering the back face only. The option **left** is an abbreviation for **style=left**.

```
\begin{ProductBox}[left]
  \begin{Front}
    ...
  \end{Front}
  \begin{Left}
    ...
  \end{Left}
  ...
\end{ProductBox}
```



**right** The option **right** switches to the box style for rendering the back face only. The option **right** is an abbreviation for **style=right**.

```
\begin{ProductBox}[right]
  \begin{Front}
    ...
  \end{Front}
  \begin{Left}
    ...
  \end{Left}
  ...
\end{ProductBox}
```



**top** The option **top** switches to the box style for rendering the back face only. The option **top** is an abbreviation for **style=top**.

```

\begin{ProductBox}[top]
  \begin{Front}
    ...
  \end{Front}
  \begin{Left}
    ...
  \end{Left}
  ...
\end{ProductBox}

```



**bottom** The option `bottom` switches to the box style for rendering the back face only. The option `bottom` is an abbreviation for `style=bottom`.

```

\begin{ProductBox}[bottom]
  \begin{Front}
    ...
  \end{Front}
  \begin{Left}
    ...
  \end{Left}
  ...
\end{ProductBox}

```

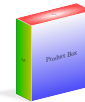


**scale** The option `scale` controls the scaling of the whole rendering. It is a number where 1. represents the original size.<sup>1</sup>

```

\begin{ProductBox}[scale=.1]
  \begin{Front}
    ...
  \end{Front}
  \begin{Left}
    ...
  \end{Left}
  ...
\end{ProductBox}

```

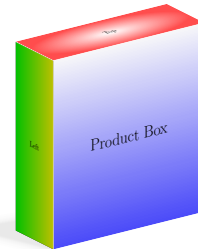


**view** The option `view` takes a name of a view definition and activates the appropriate settings. A few views are predefined. The default value is 1.

```

\begin{ProductBox}[view=1]
  \begin{Front}
    ...
  \end{Front}
  \begin{Left}
    ...
  \end{Left}
  ...
\end{ProductBox}

```



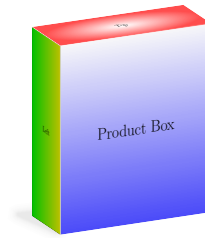
<sup>1</sup>The examples on the right side are normally rendered with a scale of 0.25.



```

\begin{ProductBox}[view=2]
  \begin{Front}
    ...
  \end{Front}
  \begin{Left}
    ...
  \end{Left}
  ...
\end{ProductBox}

```



```

\begin{ProductBox}[view=3]
  \begin{Front}
    ...
  \end{Front}
  \begin{Left}
    ...
  \end{Left}
  ...
\end{ProductBox}

```



- width** The option **width** takes a dimension denoting the width of the box. The default value is 88mm.
- height** The option **height** takes a dimension denoting the height of the box. The default value is 100mm.
- depth** The option **depth** takes a dimension denoting the depth of the box. The default value is 30mm.
- clip** The option **clip** controls the clipping of the faces to their defined size. If it is turned off then the faces can be oversized leading to strange effects. It is a boolean value taking the values **true** and **false**. The default value is **true**.

## 2 The Documentation Driver

The documentation driver changes `productbox.dtx` into a self-extracting documentation. Thus it is possible to run  $\text{\LaTeX}$  on `productbox.dtx` to produce the documentation.

The documentation can be adapted in a file named `productbox.dcf` (documentation configuration). This file can contain instructions for `docstrip`. Especially useful might be the instruction

`\OnlyDescription`

which suppresses the generation of the implementation description.

```
1 <*driver>
2 \documentclass{ltxdoc}
3 \InputIfFileExists{productbox.dcf}{-}{-}
4 \usepackage{productbox}
5 \usepackage{moreverb}
6 \RecordChanges
7 \EnableCrossrefs
8 \CodelineIndex
9 \setcounter{IndexColumns}2
10 \parindent=0pt
11 \parskip=1ex plus .5ex minus .25ex
12 \begin{document}
13 \DocInput{productbox.dtx}
14 \end{document}
15 </driver>
```

## 3 The Implementation

The implementation contains the code of the style.

### 3.1 The Version Information

The following lines define the version information for the class file.

```
16 <*class>
17 \begingroup
18 \def\ProductBox@VC$#1: #2 #3${#2}
19 \def\ProductBox@VCdate$#1: #2-#3-#4 #5${#2/#3/#4}
20 \xdef\fileversion{1.0}
21 \xdef\filerevision{\ProductBox@VC$Revision: 8332 $}
22 \xdef\filedate{\ProductBox@VCdate$Date: 2010-12-20 23:22:36 +0100 (Mo, 20 Dez 2010) $}
23 \xdef\filename{productbox.dtx}
24 \endgroup
25 \let\docversion=\fileversion
```

```

26 \let\docdate=\filedate
27 \</class>

```

## 3.2 Getting Started

First we have to determine that the right kind of L<sup>A</sup>T<sub>E</sub>X is running and identify style file.

```

28 \<class>
29 \NeedsTeXFormat{LaTeX2e}
30 \ProvidesPackage{productbox}[\filedate Another type of boxes...]

```

A bunch of packages is loaded to form the base of the work herein.

```

31 \RequirePackage{keyval}
32 \RequirePackage{pgf}
33 \RequirePackage{tikz}
34 \usetikzlibrary{calc}
35 \usetikzlibrary{fadings}

```

## 3.3 Parameters

The parameters are stored to be used later. Here the built-in defaults are defined.

The boolean `ProductBox@shadow` determines whether or not the shadow in the 3d rendering is shown.

```

36 \newif\ifProductBox@shadow\ProductBox@shadowtrue

```

The boolean `ProductBox@mirror` determines whether or not the mirror effect in the 3d rendering is shown.

```

37 \newif\ifProductBox@mirror

```

The boolean `ProductBox@flare` determines whether or not the flare effect in the 3d rendering is shown.

```

38 \newif\ifProductBox@flare

```

The boolean `ProductBox@clip` determines whether or not the additional clipping of the boxes should be enabled.

```

39 \newif\ifProductBox@clip\ProductBox@cliptrue

```

The edge color in the 3D rendering.

```

40 \newcommand\ProductBox@edgeColor{white}

```

The background color for the mirror effect.

```

41 \newcommand\ProductBox@bgColor{white}

```

The default style is the 3D rendering.

```
42 \newcommand\ProductBox@style{threeD}
```

A hook to add some code at the beginning.

```
43 \newcommand\ProductBox@startOptions{}
```

A hook to add some code at the end.

```
44 \newcommand\ProductBox@endOptions{}
```

The color of the additional lines in the fol rendering.

```
45 \newcommand\ProductBox@foldLine{white!80!black}
```

The diameter of the flare.

```
46 \newcommand\ProductBox@flareDiameter{24mm}
```

The width of the box.

```
47 \newcommand\ProductBox@x{88mm}
```

The height of the box.

```
48 \newcommand\ProductBox@y{100mm}
```

The depth of the box.

```
49 \newcommand\ProductBox@z{30mm}
```

Define the parameters for the keyval package.

```
50 \define@key{ProductBox}{flat}[true]{\def\ProductBox@style{flat}}
51 \define@key{ProductBox}{fold}[true]{\def\ProductBox@style{fold}}
52 \define@key{ProductBox}{3d}[true]{\def\ProductBox@style{threeD}}
53 \define@key{ProductBox}{3D}[true]{\def\ProductBox@style{threeD}}
54 \define@key{ProductBox}{threeD}[true]{\def\ProductBox@style{threeD}}
55 \define@key{ProductBox}{top}[true]{\def\ProductBox@style{top}}
56 \define@key{ProductBox}{bottom}[true]{\def\ProductBox@style{bottom}}
57 \define@key{ProductBox}{front}[true]{\def\ProductBox@style{front}}
58 \define@key{ProductBox}{back}[true]{\def\ProductBox@style{back}}
59 \define@key{ProductBox}{left}[true]{\def\ProductBox@style{left}}
60 \define@key{ProductBox}{right}[true]{\def\ProductBox@style{right}}
61 \define@key{ProductBox}{style}{\def\ProductBox@style{#1}}
62 \define@key{ProductBox}{shadow}[true]{%
63   \csname ProductBox@shadow#1\endcsname}
64 \define@key{ProductBox}{mirror}[true]{%
65   \csname ProductBox@mirror#1\endcsname}
66 \define@key{ProductBox}{flare}[true]{%
67   \csname ProductBox@flare#1\endcsname}
68 \define@key{ProductBox}{edgeColor}{\def\productBox@edgeColor{#1}}
69 \define@key{ProductBox}{backgroundColor}{\def\ProductBox@bgColor{#1}}
70 \define@key{ProductBox}{scale}{\def\ProductBox@scale{#1}}
```

```

71 \define@key{ProductBox}{width}{\def\ProductBox@x{#1}}
72 \define@key{ProductBox}{height}{\def\ProductBox@y{#1}}
73 \define@key{ProductBox}{depth}{\def\ProductBox@z{#1}}
74 \define@key{ProductBox}{flareDiameter}{%
75   \def\ProductBox@flareDiameter{#1}}
76 \define@key{ProductBox}{view}{\@nameuse{ProductBox@View@#1}}

```

### 3.4 Internal Storage

The box `\ProductBox@Front` contains the front material.

```
77 \newbox\ProductBox@Front
```

The box `\ProductBox@Left` contains the left material.

```
78 \newbox\ProductBox@Left
```

The box `\ProductBox@Top` contains the top material.

```
79 \newbox\ProductBox@Top
```

The box `\ProductBox@Right` contains the right material.

```
80 \newbox\ProductBox@Right
```

The box `\ProductBox@Bottom` contains the bottom material.

```
81 \newbox\ProductBox@Bottom
```

The box `\ProductBox@Back` contains the back material.

```
82 \newbox\ProductBox@Back
```

### 3.5 Settings

`\ProductBoxSet` The macro `\ProductBoxSet` defines the global parameters used by the environment `ProductBox`. They can be overwritten either within a group or in the optional parameter of the environment.

```
83 \newcommand\ProductBoxSet[1]{\setkeys{ProductBox}{#1}}
```

### 3.6 The Main Environment

`ProductBox` This is the central environment provided by this style. In the begin code only the local environments are initialized and the optional parameters are evaluated with the help of the package `keyval`.

```

84 \newenvironment{ProductBox}[1][{}]{%
85   \setkeys{ProductBox}{#1}%
86   %
87   \def\Left{\ProductBox@Start\ProductBox@Left

```

```

88     (\ProductBox@z,\ProductBox@y)}%
89 \let\endLeft\ProductBox@end
90 \def\Front{\ProductBox@Start\ProductBox@Front
91     (\ProductBox@x,\ProductBox@y)}%
92 \let\endFront\ProductBox@end
93 \def\Top{\ProductBox@Start\ProductBox@Top
94     (\ProductBox@x,\ProductBox@z)}%
95 \let\endTop\ProductBox@end
96 \def\Bottom{\ProductBox@Start\ProductBox@Bottom(
97     \ProductBox@x,\ProductBox@z)}%
98 \let\endBottom\ProductBox@end
99 \def\Back{\ProductBox@Start\ProductBox@Back
100     (\ProductBox@x,\ProductBox@y)}%
101 \let\endBack\ProductBox@end
102 \def\Right{\ProductBox@Start\ProductBox@Right
103     (\ProductBox@z,\ProductBox@y)}%
104 \let\endRight\ProductBox@end
105 \ignorespacesafterend
106 }{%---

```

The main activity is performed in the end code. Since the flexibility of the environment is one of its design goals, the expansion of the macro `\ProductBox@style` is used to invoke the macro stored in it.

```

107 \ifundefined{ProductBox@style@\ProductBox@style}{%
108     \errmessage{Style '\ProductBox@style' for ProductBox is unknown}%
109 }{%
110     \ifundefined{ProductBox@scale}{%
111         \@nameuse{ProductBox@style@\ProductBox@style}{%
112             \scalebox{\ProductBox@scale}%
113                 {\@nameuse{ProductBox@style@\ProductBox@style}}
114         }%
115     \ignorespacesafterend
116 }

```

`\ProductBox@Start` The macro `\ProductBox@Start` starts the environment storing a face.

```

117 \def\ProductBox@Start#1(#2){%
118     \global\setbox#1\hbox\bgroup\begin{tikzpicture}%
119         \ifProductBox@clip \clip (0,0) rectangle (#2); \fi
120         \ignorespaces
121     }%

```

`\ProductBox@end` The macro `\ProductBox@end` ends the environment storing a face.

```

122 \def\ProductBox@end{\end{tikzpicture}\egroup \ignorespacesafterend}

```

### 3.7 Box Styles

`\ProductBox@style@flat` This macro defines the style *flat* for a product box.

```

123 \newcommand\ProductBox@style@flat{%
124   \par\noindent
125   \hspace*{\ProductBox@z}\kern1mm \copy\ProductBox@Top\\[1ex]
126   \copy\ProductBox@Left\kern1mm \copy\ProductBox@Front\kern1mm
127   \copy\ProductBox@Right\kern1mm \copy\ProductBox@Back\\[1ex]
128   \hspace*{\ProductBox@z}\kern1mm \copy\ProductBox@Bottom\par
129 }

```

### 3.7.1 Box Style front

`\ProductBox@style@front` This macro defines the style *front* for a product box. Only this one face of the box is shown.

```

130 \newcommand\ProductBox@style@front{%
131   \copy\ProductBox@Front
132 }

```

### 3.7.2 Box Style back

`\ProductBox@style@back` This macro defines the style *back* for a product box. Only this one face of the box is shown.

```

133 \newcommand\ProductBox@style@back{%
134   \copy\ProductBox@Back
135 }

```

### 3.7.3 Box Style left

`\ProductBox@style@left` This macro defines the style *left* for a product box. Only this one face of the box is shown.

```

136 \newcommand\ProductBox@style@left{%
137   \copy\ProductBox@Left
138 }

```

### 3.7.4 Box Style right

`\ProductBox@style@right` This macro defines the style *right* for a product box. Only this one face of the box is shown.

```

139 \newcommand\ProductBox@style@right{%
140   \copy\ProductBox@Right
141 }

```

### 3.7.5 Box Style top

`\ProductBox@style@top` This macro defines the style *top* for a product box. Only this one face of the box is shown.

```
142 \newcommand\ProductBox@style@top{%
143   \copy\ProductBox@Top
144 }
```

### 3.7.6 Box Style bottom

`\ProductBox@style@bottom` This macro defines the style *bottom* for a product box. Only this one face of the box is shown.

```
145 \newcommand\ProductBox@style@bottom{%
146   \copy\ProductBox@Bottom
147 }
```

### 3.7.7 Box Style fold

`\ProductBox@style@fold` This macro defines the style *fold* for a product box.

```
148 \newcommand\ProductBox@style@fold{%
149   \begin{tikzpicture}

front

150   \begin{scope}[xshift=\ProductBox@x]
151     \clip (0mm,0mm) rectangle (\ProductBox@x,\ProductBox@y);
152     \draw
153       node[anchor=south west,
154         inner sep=0pt]{\copy\ProductBox@Front};
155     \draw[\ProductBox@foldLine]
156       (0mm,0mm) rectangle (\ProductBox@x,\ProductBox@y);
157   \end{scope}

back

158   \begin{scope}[xshift=\ProductBox@x,
159                 xshift=\ProductBox@z,
160                 xshift=\ProductBox@z]
161     \clip (0mm,0mm) rectangle (\ProductBox@x,\ProductBox@y);
162     \draw
163       node[anchor=south west,
164         inner sep=0pt]{\copy\ProductBox@Back};
165     \draw[\ProductBox@foldLine]
166       (0mm,0mm) rectangle (\ProductBox@x,\ProductBox@y);
167   \end{scope}
```



top

```
168 \begin{scope}[xshift=\ProductBox@z,yshift=\ProductBox@y]
169 \clip (0mm,0mm) rectangle (\ProductBox@x,\ProductBox@z);
170 \draw
171 node[anchor=south west,
172 inner sep=0pt]{\copy\ProductBox@Top};
173 \draw[\ProductBox@foldLine]
174 (0mm,0mm) rectangle (\ProductBox@x,\ProductBox@z);
175 \end{scope}
```

left

```
176 \begin{scope}
177 \clip (0mm,0mm) rectangle (\ProductBox@z,\ProductBox@y);
178 \draw
179 node[anchor=south west,
180 inner sep=0pt]{\copy\ProductBox@Left};
181 \draw[\ProductBox@foldLine]
182 (0mm,0mm) rectangle (\ProductBox@z,\ProductBox@y);
183 \end{scope}
```

right

```
184 \begin{scope}[xshift=\ProductBox@z,xshift=\ProductBox@x]
185 \clip (0mm,0mm) rectangle (\ProductBox@z,\ProductBox@y);
186 \draw
187 node[anchor=south west,
188 inner sep=0pt]{\copy\ProductBox@Right};
189 \draw[\ProductBox@foldLine]
190 (0mm,0mm) rectangle (\ProductBox@z,\ProductBox@y);
191 \end{scope}
```

bottom ear 3 front

```
192 \begin{scope}[xshift=\ProductBox@z,yshift=-\ProductBox@z]
193 \clip (0mm,\ProductBox@z) --
194 ($.5*(\ProductBox@z,\ProductBox@z)$) --
195 ($.5*(\ProductBox@z,0mm)$) --
196 ($(\ProductBox@x,0mm)-.5*(\ProductBox@z,0mm)$) --
197 ($(\ProductBox@x,0mm)+.5*(-\ProductBox@z,\ProductBox@z)$) --
198 (\ProductBox@x,\ProductBox@z) -- cycle;
199 \draw (\ProductBox@x,0mm)
200 node[anchor=south east,
201 inner sep=0pt]{\copy\ProductBox@Bottom};
202 \draw [\ProductBox@foldLine]
203 (0mm,\ProductBox@z) --
204 ($.5*(\ProductBox@z,\ProductBox@z)$) --
205 ($.5*(\ProductBox@z,0mm)$) --
206 ($(\ProductBox@x,0mm)-.5*(\ProductBox@z,0mm)$) --
207 ($(\ProductBox@x,0mm)+.5*(-\ProductBox@z,\ProductBox@z)$) --
208 (\ProductBox@x,\ProductBox@z) -- cycle;
```

```

209     \draw ($.5*(\ProductBox@x,\ProductBox@z)-.25*(0mm,\ProductBox@z)$)
210         node[circle,fill=white!90!black]{\small\sfl};
211 \end{scope}

```

bottom ear 1 back

```

212 \begin{scope}[xshift=\ProductBox@x,
213             xshift=\ProductBox@z,
214             xshift=\ProductBox@z,
215             yshift=-\ProductBox@z]
216 \clip (0mm,0mm) --
217     ($.5*(\ProductBox@z,0mm)$) --
218     ($.5*(\ProductBox@z,\ProductBox@z)$) --
219     ($(\ProductBox@x,0mm)-.5*(\ProductBox@z,-\ProductBox@z)$) --
220     ($(\ProductBox@x,0mm)-.5*(\ProductBox@z,0mm)$) --
221     (\ProductBox@x,0mm) -- (\ProductBox@x,\ProductBox@z) --
222     (0mm,\ProductBox@z) -- cycle;
223 \draw (0mm,\ProductBox@z)
224     node[rotate=180,anchor=south east,
225         inner sep=0pt]{\copy\ProductBox@Bottom};
226 \draw[\ProductBox@foldLine]
227     (0mm,0mm) --
228     ($.5*(\ProductBox@z,0mm)$) --
229     ($.5*(\ProductBox@z,\ProductBox@z)$) --
230     ($(\ProductBox@x,0mm)-.5*(\ProductBox@z,-\ProductBox@z)$) --
231     ($(\ProductBox@x,0mm)-.5*(\ProductBox@z,0mm)$) --
232     (\ProductBox@x,0mm) -- (\ProductBox@x,\ProductBox@z) --
233     (0mm,\ProductBox@z) -- cycle;
234 \draw ($.25*(\ProductBox@z,\ProductBox@z)$)
235     node[circle,fill=white!90!black]{\small\sfl};
236 \draw ($(\ProductBox@x,0mm)+.25*(-\ProductBox@z,\ProductBox@z)$)
237     node[circle,fill=white!90!black]{\small\sfl};
238 \end{scope}

```

bottom ear 2 right

```

239 \begin{scope}[xshift=\ProductBox@z,yshift=-\ProductBox@z]
240 \clip
241     (\ProductBox@x,\ProductBox@z) --
242     ($(\ProductBox@x,\ProductBox@z)+(\ProductBox@z,0mm)$) --
243     ($(\ProductBox@x,0mm) + .5*(\ProductBox@z,\ProductBox@z)$) --
244     ($(\ProductBox@x,0mm) + .5*(\ProductBox@z,0mm)$) --
245     (\ProductBox@x,0mm) -- cycle;
246 \begin{scope}[xshift=1mm,yshift=1mm]
247 \draw[xshift=\ProductBox@z,yshift=\ProductBox@z]
248     (\ProductBox@x,0mm)
249     node[rotate=90,anchor=south east]{\copy\ProductBox@Bottom};
250 \end{scope}
251 \draw[\ProductBox@foldLine]
252     (\ProductBox@x,\ProductBox@z) --
253     ($(\ProductBox@x,\ProductBox@z)+(\ProductBox@z,0mm)$) --

```

```

254      ($(\ProductBox@x,0mm) + .5*(\ProductBox@z,\ProductBox@z)$) --
255      ($(\ProductBox@x,0mm) + .5*(\ProductBox@z,0mm)$) --
256      (\ProductBox@x,0mm) -- cycle;
257      \draw[xshift=\ProductBox@x]
258      ($.25*(\ProductBox@z,\ProductBox@z)$)
259      node[circle,fill=white!90!black]{\small\sff2};
260      \end{scope}

```

bottom ear 2 left

```

261      \begin{scope}[yshift=-\ProductBox@z]
262      \clip
263      (0mm,\ProductBox@z) -- (\ProductBox@z,\ProductBox@z) --
264      (\ProductBox@z,0mm) -- ($.5*(\ProductBox@z,0mm)$) --
265      ($.5*(\ProductBox@z,\ProductBox@z)$) -- cycle;
266      \draw (0mm,\ProductBox@z)
267      node[rotate=270,anchor=south west,
268      inner sep=0pt]{\copy\ProductBox@Bottom};
269      \draw [\ProductBox@foldLine]
270      (0mm,\ProductBox@z) -- (\ProductBox@z,\ProductBox@z) --
271      (\ProductBox@z,0mm) -- ($.5*(\ProductBox@z,0mm)$) --
272      ($.5*(\ProductBox@z,\ProductBox@z)$) -- cycle;
273      \draw ($(\ProductBox@z,0mm)+.25*(-\ProductBox@z,\ProductBox@z)$)
274      node[circle,fill=white!90!black]{\small\sff2};
275      \end{scope}

```

glue ear

```

276      \begin{scope}[xshift=\ProductBox@x,
277      xshift=\ProductBox@x,
278      xshift=\ProductBox@z,
279      xshift=\ProductBox@z,\ProductBox@foldLine]
280      \clip
281      (0mm,0mm) -- (6mm,3mm) --
282      ($(6mm,\ProductBox@y)-(0mm,3mm)$) --
283      (0mm,\ProductBox@y) -- cycle;
284      \draw node[anchor=south west,
285      inner sep=0pt]{\copy\ProductBox@Left};
286      \draw[\ProductBox@foldLine]
287      (0mm,0mm) -- (6mm,3mm) --
288      ($(6mm,\ProductBox@y)-(0mm,3mm)$) --
289      (0mm,\ProductBox@y) -- cycle;
290      \end{scope}

```

top ear left

```

291      \begin{scope}[yshift=\ProductBox@y]
292      \clip
293      (0mm,0mm) -- (6mm,12mm) --
294      ($(\ProductBox@z,12mm)-(6mm,0mm)$)
295      -- (\ProductBox@z,0mm) -- cycle;
296      \draw

```

```

297         node[rotate=90,anchor=north west,
298             inner sep=0pt]{\copy\ProductBox@Top};
299     \draw[\ProductBox@foldLine]
300         (0mm,0mm) -- (6mm,12mm) --
301         ($(\ProductBox@z,12mm)-(6mm,0mm)$)
302         -- (\ProductBox@z,0mm) -- cycle;
303     \end{scope}

top ear right

304     \begin{scope}[xshift=\ProductBox@x,
305                  xshift=\ProductBox@z,
306                  yshift=\ProductBox@y]
307     \clip
308         (0mm,0mm) -- (6mm,12mm) --
309         ($(\ProductBox@z,12mm)-(6mm,0mm)$)
310         -- (\ProductBox@z,0mm) -- cycle;
311     \draw
312         node[rotate=270,anchor=south east,
313             inner sep=0pt]{\copy\ProductBox@Top};
314     \draw[\ProductBox@foldLine]
315         (0mm,0mm) -- (6mm,12mm) -- ($(\ProductBox@z,12mm)-(6mm,0mm)$)
316         -- (\ProductBox@z,0mm) -- cycle;
317     \end{scope}

top ear back

318     \begin{scope}[xshift=\ProductBox@z,
319                  yshift=\ProductBox@y,
320                  yshift=\ProductBox@z]
321     \clip
322         (0mm,0mm) -- (6mm,12mm) --
323         ($(\ProductBox@x,12mm)-(6mm,0mm)$) --
324         (\ProductBox@x,0mm) -- cycle;
325     \draw (0mm,\ProductBox@y)
326         node[rotate=180,anchor=south east,
327             inner sep=0pt]{\copy\ProductBox@Back};
328     \draw[\ProductBox@foldLine]
329         (0mm,0mm) -- (6mm,12mm) --
330         ($(\ProductBox@x,12mm)-(6mm,0mm)$) --
331         (\ProductBox@x,0mm) -- cycle;
332     \end{scope}
333 \end{tikzpicture}}

```

### 3.7.8 Box Style threeD

`\ProductBox@style@threeD` This macro defines the style *threeD* for a product box. The faces are placed such the illusion of a three-dimensional box appears. In addition a shadow is shown if not disabled.

```

334 \newcommand\ProductBox@style@threeD{
335   \begin{tikzpicture}\ProductBox@startOptions
336     \ifProductBox@mirror \ProductBox@threeD@mirror \fi
337     \ifProductBox@shadow \ProductBox@threeD@shadow \fi
338
339     \begin{scope}
340       \fill[white,
341         yslant=\ProductBox@p@front@yslant,
342         xscale=\ProductBox@p@front@xscale,
343         anchor=south west]
344         rectangle (\ProductBox@x,\ProductBox@y);
345       \draw
346         node[yslant=\ProductBox@p@front@yslant,
347           xscale=\ProductBox@p@front@xscale,
348           anchor=south west,
349           inner sep=0pt] {\copy\ProductBox@Front};
350       \fill[black,
351         fill opacity=.025,
352         yslant=\ProductBox@p@front@yslant,
353         xscale=\ProductBox@p@front@xscale,
354         anchor=south west]
355         rectangle (\ProductBox@x,\ProductBox@y);
356       \ifProductBox@flare \ProductBox@threeD@flare \fi
357     \end{scope}
358     \begin{scope}[shift={($\ProductBox@p@left@yslant
359       *\ProductBox@p@left@xscale
360       *(0mm,\ProductBox@z)
361       -\ProductBox@p@left@xscale
362       *(\ProductBox@z,0mm)$)}]
363       \fill[white,
364         yslant=-\ProductBox@p@left@yslant,
365         xscale=\ProductBox@p@left@xscale,
366         anchor=south west]
367         rectangle (\ProductBox@z,\ProductBox@y);
368       \draw
369         node[yslant=-\ProductBox@p@left@yslant,
370           xscale=\ProductBox@p@left@xscale,
371           anchor=south west,
372           inner sep=0pt] {\copy\ProductBox@Left};
373       \fill[black,
374         fill opacity=.25,
375         yslant=-\ProductBox@p@left@yslant,
376         xscale=\ProductBox@p@left@xscale,
377         anchor=south west] rectangle (\ProductBox@z,\ProductBox@y);
378     \end{scope}
379     \begin{scope}[yshift=\ProductBox@y]
380       \fill [white,
381         xslant=-\ProductBox@p@top@xslant,
382         yslant=\ProductBox@p@top@yslant,
383         xscale=\ProductBox@p@top@xscale,

```

```

384         yscale=\ProductBox@p@top@yscale,
385         anchor=south west] rectangle (\ProductBox@x,\ProductBox@z);
386     \draw
387         node[xslant=-\ProductBox@p@top@xslant,
388             yslant=\ProductBox@p@top@yslant,
389             xscale=\ProductBox@p@top@xscale,
390             yscale=\ProductBox@p@top@yscale,
391             anchor=south west,
392             inner sep=0pt] {\copy\ProductBox@Top};
393     \fill [black,
394         fill opacity=.0025,
395         xslant=-\ProductBox@p@top@xslant,
396         yslant=\ProductBox@p@top@yslant,
397         xscale=\ProductBox@p@top@xscale,
398         yscale=\ProductBox@p@top@yscale,
399         anchor=south west] rectangle (\ProductBox@x,\ProductBox@z);
400 \end{scope}
401 \begin{scope}[shift={($\ProductBox@p@left@yslant
402                     *\ProductBox@p@left@xscale
403                     *(0mm,\ProductBox@z)
404                     -\ProductBox@p@left@xscale
405                     *(\ProductBox@z,0mm)$)}]
406     \draw [\ProductBox@edgeColor,
407         line width=.5mm,
408         draw opacity=.25,
409         yslant=-\ProductBox@p@left@yslant,
410         xscale=\ProductBox@p@left@xscale]
411         (\ProductBox@z,0mm) --
412         (\ProductBox@z,\ProductBox@y) --
413         (0mm,\ProductBox@y);
414 \end{scope}
415 \draw [\ProductBox@edgeColor,
416     line width=.5mm,
417     draw opacity=.25,
418     yslant=\ProductBox@p@front@yslant,
419     xscale=\ProductBox@p@front@xscale,
420     anchor=south west]
421     (0mm,\ProductBox@y) --
422     (\ProductBox@x,\ProductBox@y);
423 \ProductBox@endOptions
424 \end{tikzpicture}}

```

#### Parameters

```

425 \newcommand\ProductBox@Set@params[9]{%
426     \def\ProductBox@p@front@yslant{#1}
427     \def\ProductBox@p@front@xscale{#2}
428     \def\ProductBox@p@left@yslant{#3}
429     \def\ProductBox@p@left@xscale{#4}
430     \def\ProductBox@p@top@xslant{#5}

```

```

431 \def\ProductBox@p@top@yslant{#6}
432 \def\ProductBox@p@top@xscale{#7}
433 \def\ProductBox@p@top@yscale{#8}
434 \def\ProductBox@p@mirror@yscale{#9}
435 }
436 \@namedef{ProductBox@View@1}{
437 \ProductBox@Set@params
438 {.25}{.9090909}%
439 {.5}{.6666666}%
440 {2}{.1666666}{1.36363636}{.3333333}%
441 {.2}}
442 \@namedef{ProductBox@View@2}{
443 \ProductBox@Set@params
444 {.15}{.9090909}%
445 {.6666666}{.5}%
446 {1.5}{.12}{1.11}{.3333333}%
447 {.2}}
448 \@namedef{ProductBox@View@3}{
449 \ProductBox@Set@params
450 {.05}{.95}%
451 {.25}{.4}%
452 {4}{.04}{1.133333}{.1}%
453 {.2}}
454 \@nameuse{ProductBox@View@1}

```

`\ProductBox@threeD@shadow` This macro defines the code to produce the shadow effect for the 3D rendering.

```

455 \newcommand\ProductBox@threeD@shadow{
456 \begin{scope}
457 \pgfsetcornersarced{\pgfpoint{2mm}{2mm}}
458 \foreach \x in {.5,1,1.5,2,2.5,3,4,5,6,8,10} {
459 \filldraw [black,
460 line width=\x mm,
461 opacity=.01,
462 shift={(-1mm,1mm)}]
463 (0mm,0mm) --
464 (-\ProductBox@p@top@xslant
465 *\ProductBox@p@left@xscale
466 *\ProductBox@z,
467 \ProductBox@p@top@yscale
468 *\ProductBox@z) --
469 (0mm,
470 \ProductBox@p@top@yscale*\ProductBox@z +
471 \ProductBox@p@top@xslant
472 *\ProductBox@p@left@xscale
473 *\ProductBox@p@top@yslant
474 *\ProductBox@z) --
475 cycle;
476 }
477 \end{scope}

```

478 }

The following fading is used for the mirror effect in the 3D rendering.

```
479 \tikzfading[name=ProductBoxFade,
480             top color=transparent!0,
481             bottom color=transparent!60]
```

The following fading is used for the flare effect in the 3D rendering.

```
482 \tikzfading[name=ProductBoxFlare,
483             inner color=transparent!60,
484             outer color=transparent!100]
```

`\ProductBox@threeD@mirror` This macro defines the code to produce the mirror effect.

```
485 \newcommand\ProductBox@threeD@mirror{%
486   \begin{pgflowlevelscope}{
487     \pgftransformyslant{\ProductBox@p@front@yslant}
488     \pgftransformyscale{-\ProductBox@p@mirror@yscale}
489     \pgftransformxscale{\ProductBox@p@front@xscale}}
490   \begin{scope}
491     \clip rectangle (\ProductBox@x,50mm);
492     \fill
493       node[anchor=south west,
494           inner sep=0pt]{\copy\ProductBox@Front};
495   \end{scope}
496   \fill [white,path fading=ProductBoxFade]
497     rectangle (\ProductBox@x,50.5mm);
498 \end{pgflowlevelscope}
499
500 \begin{pgflowlevelscope}{
501   \pgftransformxshift{-\ProductBox@p@left@xscale*\ProductBox@z}
502   \pgftransformyshift{\ProductBox@p@top@yscale*\ProductBox@z}
503   \pgftransformyslant{-\ProductBox@p@left@yslant}
504   \pgftransformxscale{\ProductBox@p@left@xscale}
505   \pgftransformyscale{-\ProductBox@p@mirror@yscale}}
506 \begin{scope}
507   \clip rectangle (\ProductBox@z,50mm);
508   \fill
509     node[anchor=south west,
510         inner sep=0pt]{\copy\ProductBox@Left};
511   \fill [opacity=.25] rectangle (\ProductBox@z,\ProductBox@y);
512 \end{scope}
513 \fill [white,path fading=ProductBoxFlare]
514   rectangle (\ProductBox@z,50.5mm);
515 \end{pgflowlevelscope}
516 }
```

`\ProductBox@threeD@flare` This macro defines the code to produce the flare effect.



```

517 \newcommand\ProductBox@threeD@flare{
518   \fill [white,path fading=ProductBoxFlare]
519     (.8*\ProductBox@x,.9*\ProductBox@y)
520     circle(\ProductBox@flareDiameter);
521 }

522 \@namedef{ProductBox@style@3D}{\ProductBox@style@threeD}
523 \end{class}

```

That's all.

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