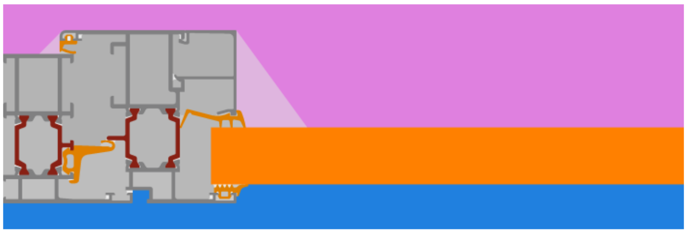
BISCO
SAMPLE WINDOW FRAMES

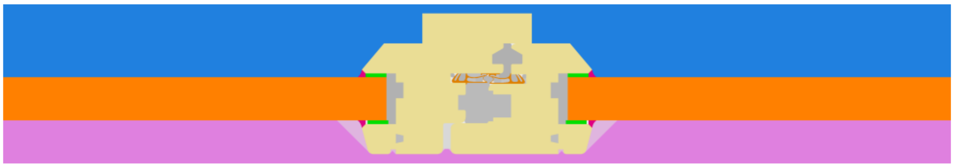
- Bisco data alu_1_frame_panel.bsc



The file alu_1_frame_panel.dxf was used to create the data. The DXF file contains layer names such as "aluminium", "EPDM", ... After opening the DXF file in BISCO, the DXF file is converted to a BMP file (alu_1_frame_panel.bmp) either using BiscoDxf.exe or using directly Bisco.exe. In this last case a layer file (alu_1_frame_panel.lay) containing the colour index and fill mode for each layer is required. In Bisco the "EN 10077 preparation" function (menu Bitmap) is used to adjust the data according to EN ISO 10077. Before using this function, the EN 10077 settings should be checked.

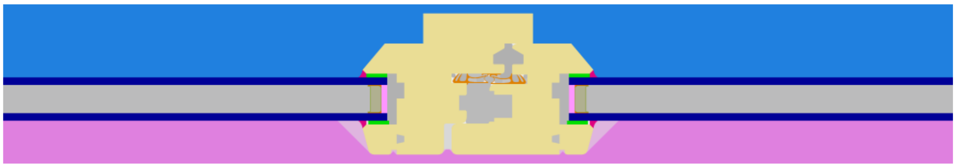
Alternatively, alu_1_frame_panel.bsc can be directly obtained from the DXF file alu_1_frame_panel_prepared.dxf. In this file the 3 first digits of the layer name correspond to the Physibel Colour Database index[1] and the 5th digit corresponds to the required fill mode (1 = fill contour, 2 = flood fill), for example "008_1_aluminium. The DXF file is directly opened in BISCO without the need of a .LAY file. Then the "EN 10077 preparation" function (menu Bitmap) is used. Another possibility is to perform a batch calculation for the DXF file. This will cause the bitmap conversion, the EN 10077 preparation, the calculation and output in 1 step.

- Bisco data central_wood_frame_panel.bsc.



The file central_wood_frame_panel.dxf was used to create the data. The DXF file uses indexed layer names as in the previous example.

- Bisco data central_wood_frame_glazed.bsc.



The insulation panel in the previous data was replaced by a double glazing (bitmap

[1] More information: Knowledge Base document MATERIAL AND BOUNDARY CONDITIONS: EN 10077-2, EN 6946 and EN 10456.pdf

glazing_spacer_4_15_4_inox1.bmp) using the Bisco "import bitmap" function or within the BiscoBmp environment (menu Bitmap-> Edit Using BiscoBmp). For the glazing cavity an equivalent thermal conductivity was used in order to obtain a glazing thermal transmittance U_g = 1.1 W/m^{2}K.

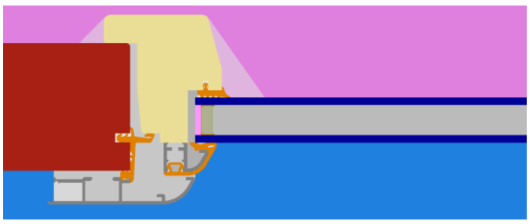
In order to derive the linear thermal transmittance ψ_g of the glazing edge

- The thermal transmittance of the frame U_f = 1.419 W/m^{2}K (obtained by using the previous Bisco data) is entered as an "enforced U-value" in the Border U-values Window (using the left border by lack of a central position).
- The appropriate parameters are specified in the Derived Thermal Properties dialogue box.

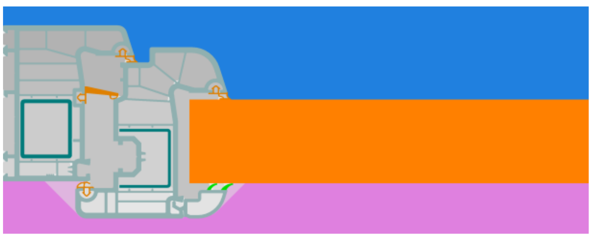
It should be emphasized that the derived ψ value in the text output = 2 x ψg. More information on this topic can be found in the Knowledge Base document: 'LINEAR THERMAL TRANSMITTANCE OF A GLAZING SPACER ACCORDING TO EN ISO 10077-2.pdf'

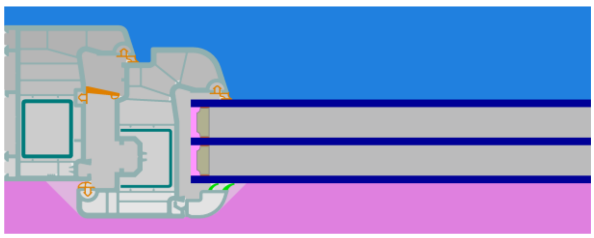
- **Bisco data pvc_frame_vert_panel.bsc and pvc_frame_vert_glazed.bsc.**
  The data were created from the DXF files pvc_frame_vert_panel.dxf and pvc_frame_vert_glazed.dxf that use indexed layer names.
  In order to derive the linear thermal transmittance ψ_g of the glazing edge
  - The thermal transmittance of the frame U_f = 1.425 W/m^{2}K (obtained by using the data with the panel) is entered as an "enforced U-value" in the Border U-values Window.
  - The appropriate parameters are specified in the Derived Thermal Properties dialogue box.

- **Bisco data wood_alu_glazed.bsc**



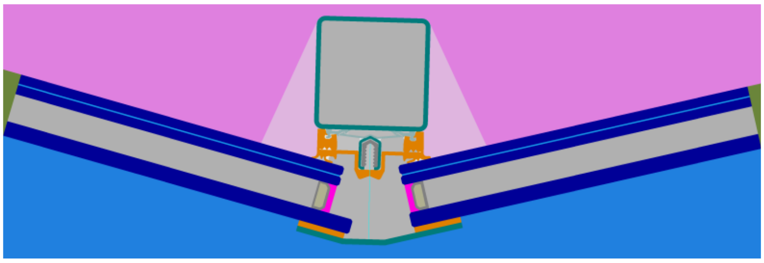
- **Bisco data pvc_frame_panel.bsc and pvc_frame_glazed.bsc.**



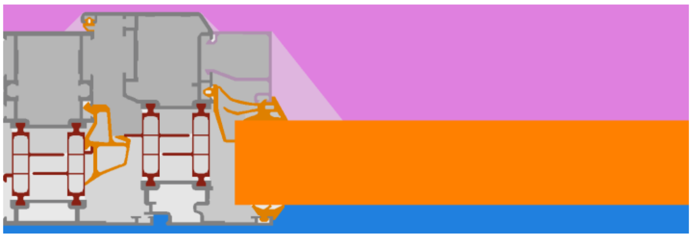


- **Bisco data** steel_frame_sloped.bsc

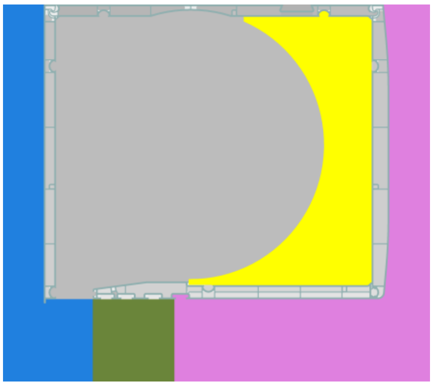
Data highlights:
- adiabatic colour left & right
- Screw 2D method (equivalent thickness)[2]
- U-value of glazing calculated in window Distances
- Node linear thermal transmittance[3].



- **Bisco data** alu_3_frame_panel.bsc



- **Bisco data** shutter_box.bsc



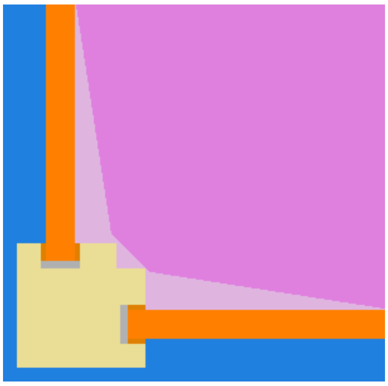
- **Bisco data** corner_ex.bsc corner_glazed.bsc

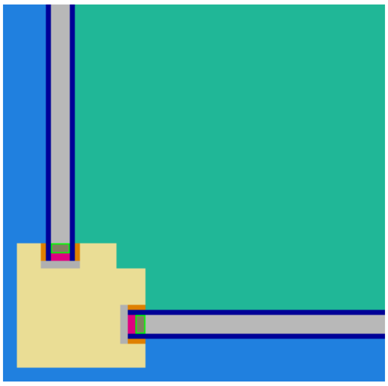
EN ISO 10077-2 is only applicable for frames for which the glazing lies in the same line with the frame. EN ISO 10077-2 does for example not anticipate for corner frames. In such case the definition of a) width of the frame and b) zones with reduced surface coefficient are open for interpretation. Using the external width of the frame (corner_ex.bsc) results in an artificial low Uf-value. Therefore it is suggested to apply the node linear thermal transmittance ψ_n with detailed

[2] More information on this topic in Physibel Knowledge Base document '3D & 2D SIMULATION OF FIXINGS - VALIDATION OF EN 12631:2017 ANNEX E.pdf'

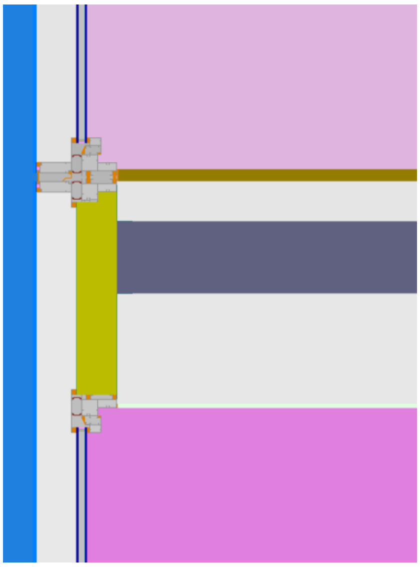
[3] More information on this topic in Physibel Knowledge Base document 'GLAZED FACADES: DERIVED THERMAL PROPERTIES.pdf'

radiation at the interior side. This will include directly the thermal transmittance of the frame + glass spacer (corner_glazed.bsc). More information on this topic can be found in the Physibel Knowledge Base document 'GLAZED FACADES: DERIVED THERMAL PROPERTIES.pdf'



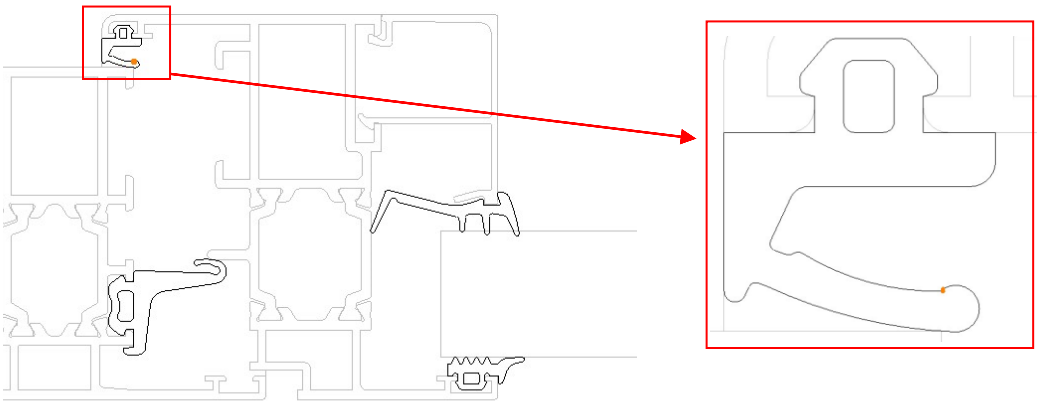


- **Double skin façade** facade_floor.bsc



The file facade_floor.bsc is used the determine the U_{TJ} of a (double skin) curtain wall in line with EN 12631. The air cavity between the two glazing panes (10cm) is modelled by the type BC_FREE.

- **DXF files with a non-closed polyline** alu_1_frame_panel_not_closed.dxf



When loading a DXF file in BISCO, locations where a polyline is not closed will be highlighted with an orange marker within BiscoDxf. For such layers it is recommended to apply the fill mode 'Line' when generating the BMP file. Thereafter, in BISCO or within BiscoBmp, these zones can be easily closed (Bitmap -> Line or Draw) and filled with the paint brush (Bitmap -> Fill).

- **Cleaning DXF files.**

When opening a dxf file in BiscoDxf the object to be simulated isn't in the blue rectangle.
Example: opening example_dxf_before_-clean.dxf in BiscoDxf results in the picture bottom left.
After applying the command "-Clean" in DraftSight or "Purge" in AutoCad the blue rectangle borders the object.
Example: opening example_dxf_after_-clean.dxf in BiscoDxf results in the picture bottom right.