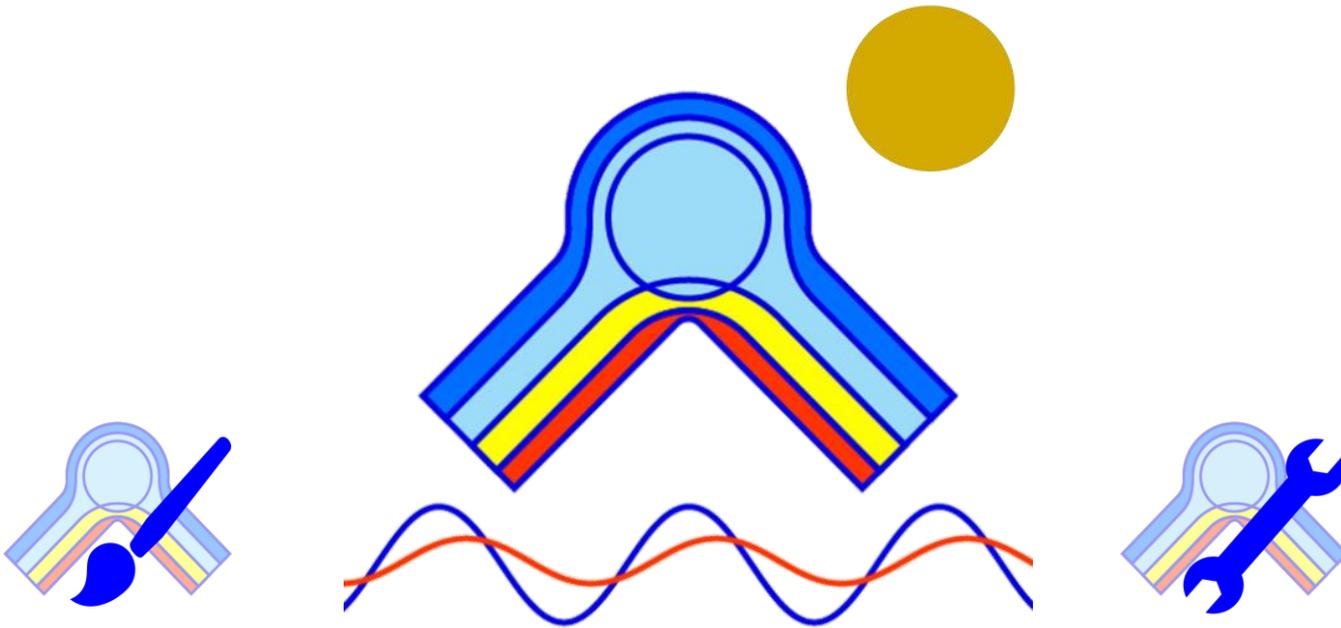




BISTRA v5 New program performances



BISTRA v5

A [Solar processor – feature RADCON](#)

- A.1 Specular reflection of solar radiation
- A.2 Handling of opaque materials in contact with transparent materials
- A.3 Revised Solar Data input – option to fix sun position
- A.4 Improved algorithms – reduced calculation time

B [Climatic data](#)

- B.1 Input of EPW and TRY files
- B.2 Handling sub-hourly solar data from hourly solar data
- B.3 User defined start time

C [EN ISO standards](#)

- C.1 Revision of Colours Window in line with BISCO v12
- C.2 Gas mix according to EN 673
- C.3 Cavities and layers according to EN ISO 6946

D [Bitmap editing](#)

- D.1 New function ‘Bisect’
- D.2 Snap to pixel
- D.3 New drawing functions
- D.4 Miscellaneous

E [Reporting: Graphic output](#)

- E.1 Sun position
- E.2 Visualisation of absorbed solar radiation
- E.3 Revised legend: clustered cavities + material names
- E.4 Miscellaneous

F [Reporting: Text output](#)

- F.1 New report definitions: ΔT_{max} , E_{tot} , E_{diff} , E_{dir} , E_{gr}
- F.2 Absorbed solar flux/energy into materials (q_{sol} , Q_{sol})
- F.3 Option to save data as .csv
- F.4 Miscellaneous

G [Online Physibel Portal](#)

- G.1 User management
- G.2 Support
- G.3 Physibel Knowledge Base
 - Documentation
 - Tutorials and examples
 - Videos

H [Licencing](#)

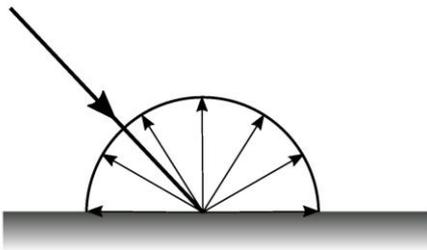
- H.1 Perpetual licence (USB key)
- H.2 Subscription licence (software key)

A1. Specular reflection of short-wave radiation

New parameter in Colour window:

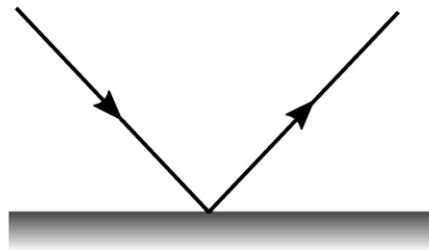
Specularity (%) = percentage specular reflection of direct solar radiation

Diffuse reflection



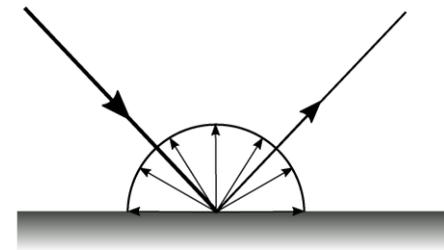
$S=0\%$

100% specular reflection



$S=100\%$

Partial specular reflection



$0\% < S < 100\%$

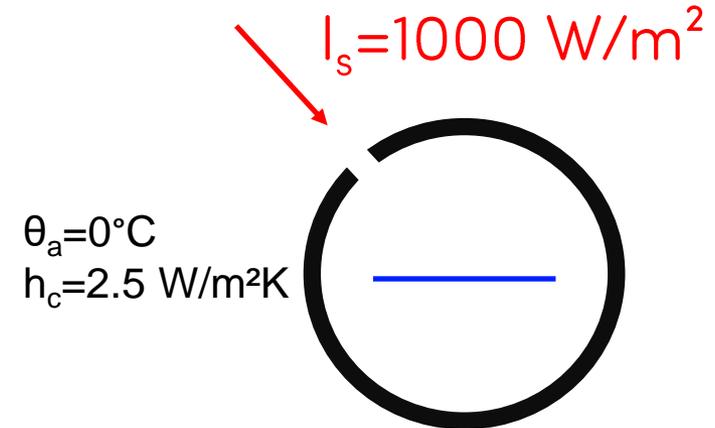
Col.	Type	Name	λ [W/mK]	c [-]	θ_a [°C]	hc [W/m²K]	θ_r [°C]	Sun	ρ_s [-]	Specular [%]	τ_s [-]	Standard
2	MATERIAL	100% specular reflection	10.000	0.00					1.00	100	0.00	
4	MATERIAL	100% absorption (inner ring)	0.040	0.00					0.00	0	0.00	
7	MATERIAL	100% reflection surface (outer ring)	0.040	0.00					1.00	0	0.00	
8	MATERIAL	filling	0.040	0.00					0.10	0	0.00	
170	BC_SKY	solar zone			0.0	2.50	0.0	YES				

α_s : solar absorption factor (-)
 ρ_s : solar reflection factor (-)
 τ_s : solar transmission factor (-)
S : specularity (%)

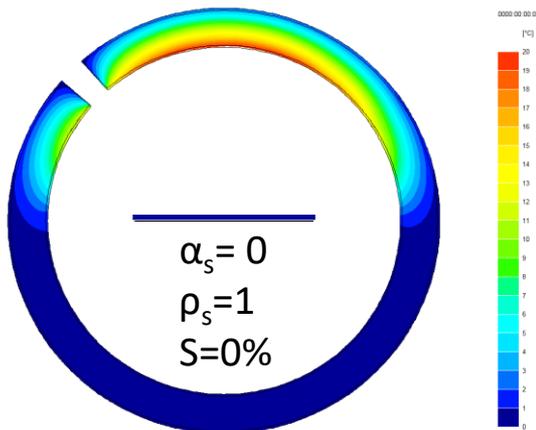
A1. Specular reflection of short-wave radiation

Theoretical example:

- Insulated circle with small opening
 - Outside surface: $\alpha_s = 0$, $\rho_s = 1$
 - Inside surface: $\alpha_s = 1$, $\rho_s = 0$
 - Horizontal opaque plate
- Solar radiation
 - 1000 W/m^2
 - Fixed sun position (45°)

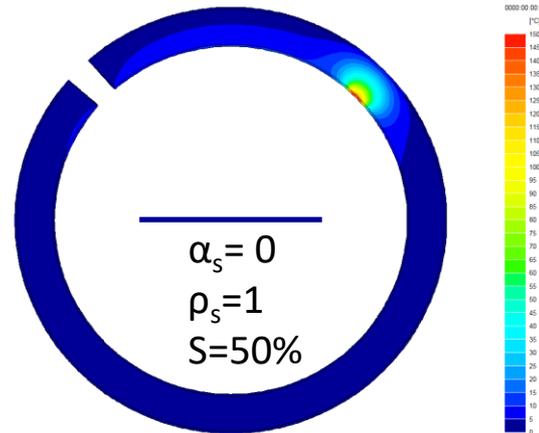


0% specular
(100% diffuse)



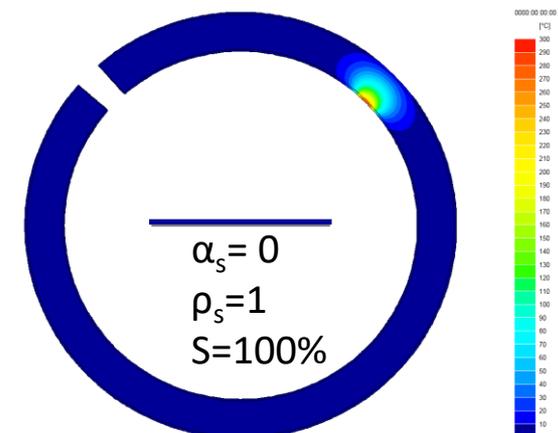
$0^\circ\text{C} - 20^\circ\text{C}$

50% specular



$0^\circ\text{C} - 150^\circ\text{C}$

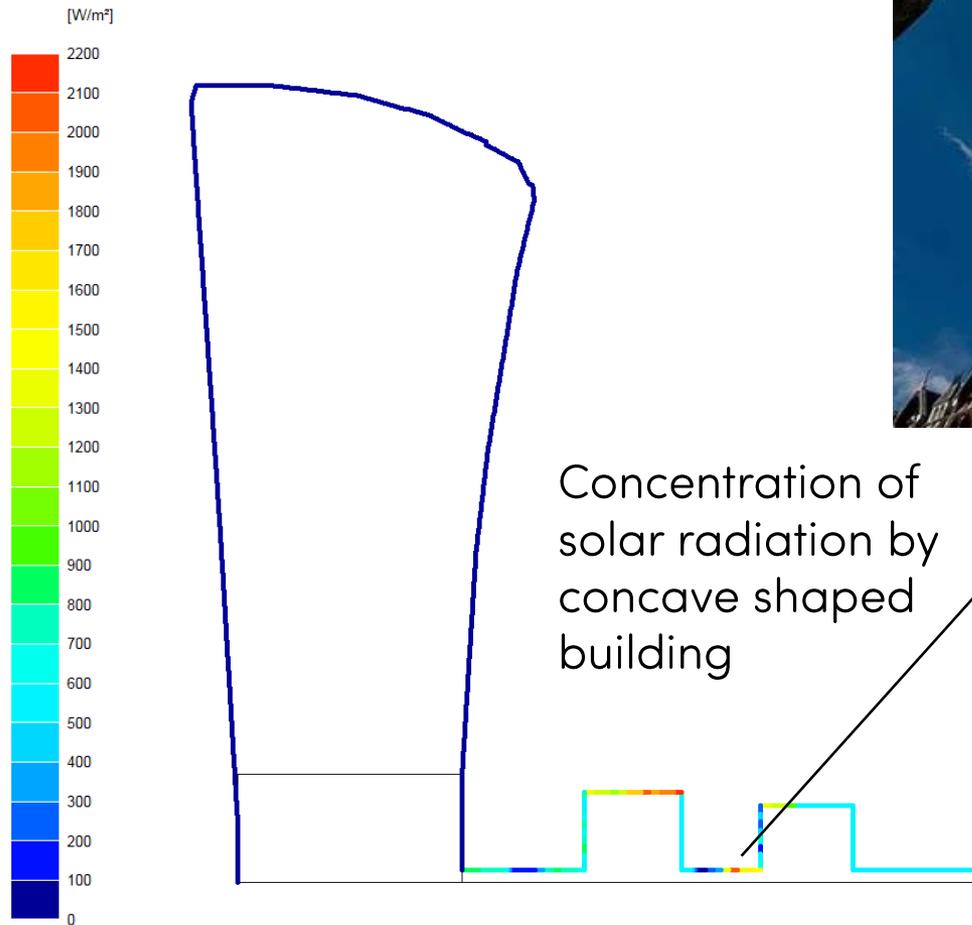
100% specular



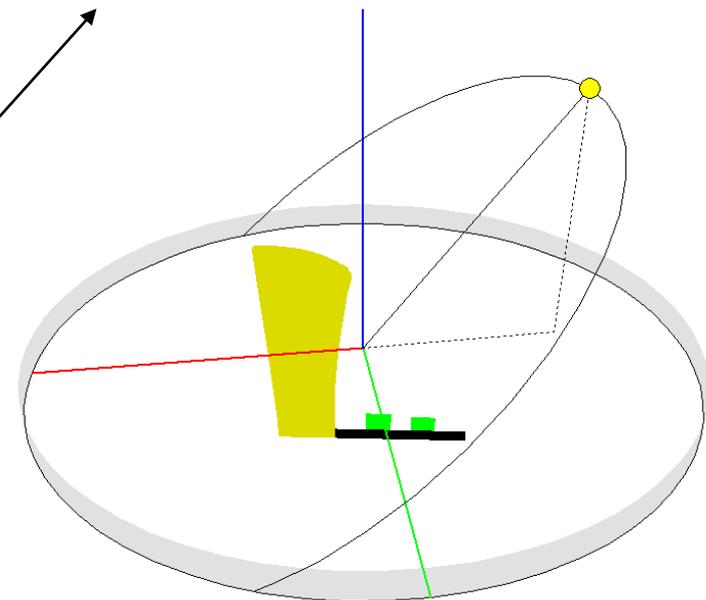
$0^\circ\text{C} - 300^\circ\text{C}$

A1. Specular reflection of short-wave radiation

Practical example 1 : specular reflection from built environment

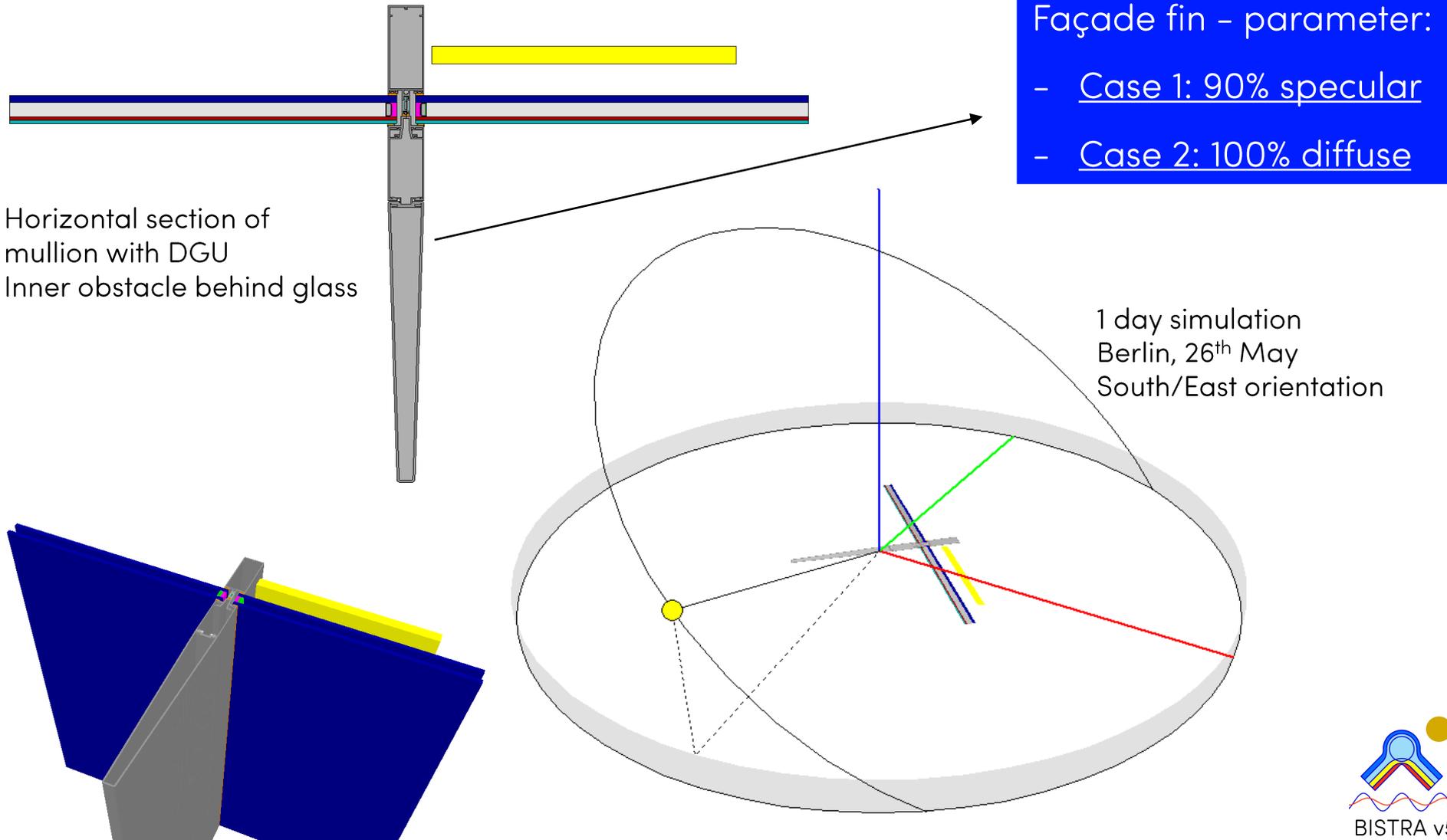


(*)



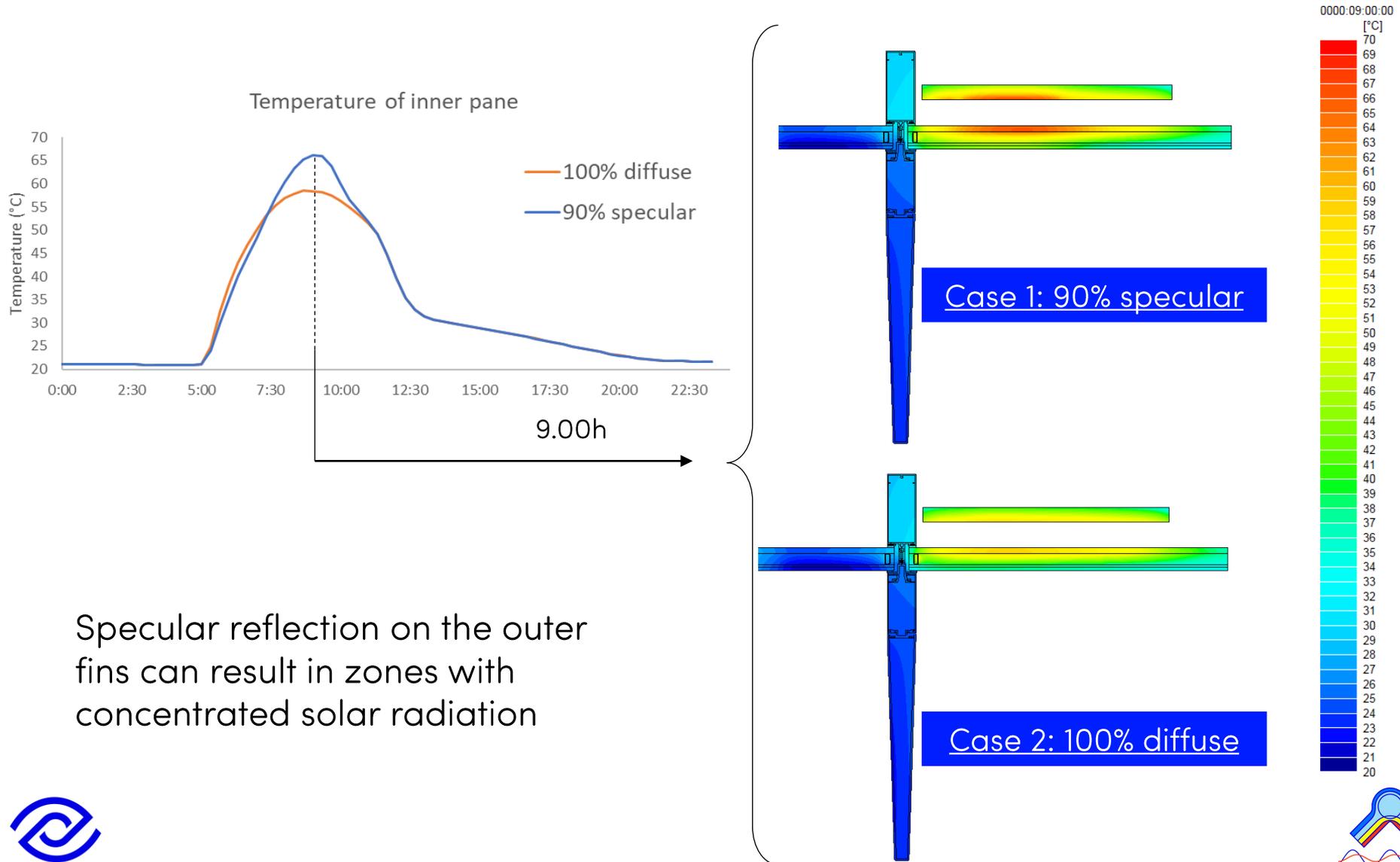
A1. Specular reflection of short-wave radiation

Practical example 2 : specular reflection of façade elements



A1. Specular reflection of short-wave radiation

Practical example 2 : specular reflection of façade elements

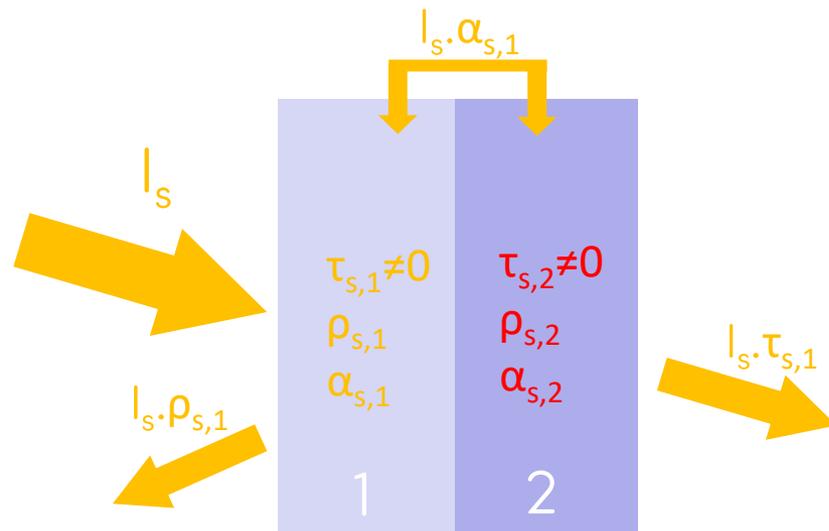


A2. Contact between opaque & transparent materials

[overview](#)

Absorption and interreflections at opaque materials behind transparent material are considered.

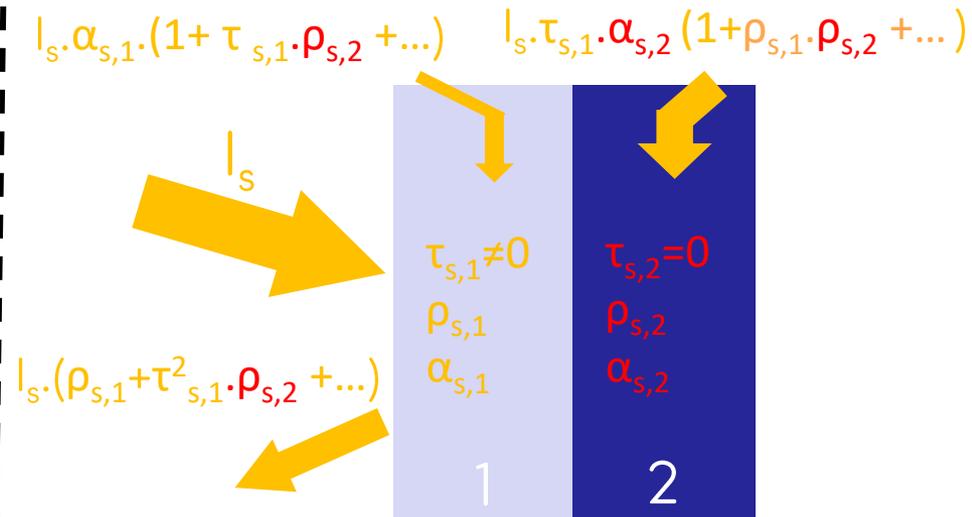
Transparent materials



Solar properties at incident side are applied.

Same as in BISTRA v4

Opaque behind transparent material



Absorption and interreflections at intermediate opaque materials are considered.

New in BISTRA v5

(BISTRA v4: required trick with virtual layer of RADCON type to consider absorption in opaque material behind transparent material)

A3. Revised Solar data – Option to fix sun position

Solar Data:

- Real sun path
- Fixed sun position

Solar data dialog box

Solar Data

Real sun path
 Fixed sun position

North orientation

1. Rotate bitmap (in XY) around Z axis so that new X axis is parallel to horizon plane
(clockwise) rotation angle = °

2. Rotate bitmap upward (in YZ) around X axis so that new XY plane is parallel to horizon plane
elevation angle = °
(0° = horizontal bitmap, 90° = vertical bitmap)

3. Azimuth from X axis to north direction
(clockwise) azimuth = °

Earth position

Latitude °N

Longitude °E

Time zone h E

Solar radiation

Horizontal global solar radiation function

Horizontal diffuse solar radiation function

Ground reflection factor

Sun position on June 21 at 12 h

Fixed sun position

Total solar radiation:

Function

Constant value W/m²

Angle of incidence of solar radiation °

(0° = radiation from right, 90° = from top, 180° = from left, 270° = from bottom)

OK

Cancel

- Visualisation of bitmap orientation (for June 21th at 12h)
- Rotation possible with mouse cursor

A3. Revised Solar data – Option to fix sun position

Solar Data:

- Real sun path
- Fixed sun position

Solar Data

Real sun path
 Fixed sun position

North orientation

1. Rotate bitmap (in XY) around Z axis so that new X axis is parallel to horizon plane (clockwise) rotation angle = °
2. Rotate bitmap upward (in YZ) around X axis so that new XY plane is parallel to horizon plane elevation angle = ° (0° = horizontal bitmap, 90° = vertical bitmap)
3. Azimuth from X axis to north direction (clockwise) azimuth = °

Earth position

Latitude °N

Longitude °E

Time zone h E

Solar radiation

Horizontal global solar radiation function

Horizontal diffuse solar radiation function

Ground reflection factor

Sun position on June 21 at 12 h

Fixed sun position

Total solar radiation:

Function
 Constant value W/m²

Angle of incidence of solar radiation °

(0° = radiation from right, 90° = from top, 180° = from left, 270° = from bottom)

OK

Cancel

- Total (direct) solar radiation via:
 - Function (I01)
 - Constant value
- User-defined angle of incidence

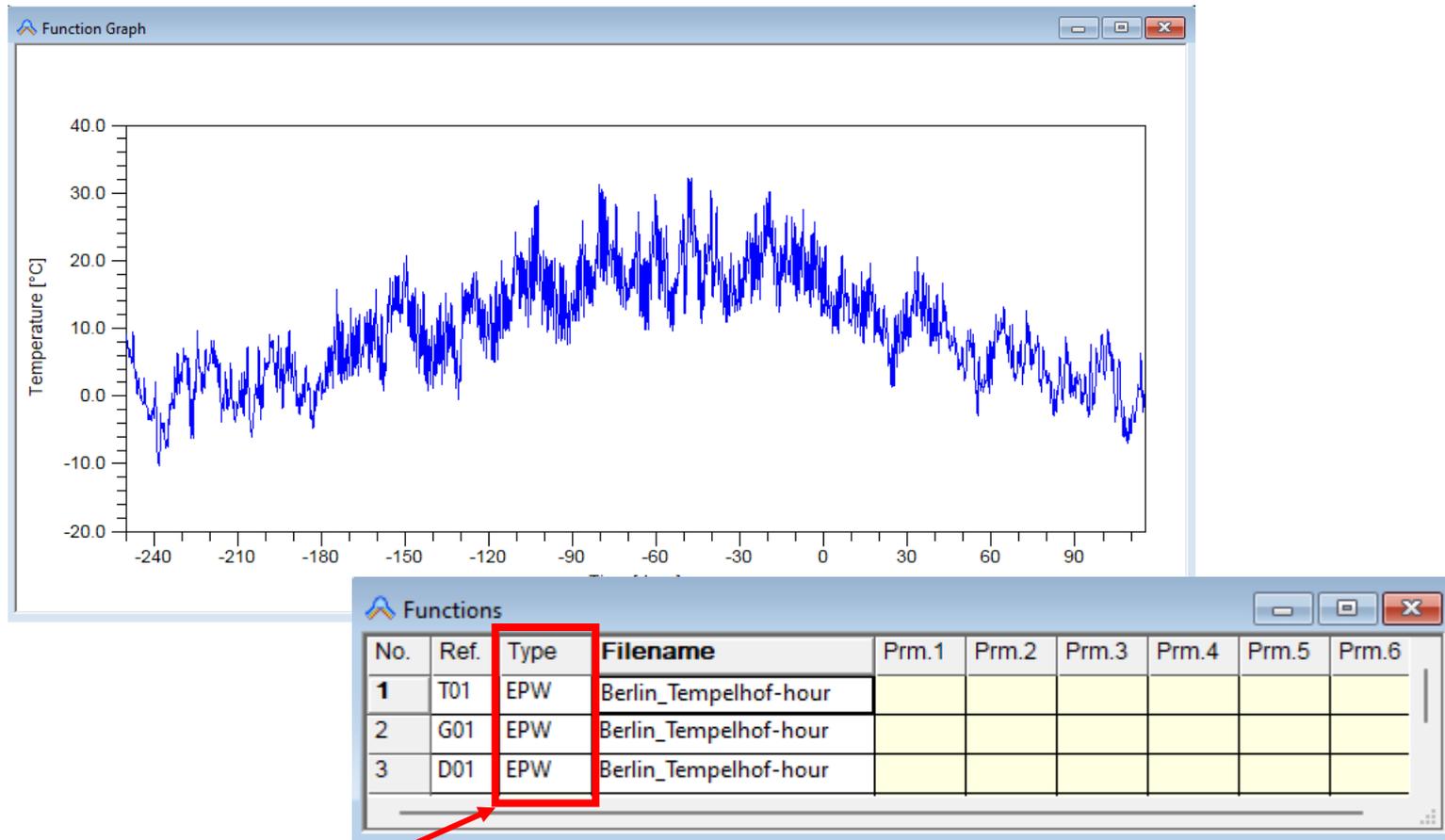
A4. Improved algorithms – reduced calculation time

- Clustered triangle faces for larger view factor faces in RADCON zone
- Number of rays for sky visibility calculation is a calculation parameter
- Increased calculation speed due to improved neighbouring nodes algorithm for view factor zones (RADCON)

Radiation	
<input type="checkbox"/> Linear Radiation	
Black radiation heat transfer coefficient (linear radiation)	5.1 W/(m ² .K)
Smallest accepted view factor	0.0001
Number of visibility rays between radiative surfaces	100
Max. number of view factor faces (per view factor zone)	500

B1. Input of EPW and TRY files (climate files)

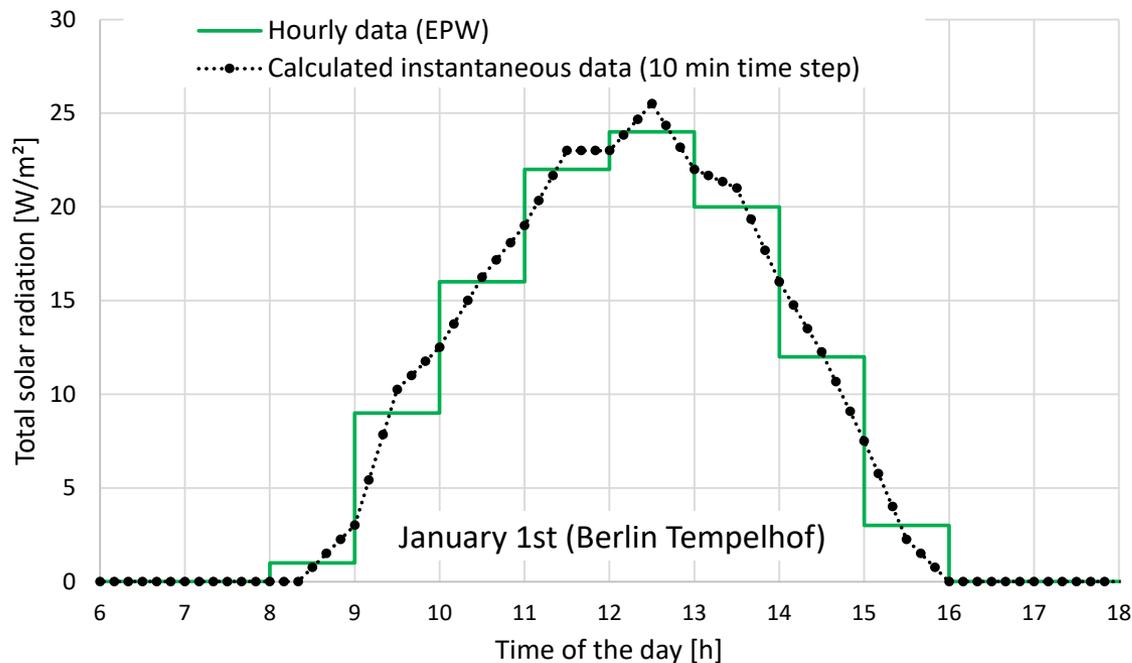
Standardised climate data formats **EPW** and **TRY3** are available as input for temperature, global and diffuse radiation



B2. Handling sub-hourly data from hourly solar data

Solar (climate) data is typically only available on hourly basis, where façades need often to be modelled with smaller time steps (e.g. 10 min).

An algorithm* to handle sub-hourly solar data when using stepped climate data is included.



B3. User-defined start time

Calculation Parameters are extended allowing to define start time (in addition to start day)

Calculation Parameters ✕

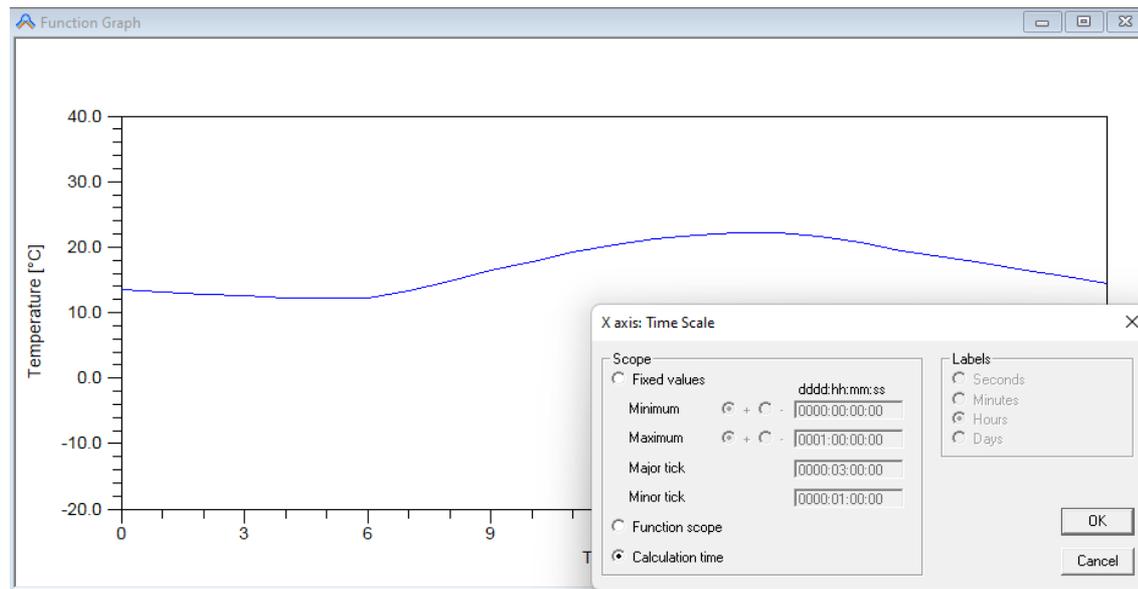
Time axis

Time step ddd:hh:mm:ss

Start-up calculation duration ddd:hh:mm:ss

Calculation duration ddd:hh:mm:ss

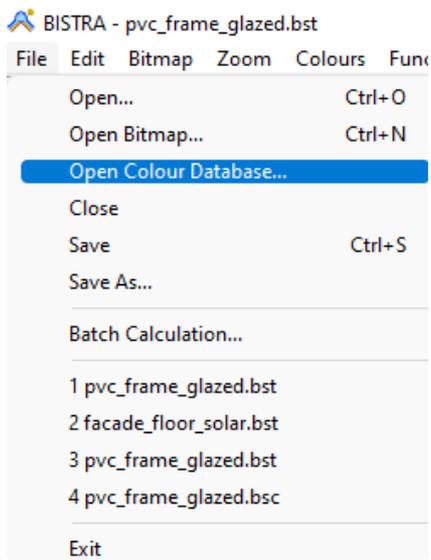
Calculation start Day Time hh:mm:ss



C.1 Revision of Colour Window in line with BISCO v12

Customisable **Colour Database** with predefined colours

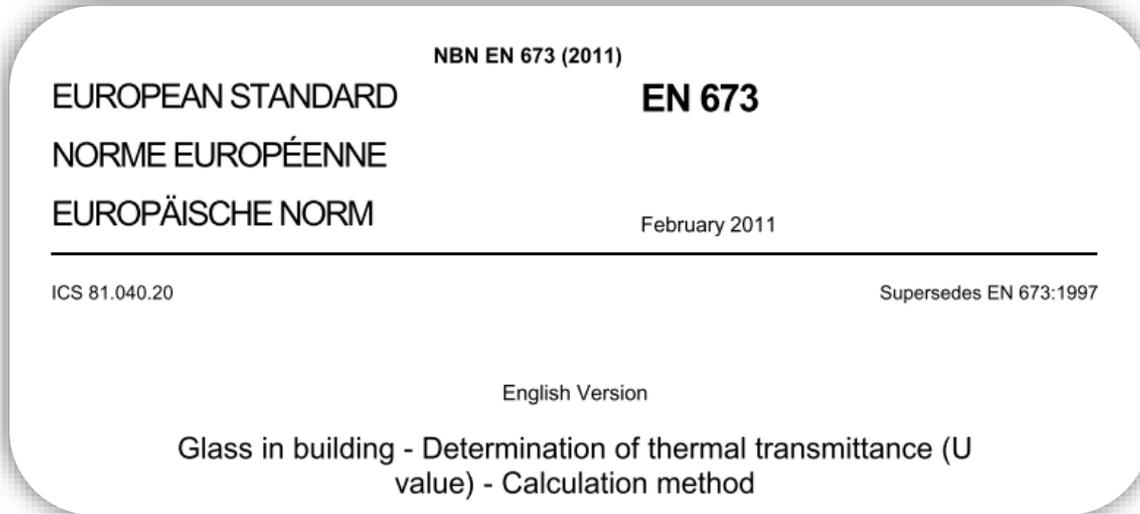
File → *Open Colour Database...* allows to quickly adjust frequently used materials and boundary conditions.



BISCO - ColourDatabase.bsc - [Colours]

File Edit Zoom Bitmap Colours Calc Output Settings Window Help

Col	Type	Subtype	Physical flow dir.	Geometrical flow dir.	Name	c1 / c2 [- / -]	λ [W/mK]	ρ [kg/m ³]	θ [°C]	h [W/m ² K]	q [W/m ²]	θ_a [°C]	hc [W/m ² K]	Pc [W/m]	θ_r [°C]	Standard
0	MATERIAL						1.000	0.90								
1	MATERIAL						1.000	0.90								
2	MATERIAL				aluminium untreated surface		160.000	0.10								
3	MATERIAL				PVC rigid		0.170	0.90								
4	MATERIAL				copper		380.000	0.90								
5	MATERIAL				fibreglass (UP-resin)		0.400	0.90								
6	MATERIAL				aluminium slightly oxidized surface		160.000	0.30								
7	MATERIAL						1.000	0.90								
8	MATERIAL				aluminium		160.000	0.90								
9	MATERIAL				lead		35.000	0.90								
10	MATERIAL				stainless steel (ferritic/martensitic)		30.000	0.30								
11	MATERIAL				stainless steel (austenitic/aust.ferritic)		17.000	0.30								
12	MATERIAL				hardwood		0.180	0.90								
13	MATERIAL				steel		50.000	0.90								
14	MATERIAL				brass		120.000	0.90								
15	MATERIAL				softwood 500 kg/m ³		0.130	0.90								
16	MATERIAL				basalt		3.500	0.90								
17	MATERIAL				limestone hard		1.700	0.90								
18	MATERIAL				soda lime		1.000	0.90								
19	MATERIAL						1.000	0.90								
20	MATERIAL						1.000	0.90								
21	MATERIAL				polycarbonate		0.200	0.90								
22	MATERIAL				ABS (acrylonitrile butadiene styrene)		0.200	0.90								
23	MATERIAL				sand and gravel		2.000	0.90								
24	MATERIAL						1.000	0.90								
25	MATERIAL						1.000	0.90								
26	MATERIAL				ceramic/porcelain tiles		1.300	0.90								
27	MATERIAL						1.000	0.90								
28	MATERIAL				insulation panel		0.025	0.90								
29	MATERIAL				PMMA		0.180	0.90								
30	MATERIAL						1.000	0.90								
31	MATERIAL				clay or silt		1.500	0.90								
32	MATERIAL				bitumen sheet		0.230	0.90								
33	MATERIAL						1.000	0.90								



Implementation of equivalent thermal conductivity of **gas mixes** according to **EN 673** for the types:

- EQUIMAT
- TRANSMAT
- BC_FREE

C.2 EN 673 – Gas mixes

[overview](#)

Col.	Type	Subtype	Physical flow dir.	Geometrical flow dir.	Name	ϵ_1 / ϵ_2 [- / -]	λ [W/mK]	c [-]	ρ [kg/m ³]	c [J/kgK]	Specular [%]	Standard
243	EQUIMAT	CAVITY	HOR	Y		0.90 / 0.90	0.056	0.90	1.2	1008.0		EN10077
244	EQUIMAT	CAVITY	HOR	Y		0.90 / 0.90	0.033	0.90	1.2	1008.0		EN10077
245	EQUIMAT	CAVITY	HOR	Y		0.90 / 0.90	0.033	0.90	1.2	1008.0		EN10077
246	EQUIMAT	CAVITY	HOR	Y		0.90 / 0.90	0.046	0.90	1.2	1008.0		EN10077
247	EQUIMAT	CAVITY	HOR	Y		0.90 / 0.90	0.033	0.90	1.2	1008.0		EN10077
249	TRANSMAT	LAYER	HOR	Y	90%Argon 10%Air		0.019		1.7	567.0		EN673
250	TRANSMAT	LAYER	HOR	Y	90%Argon 10%Air		0.019		1.7	567.0		EN673
252	MATERIAL				cavity <2x2 mm2		0.031	0.90	1000.0	1000.0	0	0.00

Cavity Properties ✕

Vacuum

Cavity inclination angle °
(0° -> upward heat flow, 90° -> horizontal heat flow)

Gas mix:

% Air

% Argon

% Krypton

% Xenon

% SF6

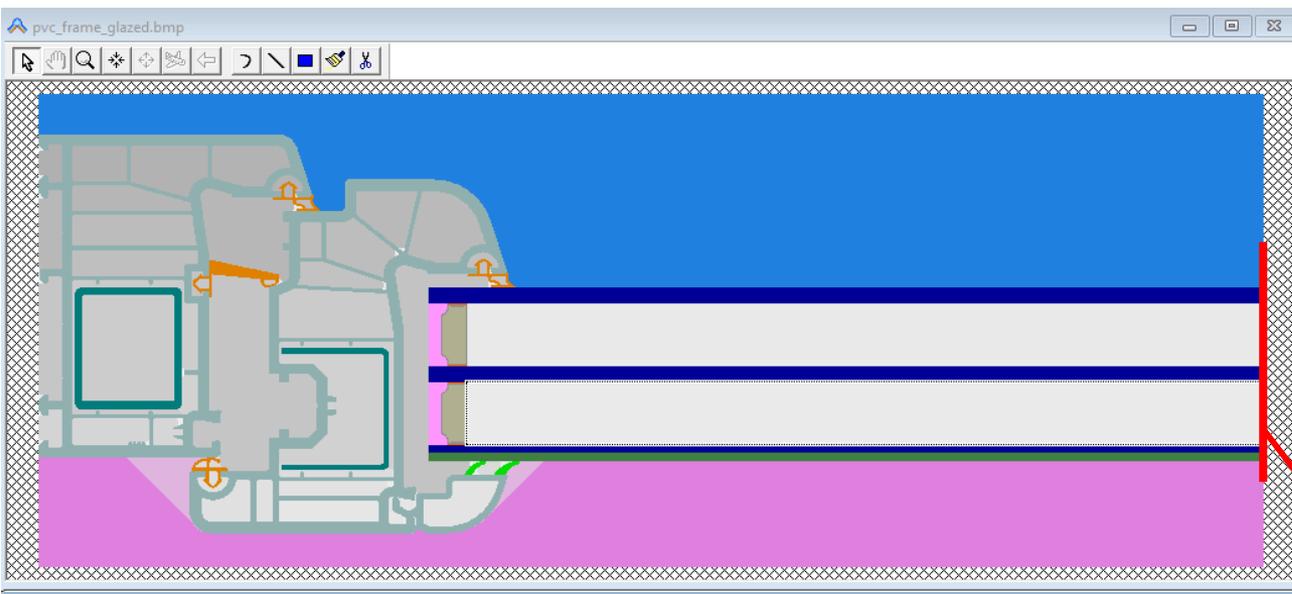
(accessible by double clicking)

Set heat flow direction: X, Y

Selection of standard

Set physical flow direction:
horizontal, downwards, upwards

C.2 EN 673 – Gas mixes

[overview](#)


Bitmap border U Values

Bitmap Border	U [W/m ² K]
Left	2.015
Right	1.093
Top	
Bottom	

Calculation of U-value at border of bitmap

C.3 EN ISO 6946 – cavities and layers

Example 1: window-wall connection: air layer in wall → EN ISO 6946

BISTRA - wall_frame_wood_glazed.bst

File Edit Bitmap Zoom Colours Functions Calc Output Settings Window Help

wall_frame_wood_glazed.bmp

Measures

Col.	Width [pix.]	Width [m]	Height [pix.]	Height [m]	Area [pix.]	Zones	Triang [pix.]
55	720	0.0720	2870	0.2870	510490	2	10.0
62	730	0.0730	620	0.0620	900	3	10.0
86	49	0.0049	360	0.0360	11532	2	10.0
92	49	0.0049	360	0.0360	712	4	10.0
105	59	0.0059	346	0.0346	15904	2	10.0
129	7380	0.7380	100	0.0100	738000	1	10.0
156	7380	0.7380	1900	0.1900	14022000	1	15.0
170	10000	1.0000	270	0.0270	1324600	1	
174	10000	1.0000	3160	0.3160	9589095	1	
182	350	0.0350	210	0.0210	20045	2	
224	1912	0.1912	160	0.0160	305920	1	10.0
225	1912	0.1912	160	0.0160	305920	1	10.0
242	50	0.0050	460	0.0460	23000	1	10.0
243	80	0.0080	10	0.0010	800	1	10.0
244	80	0.0080	10	0.0010	800	1	10.0
245	10	0.0010	190	0.0190	1900	1	10.0
246	7020	0.7020	270	0.0270	1895400	1	10.0

Colours

Col.	Type	Subtype	Physical flow dir.	Geometrical flow dir.	Name	ϵ_1 / ϵ_2 [- / -]	λ [W/mK]	c [-]	ρ [kg/m ³]	c [J/kgK]	θ [°C]	h [W/m ² K]	q [W/m ²]	θ_a [°C]	h_c [W/m ² K]	h_{fc} [W/m ²]	θ_r [°C]	Sun	ρ_s [-]	Specular [%]	τ_s [-]	Standard	
224	EQUIMAT	LAYER	HOR	Y	90%Argon 10%Air	0.84 / 0.03	0.022		1.7	567.0												EN673	
225	EQUIMAT	LAYER	HOR	Y	90%Argon 10%Air	0.84 / 0.03	0.022		1.7	567.0													EN673
242	EQUIMAT	CAVITY	HOR	Y	cavity (CEN)	0.90 / 0.90	0.127		1.2	1008.0													EN10077
243	EQUIMAT	CAVITY	HOR	Y	cavity (CEN)	0.90 / 0.90	0.029		1.2	1008.0													EN10077
244	EQUIMAT	CAVITY	HOR	Y	cavity (CEN)	0.90 / 0.90	0.029		1.2	1008.0													EN10077
245	EQUIMAT	CAVITY	HOR	Y	cavity (CEN)	0.90 / 0.90	0.066		1.2	1008.0													EN10077
246	EQUIMAT	LAYER	HOR	Y	cavity (CEN)	0.90 / 0.90	0.147		1.2	1008.0													EN6946

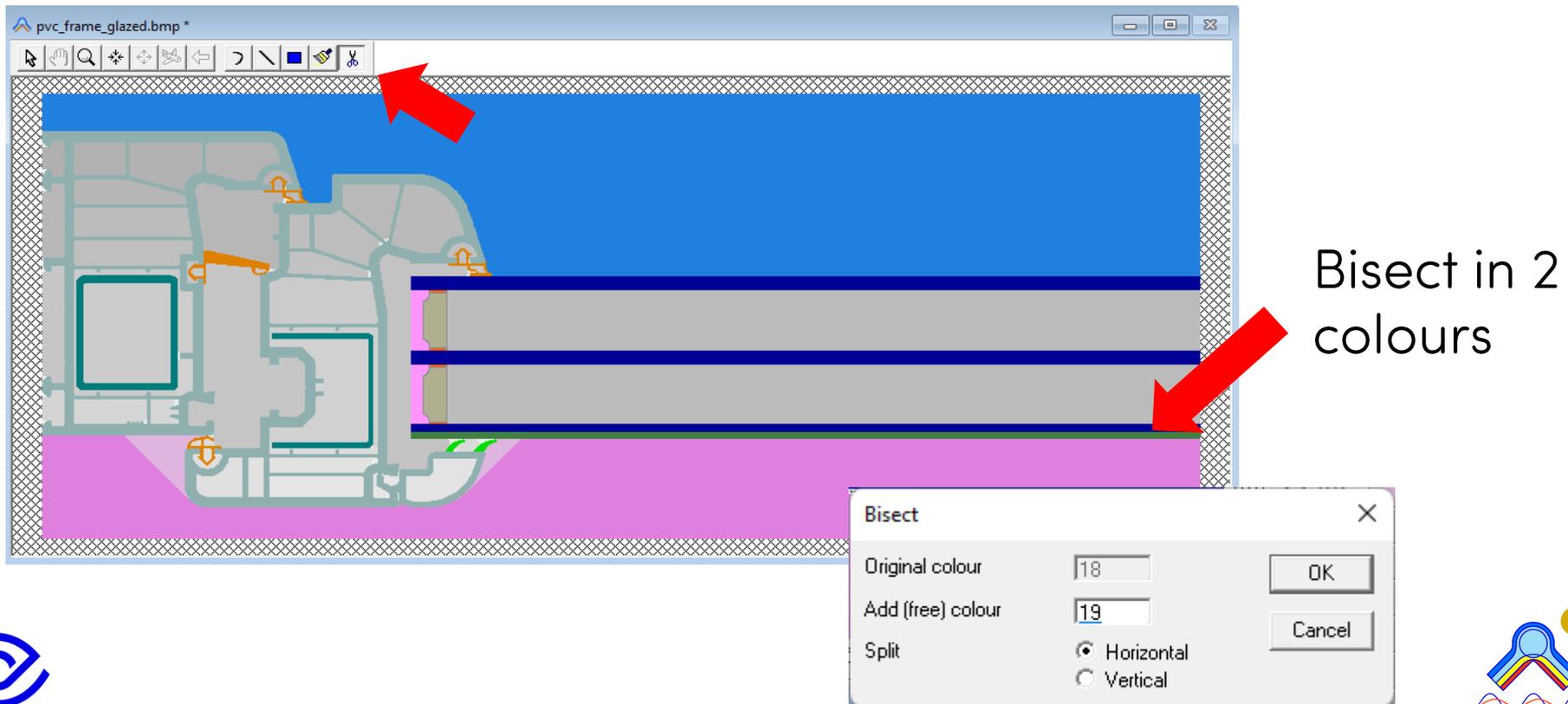
LAYER: air layer (unventilated)

D.1 Bitmap editing – New function ‘Bisect’

Bisect: Split a colour in two equal parts.

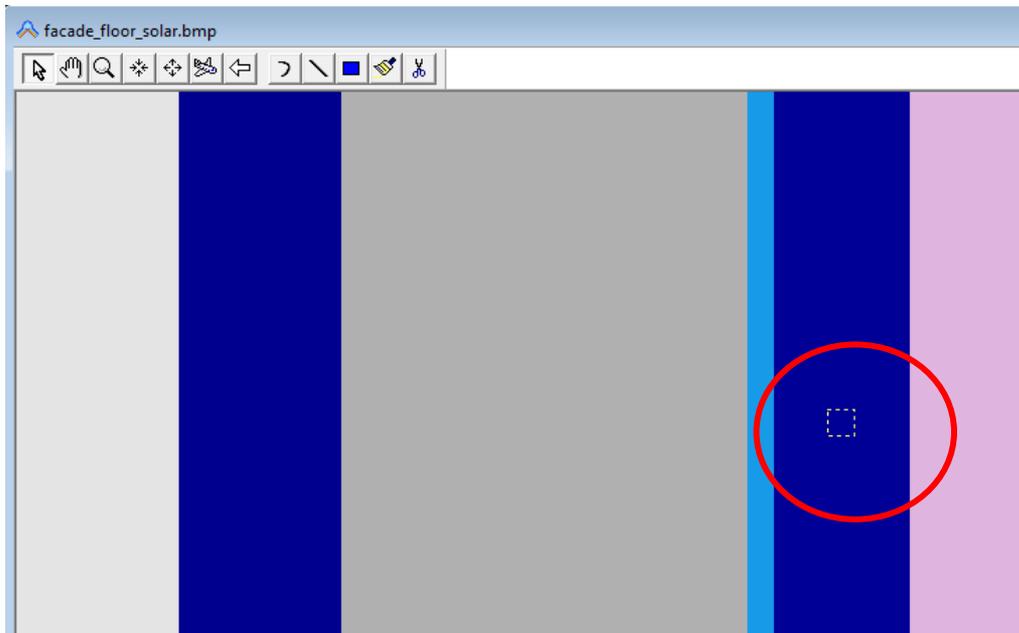
Applications:

- definition of solar properties on glazing sides
- splitting type BC_FREE for definition of ventilation paths



D.2 Bitmap editing – snap to pixel

Pixel is **highlighted** when in 'selection' mode or in 'drawing' mode

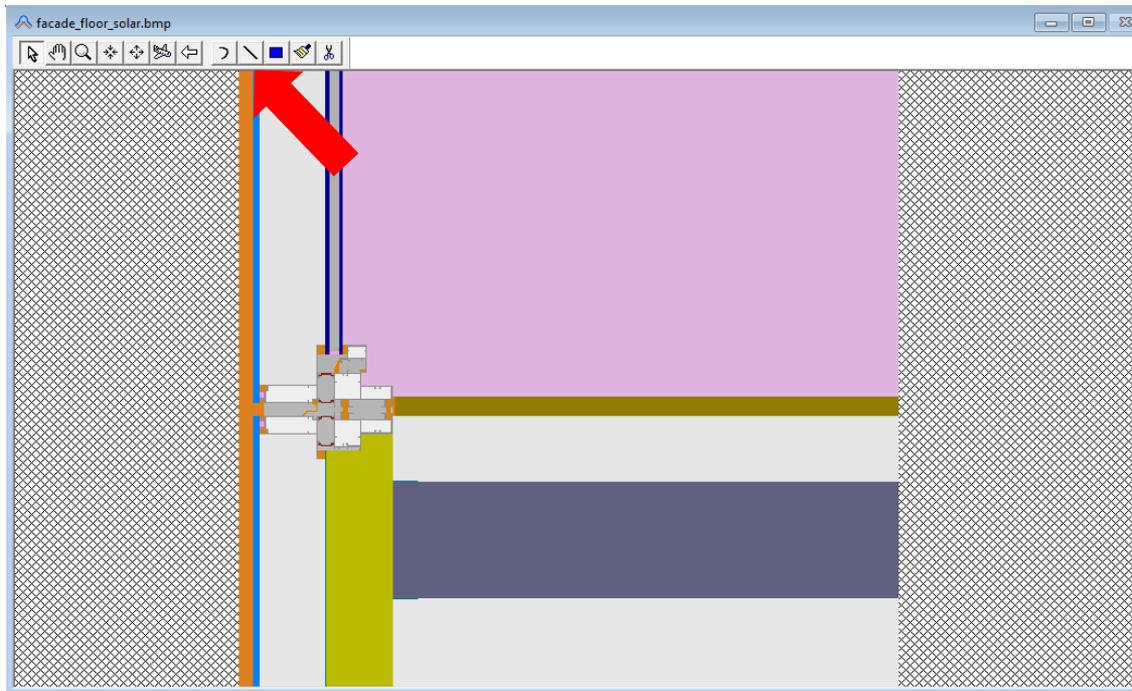


Snap to pixel simplifies:

- drawing
- Selecting colours

D.3 Bitmap editing – New drawing functions

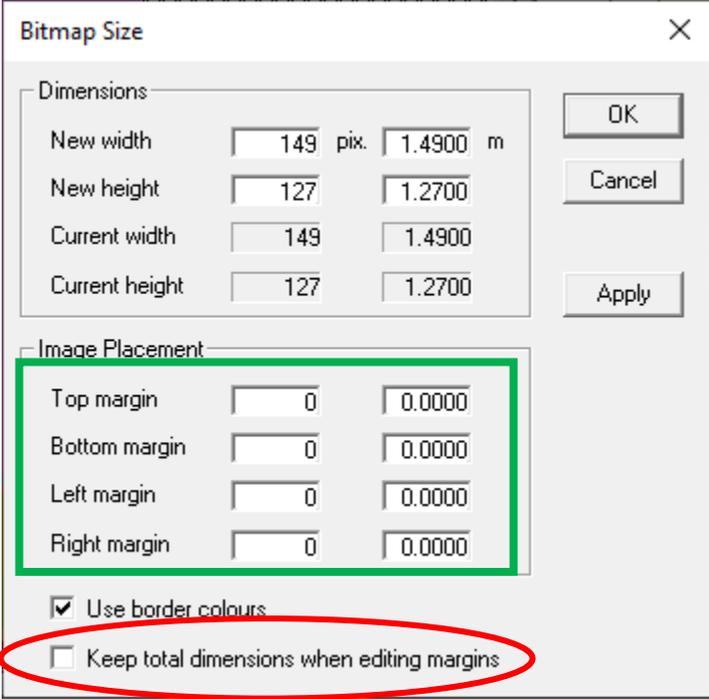
New drawing functions in line with BISCO v12: rectangles & lines



D.4 Bitmap editing – Miscellaneous

Bitmap size: option to keep dimension when editing margins

Allows to easily extend the
bitmap borders with
desired extension length



Bitmap Size

Dimensions

New width	<input type="text" value="149"/> pix.	<input type="text" value="1.4900"/> m
New height	<input type="text" value="127"/>	<input type="text" value="1.2700"/>
Current width	<input type="text" value="149"/>	<input type="text" value="1.4900"/>
Current height	<input type="text" value="127"/>	<input type="text" value="1.2700"/>

Image Placement

Top margin	<input type="text" value="0"/>	<input type="text" value="0.0000"/>
Bottom margin	<input type="text" value="0"/>	<input type="text" value="0.0000"/>
Left margin	<input type="text" value="0"/>	<input type="text" value="0.0000"/>
Right margin	<input type="text" value="0"/>	<input type="text" value="0.0000"/>

Use border colours

Keep total dimensions when editing margins

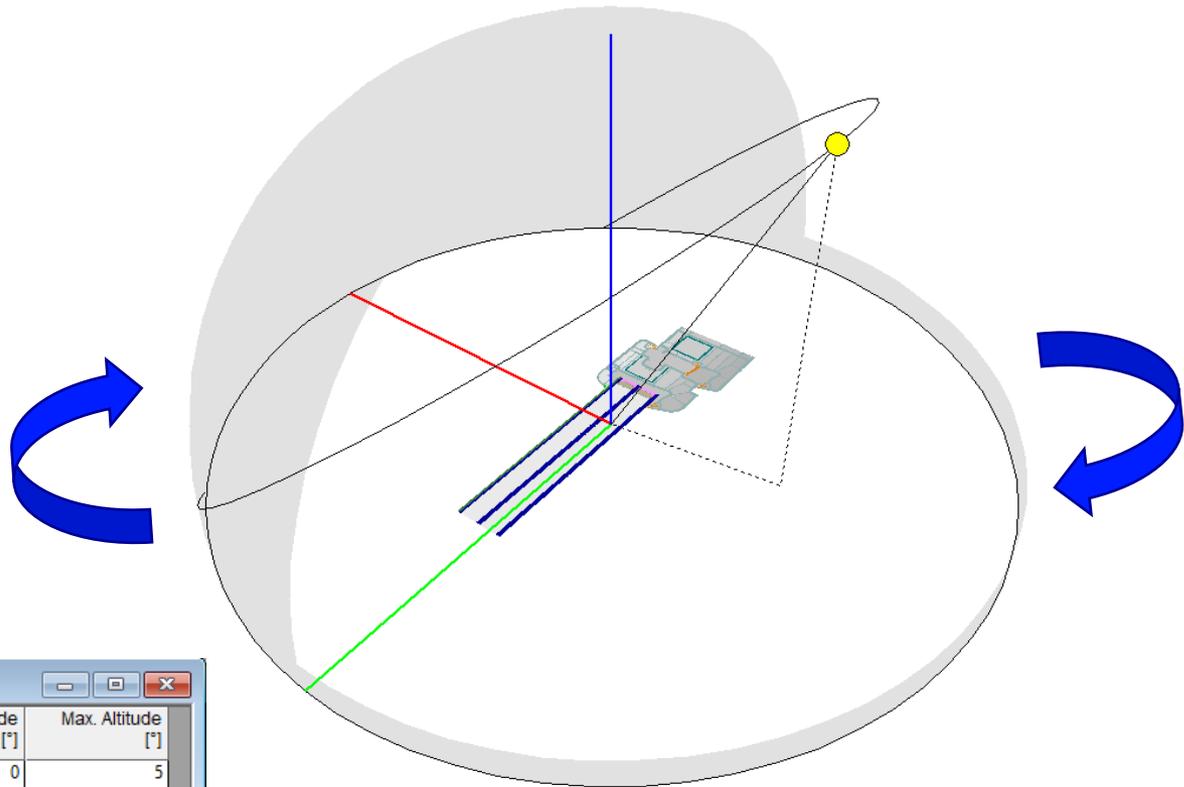
OK
Cancel
Apply

D.4 Bitmap editing – Miscellaneous

- Cursor colour adjusted for background colour
- Zoom and draw function buttons moved to Bitmap window
- Pan: drag mode changed to 'drag object'
- Mouse scroll to navigate through grid control (e.g. Colours Window)
- 'Change Colour...', 'Split Zones...' and 'Copy Row' are available with active Image Window

E.1 Graphic output – Sun position

- Visualisation of Sun Obstacles in Sun Position view  
- Rotation possible in Sun Position view (left mouse click or keyboard arrows)

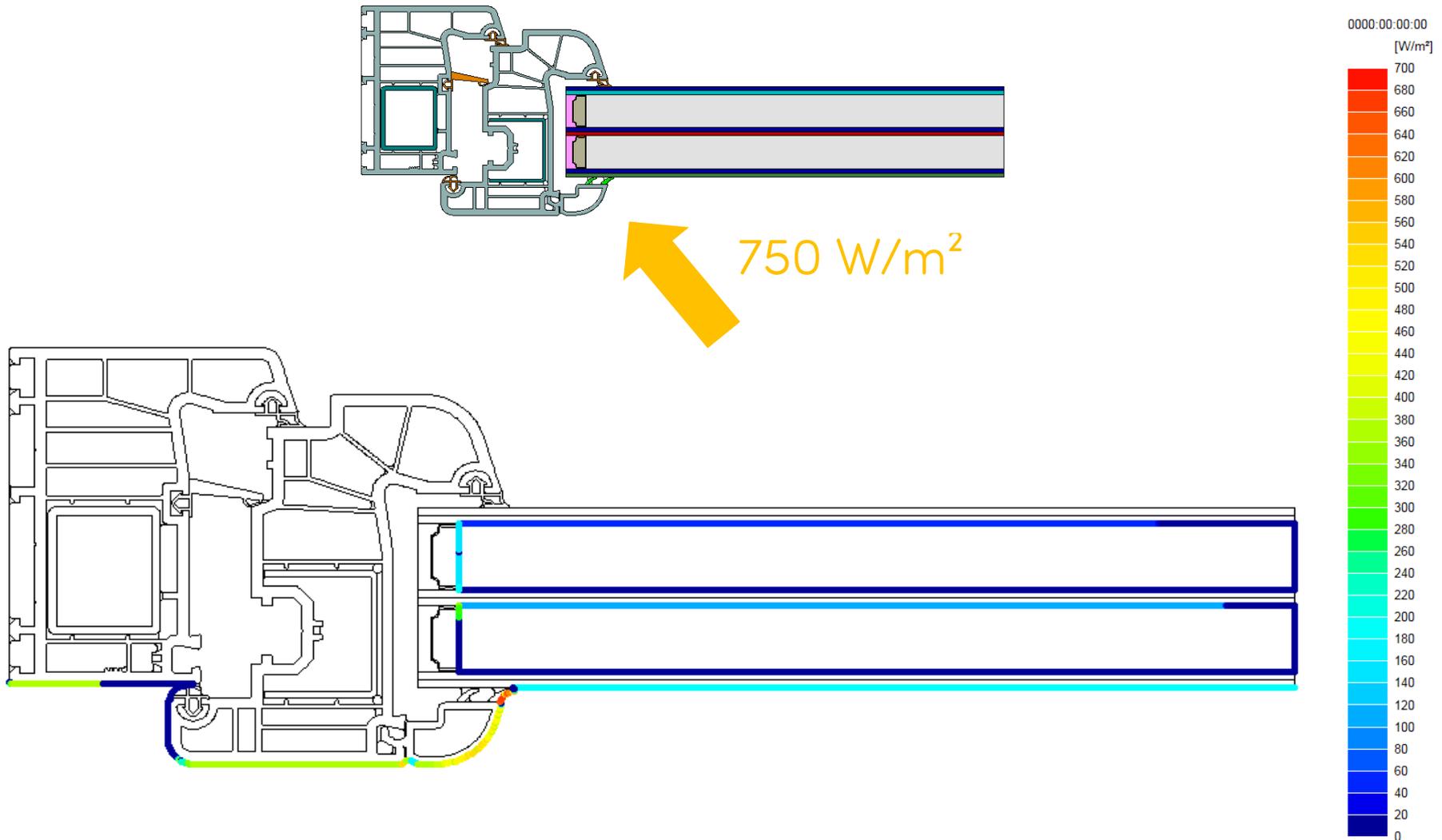


No.	Min. Azimuth [°]	Max. Azimuth [°]	Min. Altitude [°]	Max. Altitude [°]
1	-180	180	0	5
2	90	270	0	90

E.2 Visualisation of absorbed solar radiation

- Visualisation of absorbed solar radiation ☀️

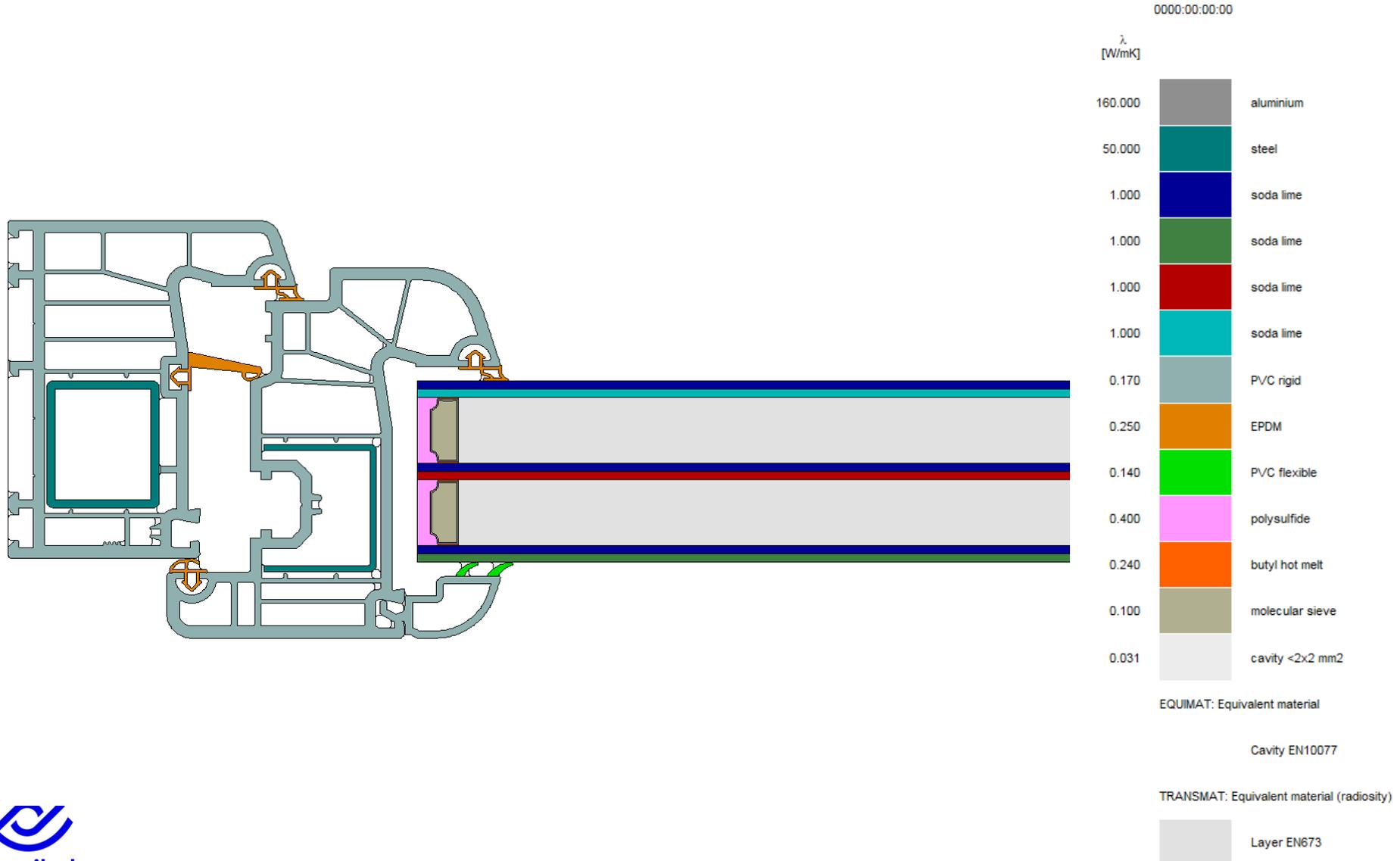
Example of PVC window profile under solar exposure (315° , 750W/m^2)



E.3 Graphic output – Legend

[overview](#)

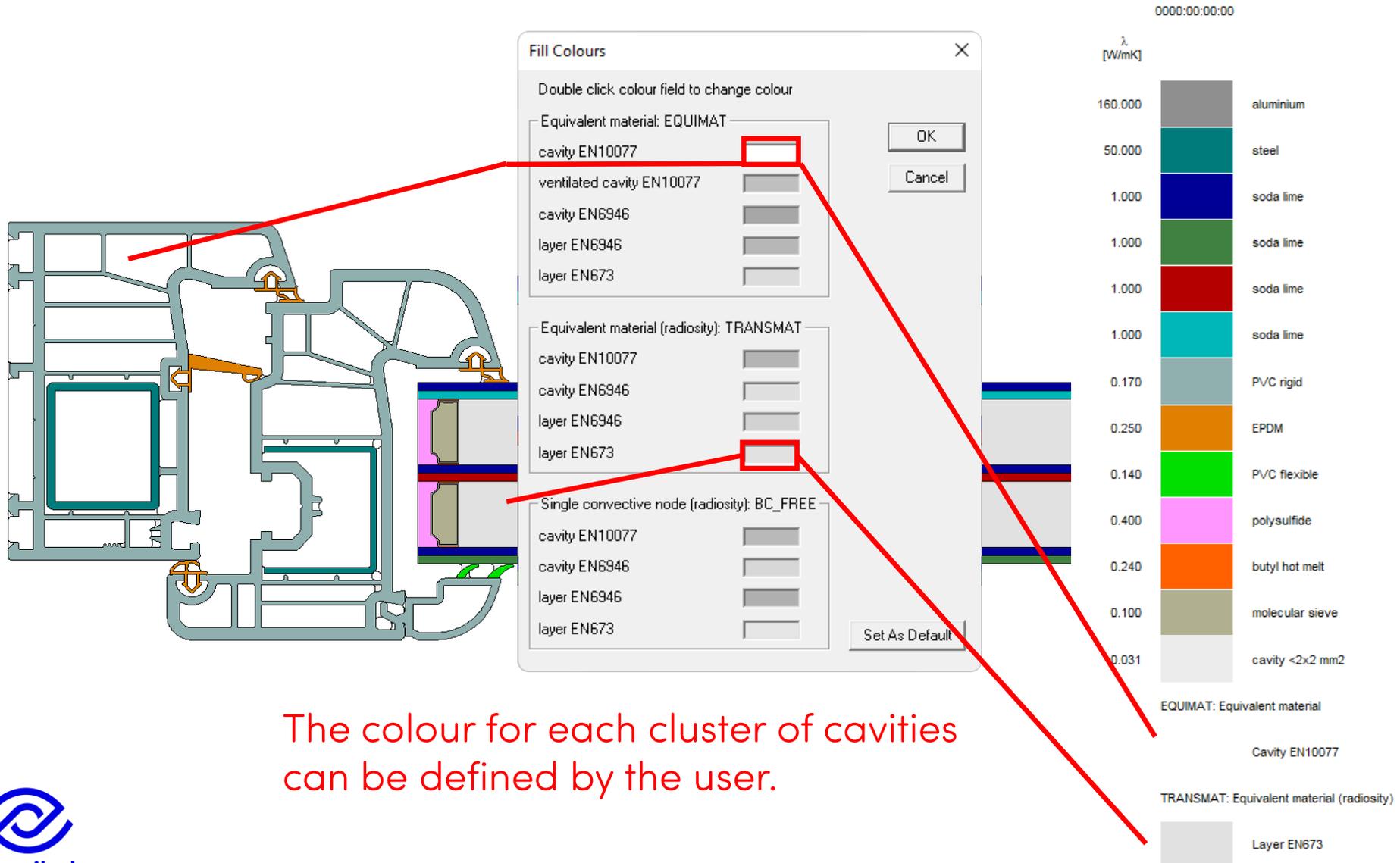
Fill materials → revised legend: material name + clustered cavities



E.3 Graphic output – Legend

[overview](#)

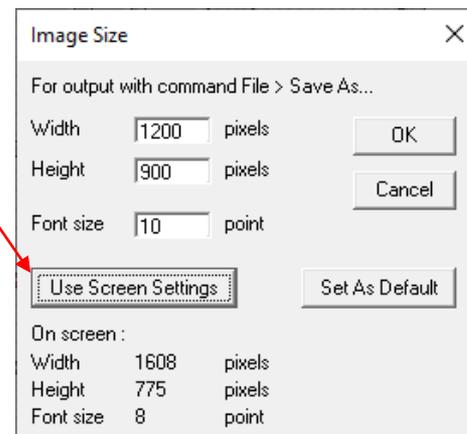
Fill materials → revised legend: material name + clustered cavities



The colour for each cluster of cavities can be defined by the user.

E.4 Graphic output – Miscellaneous

- Triangulation mesh only visible when image has relevant scale
- Faster image processing algorithm (for complex files)
- Improved algorithm for visualizing BC_FREE in graphic output resulting in higher rendering speed
- Image Size: possible to use Screen Settings for image output



F.1 New report definitions: ΔT_{\max} , E_{tot} , E_{diff} , E_{dir} , E_{gr}

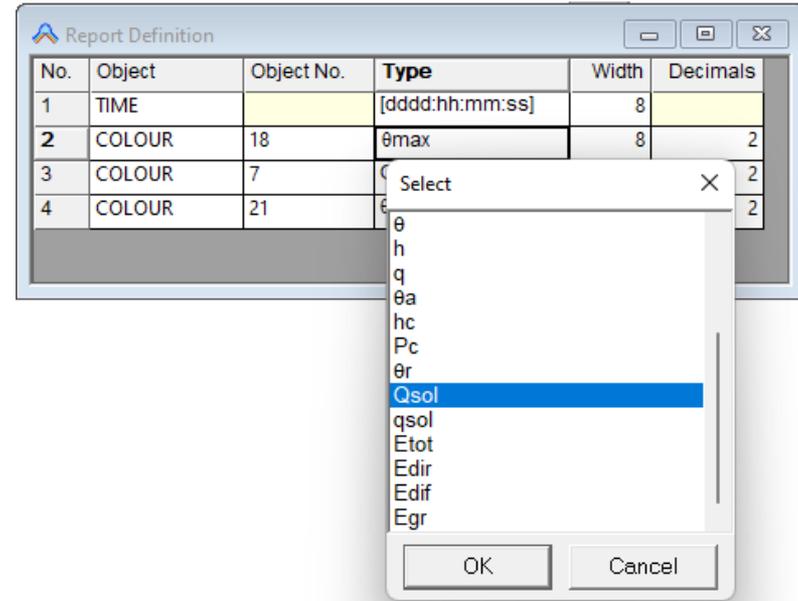
- ΔT_{\max} : maximum temperature difference within 1 or 2 colours

No.	Object	Object No.	Type	Width	Decimals
1	TIME		[s]	8	
2	2 COLOURS	18 / 19	$\Delta\theta_{\max}$	8	2

Solar radiation received on materials exposed to a solar zone

- E_{tot} : Total irradiance (W/m^2)
- E_{diff} : Diffuse sky irradiance (W/m^2)
- E_{dir} : Direct irradiance (W/m^2)
- E_{gr} : Ground reflected irradiance (W/m^2)

F.2 Absorbed solar flux/energy into materials (q_{sol} , Q_{sol}) overview



The report definitions Q_{sol} and q_{sol} allow to report the energy and heat flux absorbed into materials (not limited to materials facing the solar zone)

F.2 Absorbed solar flux/energy into materials (q_{sol} , Q_{sol}) overview

Application: effective solar absorption according to EN 410

Fixed sun position

Total solar radiation:

Function

Constant value W/m²

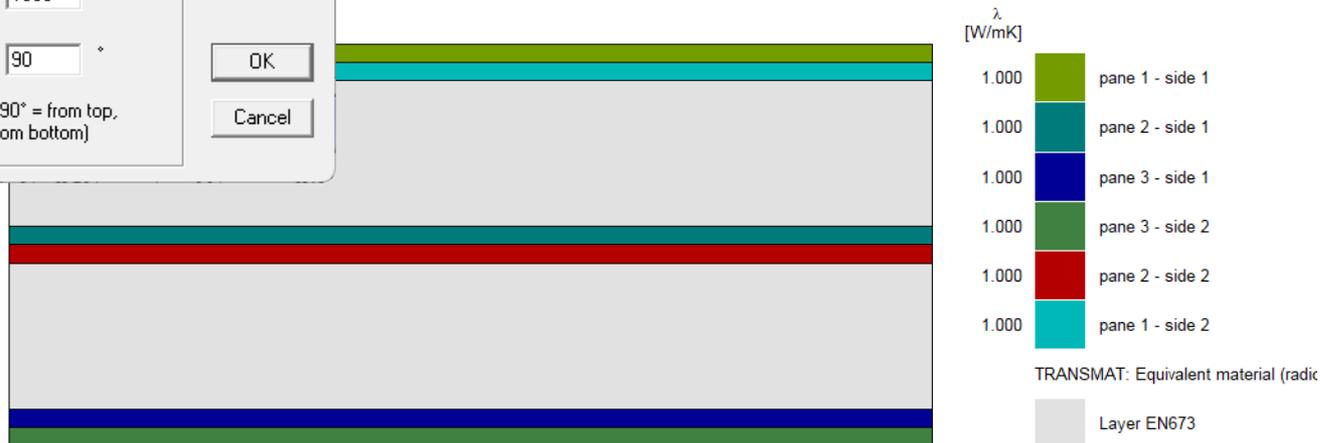
Angle of incidence of solar radiation °

(0° = radiation from right, 90° = from top, 180° = from left, 270° = from bottom)

OK

Cancel

No.	Object	Object No.	Type	Width	Decimals
1	TIME		[s]	8	
2	COLOUR	11	qsol	8	2
3	COLOUR	21	qsol	8	2
4	COLOUR	13	qsol	8	2
5	COLOUR	20	qsol	8	2
6	COLOUR	18	qsol	8	2
7	COLOUR	19	qsol	8	2



BISTRA - Report Output

BISTRA data file: glazed.bst

```

Column 1: Time [s]
Column 2: Colour 11 (pane 1 - side 1), absorbed solar flux [W/m²]
Column 3: Colour 21 (pane 1 - side 2), absorbed solar flux [W/m²]
Column 4: Colour 13 (pane 2 - side 1), absorbed solar flux [W/m²]
Column 5: Colour 20 (pane 2 - side 2), absorbed solar flux [W/m²]
Column 6: Colour 18 (pane 3 - side 1), absorbed solar flux [W/m²]
Column 7: Colour 19 (pane 3 - side 2), absorbed solar flux [W/m²]

```

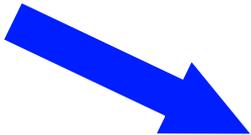
0 360.00 23.96 198.22 10.34 108.57 0.00

F.3 Option to save data as .csv

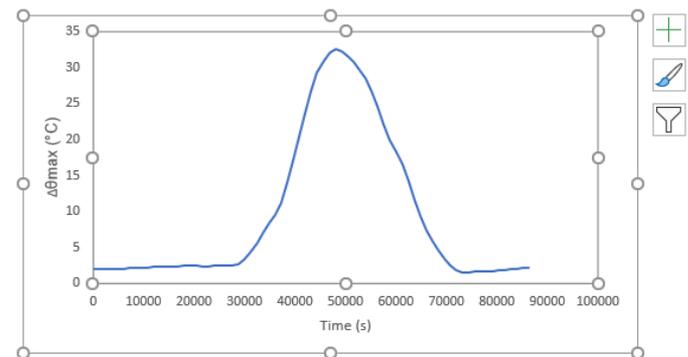
Report data is also saved in .csv format allowing to simplify post-processing

```

1 Time [s],Colour 10 (ext glazing ): temperature difference [°C]
2 0,1.96
3 1200,1.96
4 2400,1.96
5 3600,1.96
6 4800,2.00
7 6000,2.05
8 7200,2.11
9 8400,2.16
10 9600,2.21
11 10800,2.25
12 12000,2.27
13 13200,2.27
14 14400,2.26
15 15600,2.31
16 16800,2.41
17 18000,2.52
18 19200,2.53
19 20400,2.46
20 21600,2.39
21 22800,2.39
22 24000,2.43
23 25200,2.50
  
```

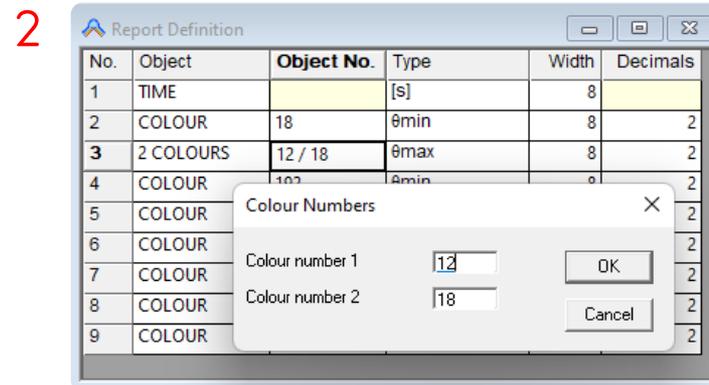
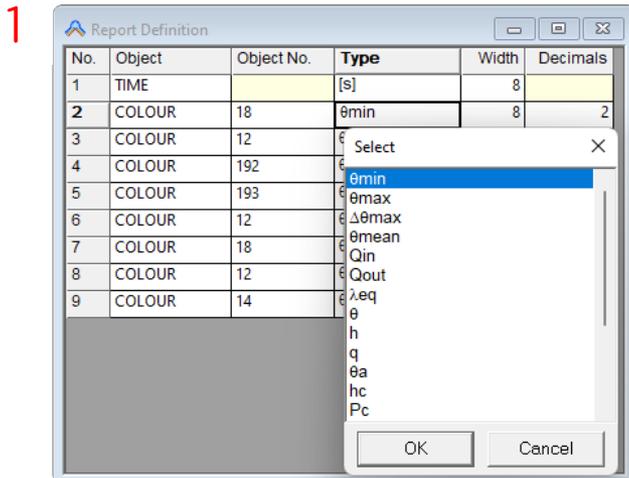


Time [s]	Colour 10 (ext glazing): temperature difference [°C]
0	1.96
1200	1.96
2400	1.96
3600	1.96
4800	2
6000	2.05
7200	2.11
8400	2.16
9600	2.21
10800	2.25
12000	2.27
13200	2.27
14400	2.26
15600	2.31
16800	2.41
18000	2.52
19200	2.53
20400	2.46
21600	2.39
22800	2.39
24000	2.43
25200	2.5

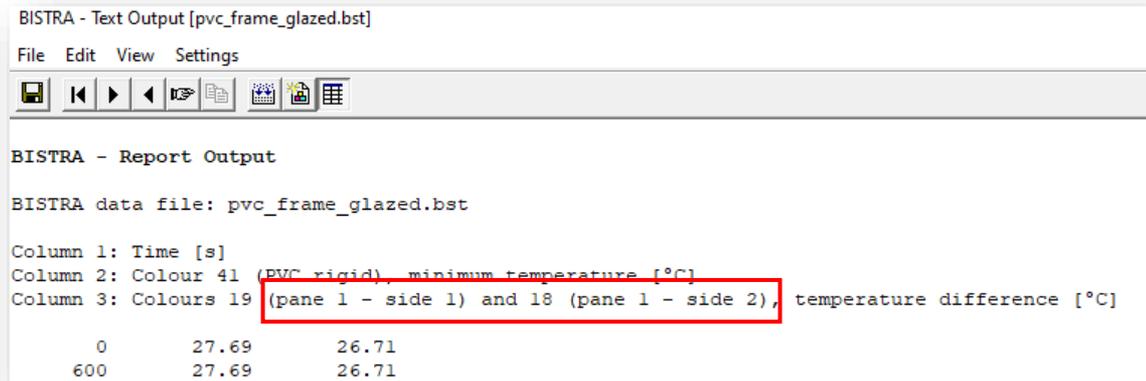


F.4 Miscellaneous

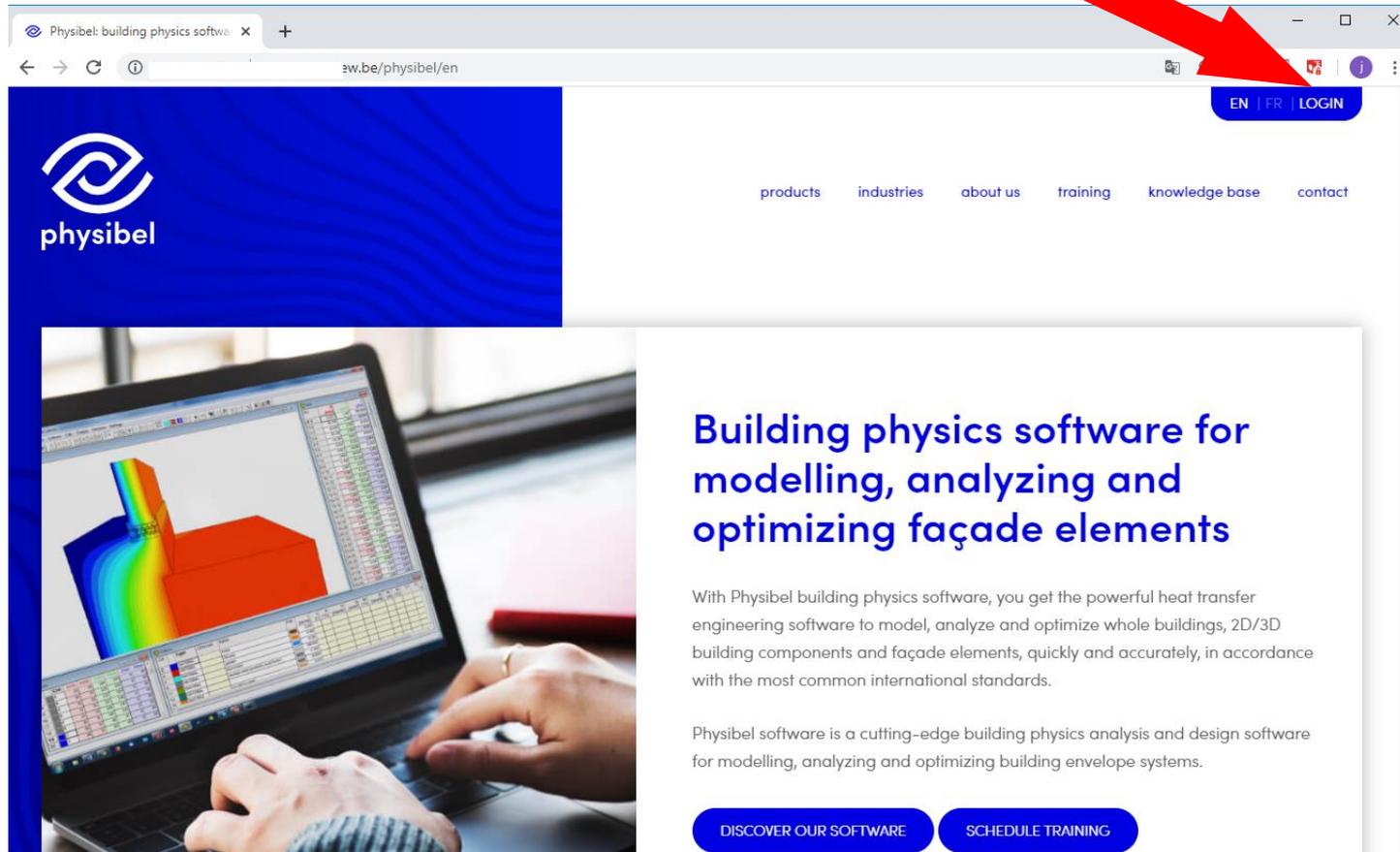
1. Introduction of Listbox to select Report Definition 'Type'
2. Temperature outputs of combination of 2 colours possible
3. Colour name included in header of Report output
4. Text output: always entirely visible (no memory caps)
5. Text output: column with non-valid results show '-' (e.g. θ_a for BC_SKY)



3



log in to portal via www.physibel.be



The screenshot shows a web browser window displaying the Physibel website. The address bar shows the URL www.physibel.be. The website features a blue header with the Physibel logo on the left and a navigation menu on the right. The navigation menu includes links for [products](#), [industries](#), [about us](#), [training](#), [knowledge base](#), and [contact](#). A prominent blue button labeled **EN | FR | LOGIN** is located in the top right corner, with a large red arrow pointing to it from the text above. Below the header, there is a large image of a laptop displaying a 3D building model with a color-coded heat transfer analysis. To the right of the image, the main content area contains the following text:

Building physics software for modelling, analyzing and optimizing façade elements

With Physibel building physics software, you get the powerful heat transfer engineering software to model, analyze and optimize whole buildings, 2D/3D building components and façade elements, quickly and accurately, in accordance with the most common international standards.

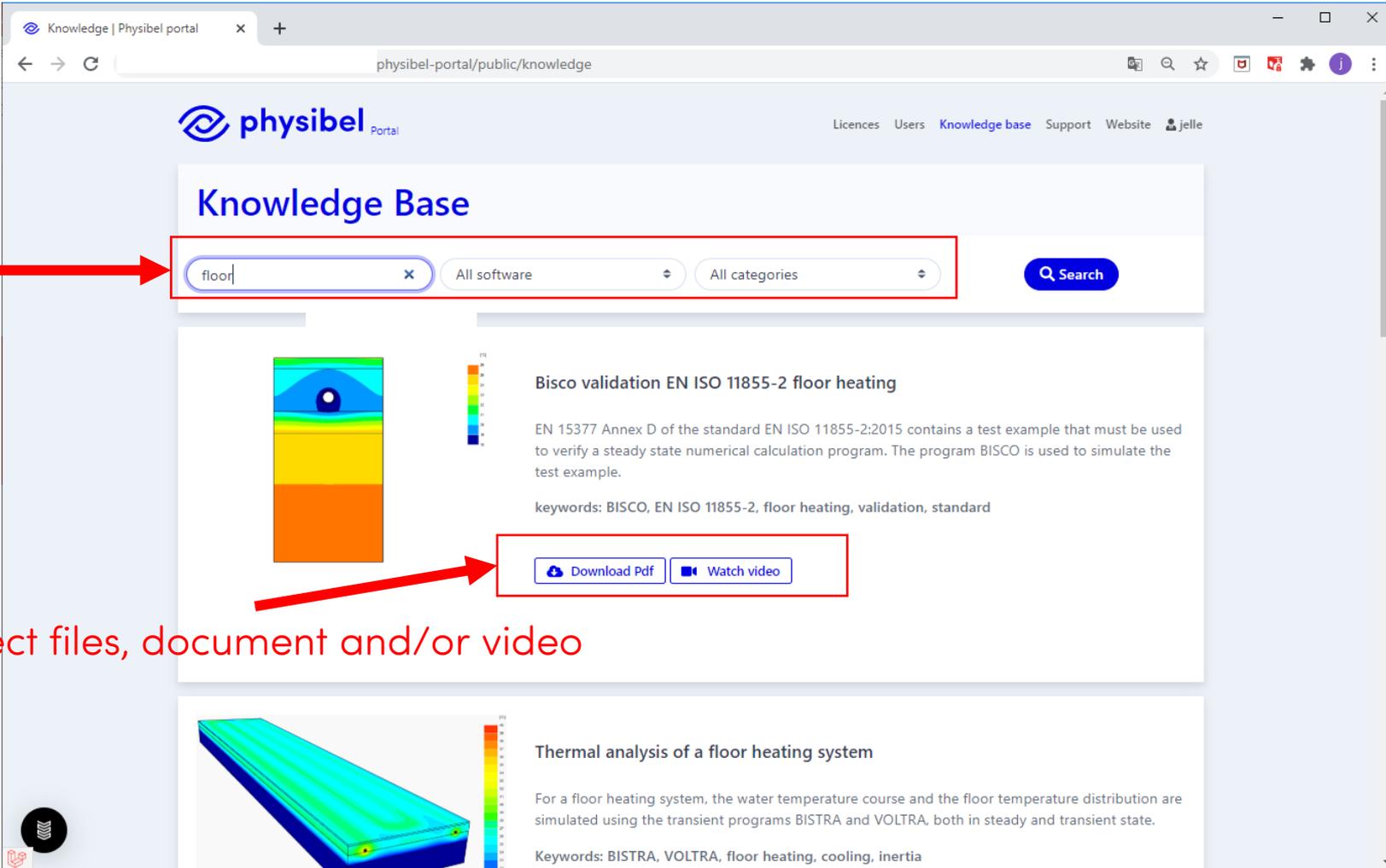
Physibel software is a cutting-edge building physics analysis and design software for modelling, analyzing and optimizing building envelope systems.

At the bottom of the main content area, there are two blue buttons: **DISCOVER OUR SOFTWARE** and **SCHEDULE TRAINING**.

G.1 Online Physibel Portal

Access to

- Knowledge Base with example projects, tutorials and videos



The screenshot shows a web browser window with the URL `physibel-portal/public/knowledge`. The page header includes the Physibel logo and navigation links for Licences, Users, Knowledge base, Support, Website, and a user profile for Jelle. The main heading is "Knowledge Base". A search bar contains the text "floor" and is highlighted with a red box and a red arrow pointing to it from the text "Search tool". Below the search bar, there are two dropdown menus: "All software" and "All categories". The search results display two entries:

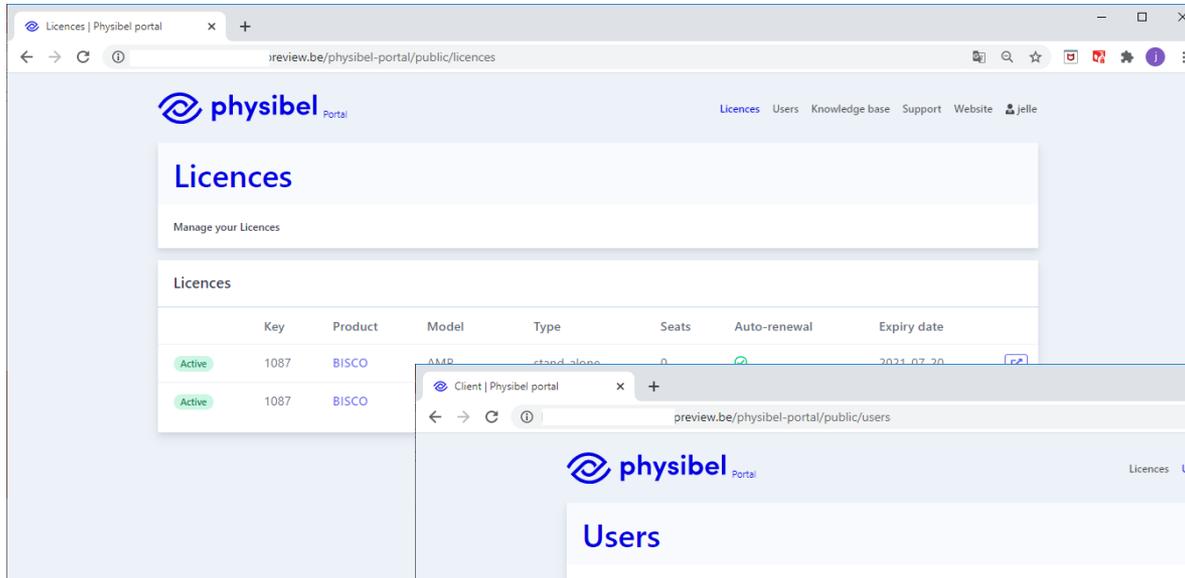
- Bisco validation EN ISO 11855-2 floor heating**
EN 15377 Annex D of the standard EN ISO 11855-2:2015 contains a test example that must be used to verify a steady state numerical calculation program. The program BISCO is used to simulate the test example.
keywords: BISCO, EN ISO 11855-2, floor heating, validation, standard
This entry includes a 2D cross-section thermal image of a floor heating system and a red box containing two buttons: "Download Pdf" and "Watch video". A red arrow points from the text "Access project files, document and/or video" to this box.
- Thermal analysis of a floor heating system**
For a floor heating system, the water temperature course and the floor temperature distribution are simulated using the transient programs BISTRA and VOLTRA, both in steady and transient state.
Keywords: BISTRA, VOLTRA, floor heating, cooling, inertia

G.1 Online Physibel Portal

[overview](#)

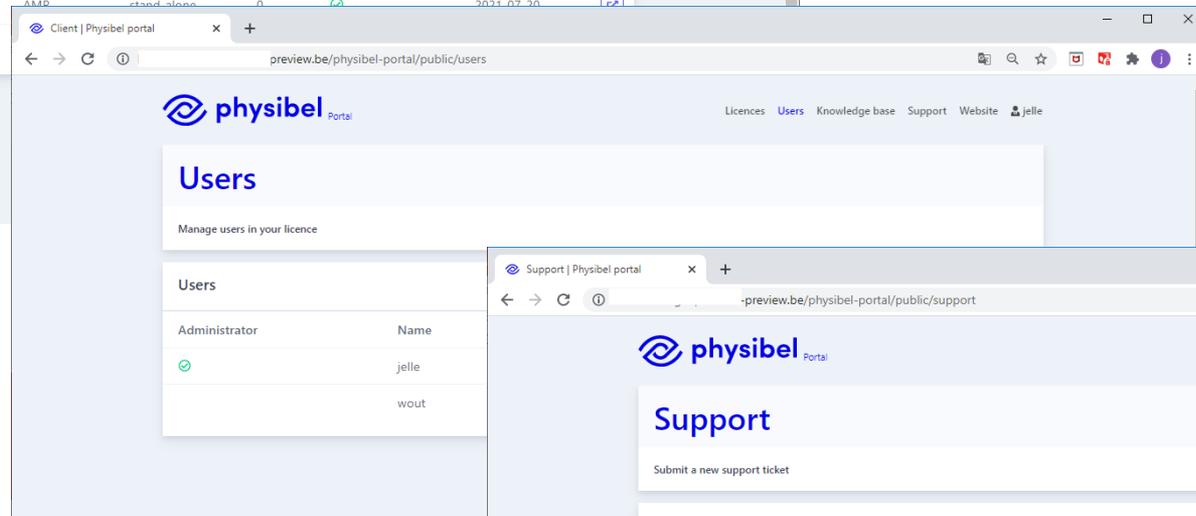
Access to

- Licence and user management
- Support



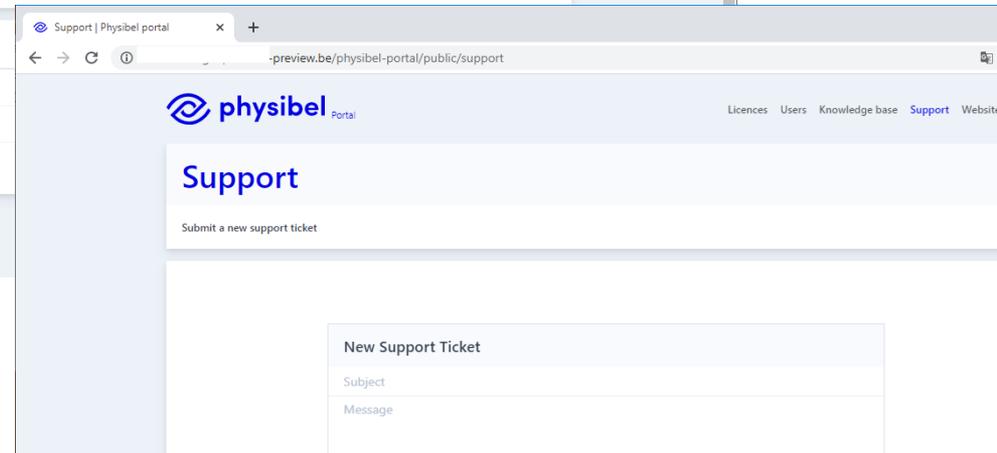
Screenshot of the Physibel Portal Licences page. The page title is "Licences" and the subtitle is "Manage your Licences". The page displays a table of licences with the following columns: Key, Product, Model, Type, Seats, Auto-renewal, and Expiry date. The table contains two rows of active licences.

	Key	Product	Model	Type	Seats	Auto-renewal	Expiry date
Active	1087	BISCO	AMP	stand alone	0		2021-07-20
Active	1087	BISCO					



Screenshot of the Physibel Portal Users page. The page title is "Users" and the subtitle is "Manage users in your licence". The page displays a table of users with the following columns: Administrator and Name. The table contains two rows of active users.

Administrator	Name
✓	jelle
	wout



Screenshot of the Physibel Portal Support page. The page title is "Support" and the subtitle is "Submit a new support ticket". The page displays a form for submitting a new support ticket with the following fields: Subject and Message.

New Support Ticket

Subject

Message

H Licencing options

[overview](#)

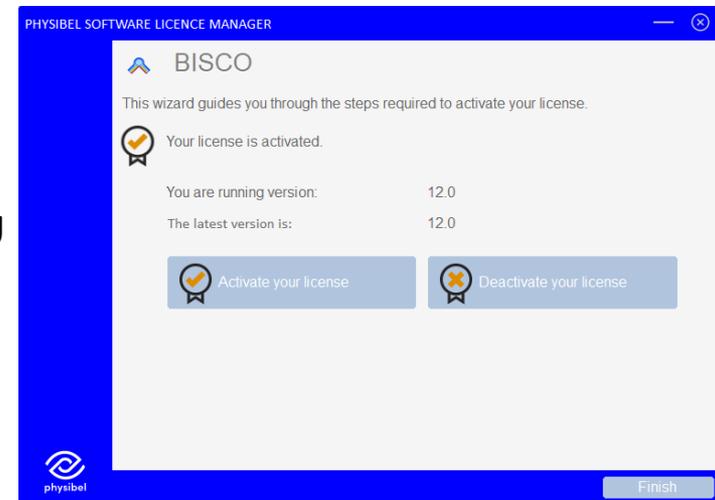
Option 1: hardware key

- Stand-alone
- Model: perpetual
- Updates and support via Annual Maintenance Plan (AMP)



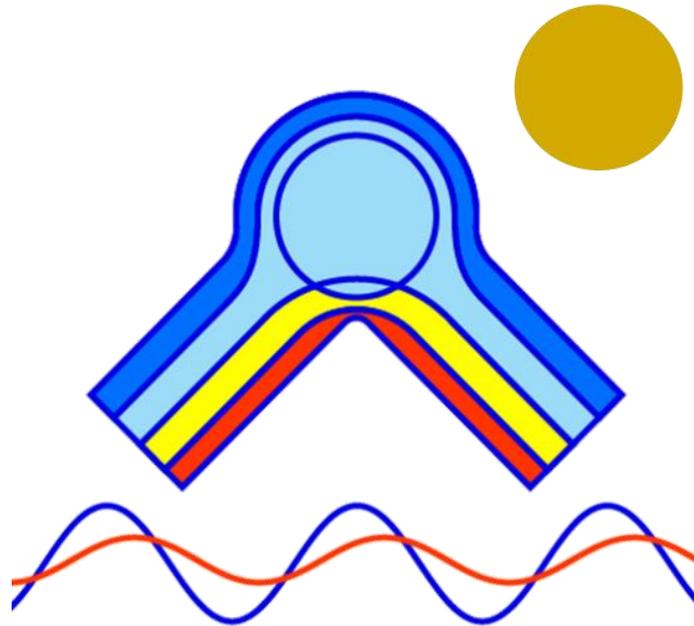
Option 2: Software licence

- Stand-alone / network floating / cloud-based floating
- Model: subscription (1 or 3-yearly)
- Updates and support included in subscription





BISTRA v5 New program performances



www.physibel.be/bistra

downloadable program demo version