October 2013 – No. W20 – Revision index 3-09/2019 – valid until June 30th, 2021

'WARM EDGE' WORKING PARTY

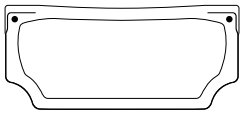
Data sheet Psi values for windows

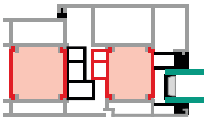
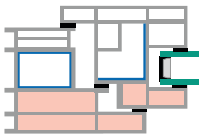
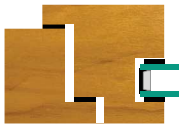
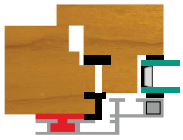
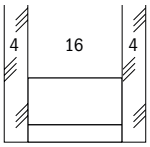
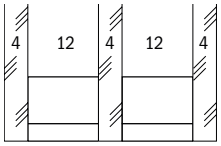
based on determination of the equivalent thermal conductivity of spacers by measurement

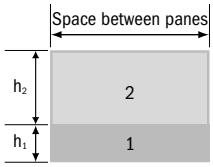
TECHNOFORM

Technoform Glass Insulation GmbH
Matthäus-Merian-Str. 6
D - 34253 Lohfelden

RAL GÜTEZEICHEN MEHRSCHEIBEN ISOLIERGLAS

	Product name	Space height in mm	Material	Thickness d in mm
Cross-section	**TGI Spacer M** 	6.85	Stainless steel Plastic	0.09 0.6/0.8

	Representative glass constructions	Metal with thermal break	Plastic	Wood	Wood/Metal
Representative frame profile					
Representative psi value double-sheet thermally insulating glass W/mK	 Double-sheet insulating glass U_g=1.1 W/m²K	0.049	0.040	0.040	0.044
Representative psi value triple-sheet thermally insulating glass W/mK	 Triple-sheet insulating glass U_g=0.7 W/m²K	0.044	0.038	0.039	0.042

		Space between panes in mm	$\lambda_{eq,2B}$ in W/mK	
			Box 1 · h_1 = 3 mm	Box 2 · h_2 = 6.9 mm
Two Box model Characteristic values		Can be used for all spacer widths	0.40	0.31

Explanations

The equivalent thermal conductivity has been determined in accordance with the ift guideline WA-17engl/1 "Thermally improved spacers – Determination of the equivalent thermal conductivity by measurement". The representative linear heat transfer coefficients calculated in this way (representative psi values) apply to typical frame profiles and glazing for the determination of the heat transfer coefficient U_W of windows. They have been determined under the boundary conditions (frame profiles, glazing, glass mounting depth, back covering, primary and secondary sealant) defined in the ift guideline WA-08engl/3 "Thermally improved spacers – Part 1: Determination of the representative Psi value for window frame profiles". This guideline also governs the area of validity and application of the representative psi values. In order to avoid rounding errors, the psi values in the data sheet have been given at 0.001 W/mK. The method for the arithmetical determination of the psi values has an accuracy of ± 0.003 W/mK. Differences of less than 0.005 W/mK are not significant. For further information, refer to the Bulletin 004/2008 "Guide to Warm Edge" of Bundesverband Flachglas.

Characteristic values determined by:

Hochschule Rosenheim
University of Applied Sciences

ift ROSENHEIM

March 2016 – No. CW20 – Revision index 2-09/2019 – valid until June 30th, 2021

'WARM EDGE' WORKING PARTY

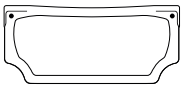
Data sheet Psi values for facade profiles

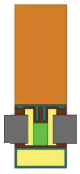
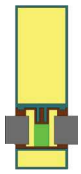
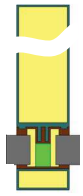
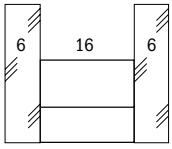
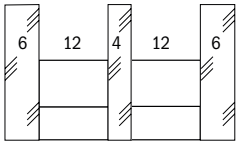
based on determination of the equivalent thermal conductivity of spacers by measurement

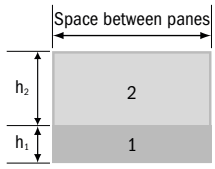
TECHNOFORM

Technoform Glass Insulation GmbH
Matthäus-Merian-Str. 6
D - 34253 Lohfelden

RAL GÜTEZEICHEN MEHRSCHEIBEN ISOLIERGLAS

	Product name	Spacer height in mm	Material	Thickness d in mm
Cross-section	***TGI-Spacer M*** 	6.85	Stainless steel Plastic	0.09 0.6/0.8

	Representative glass constructions	Wood/metal	Metal with thermal break (d_i = 100 mm)	Metal with thermal break (d_i = 200 mm)
Representative facade profiles				
Representative psi value double-sheet thermally insulating glass W/mK	 Double-sheet insulating glass U_g=1.1 W/m²K	0.068	0.091	0.096
Representative psi value triple-sheet thermally insulating glass W/mK	 Triple-sheet insulating glass U_g=0.7 W/m²K	0.063	0.079	0.082

		Space between panes in mm	$\lambda_{eq,2B}$ in W/mK	
			Box 1 · h_1 = 6 mm	Box 2 · h_2 = 6.85 mm
Two Box model Characteristic values		Can be used for all spacer widths	0.40	0.31

Explanations

The equivalent thermal conductivity has been determined in accordance with ift guideline WA-17engl/1 "Thermally improved spacers – Determination of the equivalent thermal conductivity by measurement". The representative linear heat transfer coefficients (representative psi values) determined thereby apply to typical facade profiles and glazing for determination of the coefficients of thermal conductivity U_{CW} of curtain walls. They have been determined under the framework conditions (frame profiles, glazing, glass mounting depth, back covering, primary and secondary sealant) defined in ift guideline WA-22engl/1 "Thermally improved spacers – Part 3: Determination of the representative psi value for facade profiles". This guideline also governs the area of validity and application of the representative psi values. In order to avoid rounding errors, the psi values in the data sheet have been specified to the nearest 0.001 W/mK. The calculation method for determining the psi values has an accuracy of ± 0.003 W/mK. Differences of less than 0.005 W/mK are not significant. Further information can be found in the bulletin 004/2008 "Guide to Warm Edge" published by Bundesverband Flachglas.

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