References & Disclaimer

References

Van Duser, A., Jagota, A., Bennison, S. J., “Analysis of Glass/Polyvinyl Butyral Laminates Subjected to Uniform Pressure” *Journal of Engineering Mechanics*, ASCE, **125**[4], 435-42 (1999).

S. J. Bennison, C. A. Smith, A. Van Duser, & A. Jagota, “Structural Performance of Laminated Safety Glass Made with “Stiff” Interlayers”, Proceedings of *Glass Processing Days 2001*, Tampere, Finland June 2001.

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Results

Maximum Design Limits:

Maximum allowable glass stress limit per ASTM E1300	Tempered @ 3 second load - **94.8 N/mm^2**
Maximum panel deflection limit	

Calculated Limits

The greatest maximum principal glass stress and laminate deflection have been extracted from each loading step; the values are presented in the table below for the glazing constructions modeled.

Laminate	Maximum Glass Stress (N/mm^2)	Maximum Deflection (mm)
6 mm FT- 0.89 mm SentryGlas® - 6 mm FT	19.4	14.2

Conclusion

The analysis presented here indicates that properly fabricated laminate constructions using SentryGlas® interlayer is below the maximum glass stress for fully tempered glass considering a uniform load of 1.9 kPa.

Note

Care should be taken to avoid direct contact between the glass and metal.

Seals must be sufficient to prevent water leakage that could lead to delamination.

Finite Element Model

MEPLA™-Software version 3.5 has been used for the analysis. MEPLA is a program for design and statics of multi-layered sandwich plates. The finite element models are shown below.

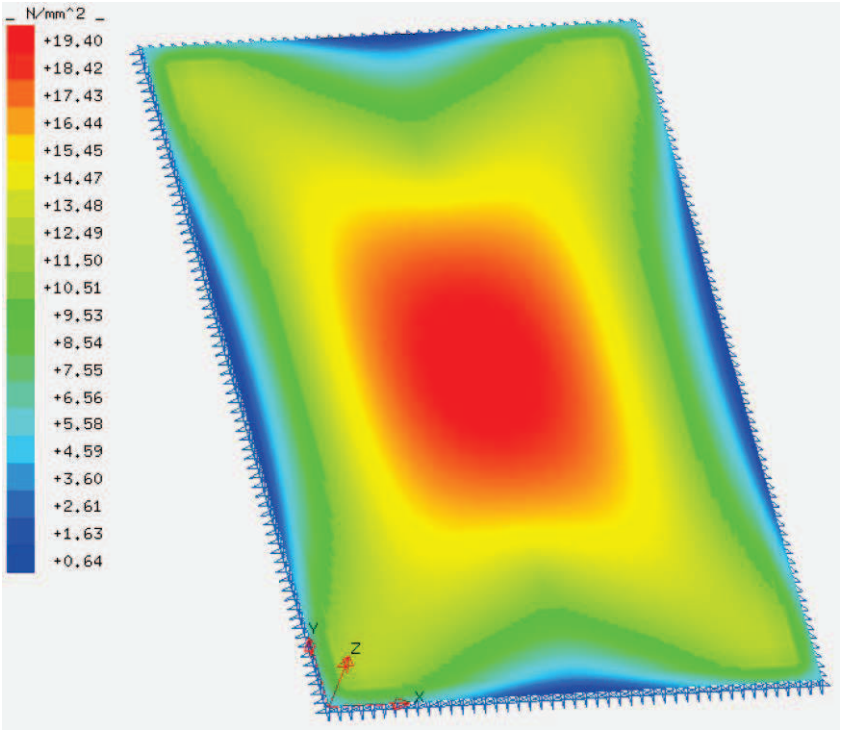

Figure 1. Maximum Stress - Uniform Load
6 mm FT – 0.89 mm SentryGlas® – 6 mm FT
The picture above shows the maximum glass stress, layer 1, bottom

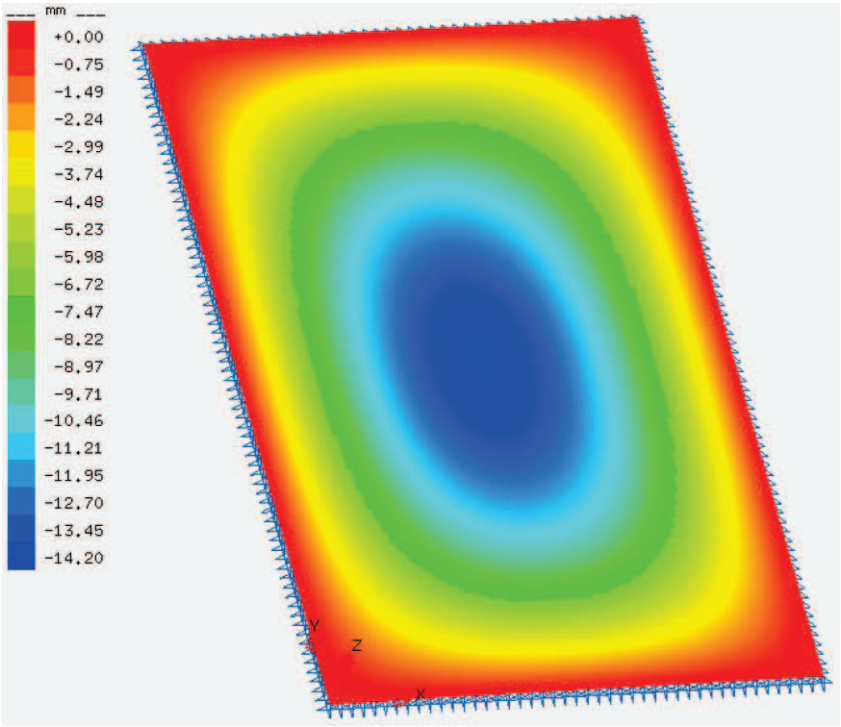

Figure 2. Maximum Displacement - Uniform Load
6 mm FT – 0.89 mm SentryGlas® – 6 mm FT
The picture above shows the maximum glass displacement, layer 1, deform w

Geometry and Glazing Construction

Shape:

Plate dimensions: **Façade**

- **Size (length x height)**
  - **1810 mm x 2817 mm**
- Shape : **Rectangular**
- Sloped position:
  - Sides = 90°, Vertical

***Support Conditions*:**

- **Side: 4 sides simply supported**
- Idealized model

***Loading*:**

The glazing shall withstand, without failure, the following load case:

- Uniform wind Load

200 km/h ≈ 1.9 kPa.

Laminate Construction

6 mm Tempered Glass
0.89 mm SentryGlas®
6 mm Tempered Glass