



Tutorial on SCHOTT filter calculation tool

2017

Agenda

1. Introduction

2. Properties of a single filter

- transmittance and internal transmittance
- optical density and extinction

3. Comparing or Combining filters

4. Color of a filter (combination) and its light source

5. Tabulated data

6. User defined filters and light sources

Intention of the calculation tool

Overview on the functions of the Excel Spreadsheet

- The calculation tool is intended to use for visualizing the optical reference values of our glasses. Internal Transmittance, Transmittance, Optical Density and Extinction data can be displayed as a function of wavelength and a desired thickness.
- The internal transmittance data is listed from 200 nm to 5200 nm.
- Some values for the color analysis can be calculated as well.
- The spread sheet offers the possibility to combine and compare several filters in respect to their optical properties.
- The user may add spectral data of filter functions as a target.
- The user may add spectral data for a user defined light source for color analysis.

Functions that are not present

- This tool is not designed for optimizing the design process of an optical system.
- The data base contains only typical transmittance data. There are no tolerances given in this tool.
- This tool was composed with utmost care, however, there is no guarantee on the correctness of algorithms and data.

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SCHOTT reserves the right to change the optical and non-optical data without prior notice. This calculation tool renders all previous versions of the tool obsolete and was composed with utmost care.

Mainz, February 2017

Language

SCHOTT
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Single filter

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- [Ti diabolic](#)
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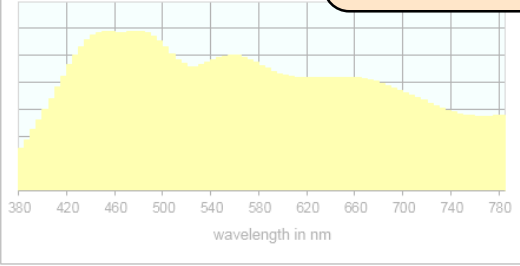
Sprache / language: **English**

Calculation of single filter with colorimetric evaluation

Select by drop-down: Filter type
Input: Thickness d =

Select by drop-down: Illuminant type

Illuminant type



Desired color locus

NVIS Green A

$u^* = 0,088$
 $v^* = 0,543$
radius of tolerance $r = 0,037$

InpS CIE diag | CIE data | TidiaS | TdiaS | TlinS | TlinS | ExtS | DS | InpC | TdiaC | TdiaC | TlinC | TnormC | User | user_light | Tau_j_data | Copyright

Only on the first spread sheet „InpS“ you can choose your preferred language.

Menus and Overview

The screenshot shows the SCHOTT software interface. On the left is a blue menu bar with the SCHOTT logo and the year 2017. The menu is organized into sections: 'Single filter', 'Combination of filters', 'User defined curves', 'Results', and 'Copyright'. Each section contains a 'Data input' link and several specific filter or curve types. Callouts point to these sections and other parts of the interface:

- All spread sheets have the same menu bar on the left**: Points to the entire left menu bar.
- Analysis of a single filter**: Points to the 'Single filter' section.
- Analysis of multiple filters or combinations of filters**: Points to the 'Combination of filters' section.
- User defined input for**
 - own filter curves
 - own light sources: Points to the 'User defined curves' section.
- Results as tabulated data**: Points to the 'Results' section.
- Note on copyright**: Points to the 'Copyright' link.

The main area of the software displays a graph titled 'Illuminat type' showing a yellow curve on a grid. Below the graph is a table with columns for wavelength (380 to 780 nm) and transmittance. The table is titled 'Desired color locus' and 'NVIS Green A'. At the bottom, a status bar shows the current spreadsheet: 'InpS' (selected), 'CIE diag', 'CIE data', 'TidiaS', 'TdiaS', 'TilinS', 'TlinS', 'ExtS', 'DS', 'InpC', 'TidiaC', 'TdiaC', 'TilinC', 'TnormC', 'User', 'user_light', 'Tau_j_data', and 'Copyright'.

Navigation

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Sprache / language: **English**

Calculation of single filter with colorimetric evaluation

Select by drop-down : Filter type **KG1**
Input: Thickness **d = 3,000 mm**

Select by drop-down : Illuminant type **C**

Illuminat type **C** CIE standard illuminant C

wavelength

Desired color locus

$u^* = 0,08$
 $v^* = 0,543$
radius of tolerance $r = 0,037$

Navigation is also possible with this bar
In green marked fields inputs are possible
Blue marked fields show the transmittance

InpS CIE diag CIE data Tidias Tdias TilinS TlinS ExtS DS **InpC** TdiaC TdiaC TilinC TnormC **User** **user_light** Tau_i data Copyright

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4. Color of a filter (combination) and its light source

5. Tabulated data

6. User defined filters and light sources

There are 9 sheets for analysis of a single filter

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Sprache / language: **English**

Calculation of single filter v...

Select by drop-down menu
Input: 1

Illuminance

Desired color locus

radius of

Data Input defining the language for annotations
defining the filter type and its thickness
defining the light source for color analysis

CIE diagram color diagram and results of color analysis
CIE data table

Ti diabolic diagram for internal transmittance in **diabatic** scale
T diabolic diagram for transmittance in **diabatic** scale
Ti linear diagram for internal transmittance in **linear** scale
T linear diagram for transmittance in **linear** scale

Extinction diagram for **extinction**
Optical density diagram for **optical density**

InpS | CIE diag | CIE data | TidiaS | TdiaS | TilinS | TlinS | ExtS | DS | InpC | TdiaC | TdiaC | TilinC | TnormC | User | user_light | Tau_i_data | Copyright .

Single filter: Data Input

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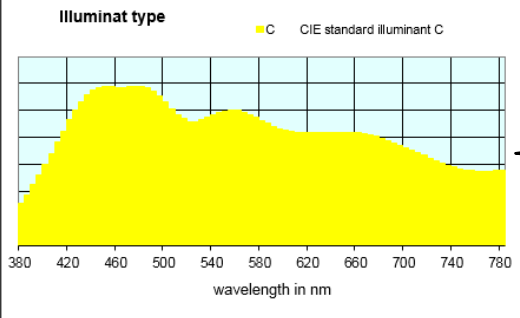
Sprache / language: **English**

Calculation of single filter with colorimetric evaluation

Select by drop-down : Filter type **KG1**
Input: Thickness **d = 3,000 mm**

Select by drop-down : Illuminant type **C**

Illuminat type ■ C CIE standard illuminant C



Desired color locus **NVIS Green A**
 $u^* = 0,088$
 $v^* = 0,543$
radius of tolerance $r = 0,037$

Select a filter type from the drop down menu and define the thickness of the filter. Your filter combination or user defined filters are at the end of the list

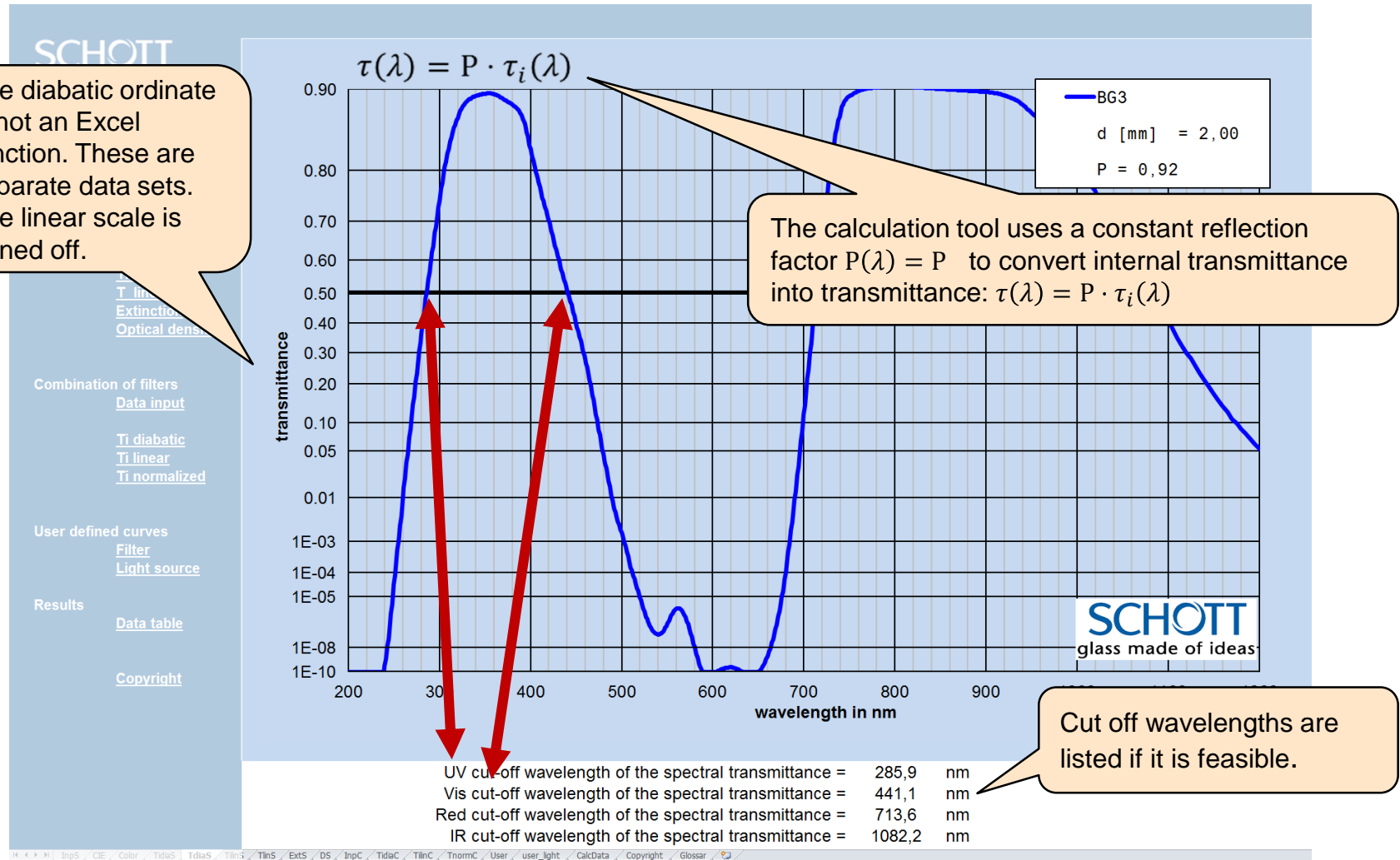
Select a light source for the color evaluation.

Graph of the spectral distribution of the emissivity of the chosen light source.

Select a NVIS color (acc. MIL-STD3009)

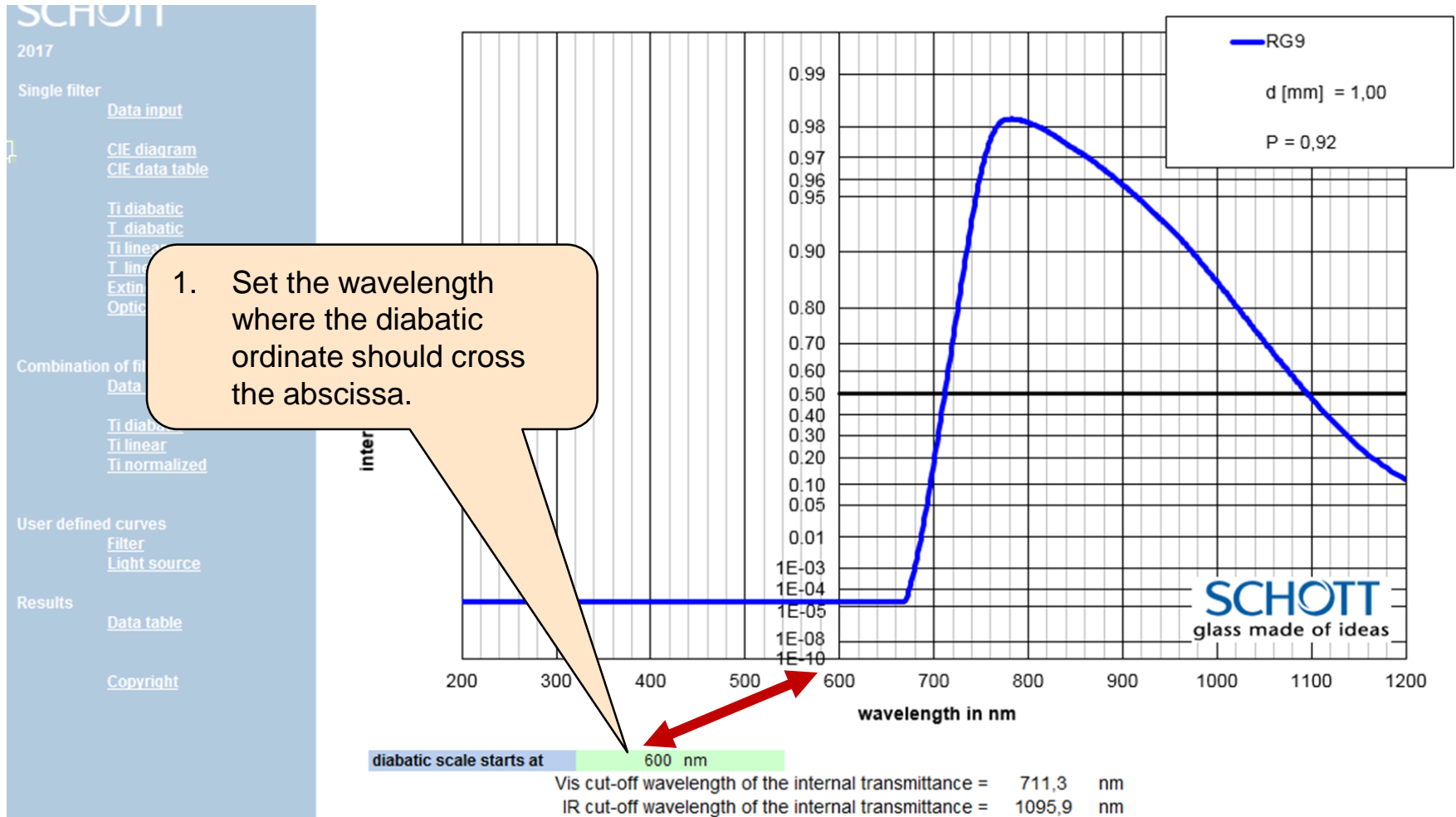
► **InpS** CIE diag CIE data TidiaS TdiaS TlinS TlinS ExtS DS **InpC** TdiaC TdiaC TlinC TnormC **User** **user_light** Tau_i_data Copyright .

Single filter: Transmittance and internal transmittance



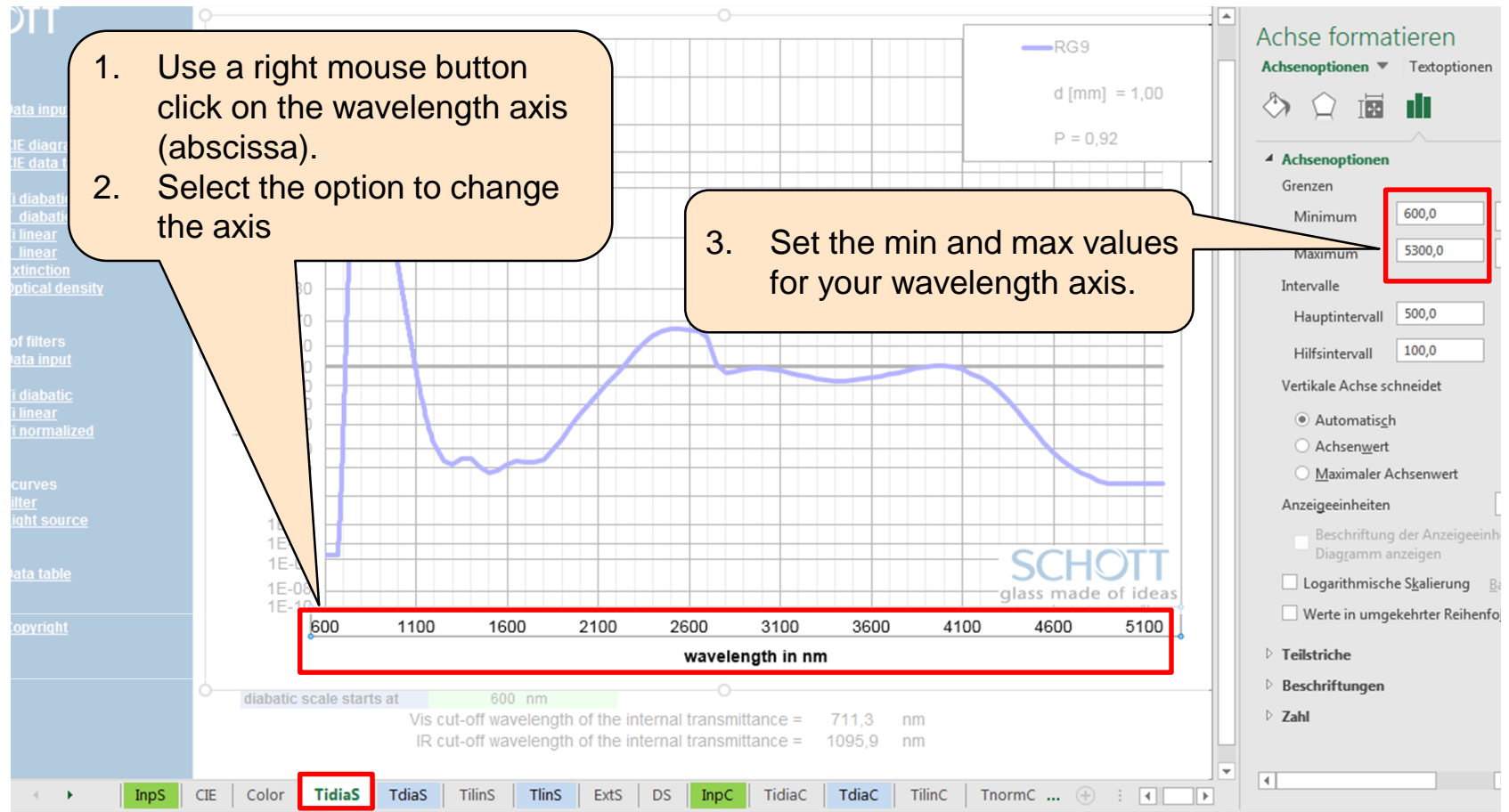
Single filter: IR data and changing the wavelength range

(1) wavelength change for diabolic scale



Single filter: IR data and changing the wavelength range

(2) change of wavelength range



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6. User defined filters and light sources

Comparing /Combining filters: There are 4 sheets for multiple filter analysis

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Calculation of cemented glass filter combination (up to 5 types)
and comparison with a given target

Type : COMBI

$\tau_i \text{ COMBI} = \tau_{i1} \times \tau_{i2} \times \tau_{i3} \times \tau_{i4} \times \tau_{i5}$

$\tau_i \text{ COMBI} = P_{ef} (\tau_{i1} \times \tau_{i2} \times \tau_{i3} \times \tau_{i4} \times \tau_{i5})$

| Display graph? | Target | choose the filter glass type | input glass thickness | Reference thickness |
|----------------|-------------|------------------------------|-----------------------|---------------------|
| NO | Target | V-LAMBDA | 1,000 mm | 1,00 mm |
| YES | Filter 1 | | | |
| YES | Filter 2 | | | |
| NO | Filter 3 | | | |
| NO | Filter 4 | | | |
| NO | Filter 5 | | | |
| NO | Combination | | | |

effective reflection factor of the combination

Data Input defining filter types and their thickness

Ti diabolic diagram for internal transmittance in **diabatic** scale

T diabolic diagram for transmittance in **diabatic** scale

Ti linear diagram for internal transmittance in **linear** scale

Ti normalized diagram for internal transmittance in **linear** scale with all graphs normalized for their maximum transmittance = 1

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CIE data
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Comparing filters: defining filter types and other input

SCHOTT 2017

Single filter

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CIE diagram
CIE data table

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T diabolic
Ti linear
T linear
Extinction
Optical density

Combination of filters
Data input

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Define a name for your combination. The thickness is computed automatically.

Input: define a target filter at a certain thickness

Up to 5 different filters each at a different thickness can be chosen

Input: the effective reflection factor P_{eff} of the cemented filter combination must be specified by the user

Input: Which curves should be displayed?

| Display graph? | | Choose the filter glass type | input glass thickness | Reference thickness |
|----------------|----------|------------------------------|-----------------------|---------------------|
| NO | Target | V-LAMBDA | 1,000 mm | 1,00 mm |
| YES | Filter 1 | KG1 | 3,000 mm | 2,00 mm |
| YES | Filter 2 | KG2 | 5,000 mm | 2,00 mm |
| NO | Filter 3 | Ti=1 | 0,000 mm | 1,00 mm |
| NO | Filter 4 | Ti=1 | 0,000 mm | 1,00 mm |
| NO | Filter 5 | Ti=1 | 0,000 mm | 1,00 mm |
| = | | | | |
| Combination | | C1 | total thickness | 8,000 mm |

effective reflection factor of the combination $P_{eff} = 0,91$

Comparing /Combining filters: There are 4 sheets for multiple filter analysis

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Calculation of cemented glass filter combination (up to 5 types)
and comparison with a given target
Type : COMBI

$\tau_i \text{ COMBI} = \tau_{i1} \times \tau_{i2} \times \tau_{i3} \times \tau_{i4} \times \tau_{i5}$

$\tau_i \text{ COMBI} = P_{ef} (\tau_{i1} \times \tau_{i2} \times \tau_{i3} \times \tau_{i4} \times \tau_{i5})$

| Display graph? | | choose the filter glass type | input glass thickness | Reference thickness |
|--|----------|------------------------------|-----------------------|---------------------|
| NO | Target | V-LAMBDA | 1,000 mm | 1,00 mm |
| YES | Filter 1 | KG1 | 3,000 ⁰ mm | 2,00 mm |
| YES | Filter 2 | KG2 | 5,000 ⁰ mm | 2,00 mm |
| NO | Filter 3 | Ti=1 | 0,000 ⁰ mm | 1,00 mm |
| NO | Filter 4 | Ti=1 | 0,000 ⁰ mm | 1,00 mm |
| NO | Filter 5 | | | |
| = | | | | |
| effective reflection factor of the combination | | | | |

Ti diabolic

T diabolic

Ti linear

Ti normalized

diagram for internal transmittance in **diabolic** scale

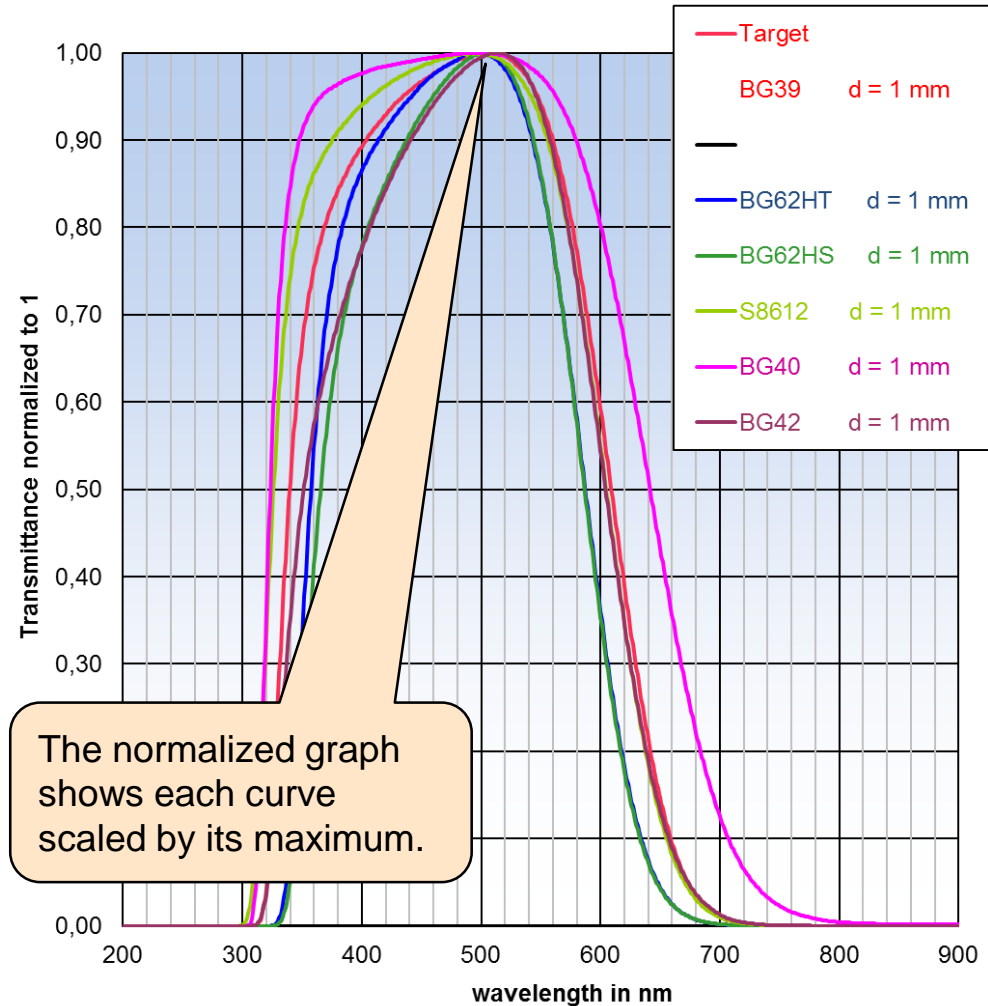
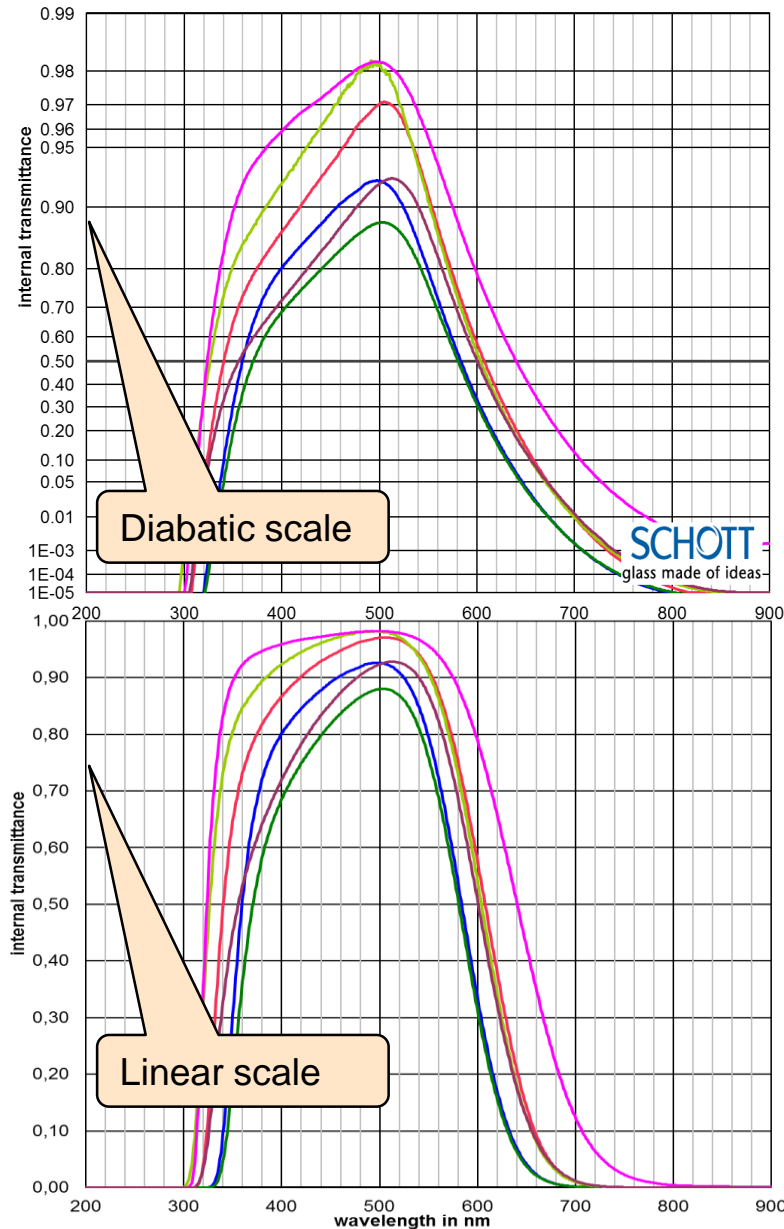
diagram for transmittance in **diabolic** scale

diagram for internal transmittance in **linear** scale

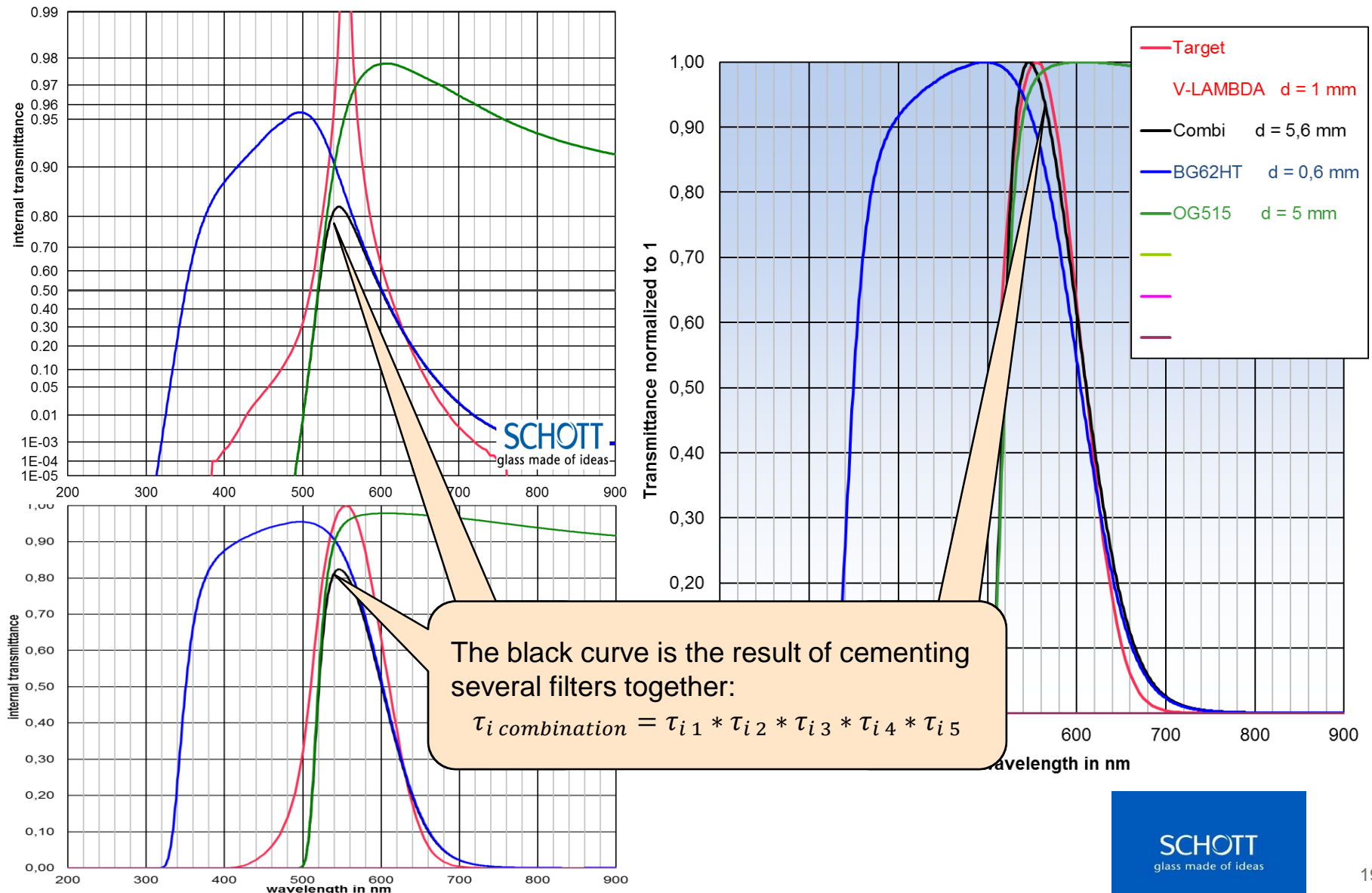
diagram for internal transmittance in **linear** scale with all graphs normalized for their maximum transmittance = 1

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CIE data
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Comparing filters: diabatic, linear, normalized scale



Combining filters: internal transmittance in diabatic, linear, normalized scale



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Color of light source and filtered radiation

- All required data input for color analysis has to be given in the sheet „**Data input**“ for a single filter.
- The user can choose any single filter glass type or the cemented combination of several filter glasses, which are given in the sheet „**Data input**“ for „**Combinations of filters**.“
- The color of filtered radiation is a function of
 - the filter glass type
 - the filter glass thickness
 - the light source
- The color of a light source or filtered radiation can be described by the definitions of the CIE made in 1931 and 1976. The results are given as a graph or tabulated data

There are two types of color diagrams available: **x-y-** or **u'-v'-** chromaticity diagram

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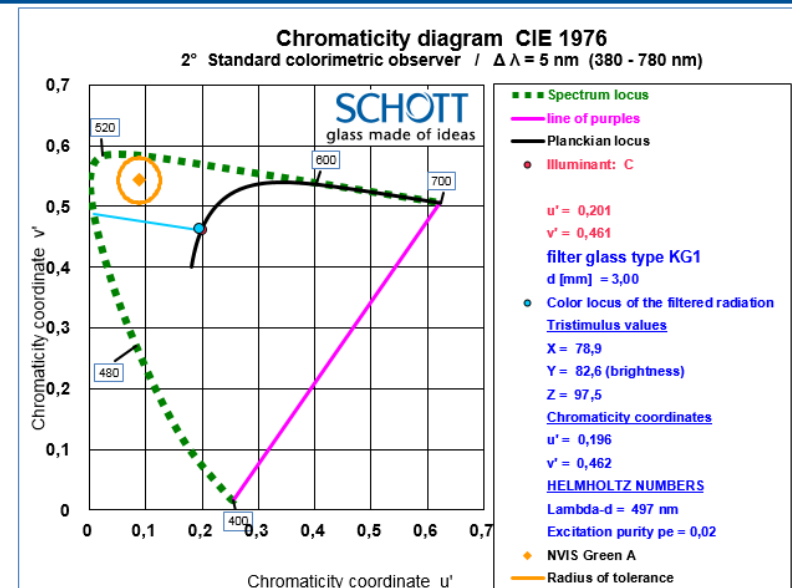
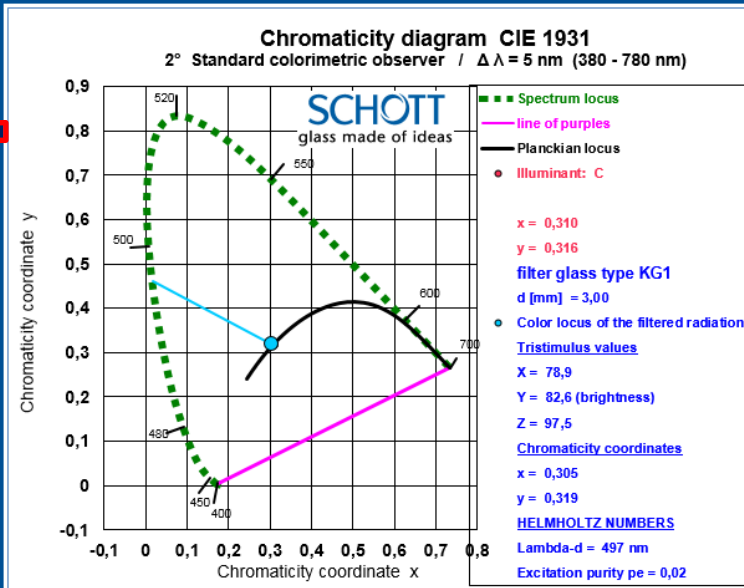
2017

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InpS

CIE diag

CIE data

TidiaS

TdiaS

TilinS

TlinS

ExtS

DS

InpC

TidiaC

TdiaC

TilinC

TnormC

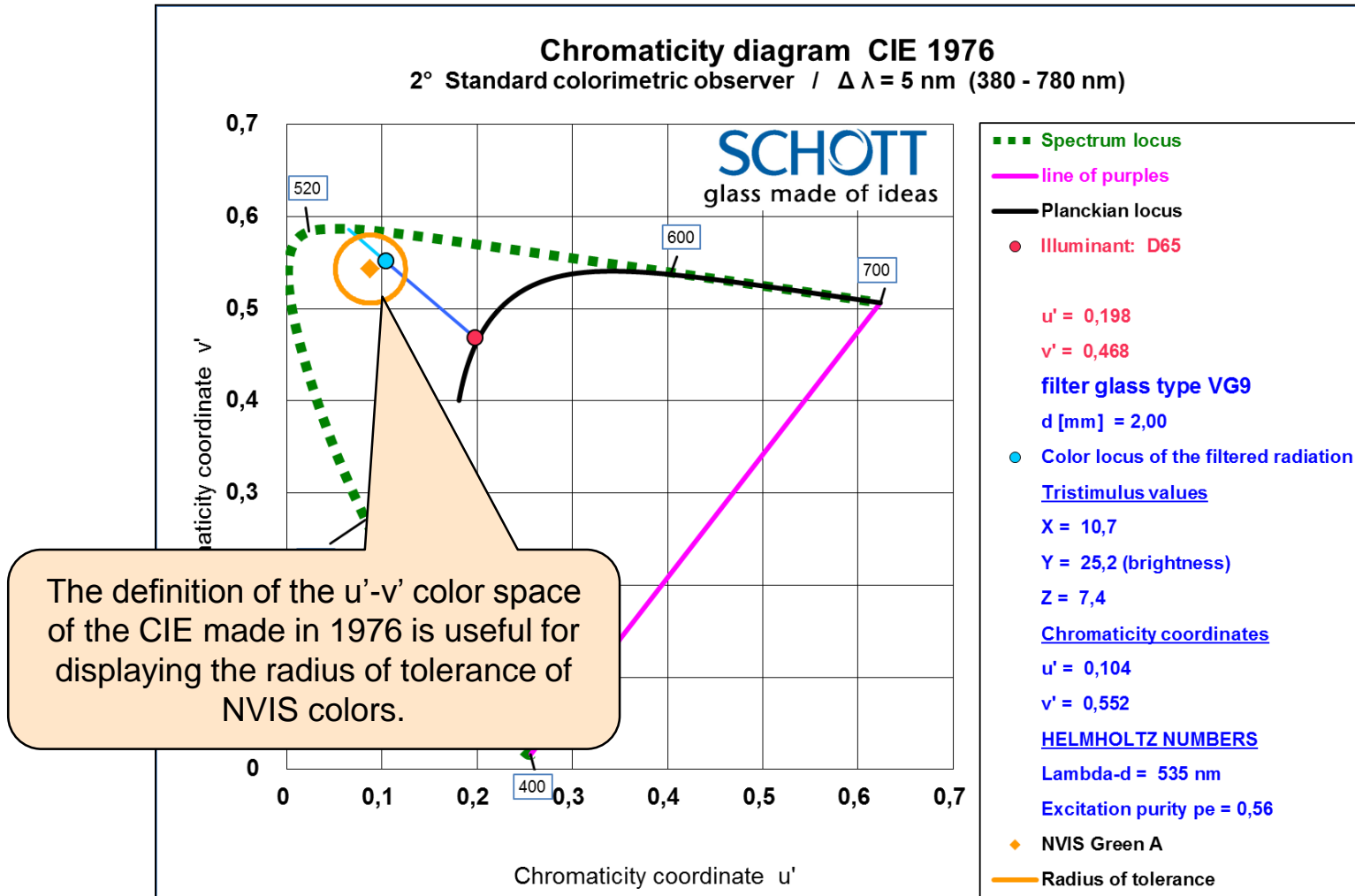
User

user_light

Tau_i data

Copyright ...

Color of filtered radiation in u' - v' -coordinates



Color of light source and filtered radiation

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Single filter

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| | |
|---------------------|---------|
| filter glass type | KG1 |
| glass thickness d = | 3,00 mm |

| COLORIMETRIC EVALUATION | | | |
|--|----------------|--------|--|
| COLOR LOCUS OF ILLUMINANT | | | |
| Chromaticity coordinates | x | 0,310 | according to CIE N0 15.2 (1986) 2° standard colorimetric observer 380 nm - 780 nm $\Delta\lambda = 5$ nm |
| | y | 0,316 | |
| COLOR LOCUS OF THE FILTERED RADIATION | | | |
| Chromaticity coordinates | x | 0,305 | |
| | y | 0,319 | |
| | u' | 0,196 | |
| | v' | 0,462 | |
| Tristimulus value | Y | 82,6 | (brightness) |
| Tristimulus values | X | 78,9 | (brightness) |
| | Y | 82,6 | |
| | Z | 97,5 | |
| HELMHOLTZ NUMBERS | | | |
| Excitation purity | p_e | 0,02 | |
| Dominant wavelength | λ_d | 497 nm | |
| Tristimulus value | Y | 82,6 | (brightness) |
| INTEGRATED TRANSMITTANCE VALUES | | | |
| Luminous transmittance | $\tau_{v,De5}$ | 82,6% | according to DIN EN ISO 4007: 2012 |
| UV-A transmittance | τ_{UVA} | 71,9% | 315 nm - 380 nm |
| UV-B transmittance | τ_{UVB} | 10,5% | 280 nm - 315 nm |
| Infrared transmittance | τ_{IRA} | 1,8% | 780 nm - 1400 nm |

►
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The internal transmittance data is listed for the specified thicknesses

- The sheet „**Tau_i data**“ contains the internal transmittance data for the chosen filter types.
- The data is listed from 200 to 1100 nm in steps of 1 nm and from 1200 nm to 5200 nm in steps of 50 nm.

| SCHOTT 2017 | | | | | | | | | |
|--|---------------------|----------------|---|-----------------|-----------------|-----------------|-----------------|-----------------|----------------------------|
| Results of calculation of internal transmittance | | | | | | | | | |
| Single filter | Single filter | | Calculation of a combination of filters | | | | | | |
| | filter glass type | KG1 | Target | Filter 1 | Filter 2 | Filter 3 | Filter 4 | Filter 5 | Combination |
| | Reflection factor P | 0,920 | V-LAMBDA | KG1 | KG2 | Ti=1 | Ti=1 | Ti=1 | C1 |
| | Reference thickness | 2,00 | 1,00 | 2,00 | 2,00 | 1,00 | 1,00 | 1,00 | --- |
| CIE diagram CIE data table | Filter thickness d | 3,000 | 1,000 | 3,000 | 5,000 | 0,000 | 0,000 | 0,000 | 8,000 |
| | λ(nm) | τ _i | τ _i Target | τ _{i1} | τ _{i2} | τ _{i3} | τ _{i4} | τ _{i5} | τ _i combination |
| | Ti diabatic | 200 | 3,16E-08 | 3,16E-08 | 3,16E-13 | 1,00E+00 | 1,00E+00 | 1,00E+00 | 1,00E-20 |
| | T diabatic | 201 | 3,16E-08 | 3,16E-08 | 3,16E-13 | 1,00E+00 | 1,00E+00 | 1,00E+00 | 1,00E-20 |
| Combination of filters | Ti linear | 202 | 3,16E-08 | 3,16E-08 | 3,16E-13 | 1,00E+00 | 1,00E+00 | 1,00E+00 | 1,00E-20 |
| | T linear | 203 | 3,16E-08 | 3,16E-08 | 3,16E-13 | 1,00E+00 | 1,00E+00 | 1,00E+00 | 1,00E-20 |
| | Extinction | 204 | 3,16E-08 | 3,16E-08 | 3,16E-13 | 1,00E+00 | 1,00E+00 | 1,00E+00 | 1,00E-20 |
| | Optical density | 205 | 3,16E-08 | 3,16E-08 | 3,16E-13 | 1,00E+00 | 1,00E+00 | 1,00E+00 | 1,00E-20 |
| User defined curves | | 206 | 3,16E-08 | 3,16E-08 | 3,16E-13 | 1,00E+00 | 1,00E+00 | 1,00E+00 | 1,00E-20 |
| | | 207 | 3,16E-08 | 3,16E-08 | 3,16E-13 | 1,00E+00 | 1,00E+00 | 1,00E+00 | 1,00E-20 |
| | | 208 | 3,16E-08 | 3,16E-08 | 3,16E-13 | 1,00E+00 | 1,00E+00 | 1,00E+00 | 1,00E-20 |
| | | 209 | 3,16E-08 | 3,16E-08 | 3,16E-13 | 1,00E+00 | 1,00E+00 | 1,00E+00 | 1,00E-20 |
| Results | | 210 | 3,16E-08 | 3,16E-08 | 3,16E-13 | 1,00E+00 | 1,00E+00 | 1,00E+00 | 1,00E-20 |
| | | 211 | 3,16E-08 | 3,16E-08 | 3,16E-13 | 1,00E+00 | 1,00E+00 | 1,00E+00 | 1,00E-20 |
| | | 212 | 3,16E-08 | 3,16E-08 | 3,16E-13 | 1,00E+00 | 1,00E+00 | 1,00E+00 | 1,00E-20 |
| | | 213 | 3,16E-08 | 3,16E-08 | 3,16E-13 | 1,00E+00 | 1,00E+00 | 1,00E+00 | 1,00E-20 |
| Copyright | | 214 | 3,16E-08 | 3,16E-08 | 3,16E-13 | 1,00E+00 | 1,00E+00 | 1,00E+00 | 1,00E-20 |
| | | 215 | 3,16E-08 | 3,16E-08 | 3,16E-13 | 1,00E+00 | 1,00E+00 | 1,00E+00 | 1,00E-20 |
| | | 216 | 3,16E-08 | 3,16E-08 | 3,16E-13 | 1,00E+00 | 1,00E+00 | 1,00E+00 | 1,00E-20 |
| | | 217 | 3,16E-08 | 3,16E-08 | 3,16E-13 | 1,00E+00 | 1,00E+00 | 1,00E+00 | 1,00E-20 |
| Data table | | 218 | 3,16E-08 | 3,16E-08 | 3,16E-13 | 1,00E+00 | 1,00E+00 | 1,00E+00 | 1,00E-20 |
| | | 219 | 3,16E-08 | 3,16E-08 | 3,16E-13 | 1,00E+00 | 1,00E+00 | 1,00E+00 | 1,00E-20 |
| | | 220 | 3,16E-08 | 3,16E-08 | 3,16E-13 | 1,00E+00 | 1,00E+00 | 1,00E+00 | 1,00E-20 |
| | | 221 | 3,16E-08 | 3,16E-08 | 3,16E-13 | 1,00E+00 | 1,00E+00 | 1,00E+00 | 1,00E-20 |
| Copyright | | 222 | 3,16E-08 | 3,16E-08 | 3,16E-13 | 1,00E+00 | 1,00E+00 | 1,00E+00 | 1,00E-20 |
| | | 223 | 3,16E-08 | 3,16E-08 | 3,16E-13 | 1,00E+00 | 1,00E+00 | 1,00E+00 | 1,00E-20 |
| | | 224 | 3,16E-08 | 3,16E-08 | 3,16E-13 | 1,00E+00 | 1,00E+00 | 1,00E+00 | 1,00E-20 |
| | | 225 | 3,16E-08 | 3,16E-08 | 3,16E-13 | 1,00E+00 | 1,00E+00 | 1,00E+00 | 1,00E-20 |
| Copyright | | 226 | 3,16E-08 | 3,16E-08 | 3,16E-13 | 1,00E+00 | 1,00E+00 | 1,00E+00 | 1,00E-20 |
| | | 227 | 3,16E-08 | 3,16E-08 | 3,16E-13 | 1,00E+00 | 1,00E+00 | 1,00E+00 | 1,00E-20 |
| | | 228 | 3,16E-08 | 3,16E-08 | 3,16E-13 | 1,00E+00 | 1,00E+00 | 1,00E+00 | 1,00E-20 |
| | | 229 | 3,16E-08 | 3,16E-08 | 3,16E-13 | 1,00E+00 | 1,00E+00 | 1,00E+00 | 1,00E-20 |
| Copyright | | 230 | 3,16E-08 | 3,16E-08 | 3,16E-13 | 1,00E+00 | 1,00E+00 | 1,00E+00 | 1,00E-20 |
| | | 231 | 3,16E-08 | 3,16E-08 | 3,16E-13 | 1,00E+00 | 1,00E+00 | 1,00E+00 | 1,00E-20 |
| | | 232 | 3,16E-08 | 3,16E-08 | 3,16E-13 | 1,00E+00 | 1,00E+00 | 1,00E+00 | 1,00E-20 |
| | | 233 | 3,16E-08 | 3,16E-08 | 3,16E-13 | 1,00E+00 | 1,00E+00 | 1,00E+00 | 1,00E-20 |

Agenda

1. Introduction
2. Properties of a single filter
 - transmittance and internal transmittance
 - optical density and extinction
3. Comparing or Combining filters
4. Color of a filter (combination) and its light source
5. Tabulated data
6. User defined filters and light sources

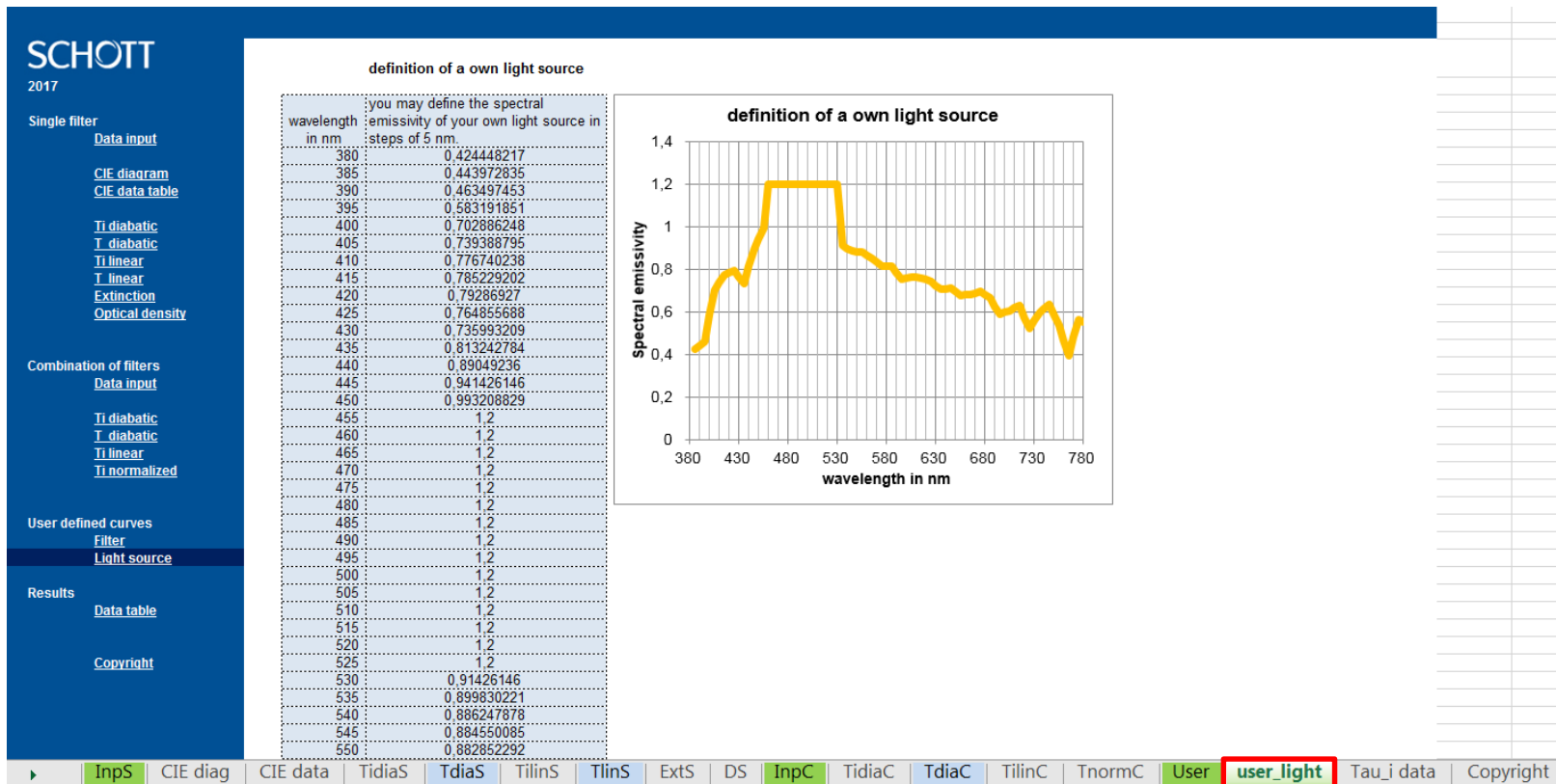
The user may define his own filter glass types

- The sheet „**User**“ has space for 100 different filter curves.
- The internal transmittance has to be given in values ranging from $0 < \tau_i < 1$.

| SCHOTT | | | | | | | | | | | | | | |
|---|---------------------------|--------------|--------------|--------------|--------------|--------------|------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| 2017 | | | | | | | | | | | | | | |
| Single filter | User type name | V-LAMBDA | Mycurve | upper limit | linear | coating | water | | | | | | | |
| | Reflection factor P | 1.00 | 0.90 | 0.90 | 0.90 | 1.00 | 0.96 | | | | | | | |
| | Reference thickness in mm | 1.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1000.00 | | | | | | | |
| Data input | free for text and notes | 380 - 780 nm | Example | Example | Example | Example | stein (1981; Internet) | | | | | | | |
| | λ [nm] | τ_{i01} | τ_{i02} | τ_{i03} | τ_{i04} | τ_{i05} | τ_{i06} | τ_{i07} | τ_{i08} | τ_{i09} | τ_{i10} | τ_{i11} | τ_{i12} | τ_{i13} |
| CIE diagram | 200 | 0.001 | | | | | 9.90E-04 | | | | | | | |
| CIE data table | 201 | 0.001 | | | 0.15075 | | 4.07E-03 | | | | | | | |
| | 202 | 0.001 | | | 0.1515 | | 7.15E-03 | | | | | | | |
| Ti diabatic | 203 | 0.001 | | | 0.15225 | | 1.02E-02 | | | | | | | |
| T diabatic | 204 | 0.001 | | | 0.153 | | 1.33E-02 | | | | | | | |
| Ti linear | 205 | 0.001 | | | 0.15375 | | 1.64E-02 | | | | | | | |
| T linear | 206 | 0.001 | | | 0.1545 | | 3.31E-02 | | | | | | | |
| Extinction | 207 | 0.001 | | | 0.15525 | | 4.99E-02 | | | | | | | |
| Optical density | 208 | 0.001 | | | 0.156 | | 6.66E-02 | | | | | | | |
| | 209 | 0.001 | | | 0.15675 | | 8.34E-02 | | | | | | | |
| | 210 | 0.001 | | | 0.1575 | | 1.00E-01 | | | | | | | |
| Combination of filters | 211 | 0.001 | | | 0.15825 | | 1.42E-01 | | | | | | | |
| Data input | 212 | 0.001 | | | 0.159 | | 1.84E-01 | | | | | | | |
| | 213 | 0.001 | | | 0.15975 | | 2.26E-01 | | | | | | | |
| Ti diabatic | 214 | 0.001 | | | 0.1605 | | 2.68E-01 | | | | | | | |
| T diabatic | 215 | 0.001 | | | 0.16125 | | 3.11E-01 | | | | | | | |
| Ti linear | 216 | 0.001 | | | 0.162 | | 3.45E-01 | | | | | | | |
| Ti normalized | 217 | 0.001 | | | 0.16275 | | 3.80E-01 | | | | | | | |
| | 218 | 0.001 | | | 0.1635 | | 4.14E-01 | | | | | | | |
| | 219 | 0.001 | | | 0.16425 | | 4.49E-01 | | | | | | | |
| User defined curves | 220 | 0.001 | | | 0.165 | | 4.84E-01 | | | | | | | |
| Filter | 221 | 0.001 | | | 0.16575 | | 4.92E-01 | | | | | | | |
| Light source | 222 | 0.001 | | | 0.1665 | | 5.00E-01 | | | | | | | |
| | 223 | 0.001 | | | 0.16725 | | 5.08E-01 | | | | | | | |
| Results | 224 | 0.001 | | | 0.168 | | 5.16E-01 | | | | | | | |
| Data table | 225 | 0.001 | | | 0.16875 | | 5.24E-01 | | | | | | | |
| | 226 | 0.001 | | | 0.1695 | | 5.28E-01 | | | | | | | |
| | 227 | 0.001 | | | 0.17025 | | 5.33E-01 | | | | | | | |
| Copyright | 228 | 0.001 | | | 0.171 | | 5.38E-01 | | | | | | | |
| | 229 | 0.001 | | | 0.17175 | | 5.43E-01 | | | | | | | |
| | 230 | 0.001 | | | 0.1725 | | 5.48E-01 | | | | | | | |
| | 231 | 0.001 | | | 0.17325 | | 5.51E-01 | | | | | | | |
| | 232 | 0.001 | | | 0.174 | | 5.54E-01 | | | | | | | |
| | 233 | 0.001 | | | 0.17475 | | 5.58E-01 | | | | | | | |
| | 234 | 0.001 | | | 0.1755 | | 5.61E-01 | | | | | | | |
| | 235 | 0.001 | | | 0.17625 | | 5.64E-01 | | | | | | | |
| <div> <div>►</div> <div>InpS</div> <div>CIE diag</div> <div>CIE data</div> <div>TidiaS</div> <div>TdiaS</div> <div>TilinS</div> <div>TlinS</div> <div>ExtS</div> <div>DS</div> <div>InpC</div> <div>TidiaC</div> <div>TdiaC</div> <div>TilinC</div> <div>TnormC</div> <div>User</div> <div>user_light</div> <div>Tau_i_data</div> <div>Copyright</div> </div> | | | | | | | | | | | | | | |

The user may define his own light source

- The sheet „**user_light**“ offers the possibility to define the spectrum of an own light source.
- The emissivity is normalized within the color analysis. Thus, the total intensity of the data input does not affect the results of color calculation.



Addendum

- Any comments or suggestions are welcome.
- If you have any questions or recommendations please contact your local sales representative.