The **hycolor** package

Heiko Oberdiek*
<heiko.oberdiek at googlemail.com>

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Abstract

Package hycolor implements the color option stuff that is used by packages hyperref and bookmark. It is not intended as package for the user.

Contents

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*Please report any issues at https://github.com/ho-tex/oberdiek/issues

1 Documentation

The package hycolor implements color options for packages hyperref and bookmark.

Package xcolor provides macros for extracting color values and converting color data to other color models. If this package is loaded, the full range of color specifications of packages color and xcolor are supported including the optional argument for the color model.

```
\hypersetup{linkbordercolor=red}% needs xcolor
\hypersetup{linkbordercolor=[named]{red}}% needs xcolor
\hypersetup{linkbordercolor=[rgb]{1,0,0}}
```

Without package xcolor some of the options only support some models, if they are given directly, e.g.:

```
\bookmarksetup{color=[rgb]{1,0,0}}
```

Because of compatibility some options of hyperref also support space separated RGB values:

```
\hypersetup{linkbordercolor=1 0 0}% is the same as
\hypersetup{linkbordercolor=[rgb]{1,0,0}}
```

Coloring is optional, it can be turned off by using an empty value:

```
\hypersetup{linkbordercolor={}}
```

The PDF specification knows some kind of an emtpy color setting without values. This applies to form field colors. The new A virtual color model `empty` is introduced for this purpose, e.g.

```
\TextField[backgroundcolor={[empty]{}}, ...]{...}% or
\TextField[{backgroundcolor=[empty]{}, ...}]{...}
```

PDF specification 1.7 also allows this for border link colors. But this isn't currently supported by this package, because the tested viewers (AR7/Linux, xpdf 3.00, ghostscript 8.54) don't support this yet. In contrary ghostscript generates an error message.

1.1 Summary

Color option	Models without xcolor	RGB color	Model empty
BKM.color	gray, rgb	no	no
Hyp.*color	all	no	no
Hyp.*bordercolor	gray, rgb	yes	no
Field.*color	gray, rgb, cmyk	yes	yes
AtFi.color	gray, rgb	yes	no

"RGB color" means that the color value can be given as space separated RGB numbers (real numbers in the range from 0 to 1). Explanation of the color option prefixes:

Prefix	Explanation
BKM	Package bookmark
Hyp	Package hyperref: package options or \hypersetup
Field	Package hyperref: Form field options
AtFi	Package attachfile2: option color

2 Implementation

```
1 ⟨*package⟩
2 \NeedsTeXFormat{LaTeX2e}
3 \ProvidesPackage{hycolor}%
4   [2016/05/16 v1.8 Color options for hyperref/bookmark (HO)]%

5 \RequirePackage{xcolor-patch}[2016/05/16]
```

2.1 Normalization

2.1.1 Sanitize value of color option

Procedure DefSanitized(cmd, value)
Param: *cmd* (macro)
Param: *value* (value of color option)
Result: *value* is expanded, sanitized, and stored in macro *cmd*.
Initialize active characters;
cmd := Expand *value*;
Sanitize *cmd*;

Sanitization means that the string does not contain any macros or special tokens. It consists of characters with catcode 12 (other). The only exception is the space with catcode 10 (space).

\HyColor@DefSanitized

```
 6 \begingroup
 7   \catcode'\!=13 %
 8   \catcode'\:=13 %
 9   \catcode'\-=13 %
10   \catcode'\+=13 %
11   \catcode'\;=13 %
12   \catcode'\"=13 %
13   \catcode'\>=13 %
14   \edef\x{%
15     \def\noexpand!{\string!}%
16     \def\noexpand:{\string:}%
17     \def\noexpand-{\string-}%
18     \def\noexpand+{\string+}%
19     \def\noexpand;{\string;}%
20     \def\noexpand"{\string"}%
21     \def\noexpand>{\string>}%
22   }%
23   \def\y#1{\endgroup
24     \def\HyColor@DefSanitized##1##2{%
25       \begingroup
26         \csname @safe@activestrue\endcsname
27         #1%
28         \edef\x{\endgroup
29           \def\noexpand##1{##2}%
30         }%
31       \x
```

```
32    \@onelevel@sanitize##1%
33    }%
34  }%
35 \expandafter\y\expandafter{\x}
```

2.1.2 Normalize result

Procedure NormalizeNum(value, cmd)

Param: *value* (Sanitized explicit number)
Param: *cmd* (Macro that stores result)

Result: *cmd* contains normalized number

if value pt < 0pt **then**
  | *cmd* ← 0;
else if *number before dot of* value < 1 **then**
  | *cmd* ← number after dot of *value*;
  | *cmd* ← strip trailing zeros from *cmd*;
  | **if** *dot remains only* **then**
  | | *cmd* ← 0;
  | **end**
else
  | *cmd* ← 1;
end

The number is limited to the range between 0.0 and 1.0 and formatted as short PDF number without leading or trailing zeros. The precision of the number isn't changed.

\HyColor@NormalizeNum

```
36 \def\HyColor@NormalizeNum#1#2{%
37  \ifdim#1pt<\z@
38    \def#2{0}%
39  \else
40    \edef#2{\zap@space#1 \@empty}%
41    \expandafter\HyColor@CheckDot#2..\@nil#2%
42  \fi
43 }
44 \def\HyColor@CheckDot#1.#2.#3\@nil#4{%
45  \ifnum0#1<\@ne
46    \ifx\\#2\\%
47      \def#4{0}%
48    \else
49      \edef#4{\HyColor@ReverseString#2\@nil{}}%
50      \edef#4{\expandafter\HyColor@StripLeadingZeros#4\@empty}%
51      \ifx#4\@empty
52        \def#4{0}%
53      \else
54        \edef#4{.\expandafter\HyColor@ReverseString#4\@nil{}}%
55      \fi
56    \fi
57  \else
58    \def#4{1}%
59  \fi
60 }
61 \def\HyColor@ReverseString#1#2\@nil#3{%
62  \ifx\\#2\\%
63    #1#3%
64  \else
65    \@ReturnAfterFi{%
66      \HyColor@ReverseString#2\@nil{#1#3}%
67    }%
```

```
68    \fi
69  }
70  \long\def\@ReturnAfterFi#1\fi{\fi#1}
71  \def\HyColor@StripLeadingZeros#1{%
72    \ifx#10%
73      \expandafter\HyColor@StripLeadingZeros
74    \else
75      #1%
76    \fi
77  }
```

\HyColor@NormalizeCommaRGB

```
78  \def\HyColor@NormalizeCommaRGB#1,#2,#3\@nil#4{%
79    \HyColor@NormalizeNum{#1}\HyColor@temp
80    \let#4\HyColor@temp
81    \HyColor@NormalizeNum{#2}\HyColor@temp
82    \edef#4{#4 \HyColor@temp}%
83    \HyColor@NormalizeNum{#3}\HyColor@temp
84    \edef#4{#4 \HyColor@temp}%
85  }
```

\HyColor@NormalizeCommaCMYK

```
86  \def\HyColor@NormalizeCommaCMYK#1,#2,#3,#4\@nil#5{%
87    \HyColor@NormalizeNum{#1}\HyColor@temp
88    \let#5\HyColor@temp
89    \HyColor@NormalizeNum{#2}\HyColor@temp
90    \edef#5{#5 \HyColor@temp}%
91    \HyColor@NormalizeNum{#3}\HyColor@temp
92    \edef#5{#5 \HyColor@temp}%
93    \HyColor@NormalizeNum{#4}\HyColor@temp
94    \edef#5{#5 \HyColor@temp}%
95  }
```

2.2   Main algorithm for color options

Procedure MainColorOptionAlgorithm(key, value, cmd)
Param: *key* (name of color option)
Param: *value* (value of color option)
Param: *cmd* (macro that stores result)
Result: Macro *cmd* contains the calculated color specification string or has the meaning of \relax if the color must not set
DefSanitized(*temp*, *value*); Call option specific algorithm(*key*, *temp*, *cmd*);

2.3   Package **bookmark**

Since v0.8 2007/03/27 package bookmark only provides one color option color. Because option rgbcolor can easily given as color specification in model rgb:

$$\text{rgbcolor}=\langle r \rangle \ \langle g \rangle \ \langle b \rangle \equiv \text{color}=[\text{rgb}]\{\langle r \rangle,\langle g \rangle,\langle b \rangle\}$$

Package bookmark stores the result in macro \BKM@color. The empty string is

interpreted as *no color.*

Procedure BookmarkColor(value, cmd, package, option)

  Param: *value* (value of option color)
  Param: *cmd* (macro for result)
  Param: *package* (package name for error message)
  Param: *option* (option name for error message)

  switch value **do**
      case *empty* **do**
          | *cmd* ← no color;
      end
      case *with model* **do**
          if *with xcolor* **then**
              | *cmd* ← ConvertToRGB(*model*, *values*);
          else
              if *model = rgb* **then**
                  | *cmd* ← *values* as normalized values;
              else if *model = gray* **then**
                  | *cmd* ← *values* as normalized tripled values;
              else
                  | error;
              end
          end
      end
      otherwise do
          if *with xcolor* **then**
              (*model, values* ← get model and values;
              cmd ← ConvertToRGB(*model, values*);
          else
              | error;
          end
      end
  end

```
96 \def\HyColor@BookmarkColor#1#2#3#4{%
97  \HyColor@IfModel{#1}{%
98   \HyColor@IfXcolor{%
99    \convertcolorspec\HyColor@model\HyColor@values
100            \HyColor@model@rgb#2%
101    \expandafter\HyColor@NormalizeCommaRGB#2\@nil#2%
102   }{%
103    \ifx\HyColor@model\HyColor@model@rgb
104     \expandafter\HyColor@NormalizeCommaRGB\HyColor@values\@nil#2%
105    \else
106     \ifx\HyColor@model\HyColor@model@gray
107      \expandafter\HyColor@NormalizeNum
108         \expandafter{\HyColor@values}#2%
109      \edef#2{#2 #2 #2}%
110     \else
111      \let#2\@empty
112      \HyColor@ErrorModelNoXcolor{#3}{#4}%
113     \fi
114    \fi
115   }%
116  }{%
117   \let#2\HyColor@values
118   \ifx#2\@empty
119   \else
120    \HyColor@IfXcolor{%
```

```
121      \extractcolorspec{#1}#2%
122      \expandafter\convertcolorspec#2\HyColor@model@rgb#2%
123      \expandafter\HyColor@NormalizeCommaRGB#2\@nil#2%
124    }{%
125      \let#2\@empty
126      \HyColor@ErrorSpecNoXcolor{#3}{#4}%
127    }%
128    \fi
129  }%
130 }

131 \def\HyColor@ErrorModelNoXcolor#1#2{%
132  \PackageError{#1}{%
133    Color model '\HyColor@model' is not supported\MessageBreak
134    without package 'xcolor' in\MessageBreak
135    '#2=[\HyColor@model]{\HyColor@values}'%
136  }\@ehc
137 }

138 \def\HyColor@ErrorSpecNoXcolor#1#2{%
139  \PackageError{#1}{%
140    This color specification is not supported\MessageBreak
141    without package 'xcolor' in\MessageBreak
142    '#2=\HyColor@values'%
143  }\@ehc
144 }

145 \def\HyColor@IfModel#1{%
146  \@ifnextchar[{%
147    \HyColor@WithModel
148  }{%
149    \HyColor@WithoutModel
150  }%
151  #1\@nil
152 }
153 \def\HyColor@WithModel[#1]#2\@nil{%
154  \HyColor@DefSanitized\HyColor@model{#1}%
155  \HyColor@DefSanitized\HyColor@values{#2}%
156  \@firstoftwo
157 }
158 \def\HyColor@WithoutModel#1\@nil{%
159  \let\HyColor@model\relax
160  \HyColor@DefSanitized\HyColor@values{#1}%
161  \@secondoftwo
162 }
```

2.4 Utils

\@ReturnAfterFi

```
163 \long\def\@ReturnAfterFi#1\fi{\fi#1}
```

\HyColor@IfXcolor

```
164 \def\HyColor@IfXcolor{%
165  \begingroup\expandafter\expandafter\expandafter\endgroup
166  \expandafter\ifx\csname convertcolorspec\endcsname\relax
167    \expandafter\@secondoftwo
168  \else
169    \expandafter\@firstoftwo
170  \fi
171 }

172 \def\HyColor@model@empty{empty}
173 \@onelevel@sanitize\HyColor@model@empty
174 \def\HyColor@model@gray{gray}
```

```
175 \@onelevel@sanitize\HyColor@model@gray
176 \def\HyColor@model@rgb{rgb}
177 \@onelevel@sanitize\HyColor@model@rgb
178 \def\HyColor@model@cmyk{cmyk}
179 \@onelevel@sanitize\HyColor@model@cmyk
180 \def\HyColor@model@Gray{Gray}
181 \@onelevel@sanitize\HyColor@model@Gray
```

2.5 Package **hyperref**

2.5.1 Options **Hyp.*color**

```
182 \def\HyColor@UseColor#1{%
183 \ifx#1\relax
184 \else
185   \ifx#1\@empty
186   \else
187     \expandafter\HyColor@@UseColor#1\@nil
188   \fi
189 \fi
190 }
191 \def\HyColor@@UseColor{%
192   \@ifnextchar[\HyColor@@@UseColor\HyColor@@@@UseColor
193 }
194 \def\HyColor@@@UseColor[#1]#2\@nil{%
195   \color[{#1}]{#2}%
196 }
197 \def\HyColor@@@@UseColor#1\@nil{%
198   \color{#1}%
199 }
```

Procedure HyperrefColor(value, cmd)

> **Param:** *value* (value of the option)
> **Param:** *cmd* (macro for result)
>
> **switch** value **do**
> > **case** *empty* **do**
> > > | *cmd* ← no color;
> >
> > **end**
> > **case** *with model* **do**
> > > | Call \color with model;
> >
> > **end**
> > **case** *without model* **do**
> > > | Call \color without model;
> >
> > **end**
>
> **end**

```
200 \def\HyColor@HyperrefColor#1#2{%
201   \HyColor@IfModel{#1}{%
202     \edef#2{[{\HyColor@model}]{\HyColor@values}}%
203   }{%
204     \let#2\HyColor@values
205     \ifx#2\@empty
206       \let#2\relax
207     \fi
208   }%
209 }
```

2.5.2 Generic algorithm

Procedure Algorithm X0134(value, cmd, package, option)

Param: *value* (value of the option)
Param: *cmd* (macro for result)
Param: *package* (package name for error message)
Param: *option* (option name for error message)

switch value **do**
    case *empty* **do**
        | *cmd* ← no color;
    end
    case *with model* **do**
        switch model **do**
            case *empty* **do**
                | *cmd* ← "";
            end
            case *gray, rgb, cmyk* **do**
                | *cmd* ← *output*();
            end
            case *Gray* **do**
                if *with xcolor* **then**
                    | (*model*, *values*) ← convert to gray;
                else
                    | error(*package*, *option*, "Missing xcolor"), *cmd* ← no color;
                end
            end
            else
                if *with xcolor* **then**
                    | (*model*, *values*) ← convert to rgb;
                    | *cmd* ← *output*();
                else
                    | error(*package*, *option*, "Missing xcolor"), *cmd* ← no color;
                end
            end
        end
    end
    case *rgb values* **do**
        | (*model*, *values*) ← ("rgb", (r,g,b));
        | *cmd* ← *output*();
    end
    case *without model* **do**
        if *with xcolor* **then**
            (*model*, *values*) ← get model and values(*value*);
            switch model **do**
                case *gray, rgb, cmyk* **do**
                    | *cmd* ← *output*();
                end
                case *Gray* **do**
                  | (*model*, *values*) ← convert to gray;
                  | *cmd* ← *output*();
                end
                else
                  | (*model*, *values*) ← convert to rgb;
                  | *cmd* ← *output*();
                end
            end
        else
            | error(*package*, *option*, "Missing xcolor"), *cmd* ← no color;
        end
    end
end

\HyColor@XZeroOneThreeFour

```
210 \def\HyColor@XZeroOneThreeFour#1#2#3#4{%
211   \HyColor@IfModel{#1}{%
212   \ifx\HyColor@model\HyColor@model@empty
213     \let#2\@empty
214   \else\ifx\HyColor@model\HyColor@model@gray
215     \expandafter\HyColor@NormalizeNum
216       \expandafter{\HyColor@values}#2%
217   \else\ifx\HyColor@model\HyColor@model@rgb
218     \expandafter\HyColor@NormalizeCommaRGB\HyColor@values\@nil#2%
219   \else\ifx\HyColor@model\HyColor@model@cmyk
220     \expandafter\HyColor@NormalizeCommaCMYK\HyColor@values\@nil#2%
221   \else\ifx\HyColor@model\HyColor@model@Gray
222     \HyColor@IfXcolor{%
223       \convertcolorspec\HyColor@model\HyColor@values
224                 \HyColor@model@gray#2%
225       \expandafter\HyColor@NormalizeNum\expandafter{#2}#2%
226       \let\HyColor@model\HyColor@model@gray
227     }{%
228       \let#2\relax
229       \HyColor@ErrorModelNoXcolor{#3}{#4}%
230     }%
231   \else
232     \HyColor@IfXcolor{%
233       \convertcolorspec\HyColor@model\HyColor@values
234                 \HyColor@model@rgb#2%
235       \expandafter\HyColor@NormalizeCommaRGB#2\@nil#2%
236       \let\HyColor@model\HyColor@model@rgb
237     }{%
238       \let#2\relax
239       \HyColor@ErrorModelNoXcolor{#3}{#4}%
240     }%
241   \fi\fi\fi\fi\fi
242 }{%
243   \let#2\HyColor@values
244   \ifx#2\@empty
245     \let#2\relax
246   \else
247     \expandafter\HyColor@IfRGB\expandafter{\HyColor@values}{%
248       \expandafter\HyColor@NormalizeCommaRGB\HyColor@values\@nil#2%
249     }{%
250       \HyColor@IfXcolor{%
251         \expandafter\extractcolorspec\expandafter{\HyColor@values}#2%
252         \edef\HyColor@model{\expandafter\@firstoftwo#2}%
253         \edef\HyColor@values{\expandafter\@secondoftwo#2}%
254         \ifx\HyColor@model\HyColor@model@gray
255           \expandafter\HyColor@NormalizeNum\expandafter
256             {\HyColor@values}#2%
257         \else\ifx\HyColor@model\HyColor@model@rgb
258           \expandafter\HyColor@NormalizeCommaRGB
259             \HyColor@values\@nil#2%
260         \else\ifx\HyColor@model\HyColor@model@cmyk
261           \expandafter\HyColor@NormalizeCommaCMYK
262             \HyColor@values\@nil#2%
263         \else\ifx\HyColor@model\HyColor@model@Gray
264           \convertcolorspec\HyColor@model\HyColor@values
265             \HyColor@model@gray#2%
266           \expandafter\HyColor@NormalizeNum\expandafter
267             {\HyColor@values}#2%
268           \let\HyColor@model\HyColor@model@gray
269         \else
270           \convertcolorspec\HyColor@model\HyColor@values
```

```
271         \HyColor@model@rgb#2%
272       \expandafter\HyColor@NormalizeCommaRGB#2\@nil#2%
273       \let\HyColor@model\HyColor@model@rgb
274     \fi\fi\fi\fi
275   }{%
276     \let#2\relax
277     \HyColor@ErrorSpecNoXcolor{#3}{#4}%
278   }%
279   }%
280   \fi
281 }%
282 }
```

2.5.3   Field options

\HyColor@FieldBColor

```
283 \let\HyColor@FieldBColor\HyColor@XZeroOneThreeFour
```

\HyColor@FieldColor

```
284 \def\HyColor@FieldColor#1#2#3#4{%
285   \let\HyColor@model\@empty
286   \HyColor@XZeroOneThreeFour{#1}{#2}{#3}{#4}%
287   \ifx#2\relax
288     \let#2\@empty
289   \else
290     \ifx#2\@empty
291     \else
292       \ifx\HyColor@model\HyColor@model@gray
293         \edef#2{#2 g}%
294       \else\ifx\HyColor@model\HyColor@model@rgb
295         \edef#2{#2 rg}%
296       \else\ifx\HyColor@model\HyColor@model@cmyk
297         \edef#2{#2 k}%
298       \else
299         \PackageError{#3}{Internal error: unsupported color model}\@ehc
300       \fi\fi\fi
301     \fi
302   \fi
303 }
```

2.5.4   Detection for naked RGB values

\HyColor@IfRGB

```
304 \newif\ifHyColor@result
305 \begingroup\expandafter\expandafter\expandafter\endgroup
306 \expandafter\ifx\csname pdfmatch\endcsname\relax
307   \expandafter\@firstoftwo
308 \else
309   \expandafter\@secondoftwo
310 \fi
311 {%
312   \begingroup
313   \def\x#1{\endgroup
314     \def\HyColor@IfRGB##1{%
315       \HyColor@@IfRGB##1#1#1#1\@nil
316     }%
317   }%
318   \x{ }%
319   \edef\HyColor@TwoSpaces{\space\space}%
320   \def\HyColor@@IfRGB#1 #2 #3 #4\@nil{%
321     \HyColor@resulttrue
322     \def\HyColor@temp{#4}%
```

```
323    \ifx\HyColor@temp\HyColor@TwoSpaces
324      \HyColor@CheckNum{#1}%
325      \ifHyColor@result
326        \HyColor@CheckNum{#2}%
327        \ifHyColor@result
328          \HyColor@CheckNum{#3}%
329        \fi
330      \fi
331    \else
332      \HyColor@resultfalse
333    \fi
334    \ifHyColor@result
335      \let\HyColor@model\HyColor@model@rgb
336      \edef\HyColor@values{#1,#2,#3}%
337      \expandafter\@firstoftwo
338    \else
339      \expandafter\@secondoftwo
340    \fi
341  }%
342  \def\HyColor@zero{0}%
343  \def\HyColor@one{1}%
344  \def\HyColor@dot{.}%
345  \def\HyColor@CheckNum#1{%
346    \def\HyColor@temp{#1}%
347    \ifx\HyColor@temp\@empty
348      \HyColor@resultfalse
349    \else
350      \edef\HyColor@temp{\@car#1\@nil}%
351      \ifx\HyColor@temp\HyColor@zero
352      \else
353        \ifx\HyColor@temp\HyColor@one
354        \else
355          \ifx\HyColor@temp\HyColor@dot
356          \else
357            \HyColor@resultfalse
358          \fi
359        \fi
360      \fi
361    \fi
362  }%
363 }{%
364  \def\HyColor@MatchNum{%
365    (0*1\string\.0*|0*1|0+\string\.?[0-9]*|\string\.[0-9]+)%
366  }%
367  \def\HyColor@IfRGB#1{%
368    \ifnum\pdfmatch{^\HyColor@MatchNum\space\HyColor@MatchNum
369      \space\HyColor@MatchNum$}{#1}>\z@
370      \let\HyColor@model\HyColor@model@rgb
371      \edef\HyColor@values{%
372        \expandafter\strip@prefix\pdflastmatch1,%
373        \expandafter\strip@prefix\pdflastmatch2,%
374        \expandafter\strip@prefix\pdflastmatch3%
375      }%
376      \HyColor@resulttrue
377      \expandafter\@firstoftwo
378    \else
379      \HyColor@resultfalse
380      \expandafter\@secondoftwo
381    \fi
382  }%
383 }
```

2.5.5 Options *bordercolor

Procedure HyperrefBorderColor(value, cmd, package, option)

Param: *value* (value of the option)
Param: *cmd* (macro for result)
Param: *package, option* (package and option for error message)

switch value **do**
    case *empty* **do**
        │ *cmd* ← no color;
    end
    case *with model* **do**
        if *with xcolor* **then**
            │ (*model*, *values*) ← convert to rgb;
            │ *cmd* ← output values;
        else
            switch model **do**
                case *rgb, gray* **do**
                    │ *cmd* ← output values;
                end
                else
                  │ error(*package*, *option*, "Missing xcolor");
                  │ *cmd* ← no color;
                end
            end
        end
    end
    case *rgb values* **do**
        │ *cmd* ← output values;
    end
    case *without model* **do**
        if *with xcolor* **then**
            │ (*model*, *values*) ← convert to rgb;
            │ *cmd* ← output values;
        else
            │ error(*package*, *option*, "Missing xcolor"); *cmd* ← no color;
        end
    end
end

\HyColor@HyperrefBorderColor

```
384 \def\HyColor@HyperrefBorderColor#1#2#3#4{%
385   \HyColor@IfModel{#1}{%
386     \HyColor@IfXcolor{%
387       \convertcolorspec\HyColor@model\HyColor@values
388                 \HyColor@model@rgb#2%
389       \expandafter\HyColor@NormalizeCommaRGB#2\@nil#2%
390     }{%
391       \ifx\HyColor@model\HyColor@model@rgb
392         \expandafter\HyColor@NormalizeCommaRGB\HyColor@values\@nil#2%
393       \else
394         \ifx\HyColor@model\HyColor@model@gray
395           \expandafter\HyColor@NormalizeNum
396             \expandafter{\HyColor@values}#2%
397           \edef#2{#2 #2 #2}%
398         \else
399           \let#2\relax
400           \HyColor@ErrorModelNoXcolor{#3}{#4}%
```

```
401        \fi
402      \fi
403    }%
404  }{%
405    \let#2\HyColor@values
406    \ifx#2\@empty
407      \let#2\relax
408    \else
409      \expandafter\HyColor@IfRGB\expandafter{\HyColor@values}{%
410        \expandafter\HyColor@NormalizeCommaRGB\HyColor@values\@nil#2%
411      }{%
412        \HyColor@IfXcolor{%
413          \extractcolorspec{#1}#2%
414          \expandafter\convertcolorspec#2\HyColor@model@rgb#2%
415          \expandafter\HyColor@NormalizeCommaRGB#2\@nil#2%
416        }{%
417          \let#2\relax
418          \HyColor@ErrorSpecNoXcolor{#3}{#4}%
419        }%
420      }%
421    \fi
422  }%
423 }
```

2.6   Package **attachfile2**

Before PDF-1.7 only RGB values are permitted in annotations. Since PDF-1.7 the color entry in annotations understands several color models, depending on the size of the color array:

- Zero entries: means transparent, not useful for file attachments. AR7/Linux and AR8/Linux show black instead.

- One entry: color model 'gray'.

- Three entries: color model 'rgb'.

- Four entries: color model 'cmyk'.

An empty color specification is interpreted as "no color".

\HyColor@DetectPdfVersion

```
424 \def\HyColor@DetectPdfVersion{%
425   \begingroup\expandafter\expandafter\expandafter\endgroup
426   \expandafter\ifx\csname Hy@pdfversion\endcsname\relax
427     \global\chardef\HyColor@PdfVersion=0 %
428   \else
429     \global\chardef\HyColor@PdfVersion=\Hy@pdfversion\relax
430   \fi
431   \global\let\HyColor@DetectPdfVersion\relax
432 }
```

\HyColor@SpaceToComma

```
433 \def\HyColor@SpaceToComma#1 #2\@nil{%
434   #1%
435   \ifx\relax#2\relax
436     \expandafter\@gobble
437   \else
438     ,%
439     \expandafter\@firstofone
440   \fi
441   {%
442     \HyColor@SpaceToComma#2\@nil
```

```
443   }%
444 }%
```

```
445 \def\HyColor@AttachfileColor#1#2#3#4#5#6{%
446 \def#2{#1}%
447 \ifx#2\@empty
448   \let#3\@gobble
449   \let#4\@empty
450 \else
451   \HyColor@resultfalse
452   \HyColor@XZeroOneThreeFour{#1}#3{#5}{#6}%
453   \ifHyColor@result
454     \edef#2{%
455       [rgb]{\expandafter\HyColor@SpaceToComma#3 \@nil}%
456     }%
457   \fi
458   \ifx\HyColor@model\HyColor@model@rgb
459     \edef#4{/C[#3]}% hash-ok
460     \edef#3##1{%
461       #3 %
462       \noexpand\csname atfi@SETRGBCOLOR##1\noexpand\endcsname
463     }%
464   \else
465     \ifx\HyColor@model\HyColor@model@gray
466       \HyColor@DetectPdfVersion
467       \ifnum\HyColor@PdfVersion<7 %
468         \edef#4{/C[#3 #3 #3]}% hash-ok
469       \else
470         \edef#4{/C[#3]}% hash-ok
471       \fi
472       \edef#3##1{%
473         #3 %
474         \noexpand\csname atfi@SETGRAYCOLOR##1\noexpand\endcsname
475       }%
476     \else
477       \ifx\HyColor@model\HyColor@model@cmyk
478         \HyColor@DetectPdfVersion
479         \ifnum\HyColor@PdfVersion<7 %
480           \HyColor@IfModel{#1}{%
481             \HyColor@IfXcolor{%
482               \convertcolorspec\HyColor@model\HyColor@values
483                     \HyColor@model@rgb#4%
484               \expandafter\HyColor@NormalizeCommaRGB#4\@nil#4%
485               \edef#4{/C[#4]}% hash-ok
486             }{%
487               \let#4\@empty
488               \HyColor@ErrorModelNoXcolor{#5}{#6}%
489             }%
490           }{%
491             \HyColor@IfXcolor{%
492               \extractcolorspec{#1}#4%
493               \expandafter\convertcolorspec#4%
494                   \HyColor@model@rgb#4%
495               \expandafter\HyColor@NormalizeCommaRGB#4\@nil#4%
496               \edef#4{/C[#4]}% hash-ok
497             }{%
498               \let#4\@empty
499               \HyColor@ErrorSpecNoXcolor{#5}{#6}%
500             }%
501           }%
502         \else
503           \edef#4{/C[#3]}% hash-ok
```

```
504        \fi
505        \edef#3##1{%
506          #3 %
507          \noexpand\csname atfi@SETCMYKCOLOR##1\noexpand\endcsname
508        }%
509      \else
510      \ifx\HyColor@model\HyColor@model@empty
511        \PackageError{#5}{%
512          Color model 'empty' is not permitted for option '#6'%
513        }\@ehc
514        \let#2\@empty
515        \let#3\@gobble
516        \let#4\@empty
517      \else
518      \ifx\HyColor@model\relax % (missing xcolor)
519        \let#3\@gobble
520        \let#4\@empty
521      \else
522        \PackageError{#5}{%
523          Internal error: unsupported color model%
524        }\@ehc
525      \fi
526      \fi
527      \fi
528      \fi
529    \fi
530  \fi
531 }

532 ⟨/package⟩
```

2.7 Patch for package xcolor

Because the test files triggered a bug in package xcolor of version 2007/01/21 v2.11. I contacted the author of xcolor Uwe Kern. He responded with a test version 2007/03/27 v2.12a00 that fixes the problem. However, apparently he did not found the time for an official release yet. Thus I have reluctantly written the following patch package using the fixes of v2.12a00.

The patch is immediately applied if package xcolor is already loaded. Otherwise the patch is delayed using \AfterPackage if package scrlfile is loaded. As last resort \AtBeginDocument is used.

```
533 ⟨*xcolor⟩
534 \NeedsTeXFormat{LaTeX2e}
535 \ProvidesPackage{xcolor-patch}[2016/05/16 xcolor patch]

536 \RequirePackage{hopatch}[2016/05/16]
537 \hopatch@AfterPackage{xcolor}{%
```

\XC@ifxcase

```
538  \long\def\reserved@a#1#2#3{%
539    \long\def\@@tmp##1##2{%
540      \ifx#1##1%
541        \toks@{##2}%
542        \expandafter\remove@to@nnil
543      \else
544        \expandafter\@@tmp
545      \fi
546    }%
547    \@@tmp#2#1{#3}\@nnil\the\toks@
548  }%
549  \ifx\XC@ifxcase\reserved@a
550    \long\def\XC@ifxcase#1#2#3{%
```

```
551    \long\def\XC@if@##1##2{%
552      \ifx#1##1%
553        \toks@{##2}%
554        \expandafter\remove@to@nnil
555      \else
556        \expandafter\XC@if@
557      \fi
558    }%
559    \XC@if@#2#1{#3}\@nnil
560    \the\toks@
561  }%
562 \fi
```

```
563    \long\def\reserved@a#1#2#3{%
564      \long\def\@@tmp##1##2{%
565        \@expandtwoargs\in@{,#1,}{,##1,}%
566        \ifin@
567          \toks@{##2}%
568          \expandafter\remove@to@nnil
569        \else
570          \expandafter\@@tmp
571        \fi
572      }%
573      \@@tmp#2{#1}{#3}\@nnil
574      \the\toks@
575    }%
576    \ifx\XC@ifcase\reserved@a
577      \long\def\XC@ifcase#1#2#3{%
578        \long\def\XC@if@##1##2{%
579          \@expandtwoargs\in@{,#1,}{,##1,}%
580          \ifin@
581            \toks@{##2}%
582            \expandafter\remove@to@nnil
583          \else
584            \expandafter\XC@if@
585          \fi
586        }%
587        \XC@if@#2{#1}{#3}\@nnil
588        \the\toks@
589      }%
590    \fi
```

\XC@cnv@gray

```
591    \def\reserved@a#1,{%
592      \XC@ifxcase\tm{%
593        \XC@mod@rgb{%
594          \XC@calcN{#1}\@@tmp
595          \edef\@@tmp{\@@tmp,\@@tmp,\@@tmp}%
596        }%
597        \XC@mod@cmy{%
598          \XC@calcC{#1}\@@tmp
599          \edef\@@tmp{\@@tmp,\@@tmp,\@@tmp}%
600        }%
601        \XC@mod@cmyk{%
602          \XC@calcC{#1}\@@tmp
603          \edef\@@tmp{0,0,0,\@@tmp}%
604        }%
605        \XC@mod@RGB{%
606          \edef\@@scl{\rangeRGB}%
607          \XC@calcM{#1}\@@tmp
608          \edef\@@tmp{\@@tmp,\@@tmp,\@@tmp}%
609        }%
```

```
610    \XC@mod@HTML{%
611      \edef\@@scl{\@cclv}%
612      \XC@calcM{#1}\@@tmp
613      \XC@calcH\@@tmp\@@tmp
614      \edef\@@tmp{\@@tmp\@@tmp\@@tmp}%
615    }%
616    \XC@mod@HSB{%
617      \edef\@@scl{\rangeHSB}%
618      \XC@calcM{#1}\@@tmp
619      \edef\@@tmp{0,0,\@@tmp}%
620    }%
621    \XC@mod@Gray{%
622      \edef\@@scl{\rangeGray}%
623      \XC@calcM{#1}\@@tmp
624    }%
625    }%
626    {%
627      \XC@calcN{#1}\@@tmp
628      \edef\@@tmp{0,0,\@@tmp}%
629    }%
630  }%
631  \ifx\XC@cnv@gray\reserved@a
632    \def\XC@cnv@gray#1,{%
633      \XC@ifxcase\tm{%
634        \XC@mod@rgb{%
635          \XC@calcN{#1}\@@tmp
636          \edef\@@tmp{\@@tmp,\@@tmp,\@@tmp}%
637        }%
638        \XC@mod@gray{}%
639        \XC@mod@cmy{%
640          \XC@calcC{#1}\@@tmp
641          \edef\@@tmp{\@@tmp,\@@tmp,\@@tmp}%
642        }%
643        \XC@mod@cmyk{%
644          \XC@calcC{#1}\@@tmp
645          \edef\@@tmp{0,0,0,\@@tmp}%
646        }%
647        \XC@mod@RGB{%
648          \edef\@@scl{\rangeRGB}%
649          \XC@calcM{#1}\@@tmp
650          \edef\@@tmp{\@@tmp,\@@tmp,\@@tmp}%
651        }%
652        \XC@mod@HTML{%
653          \edef\@@scl{\@cclv}%
654          \XC@calcM{#1}\@@tmp
655          \XC@calcH\@@tmp\@@tmp
656          \edef\@@tmp{\@@tmp\@@tmp\@@tmp}%
657        }%
658        \XC@mod@HSB{%
659          \edef\@@scl{\rangeHSB}%
660          \XC@calcM{#1}\@@tmp
661          \edef\@@tmp{0,0,\@@tmp}%
662        }%
663        \XC@mod@Gray{%
664          \edef\@@scl{\rangeGray}%
665          \XC@calcM{#1}\@@tmp
666        }%
667      }%
668      {%
669        \XC@calcN{#1}\@@tmp
670        \edef\@@tmp{0,0,\@@tmp}%
671      }%
```

```
672   }%
673  \fi
```

2.7.1 Fix fragile `\@frameb@x`

`\fbox` becomes fragile, because the internal `\@frameb@x` is redefined by package xcolor. The redefinition is no longer robust. Test file:

```
\documentclass{article}
\usepackage{xcolor}
\makeatletter
\protected@edef\x{\fbox{abc}}
\@@end
```

```
674  \@ifundefined{XC@frameb@x }{%
675    \expandafter\let\csname XC@frameb@x \endcsname\XC@frameb@x
676    \edef\XC@frameb@x{%
677      \noexpand\protect
678      \expandafter\noexpand\csname XC@frameb@x \endcsname
679    }%
680    \expandafter\ifx\csname XC@frameb@x \endcsname\@frameb@x
681      \let\@frameb@x\XC@frameb@x
682    \fi
683  }{}%
684 }
```

```
685 ⟨/xcolor⟩
```

3   Test

```
686 ⟨*test1⟩
687 \ProvidesFile{hycolor-test1.tex}[2016/05/16 test file 1]
688 ⟨/test1⟩
```

```
689 ⟨*test2⟩
690 \ProvidesFile{hycolor-test2.tex}[2016/05/16 test file 2]
691 \let\pdfmatch\relax
692 ⟨/test2⟩
```

```
693 ⟨test3⟩\ProvidesFile{hycolor-test3.tex}[2016/05/16 test file 3]
```

```
694 ⟨*test⟩
```

```
695 \documentclass{article}
696
697 \usepackage{qstest}
698 \IncludeTests{*}
699 \LogTests{log}{*}{*}
700
701 \makeatletter
702
703 \newcommand*{\TestPackageName}{test-package}
704 \newcommand*{\TestOptionName}{test-option}
705
706 \newcommand\Message{}
707 \def\Message#1#{\immediate\write16}
708
709 \newcommand*{\ExpectError}[2]{%
710   \begingroup
711     \global\let\saved@errhelp\errhelp
712     \global\let\saved@errmessage\errmessage
713     \let\errhelp\@gobble
714     \def\errmessage##1{%
715       \xdef\@ExpectErrorMessage{##1}%
716     }%
```

```
717    \PackageError\TestPackageName{#1}\@ehc
718    \def\errhelp##1{%
719      \global\let\errhelp\saved@errhelp
720    }%
721    \global\let\@ResultErrorMessage\@empty
722    \def\errmessage##1{%
723      \xdef\@ResultErrorMessage{##1}%
724      \global\let\errmessage\saved@errmessage
725    % \Message{[ ##1}%
726    % \Message{] (ignored error)}%
727    % \Message{}%
728    }%
729    #2%
730    \endgroup
731    \Expect*{\@ResultErrorMessage}*{\@ExpectErrorMessage}%
732  }
733  \usepackage{scrlfile}
734  \usepackage{hycolor}[2016/05/16]
735  ⟨/test⟩

736  ⟨*test1⟩
737  \begin{qstest}{NumNormalize}{num, normalize}
738    \def\test#1#2{%
739      \HyColor@NormalizeNum{#1}\cmd
740      \Expect*{\cmd}{#2}%
741    }%
742    \test{0}{0}%
743    \test{000}{0}%
744    \test{-1}{0}%
745    \test{ 0 }{0}%
746    \test{1.1}{1}%
747    \test{100}{1}%
748    \test{00100}{1}%
749    \test{99.99}{1}%
750    \test{0.0}{0}%
751    \test{00.00}{0}%
752    \test{0.}{0}%
753    \test{.0}{0}%
754    \test{0.1}{.1}%
755    \test{0.10}{.1}%
756    \test{0.1000}{.1}%
757    \test{.1000}{.1}%
758    \test{0.01}{.01}%
759    \test{0.01010}{.0101}%
760    \test{.0000000001}{.0000000001}%
761    \test{.9999999999}{.9999999999}%
762  \end{qstest}

764  \begin{qstest}{BookmarkColor without xcolor}{bookmark, noxcolor}
765    \def\test#1#2{%
766      \HyColor@BookmarkColor{#1}\cmd\TestPackageName\TestOptionName
767      \Expect*{\cmd}{#2}%
768    }%
769    \test{[rgb]{1,0,0}}{1 0 0}%
770    \test{[gray]{0.10}}{.1 .1 .1}%
771    \test{}{}%
772    \test{[rgb]{ 1 , 1 , 0 }}{1 1 0}%
773    \def\errortest[#1]#2{%
774      \ExpectError{%
775        Color model '#1' is not supported\MessageBreak
776        without package 'xcolor' in\MessageBreak
777        '\TestOptionName=[#1]{#2}'% hash-ok
778      }{%
```

```
779    \test{[#1]{#2}}{}% hash-ok
780      }%
781  }%
782  \errortest[cmyk]{1,0,0,0}%
783  \errortest[empty]{}%
784  \def\errortest#1{%
785    \ExpectError{%
786      This color specification is not supported\MessageBreak
787      without package 'xcolor' in\MessageBreak
788      '\TestOptionName=#1'%
789    }{%
790      \test{#1}{}%
791    }%
792  }%
793  \end{qstest}
794  ⟨/test1⟩

795  ⟨*test1 j test2⟩
796  \begin{qstest}{X0134 without xcolor}{X0134, noxcolor}
797  \def\test#1#2{%
798  \HyColor@XZeroOneThreeFour{#1}\cmd\TestPackageName\TestOptionName
799    \Expect*{\cmd}{#2}%
800  }%
801  \test{[empty]{}}{}%
802  \test{[rgb]{1,0,0}}{1 0 0}%
803  \test{[gray]{0.10}}{.1}%
804  \test{[cmyk]{0,1,0,0}}{0 1 0 0}%
805  \test{[rgb]{ 1 , 1 , 0 }}{1 1 0}%
806  \def\errortest[#1]#2{%
807    \ExpectError{%
808      Color model '#1' is not supported\MessageBreak
809      without package 'xcolor' in\MessageBreak
810      'test-option=[#1]{#2}'% hash-ok
811    }{%
812      \HyColor@XZeroOneThreeFour{[{#1}]{#2}}\cmd
813        \TestPackageName\TestOptionName
814      \Expect{true}*{\ifx\cmd\relax true\else false\fi}%
815    }%
816  }%
817  \errortest[Gray]{10}%
818  \errortest[cmy]{1,0,0}%
819  \def\errortest#1{%
820    \ExpectError{%
821      This color specification is not supported\MessageBreak
822      without package 'xcolor' in\MessageBreak
823      'test-option=#1'%
824    }{%
825        \HyColor@XZeroOneThreeFour{#1}\cmd\TestPackageName\TestOption-
    Name
826      \Expect{true}*{\ifx\cmd\relax true\else false\fi}%
827    }%
828  }%
829  \errortest{yellow}%
830  \end{qstest}
831
832  \begin{qstest}{HyperrefBorderColor without xcolor}%
833            {hyperef bordercolor, noxcolor}%
834  \def\test#1#2{%
835  \HyColor@HyperrefBorderColor{#1}\cmd\TestPackageName\TestOptionName
836    \Expect*{\cmd}{#2}%
837  }%
838  \test{[rgb]{1,0,0}}{1 0 0}%
839  \test{[gray]{0.10}}{.1 .1 .1}%
```

```
840  \test{[rgb]{ 1 , 1 , 0 }}{1 1 0}%
841  \def\errortest[#1]#2{%
842    \ExpectError{%
843      Color model '#1' is not supported\MessageBreak
844      without package 'xcolor' in\MessageBreak
845      'test-option=[#1]{#2}'% hash-ok
846    }{%
847      \HyColor@HyperrefBorderColor{[{#1}]{#2}}\cmd
848        \TestPackageName\TestOptionName
849      \Expect{true}*{\ifx\cmd\relax true\else false\fi}%
850    }%
851  }%
852  \errortest[Gray]{10}%
853  \errortest[cmy]{1,0,0}%
854  \errortest[cmyk]{0,1,0,0}%
855  \def\errortest#1{%
856    \ExpectError{%
857      This color specification is not supported\MessageBreak
858      without package 'xcolor' in\MessageBreak
859      'test-option=#1'%
860    }{%
861      \HyColor@HyperrefBorderColor{#1}\cmd
862        \TestPackageName\TestOptionName
863      \Expect{true}*{\ifx\cmd\relax true\else false\fi}%
864    }%
865  }%
866  \errortest{yellow}%
867 \end{qstest}
868 ⟨/test1 j test2⟩

869 ⟨*test1 j test2⟩
870 \usepackage{xcolor}
871 \definecolor[named]{MyGreen}{rgb}{0,0.7,0}
872 \definecolor{mygreen}{named}{MyGreen}
873 ⟨/test1 j test2⟩

874 ⟨*test1⟩
875 \begin{qstest}{BookmarkColor with xcolor}{bookmark, xcolor}
876  \def\test#1#2{%
877    \HyColor@BookmarkColor{#1}\cmd\PackageName\OptionName
878    \Expect*{\cmd}{#2}%
879  }%
880  \test{[rgb]{1,0,0}}{1 0 0}%
881  \test{[gray]{0.10}}{.1 .1 .1}%
882  \test{}{}%
883  \test{[rgb]{ 1 , 1 , 0 }}{1 1 0}%
884  \test{[cmyk]{1,0,0,0}}{0 1 1}%
885  \test{red}{1 0 0}%
886  \test{cyan}{0 1 1}%
887  \test{red!40!blue}{.4 0 .6}%
888  \test{[Gray]{10}}{.66667 .66667 .66667}%
889  \test{[RGB]{100,200,50}}{.39217 .78432 .19609}%
890  \test{[wave]{363}}{.00316 0 .00316}%
891  \test{[wave]814}{.00797 0 0}%
892  \test{[HSB]{100,200,50}}{.03473 .20833 .12152}%
893  \test{[HTML]{A800FF}}{.65881 0 1}%
894  \test{[cmy]{.3,.5,.2}}{.7 .5 .8}%
895  \test{[cmyk]{.3,.5,.2,.1}}{.6 .4 .7}%
896  \test{[hsb]{.3,.5,.2}}{.12 .2 .1}%
897  \test{[Hsb]{120,.5,.2}}{.1 .2 .1}%
898  \test{[tHsb]{120,.5,.2}}{.2 .2 .1}%
899  \test{[named]{MyGreen}}{0 .7 0}%
900  \test{mygreen}{0 .7 0}%
901 \end{qstest}
```

```
902
903 \begin{qstest}{HyperrefColor}{hyperref, color}
904   \def\test#1#2{%
905     \HyColor@HyperrefColor{#1}\cmd
906     \Expect*{\cmd}{#2}%
907   }%
908   \test{red}{red}%
909   \test{[rgb]{1,0,0}}{[{rgb]}{1,0,0}}%
910   \HyColor@HyperrefColor{}\cmd
911   \Expect{true}*{\ifx\cmd\relax true\else false\fi}%
912 \end{qstest}
913 ⟨/test1⟩

914 ⟨*test1 j test2⟩
915 \begin{qstest}{X0134 with xcolor}{hyperref, X0134, xcolor}
916   \def\test#1#2{%
917     \HyColor@XZeroOneThreeFour{#1}\cmd\PackageName\OptionName
918     \Expect*{\cmd}{#2}%
919   }%
920   \test{[empty]{}}{}%
921   \test{[gray]{0.1}}{.1}%
922   \test{[rgb]{1,0.5,0.0}}{1 .5 0}%
923   \test{[cmyk]{0,1,0,0.5}}{0 1 0 .5}%
924   \test{[Gray]{10}}{.66667}%
925   \test{red}{1 0 0}%
926   \test{1 0 0}{1 0 0}%
927   \test{001.0 .23 0}{1 .23 0}%
928   \test{[named]{MyGreen}}{0 .7 0}%
929   \test{mygreen}{0 .7 0}%
930   \HyColor@XZeroOneThreeFour{}\cmd\PackageName\OptionName
931   \Expect{true}*{\ifx\cmd\relax true\else false\fi}%
932 \end{qstest}

934 \begin{qstest}{FieldColor}{hyperref, field, FieldColor}
935   \def\test#1#2{%
936     \HyColor@FieldColor{#1}\cmd\PackageName\OptionName
937     \Expect*{\cmd}{#2}%
938   }%
939   \test{}{}%
940   \test{[gray]{0.7}}{.7 g}%
941   \test{[rgb]{1,0,0}}{1 0 0 rg}%
942   \test{[cmyk]{0,1,0,0}}{0 1 0 0 k}%
943   \test{[cmy]{.5,.4,.3}}{.5 .6 .7 rg}%
944 \end{qstest}
945 ⟨/test1 j test2⟩
```

3.1 Test for package **attachfile2**

```
946 ⟨*test3⟩
947 \def\atfi@SETRGBCOLORtest{set-rgb}
948 \def\atfi@SETGRAYCOLORtest{set-gray}
949 \def\atfi@SETCMYKCOLORtest{set-cmyk}
950 \def\Test#1#2#3#4#5{%
951   \begingroup
952     \setbox0=\hbox{%
953       \begingroup
954         \chardef\HyColor@PdfVersion=6 %
955         \HyColor@AttachfileColor{#1}\spec\inlinemacro\annot
956             \TestPackageName\TestOptionName
957         \edef\inline{\inlinemacro{test}}%
958         \expandafter\Expect\expandafter{\spec}{#2}%
959         \expandafter\Expect\expandafter{\inline}{#3}%
960         \expandafter\Expect\expandafter{\annot}{#4}%
961       \endgroup
```

```
962      \begingroup
963        \chardef\HyColor@PdfVersion=7 %
964        \HyColor@AttachfileColor{#1}\spec\inlinemacro\annot
965            \TestPackageName\TestOptionName
966        \edef\inline{\inlinemacro{test}}%
967        \expandafter\Expect\expandafter{\spec}{#2}%
968        \expandafter\Expect\expandafter{\inline}{#3}%
969        \expandafter\Expect\expandafter{\annot}{#5}%
970      \endgroup
971    }%
972    \Expect*{\the\wd0}{0.0pt}%
973  \endgroup
974 }
975 \newif\ifError
976 \def\TestError[#1]#2#3#4#5#6{%
977   \begingroup
978    \global\Errorfalse
979    \let\OrgPackageError\PackageError
980    \def\PackageError##1##2##3{%
981      \edef\TestTemp{##1}%
982      \ifx\TestTemp\TestPackageName
983        \Expect*{\ifError too many errors\else ok\fi}{ok}%
984        \Expect*{#6}*{##2}%
985        \global\Errortrue
986      \else
987        \OrgPackageError{##1}{##2}{##3}%
988      \fi
989    }%
990    \setbox0=\hbox{%
991      \begingroup
992        \chardef\HyColor@PdfVersion=#1 %
993        \HyColor@AttachfileColor{#2}\spec\inlinemacro\annot
994            \TestPackageName\TestOptionName
995        \edef\inline{\inlinemacro{test}}%
996        \expandafter\Expect\expandafter{\spec}{#3}%
997        \expandafter\Expect\expandafter{\inline}{#4}%
998        \expandafter\Expect\expandafter{\annot}{#5}%
999      \endgroup
1000       \ifx\\#6\\%
1001       \else
1002         \Expect*{\ifError ok\else missing error\fi}{ok}%
1003       \fi
1004     }%
1005     \Expect*{\the\wd0}{0.0pt}%
1006   \endgroup
1007 }
1008 \def\NoEmptyModel{%
1009   Color model 'empty' is not permitted for option '\TestOptionName'%
1010 }
1011 \def\ModelNoXcolor#1#2{%
1012   Color model '#1' is not supported\MessageBreak
1013   without package 'xcolor' in\MessageBreak
1014   '\TestOptionName=[#1]{#2}'% hash-ok
1015 }
1016 \def\SpecNoXColor#1{%
1017   This color specification is not supported\MessageBreak
1018   without package 'xcolor' in\MessageBreak
1019   'test-option=#1'%
1020 }
1021 \begin{qstest}{AttachfileColor}{AttachfileColor}
1022 \Test{}{}{}{}{}%
1023 \Test{0.1 0.2 0.3}{[rgb]{.1,.2,.3}}{.1 .2 .3 set-rgb}%
```

```
1024        {/C[.1 .2 .3]}{/C[.1 .2 .3]}%
1025    \Test{[gray]{0.4}}{[gray]{0.4}}{.4 set-gray}%
1026        {/C[.4 .4 .4]}{/C[.4]}%
1027    \Test{[rgb]{0.3,.2,.1}}{[rgb]{0.3,.2,.1}}{.3 .2 .1 set-rgb}%
1028        {/C[.3 .2 .1]}{/C[.3 .2 .1]}%
1029    \Test{0.0 1.0 1}{[rgb]{0,1,1}}{0 1 1 set-rgb}%
1030        {/C[0 1 1]}{/C[0 1 1]}%
1031    \Test{[gray]1}{[gray]1}{1 set-gray}{/C[1 1 1]}{/C[1]}%
1032    \TestError[6]{[empty]{}}{}{}{}\NoEmptyModel
1033    \TestError[7]{[empty]{}}{}{}{}\NoEmptyModel
1034    \TestError[6]{[cmyk]{.1,.2,.3,.4}}{[cmyk]{.1,.2,.3,.4}}%
1035            {.1 .2 .3 .4 set-cmyk}{}%
1036            {\ModelNoXcolor{cmyk}{.1,.2,.3,.4}}%
1037    \TestError[7]{[cmyk]{.1,.2,.3,.4}}{[cmyk]{.1,.2,.3,.4}}%
1038            {.1 .2 .3 .4 set-cmyk}{/C[.1 .2 .3 .4]}{}%
1039    \TestError[6]{red}{red}{}{}{\SpecNoXColor{red}}%
1040    \TestError[7]{red}{red}{}{}{\SpecNoXColor{red}}%
1041    \end{qstest}

1042    \usepackage{xcolor}
1043    \definecolor[named]{MyGreen}{rgb}{0,0.7,0}
1044    \definecolor{mygreen}{named}{MyGreen}
1045    \definecolor{graynine}{gray}{0.9}
1046    \definecolor{GraySix}{Gray}{9}

1047    \begin{qstest}{AttachfileColorX}{AttachfileColorX}
1048    \Test{}{}{}{}%
1049    \Test{0.1 0.2 0.3}{[rgb]{.1,.2,.3}}{.1 .2 .3 set-rgb}%
1050        {/C[.1 .2 .3]}{/C[.1 .2 .3]}%
1051    \Test{[gray]{0.4}}{[gray]{0.4}}{.4 set-gray}%
1052        {/C[.4 .4 .4]}{/C[.4]}%
1053    \Test{[rgb]{0.3,.2,.1}}{[rgb]{0.3,.2,.1}}{.3 .2 .1 set-rgb}%
1054        {/C[.3 .2 .1]}{/C[.3 .2 .1]}%
1055    \Test{0.0 1.0 1}{[rgb]{0,1,1}}{0 1 1 set-rgb}%
1056        {/C[0 1 1]}{/C[0 1 1]}%
1057    \Test{[gray]1}{[gray]1}{1 set-gray}{/C[1 1 1]}{/C[1]}%
1058    \Test{red}{red}{1 0 0 set-rgb}{/C[1 0 0]}{/C[1 0 0]}%
1059    \Test{black}{black}{0 set-gray}{/C[0 0 0]}{/C[0]}%
1060    \Test{cyan}{cyan}{1 0 0 0 set-cmyk}{/C[0 1 1]}{/C[1 0 0 0]}%
1061    \Test{[named]{black}}{[named]{black}}{0 0 0 set-rgb}%
1062        {/C[0 0 0]}{/C[0 0 0]}%
1063    \Test{[Gray]{9}}{[Gray]{9}}{.6 set-gray}{/C[.6 .6 .6]}{/C[.6]}%
1064    \Test{[HTML]{0080FF}}{[HTML]{0080FF}}{0 .50195 1 set-rgb}%
1065        {/C[0 .50195 1]}{/C[0 .50195 1]}%
1066    \Test{graynine}{graynine}{.9 set-gray}{/C[.9 .9 .9]}{/C[.9]}%
1067    \Test{GraySix}{GraySix}{.6 set-gray}{/C[.6 .6 .6]}{/C[.6]}%
1068    \Test{[wave]{500}}{[wave]{500}}{0 1 .49846 set-rgb}%
1069        {/C[0 1 .49846]}{/C[0 1 .49846]}%
1070    \TestError[6]{[empty]{}}{}{}{}\NoEmptyModel
1071    \TestError[7]{[empty]{}}{}{}{}\NoEmptyModel
1072    \end{qstest}

1073    ⟨/test3⟩

1074    ⟨*test⟩
1075    \begin{document}
1076    \end{document}
1077    ⟨/test⟩
```

3.2 Test for package **xcolor**

```
1078    ⟨*test-xcolor⟩
1079    \NeedsTeXFormat{LaTeX2e}
1080    \nofiles
1081    \documentclass{minimal}
1082    ⟨*xcol1⟩
```

```
1083 \usepackage{xcolor}
1084 \usepackage{xcolor-patch}[2016/05/16]
1085 ⟨/xcol1⟩
1086 ⟨*xcol2⟩
1087 \usepackage{scrlfile}
1088 \usepackage{xcolor-patch}[2016/05/16]
1089 \usepackage{xcolor}
1090 ⟨/xcol2⟩
1091 ⟨*xcol3⟩
1092 \usepackage{xcolor-patch}[2016/05/16]
1093 \usepackage{xcolor}
1094 \begin{document}
1095 ⟨/xcol3⟩
1096 \makeatletter
1097 \newcommand*{\ColModList}{%
1098   rgb,%
1099   cmy,%
1100   cmyk,%
1101   hsb,%
1102   Hsb,%
1103   tHsb,%
1104   gray,%
1105   RGB,%
1106   HTML,%
1107   HSB,%
1108   Gray,%
1109   % wave,
1110 }
1111 \newcommand*{\StartModel}{rgb}
1112 \newcommand*{\StartValues}{.1,.2,.3}
1113 \@for\x:=\ColModList\do{%
1114   \ifx\x\@empty
1115   \else
1116     \convertcolorspec\StartModel\StartValues\x\y
1117     \typeout{* [\StartModel]{\StartValues} ==> [\x]{\y}}%
1118     \@for\xx:=\ColModList\do{%
1119       \ifx\xx\@empty
1120       \else
1121         \convertcolorspec\x\y\xx\yy
1122         \typeout{* [\x]{\y} ==> [\xx]{\yy}}%
1123       \fi
1124     }%
1125   \fi
1126 }
1127 ⟨xcol3⟩\end{document}
1128 ⟨xcol1 j xcol2⟩\@@end
1129 ⟨/test-xcolor⟩
```

3.2.1   Test for \@frameb@x/\fbox

```
1130 ⟨*test-xcolor-fbox⟩
1131 \NeedsTeXFormat{LaTeX2e}
1132 \documentclass{article}
1133 \usepackage{xcolor}
1134 \usepackage{xcolor-patch}[2016/05/16]
1135 \makeatletter
1136 \protected@edef\x{\fbox{abc}}
1137 \let\@tempa\@undefined
1138 \protected@edef\x{\fbox{abc}}
1139 \makeatother
1140 \begin{document}
1141 \MakeUppercase{\fbox{abc}}
1142 \end{document}
1143 ⟨/test-xcolor-fbox⟩
```

4 Installation

4.1 Download

Package.   This package is available on CTAN[1]:

CTAN:macros/latex/contrib/oberdiek/hycolor.dtx The source file.

CTAN:macros/latex/contrib/oberdiek/hycolor.pdf Documentation.

Bundle.   All the packages of the bundle 'oberdiek' are also available in a TDS compliant ZIP archive. There the packages are already unpacked and the documentation files are generated. The files and directories obey the TDS standard.

CTAN:install/macros/latex/contrib/oberdiek.tds.zip

TDS refers to the standard "A Directory Structure for TeX Files" (CTAN:tds/tds.pdf). Directories with `texmf` in their name are usually organized this way.

4.2 Bundle installation

Unpacking.   Unpack the `oberdiek.tds.zip` in the TDS tree (also known as `texmf` tree) of your choice. Example (linux):

```
unzip oberdiek.tds.zip -d ~/texmf
```

Script installation.   Check the directory `TDS:scripts/oberdiek/` for scripts that need further installation steps. Package **attachfile2** comes with the Perl script `pdfatfi.pl` that should be installed in such a way that it can be called as `pdfatfi`. Example (linux):

```
chmod +x scripts/oberdiek/pdfatfi.pl
cp scripts/oberdiek/pdfatfi.pl /usr/local/bin/
```

4.3 Package installation

Unpacking.   The `.dtx` file is a self-extracting `docstrip` archive. The files are extracted by running the `.dtx` through plain TeX:

```
tex hycolor.dtx
```

TDS.   Now the different files must be moved into the different directories in your installation TDS tree (also known as `texmf` tree):

```
hycolor.sty                → tex/latex/oberdiek/hycolor.sty
xcolor-patch.sty           → tex/latex/oberdiek/xcolor-patch.sty
hycolor.pdf                → doc/latex/oberdiek/hycolor.pdf
test/hycolor-test1.tex     → doc/latex/oberdiek/test/hycolor-test1.tex
test/hycolor-test2.tex     → doc/latex/oberdiek/test/hycolor-test2.tex
test/hycolor-test3.tex     → doc/latex/oberdiek/test/hycolor-test3.tex
test/hycolor-test-xcol1.tex → doc/latex/oberdiek/test/hycolor-test-xcol1.tex
test/hycolor-test-xcol2.tex → doc/latex/oberdiek/test/hycolor-test-xcol2.tex
test/hycolor-test-xcol3.tex → doc/latex/oberdiek/test/hycolor-test-xcol3.tex
test/hycolor-test-xcol4.tex → doc/latex/oberdiek/test/hycolor-test-xcol4.tex
hycolor.dtx                → source/latex/oberdiek/hycolor.dtx
```

If you have a `docstrip.cfg` that configures and enables `docstrip`'s TDS installing feature, then some files can already be in the right place, see the documentation of `docstrip`.

---

[1] http://ctan.org/pkg/hycolor

4.4 Refresh file name databases

If your TeX distribution (teTeX, mikTeX, …) relies on file name databases, you must refresh these. For example, teTeX users run `texhash` or `mktexlsr`.

4.5 Some details for the interested

Unpacking with LaTeX. The `.dtx` chooses its action depending on the format:

plain TeX: Run `docstrip` and extract the files.

LaTeX: Generate the documentation.

If you insist on using LaTeX for `docstrip` (really, `docstrip` does not need LaTeX), then inform the autodetect routine about your intention:

```
latex \let\install=y\input{hycolor.dtx}
```

Do not forget to quote the argument according to the demands of your shell.

Generating the documentation. You can use both the `.dtx` or the `.drv` to generate the documentation. The process can be configured by the configuration file `ltxdoc.cfg`. For instance, put this line into this file, if you want to have A4 as paper format:

```
\PassOptionsToClass{a4paper}{article}
```

An example follows how to generate the documentation with pdfLaTeX:

```
pdflatex hycolor.dtx
makeindex -s gind.ist hycolor.idx
pdflatex hycolor.dtx
makeindex -s gind.ist hycolor.idx
pdflatex hycolor.dtx
```

5 Catalogue

The following XML file can be used as source for the TeX Catalogue. The elements `caption` and `description` are imported from the original XML file from the Catalogue. The name of the XML file in the Catalogue is `hycolor.xml`.

```
1144 ⟨*catalogue⟩
1145 <?xml version='1.0' encoding='us-ascii'?>
1146 <!DOCTYPE entry SYSTEM 'catalogue.dtd'>
1147 <entry datestamp='$Date$' modifier='$Author$' id='hycolor'>
1148   <name>hycolor</name>
1149   <caption>Implements colour for packages hyperref and bookmark.</caption>
1150   <authorref id='auth:oberdiek'/>
1151   <copyright owner='Heiko Oberdiek' year='2007-2011'/>
1152   <license type='lppl1.3'/>
1153   <version number='1.8'/>
1154   <description>
1155     This package provides the code for the color option
1156     that is used by packages <xref refid='hyperref'>hyperref</xref>
1157     and <xref refid='bookmark'>bookmark</xref>.
1158     It is not intended as package for the user.
1159     <p/>
1160     The package is part of the <xref refid='oberdiek'>oberdiek</xref> bundle.
1161   </description>
1162   <documentation details='Package documentation'
1163      href='ctan:/macros/latex/contrib/oberdiek/hycolor.pdf'/>
1164   <ctan file='true' path='/macros/latex/contrib/oberdiek/hycolor.dtx'/>
1165   <miktex location='oberdiek'/>
```

```
1166   <texlive location='oberdiek'/>
1167   <install path='/macros/latex/contrib/oberdiek/oberdiek.tds.zip'/>
1168 </entry>
1169 ⟨/catalogue⟩
```

6 History

[2007/04/09 v1.0]

- First version.

[2007/04/11 v1.1]

- Line ends sanitized.

[2008/07/29 v1.2]

- Support for package attachfile2 added.

[2008/08/01 v1.3]

- Patch package xcolor-patch added that fixes bugs in package xcolor to get the test files running.

[2008/09/08 v1.4]

- Fix added to package xcolor-patch: Fragile \@frameb@x (used in \fbox) is made robust.

[2009/10/02 v1.5]

- Doku fixes (Herbert Voss).

[2009/12/12 v1.6]

- Short info shortened.

[2011/01/30 v1.7]

- Package xcolor-patch uses package hopatch.

[2016/05/16 v1.8]

- Documentation updates.

7 Index

Numbers written in italic refer to the page where the corresponding entry is described; numbers underlined refer to the code line of the definition; plain numbers refer to the code lines where the entry is used.

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