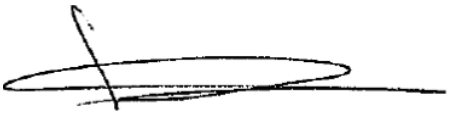
MATERIAL PROPERTIES OF PVB INTERLAYERS, *STRATOBEL* AND *STRATOBEL STRONG* LAMINATED GLASS

The material properties in this document comprise data for the PVB interlayers used in AGC laminated glass products. These values can be used for calculation of load resistance and glass deflection in the countries where national legislation does not define other data or methods. These material properties are representative of interlayers and glazings that have been tested according to the mentioned conditions.

Please contact your AGC representative or AGC TAS (tas@eu.agc.com) if you require other properties or for further information.

Louvain-la-Neuve, 20th of July 2022



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LITERATURE:
EN 16612:2019
EN 16613:2019
Product technical sheet - saflex clear_031720.pdf
Product technical sheet - saflex structural_031720.pdf
AMI ATD Saflex_Snow loads at 0C_110220
AARP_2022_07_761_0772_Datasheet
b-06-20-03-point-bending-rev02

These data are based on information available at the time of writing and are subject to change without notice. AGC Glass Europe cannot be held responsible for any deviation between these values and conditions on-site. This document is purely informative and in no way implies any commitment by AGC Glass Europe. The customer undertakes to comply fully and in good faith with AGC's recommendations, with accepted good practice and with the applicable standards and guidelines of approved institutes, professional institutes and organisations or other similar bodies. AGC's liability remains limited to those AGC products manufactured and delivered by AGC only.

MATERIAL PROPERTIES OF PVB INTERLAYERS USED IN STRATOBEL AND STRATOBEL STRONG LAMINATED GLASS

Loading	Load duration	Temperature range	Young's modulus E (MPa) **		
			Stratobel Strong	Mixed Strong/ Color PVB ***	Stratobel
WIND					
Wind gust (Mediterranean areas)	3 sec.	0°C to 35°C	25	10	2.5
Wind gust (other areas)	3 sec.	0°C to 20°C	1005	361	33
Wind storm (Mediterranean areas)	10 min.	0°C to 35°C	1.7	1.4	1.1
Wind storm (other areas)	10 min.	0°C to 20°C	254	35	2.3
PERSONAL LOADS					
Balustrade loads - no crowd (e.g. building use categories A, B, C1 and E)	30 sec.	0°C to 30°C	33	9.5	2.1
Balustrade loads - crowds	5 min.	0°C to 30°C	7.1	2.9	1.4
Maintenance loads	30 min.	0°C to 40°C	1.19	1.1	0.80
SNOW					
Snow load - external canopies and roofs of unheated buildings	3 weeks	-20°C to 0°C	426	N/A	2.3
Snow load - roofs of heated buildings	5 days	-20°C to 20°C	4.2	2.3	1.0
Snow load - external canopies and roofs of unheated buildings (application for Germany)	30 days	0° C	61.2	21.9	N/A
CAVITY PRESSURE VARIATIONS ON INSULATING GLASS UNITS					
Summer	6 hours	20°C to 40°C	1.11	0.9	0.19
Winter	12 hours	-30°C to 20°C	18	3.0	1.2
PERMANENT LOADS					
Self-weight, change in altitude etc.	50 years	-20°C to 60°C	N/A	N/A	N/A

NOTES:
General: National regulations from the building codes of the respective countries are to be respected. Corresponding values for Young's and Shear modules are to be used from the approvals.
** Values for 0°C not available, however higher stiffness has been proven*
*** The values correspond to the highest temperature in the given temperature range*
**** multilayer Strong PVB + Color PVB Mat 65 – Eastman RB47 2165*

OTHER MATERIALS PROPERTIES OF INTERLAYERS

	Poisson's ratio at 23°C and 50% RH ASTM D638 (-)	Density at 23°C ASTM D792 (kg/m³)	Thermal conductivity at 63°C ASTM D5930 (W/m.K)
Stratobel	0.5	1070	0.2
Stratobel Strong	0.5	1080	0.196

INTERLAYER THICKNESS

	Nominal thickness (mm)
Stratobel xx.1	0.38
Stratobel & Stratobel Strong xx.2	0.76
Stratobel xx.3	1.14
Stratobel & Stratobel Strong xx.4	1.52
Stratobel & Stratobel Strong xx.6	2.28

MAXIMUM SURFACE TEMPERATURE

Maximum allowed surface temperature for Stratobel Strong is in the range between 70°C and 90°C depending on other conditions like duration of exposure and/or relative humidity index. Aesthetics could be affected by long exposure in hot and/or humid environment. For calculation of load resistance and glass deflection, the surface temperature should be selected accordingly to EN 16612:2019 or valid local regulation.

STRATOBEL STRONG: YOUNG'S MODULUS OF THE INTERLAYER

Load Duration	Young's relaxation modulus E(t) (MPa)											
	Temperature (°C)											
	0	10	15	20	25	30	35	40	45	50	55	60
3 sec		1727	1585	1005	489	138	25	5.5	2.2	1.4	1.19	1.18
10 sec		1723	1419	828	317	72	12	3.2	1.6	1.2	1.18	1.14
30 sec		1713	1272	649	208	33	6	2.0	1.3	1.2	1.16	1.05
1 min		1698	1168	556	139	19	4	1.7	1.2	1.2	1.13	0.95
5 min		1600	924	324	57	7.1	2.0	1.25	1.2	1.1	0.93	0.71
10 min		1514	816	254	34	4.5	1.7	1.20	1.17	1.07	0.81	
30 min		1356	639	143	15	2.9	1.4	1.19	1.13	0.91		
1 hour		1265	546	94	10	2.2	1.2	1.18	1.08	0.79		
6 hours		988	296	30	3.5	1.40	1.19	1.11	0.80			
12 hours		891	229	18	2.7	1.25	1.18	1.03	0.71			
1 day		776	158	12	2.0	1.20	1.16	0.92				
5 days		539	65	4.2	1.4	1.18	1.04					
1 week		489	52	3.7	1.3	1.18	0.99					
3 weeks		330	21	2.4	1.2	1.14	0.79					
1 month	61.2	292	17	2.1	1.2	1.12	0.74					
1 year*		81	3.8	1.2	1.1							
10 years*		16	1.7	1.2	0.9							
15 years*		13	1.6	1.2	0.8							
50 years*		5.9	1.2	1.1								

* values not validated

Values calculated using E = 3G as per EN 16613 par 5.1
For exact values of the Young's modulus available actual Poisson's ratio can be used