



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

The screenshot displays the SCHOTT software interface. On the left is a dark blue sidebar with the SCHOTT logo and a navigation menu. The main area shows a 'Sprache / language:' dropdown menu with 'English' selected and highlighted by a red box. Below this is a graph titled 'Illuminat type' showing a yellow curve on a grid. A callout box with a black border and orange background points to the language dropdown, containing the text: 'Only on the first spread sheet „InpS“ you can choose your preferred language.' At the bottom, a horizontal tab bar shows 'InpS' selected and highlighted with a red box, along with other tabs like 'CIE diag', 'CIE data', etc.

SCHOTT
2017

Single filter
Data input
CIE diagram
CIE data table
Ti diabolic
T diabolic
Ti linear
T linear
Extinction
Optical density

Combination of filters
Data input
Ti diabolic
T diabolic
Ti linear
T linear normalized

User defined curves
Filter
Light source

Results
Data table
Copyright

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

Illuminat type

wavelength in nm

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

► **InpS** CIE diag | CIE data | TdiaS | TdiaS | TlinS | TlinS | ExtS | DS | InpC | TdiaC | TdiaC | TlinC | TnormC | User | user_light | Tau_i_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 following sections:

- SCHOTT 2017**
- Single filter**
 - Data input
 - CIE diagram
 - CIE data table
 - Ti diabolic
 - T diabolic
 - Ti linear
 - T linear
 - Extinction
 - Optical density
- Combination of filters**
 - Data input
 - Ti diabolic
 - T diabolic
 - Ti linear
 - Ti normalized
- User defined curves**
 - Filter
 - Light source
- Results**
 - Data table
 - Copyright

Callouts point to specific menu items and interface elements:

- "All spread sheets have the same menu bar on the left" points to the entire menu bar.
- "Analysis of a single filter" points to the "Data input" option under "Single filter".
- "Analysis of multiple filters or combinations of filters" points to the "Data input" option under "Combination of filters".
- "User defined input for" (with sub-points: own filter curves, own light sources) points to the "Filter" and "Light source" options under "User defined curves".
- "Results as tabulated data" points to the "Data table" option under "Results".
- "Note on copyright" points to the "Copyright" option under "Results".

The main window displays a graph titled "Illuminat type" with a yellow shaded area under a curve. The x-axis ranges from 380 to 780. Below the graph, there are labels for "Desired color locus" and "NVIS Green A". At the bottom, a tabbed interface shows several tabs, with "InpS" and "InpC" highlighted in green.

Navigation

SCHOTT
2017

Single filter

[Data input](#)

[CIE diagram](#)
[CIE data table](#)

[Ti diabolic](#)
[T diabolic](#)
[Tilinear](#)
[T linear](#)
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Combination of filters

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User defined curves

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[Light source](#)

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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

380 420 460 wavelenght

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

Desired color locus

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

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

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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

There are 9 sheets for analysis of a single filter

SCHOTT
2017

Sprache / language: **English**

Calculation of single filter v...

Select by drop-down menu
Input: ...

Desired color locus

radius of ...

380 420 460 500 540

Illumina...

Single filter

- Data input**
- CIE diagram
- CIE data table
- Ti diabolic
- T diabolic
- Ti linear
- T linear
- Extinction
- Optical density

Combination of filters

- Data input
- Ti diabolic
- T diabolic
- Ti linear
- Ti normalized

User defined curves

- Filter
- Light source

Results

- Data table
- Copyright

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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Single filter

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Combination of filters
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User defined curves
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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 in nm

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.

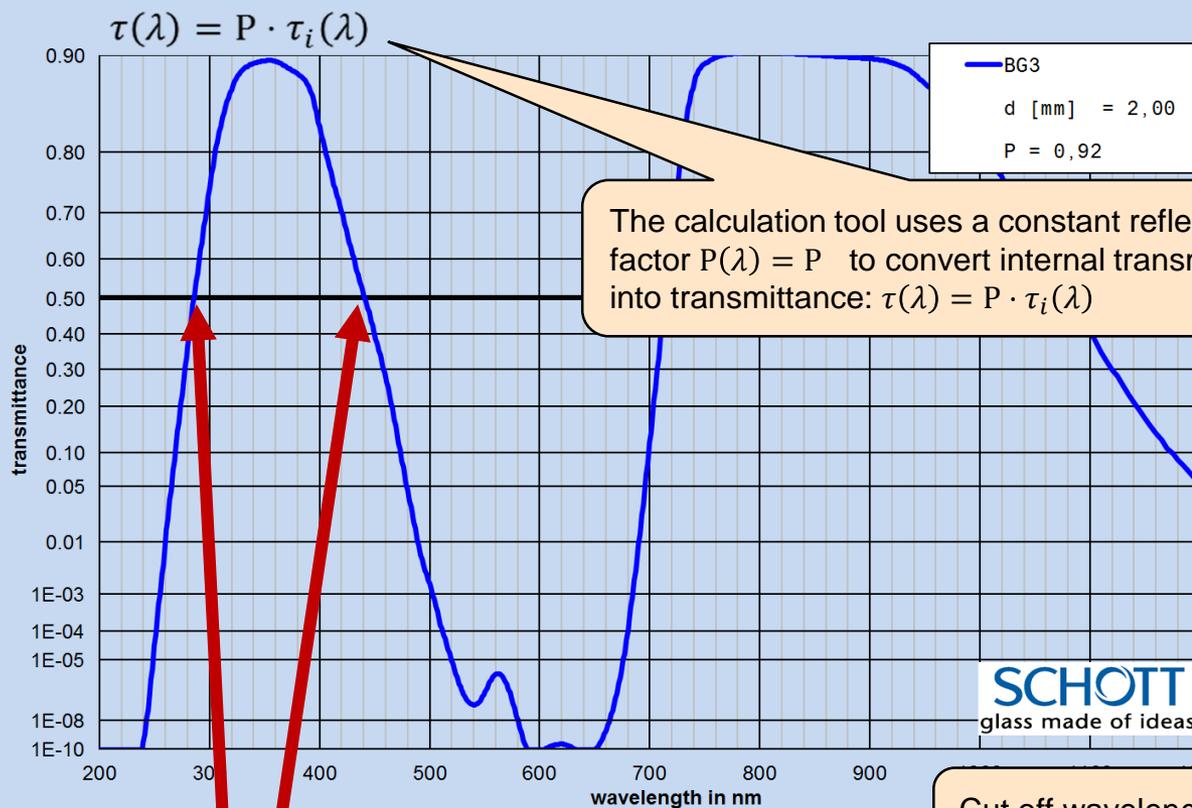
Graph of the spectral distribution of the emissivity of the chosen light source.

Select a NVIS color (acc. MIL-STD3009)

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

Single filter: Transmittance and internal transmittance

The diabatic ordinate is not an Excel function. These are separate data sets. The linear scale is turned off.



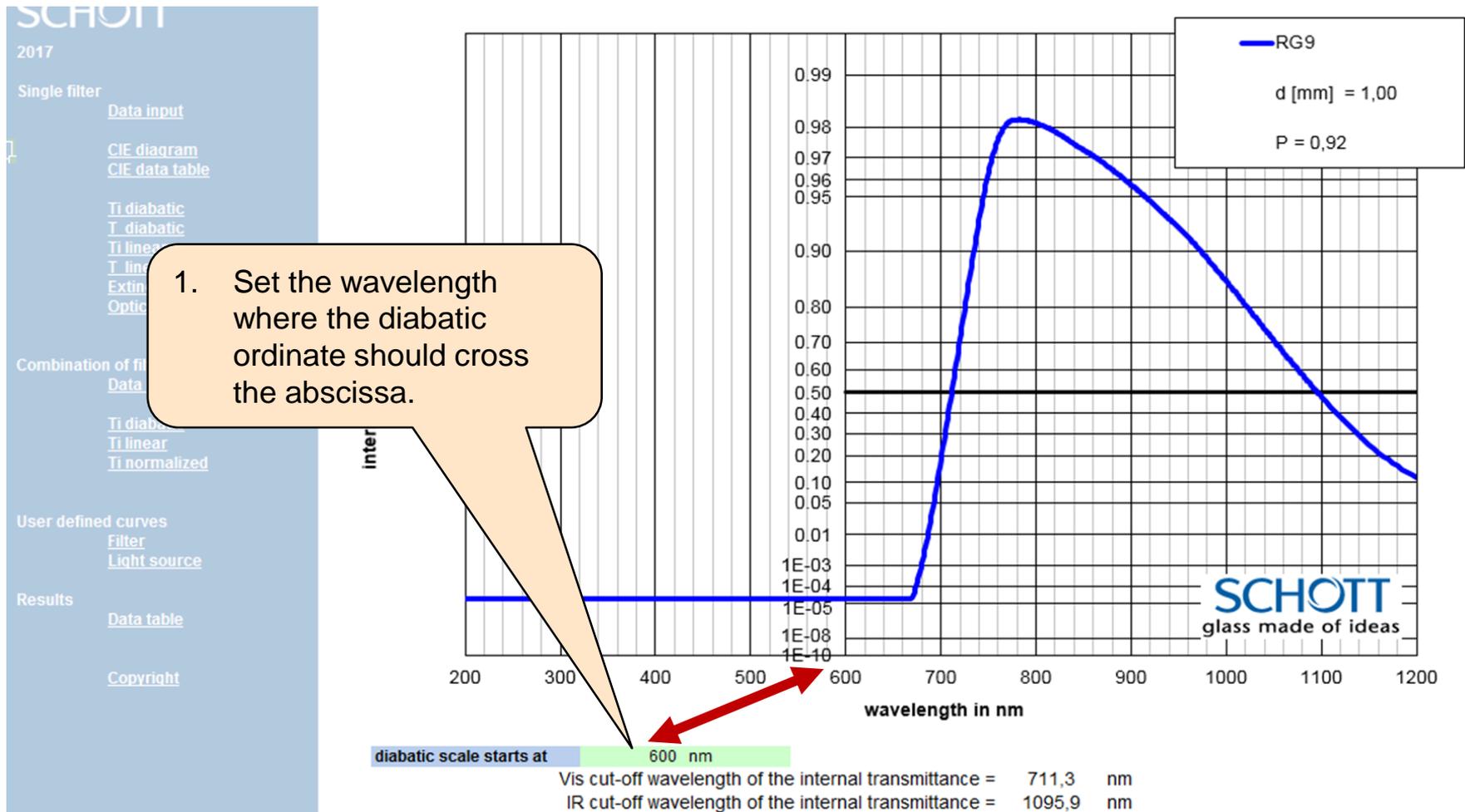
The calculation tool uses a constant reflection factor $P(\lambda) = P$ to convert internal transmittance into transmittance: $\tau(\lambda) = P \cdot \tau_i(\lambda)$

Cut off wavelengths are listed if it is feasible.

UV cut-off wavelength of the spectral transmittance = 285,9 nm
 Vis cut-off wavelength of the spectral transmittance = 441,1 nm
 Red cut-off wavelength of the spectral transmittance = 713,6 nm
 IR cut-off wavelength of the spectral transmittance = 1082,2 nm

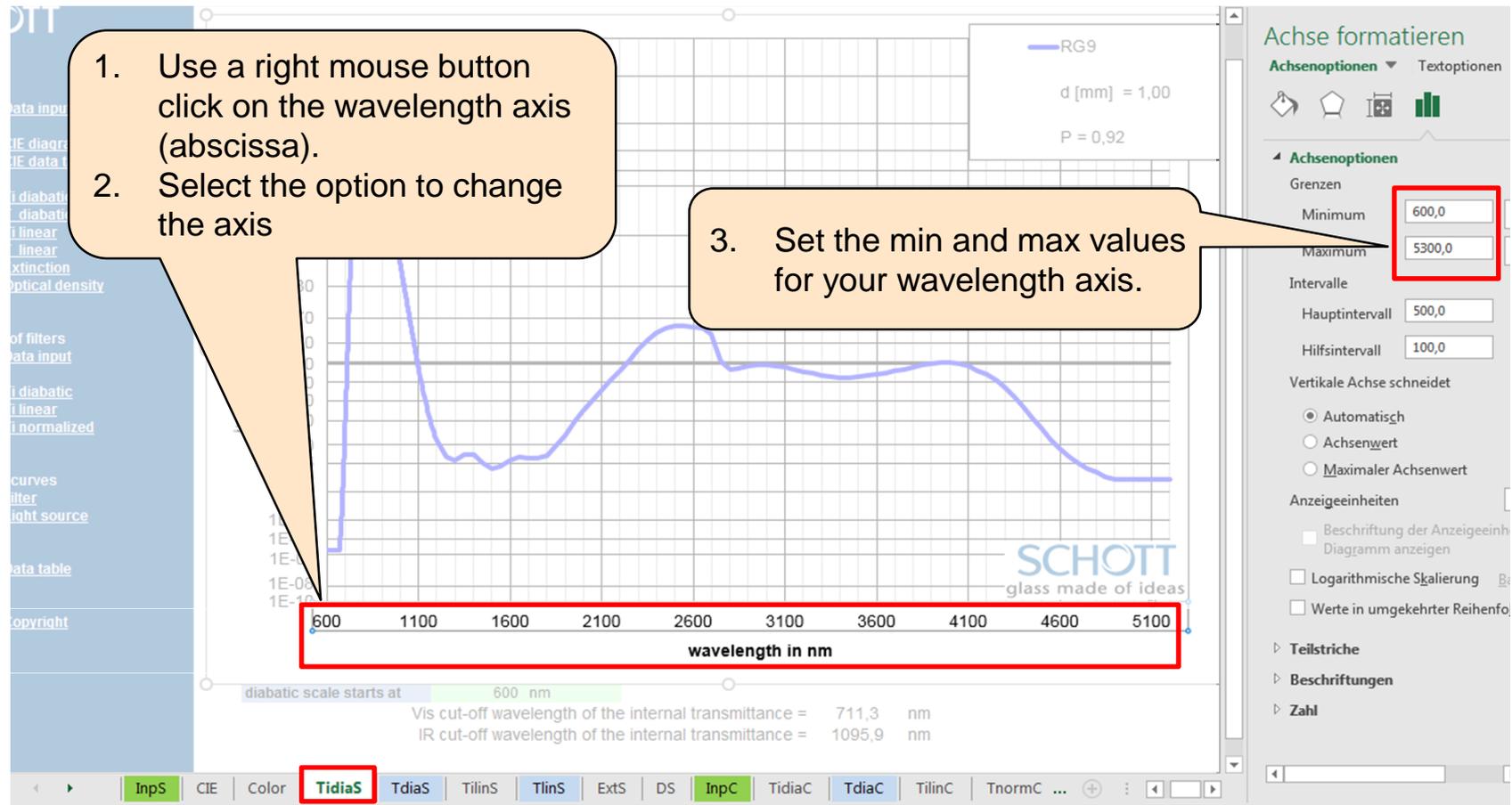
Single filter: IR data and changing the wavelength range

(1) wavelength change for diabatic scale



Single filter: IR data and changing the wavelength range

(2) change of wavelength range



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5. Tabulated data

6. User defined filters and light sources

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

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Single filter

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

Type : COMBI

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

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

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 **diabolic** scale

T diabolic diagram for transmittance in **diabolic** 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

▶ InpS CIE diag CIE data TidiaS TdiaS TlinS TlinS ExtS DS **InpC** TidiaC TdiaC TlinC TnormC User user_light Tau_i data Copyright

Comparing filters: defining filter types and other input

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?	Filter	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
=				
NO	Combination	C1	total thickness	8,000 mm

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

Navigation bar: InpS | CIE diag | CIE data | TidiaS | TdiaS | TilinS | TlinS | ExtS | DS | **InpC** | TidiaC | TdiaC | TilinC | TnormC | User | user_light | Tau_i data | Copyright

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

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Single filter

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Combination of filters

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

$\tau_i \text{ COMBI} = \tau_1 \times \tau_2 \times \tau_3 \times \tau_4 \times \tau_5$

$\tau_i \text{ COMBI} = P_{er} (\tau_1 \times \tau_2 \times \tau_3 \times \tau_4 \times \tau_5)$

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	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 diagram for internal transmittance in **diabolic** scale

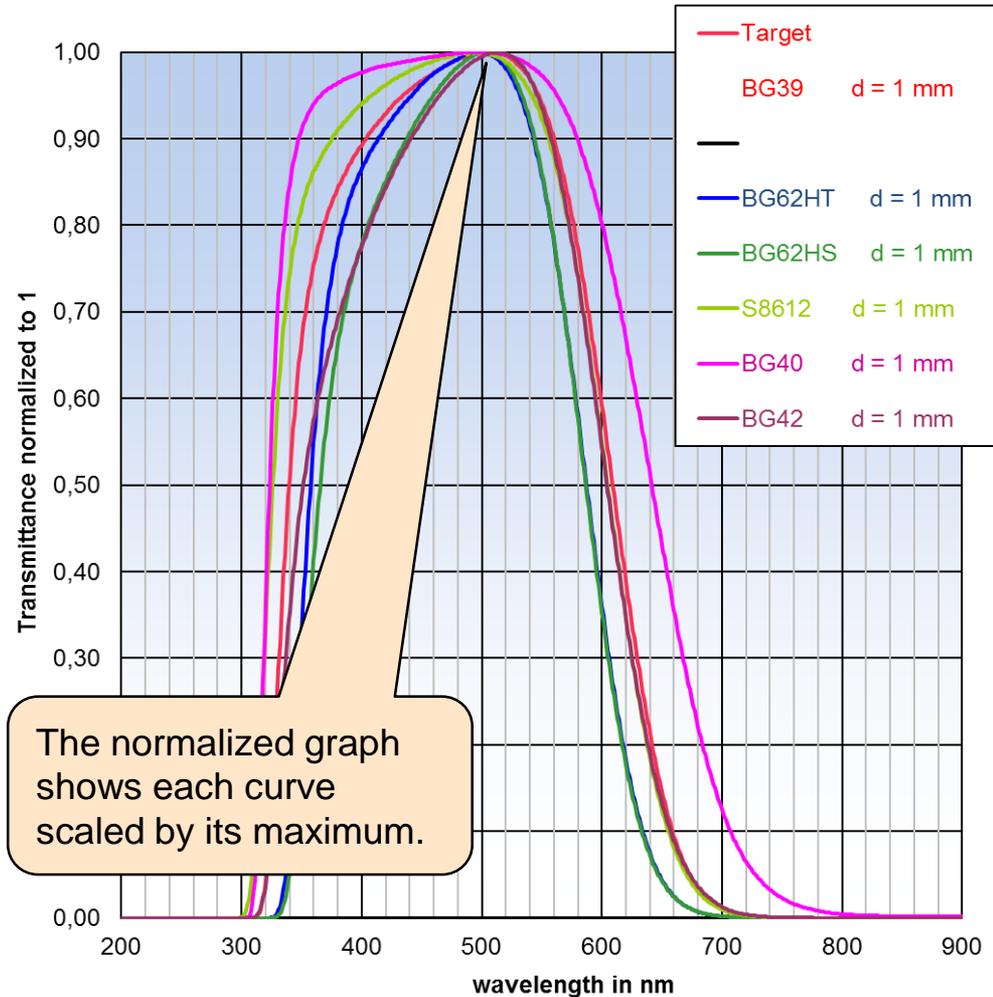
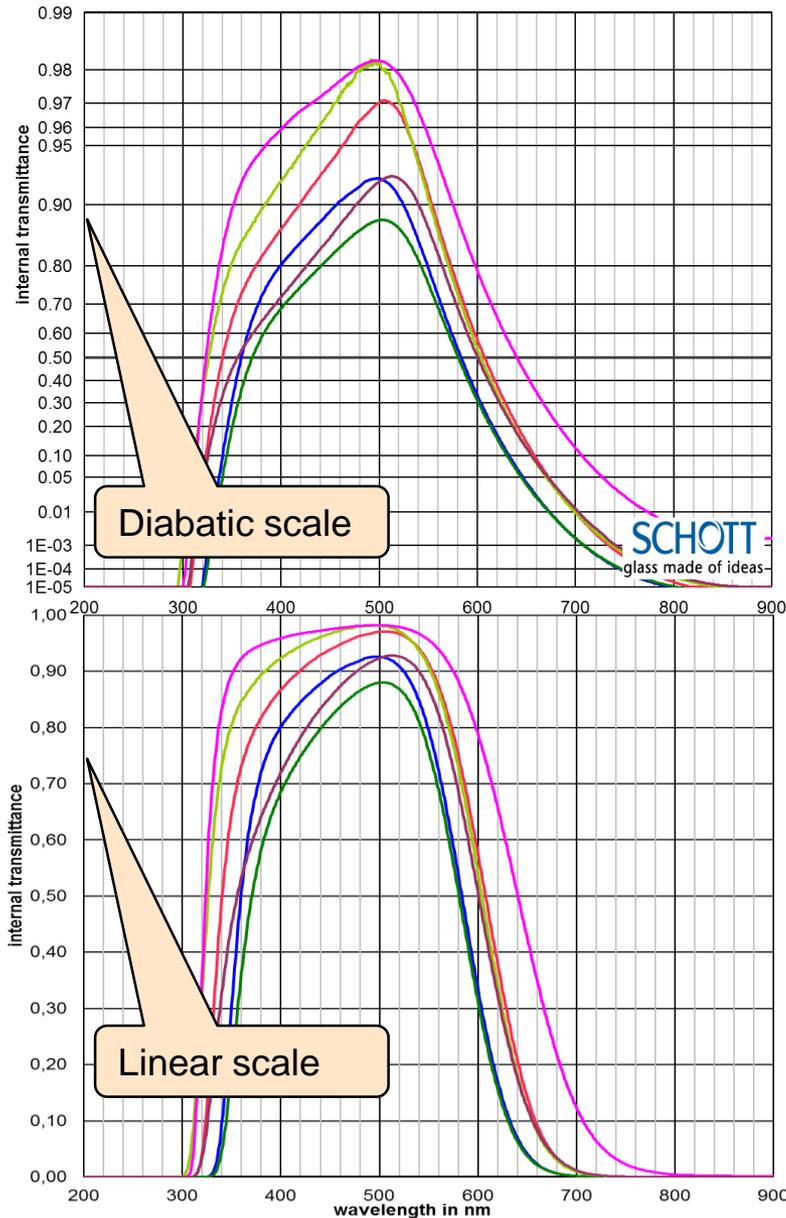
T diabolic diagram for transmittance in **diabolic** scale

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

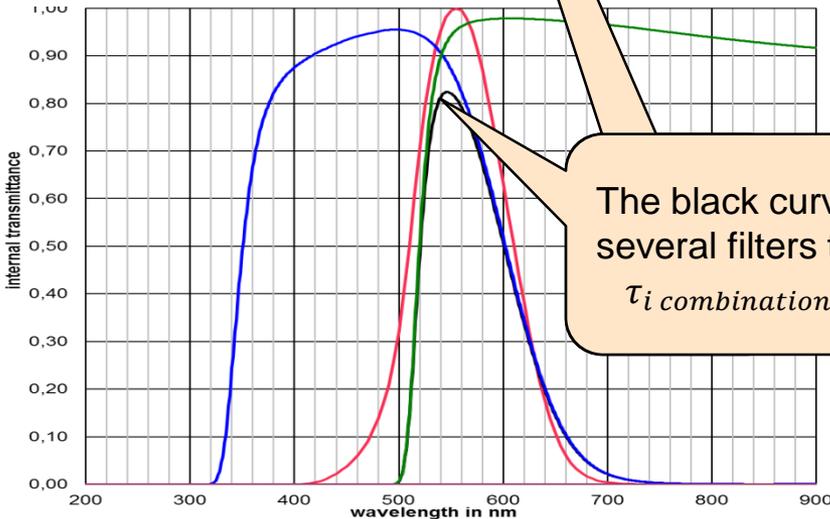
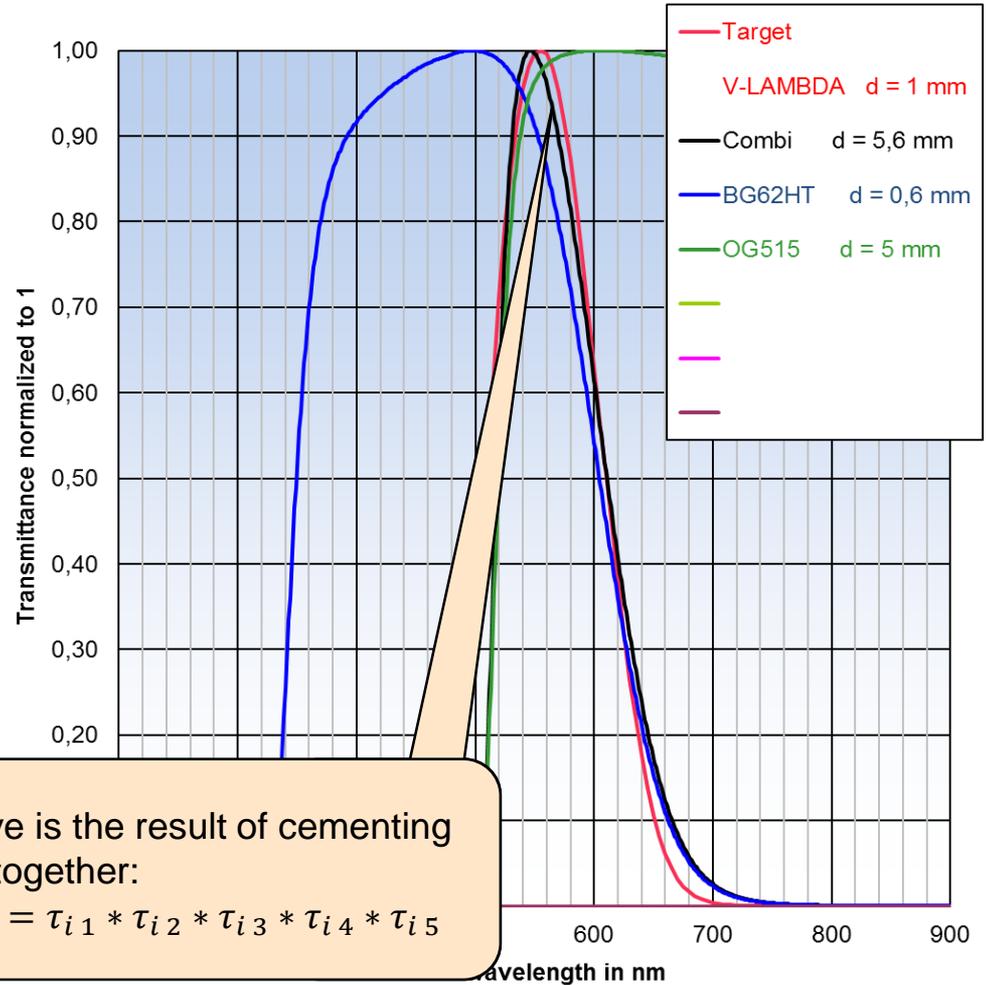
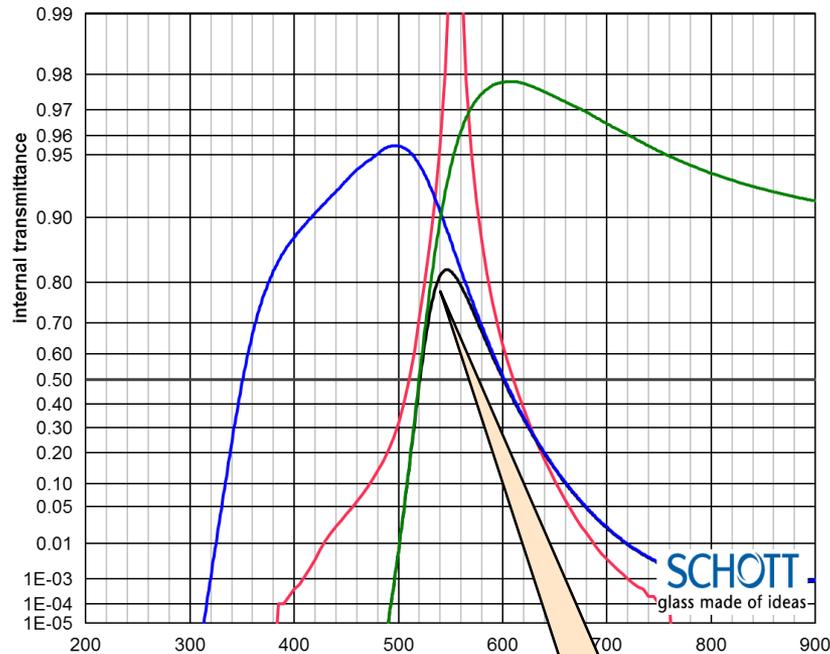
Ti normalized diagram for internal transmittance in **linear** scale with all graphs normalized for their maximum transmittance = 1

► InpS CIE diag CIE data TidiaS TdiaS TilinS TlinS ExtS DS InpC
TidiaC TdiaC TilinC TnormC
User user_light Tau_i data Copyright

Comparing filters: diabatic, linear, normalized scale



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



The black curve is the result of cementing several filters together:

$$\tau_{i \text{ combination}} = \tau_{i1} * \tau_{i2} * \tau_{i3} * \tau_{i4} * \tau_{i5}$$

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6. User defined filters and light sources

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

Single filter

Data input

CIE diagram

CIE data table

Ti diabatic

T diabatic

Ti linear

T linear

Extinction

Optical density

Combination of filters

Data input

Ti diabatic

T diabatic

Ti linear

T linear

Ti normalized

User defined curves

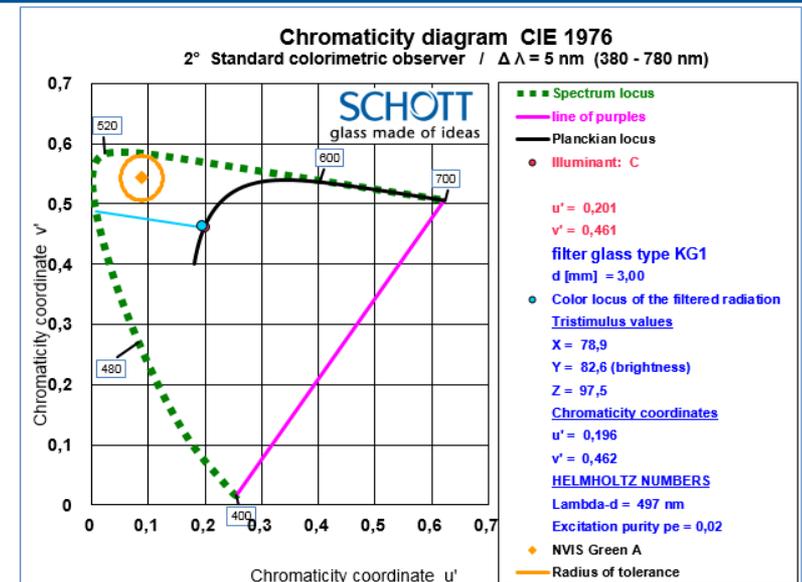
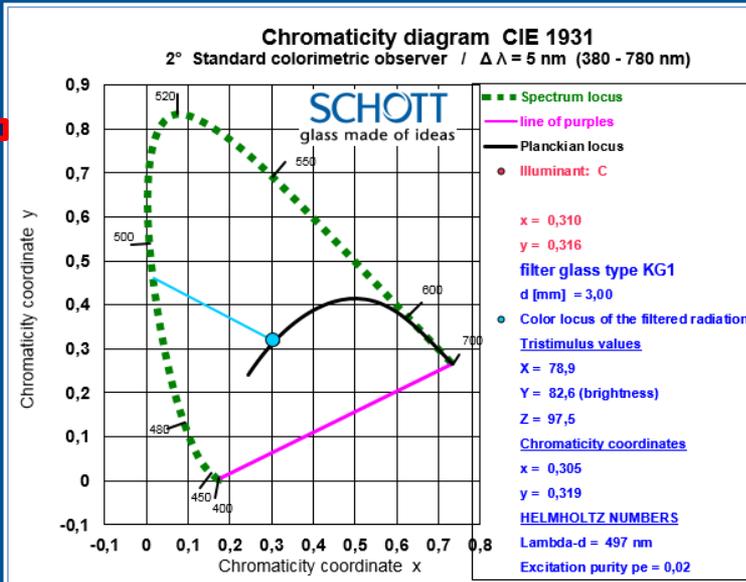
Filter

Light source

Results

Data table

Copyright



InpS

CIE diag

CIE data

TidiaS

TdiaS

TilinS

TlinS

ExtS

DS

InpC

TidiaC

TdiaC

TilinC

TnormC

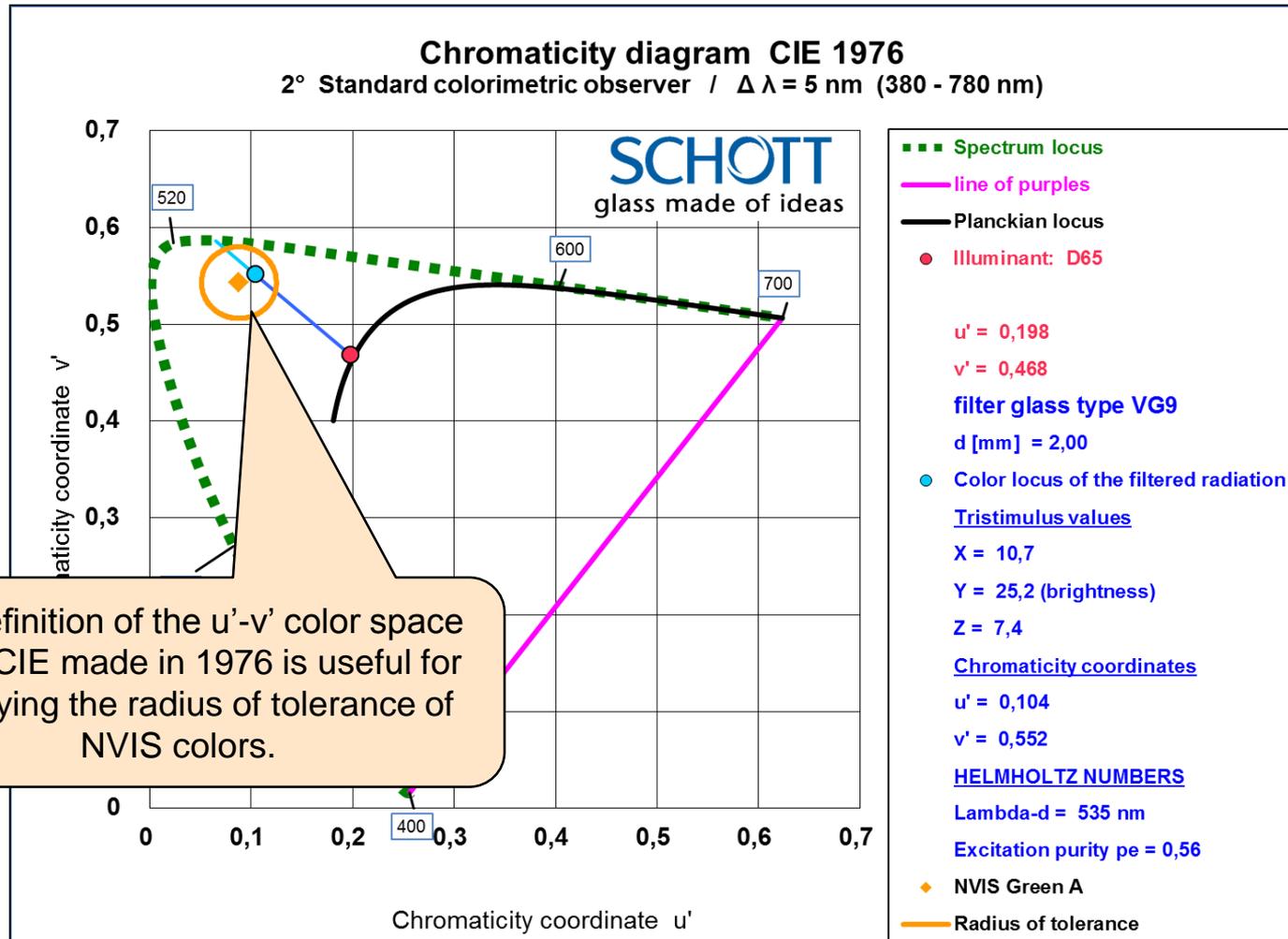
User

user_light

Tau_i data

Copyright ...

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



The definition of the u' - v' color space of the CIE made in 1976 is useful for displaying the radius of tolerance of NVIS colors.

Color of light source and filtered radiation

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2017

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)
	y	0,316	2° standard colorimetric observer
			380 nm - 780 nm $\Delta\lambda = 5$ nm
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

▶
InpS
CIE diag
CIE data
TidiaS
TdiaS
TilinS
TlinS
ExtS
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InpC
TidiaC
TdiaC
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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					Combination	
Data input	filter glass type	KG1	V-LAMBDA	KG1	KG2	Ti=1	Ti=1	Ti=1	C1
CIE diagram	Reflection factor P	0,920	1,000	0,920	0,920	1,000	1,000	1,000	0,908
CIE data table	Reference thickness	2,00	1,00	2,00	2,00	1,00	1,00	1,00	---
	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
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
	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
Combination of filters	208	3.16E-08		3.16E-08	3.16E-13	1.00E+00	1.00E+00	1.00E+00	1.00E-20
Data input	209	3.16E-08		3.16E-08	3.16E-13	1.00E+00	1.00E+00	1.00E+00	1.00E-20
	210	3.16E-08		3.16E-08	3.16E-13	1.00E+00	1.00E+00	1.00E+00	1.00E-20
Ti diabatic	211	3.16E-08		3.16E-08	3.16E-13	1.00E+00	1.00E+00	1.00E+00	1.00E-20
T diabatic	212	3.16E-08		3.16E-08	3.16E-13	1.00E+00	1.00E+00	1.00E+00	1.00E-20
Ti linear	213	3.16E-08		3.16E-08	3.16E-13	1.00E+00	1.00E+00	1.00E+00	1.00E-20
Ti normalized	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
User defined curves	217	3.16E-08		3.16E-08	3.16E-13	1.00E+00	1.00E+00	1.00E+00	1.00E-20
Filter	218	3.16E-08		3.16E-08	3.16E-13	1.00E+00	1.00E+00	1.00E+00	1.00E-20
Light source	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
Results	221	3.16E-08		3.16E-08	3.16E-13	1.00E+00	1.00E+00	1.00E+00	1.00E-20
Data table	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
Copyright	225	3.16E-08		3.16E-08	3.16E-13	1.00E+00	1.00E+00	1.00E+00	1.00E-20
	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
	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

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		User type name	V-LAMBDA	Mycurve	upper limit	linear	coating	water						
Single filter	Reflection factor P	1,00	0,90	0,90	0,90	1,00	1,00	0,96						
	Reference thickness in mm	1,00	2,00	1,00	1,00	1,00	1,00	1000,00						
Data input	free for text and notes	380 - 780 nm	Example	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							
	224	0,001			0,168		5,16E-01							
Results	225	0,001			0,16875		5,24E-01							
Data table	226	0,001			0,1695		5,28E-01							
	227	0,001			0,17025		5,33E-01							
	228	0,001			0,171		5,38E-01							
Copyright	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							

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.

SCHOTT
2017

Single filter

[Data input](#)

[CIE diagram](#)

[CIE data table](#)

[Ti diabatic](#)

[T diabatic](#)

[Ti linear](#)

[T linear](#)

[Extinction](#)

[Optical density](#)

Combination of filters

[Data input](#)

[Ti diabatic](#)

[T diabatic](#)

[Ti linear](#)

[Ti normalized](#)

User defined curves

[Filter](#)

[Light source](#)

Results

[Data table](#)

[Copyright](#)

definition of a own light source

you may define the spectral emissivity of your own light source in steps of 5 nm

wavelength in nm	emissivity
380	0.424448217
385	0.443972835
390	0.463497453
395	0.583191851
400	0.702886248
405	0.739388795
410	0.776740238
415	0.785229202
420	0.79286927
425	0.764855688
430	0.735993209
435	0.813242784
440	0.89049236
445	0.941426146
450	0.993208829
455	1.2
460	1.2
465	1.2
470	1.2
475	1.2
480	1.2
485	1.2
490	1.2
495	1.2
500	1.2
505	1.2
510	1.2
515	1.2
520	1.2
525	1.2
530	0.91426146
535	0.899830221
540	0.886247878
545	0.884550085
550	0.882852292

definition of a own light source

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

Addendum

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