



MATERIAL PROPERTIES OF PVB INTERLAYERS USED IN 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 March 2017

A handwritten signature in black ink, appearing to be 'Ir. Hugues Lefèvre', written over a horizontal line.

Ir. Hugues Lefèvre
Product Manager Laminated Glass

LITERATURE:

prEN16612:2016
prEN16613:2015

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 | Stratobel Strong | | Stratobel | | Young's modulus E (MPa) | | |
|---------|---------------|-------------------|-----------------------------|----------------------------|----------------------------|----------------------------|-------------------------|-----------------------|-----------------------|
| | | | Young's modulus E (MPa) *** | Family type prEN16613:2016 | Young's modulus E (MPa)*** | Family type prEN16613:2016 | Required for family 0 | Required for family 1 | Required for family 2 |

WIND

| | | | | | | | | | |
|----------------------------------|---------|--------------|------|---|------|---|-----|-----------|------|
| Wind gust (Mediterranean areas) | 3 sec. | 0°C to 35 °C | 81 | 2 | 2,4 | 1 | <1 | 1 to 20 | >20 |
| Wind gust (other areas) | 3 sec. | 0°C to 20 °C | 1020 | 2 | 42 | 1 | <10 | 10 to 100 | >100 |
| Wind storm (Mediterranean areas) | 10 min. | 0°C to 35 °C | 3,36 | 2 | 1,2 | 2 | <1 | <1 | >1 |
| Wind storm (other areas) | 10 min. | 0°C to 20 °C | 569 | 2 | 3,06 | 1 | <1 | 1 to 20 | >20 |

PERSONAL LOADS

| | | | | | | | | | |
|-------------------------------------|---------|--------------|------|---|-----|-----|----|---------|-----|
| Barrier personal load - normal duty | 30 sec. | 0°C to 30 °C | 117 | 2 | 2,1 | 1 | <1 | 1 to 20 | >20 |
| Barrier personal load - crowds | 5 min. | 0°C to 30 °C | 20,4 | 2 | 1,5 | 1 | <1 | 1 to 10 | >10 |
| Maintenance | 30 min. | 0°C to 40 °C | 1,8 | 2 | 0,9 | 0&1 | <1 | <1 | >1 |

SNOW

| | | | | | | | | | |
|--------------------------|---------|---------------|------|---|-----------|----|----|---------|-----|
| Snow (external canopies) | 3 weeks | -20°C to 0°C | 24 | 2 | min. 0.9* | 1* | <1 | 1 to 10 | >10 |
| Snow (roof) | 5 days | -20°C to 20°C | 19,5 | 2 | 1,2 | 2 | <1 | <1 | <1 |

CLIMATIC LOADS IN IGU

| | | | | | | | | | |
|--------|----------|---------------|------|---|------|-----|----|---------|-----|
| Summer | 6 hours | 20°C to 40°C | 1,67 | 2 | 0,77 | 0&1 | <1 | <1 | >1 |
| Winter | 12 hours | -30°C to 20°C | 199 | 2 | 1,66 | 1 | <1 | 1 to 10 | >10 |

PERMANENT LOADS

| | | | | | | | | | |
|--------------------------------------|----------|---------------|-----|--------|-----|--------|----|----|----|
| Self-weight, change in altitude etc. | 50 years | -20°C to 60°C | N/A | 01&0 2 | N/A | 01&0 2 | <1 | <1 | >1 |
|--------------------------------------|----------|---------------|-----|--------|-----|--------|----|----|----|

OTHER MATERIAL PROPERTIES OF INTERLAYERS

| | Poisson's ratio | Density (kg/m ³) | Coefficient of thermal expansion ASTM D 831 (m/m.K) | Thermal Conductivity ASTM F 5930 (W/m/(m ² °C)) | Specific Heat ASTM E 1269 (Joules / Kg -°C) | Heat of Combustion ISO 1716 (MJ / Kg) |
|------------------|-----------------|------------------------------|---|--|---|---------------------------------------|
| Stratobel | 0.5 | 1070 | 8.10 ⁻⁵ | | | 31 |
| Stratobel Strong | 0.5 | 1070 | 8.10 ⁻⁵ | 0,205 - 0,226 | 2150 - 2248 | 31 |

INTERLAYER THICKNESS

| | Nominal thickness (mm) | Deviation thickness (mm) |
|-----------------------------------|------------------------|--------------------------|
| Stratobel xx.1 | 0,38 | +/- 0,1 |
| Stratobel & Stratobel Strong xx.2 | 0,76 | +/- 0,1 |
| Stratobel xx.3 | 1,14 | +/- 0,1 |
| Stratobel & Stratobel Strong xx.4 | 1,52 | +/- 0,1 |
| Stratobel & Stratobel Strong xx.6 | 2,28 | +/- 0,15 |

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 based on the dominant load should be selected accordingly to prEN16612 or valid local standards and guidelines.

NOTES:

* Values for 0°C not available, however higher stiffness has been proven

** E=1.2 MPa, therefore Family 3 would be applied. We recommend to use Family 2

*** The values correspond to the highest temperature in the given temperature range