



Structural Analysis of Frame and IG for the fenestration industry



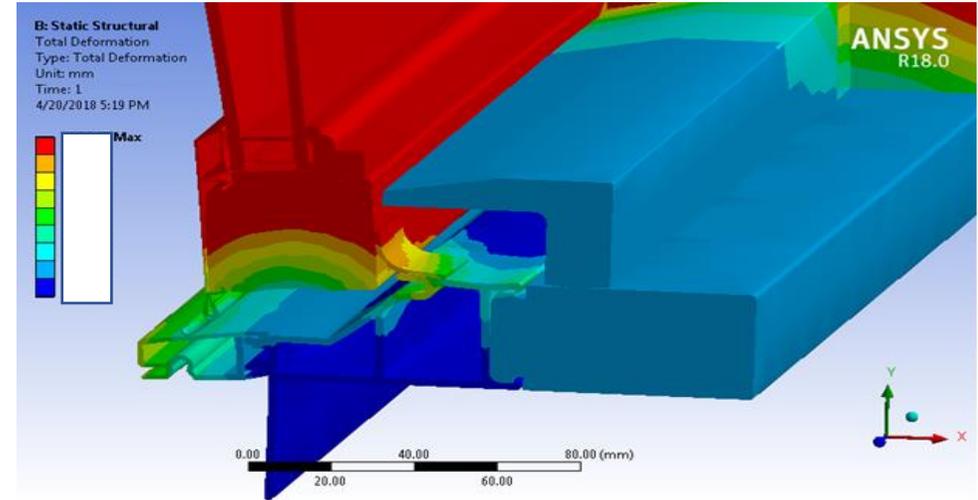
Structural Analysis and performance study of Models as per ASTM E330-14.

Frames Structural Analysis:

- FEA analysis is performed to study the overall structure of doors and windows.
- A combined structural and thermal analysis is performed by considering environmental temperature conditions and thermal stress were studied.
- To Capture the stresses in the hardware or local areas such as screws, brackets, etc., sub-model Analysis is performed.

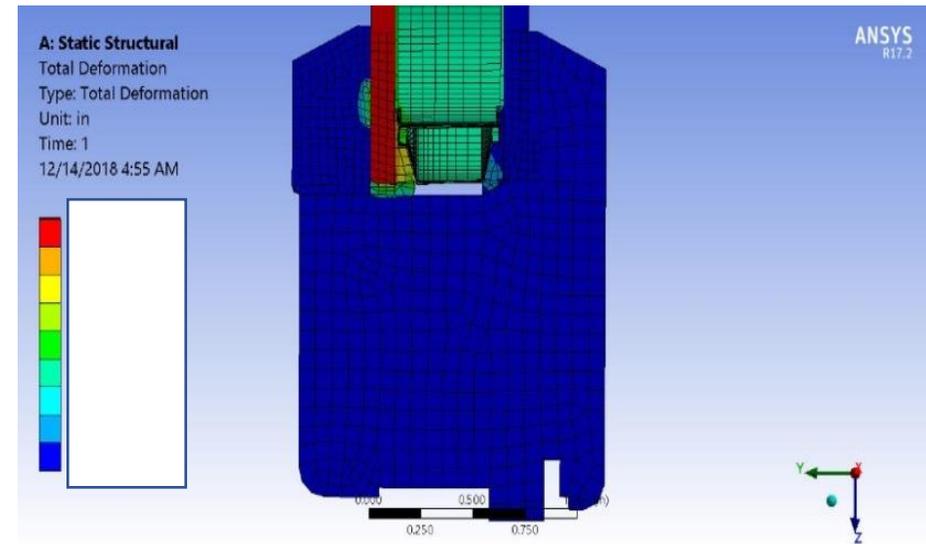
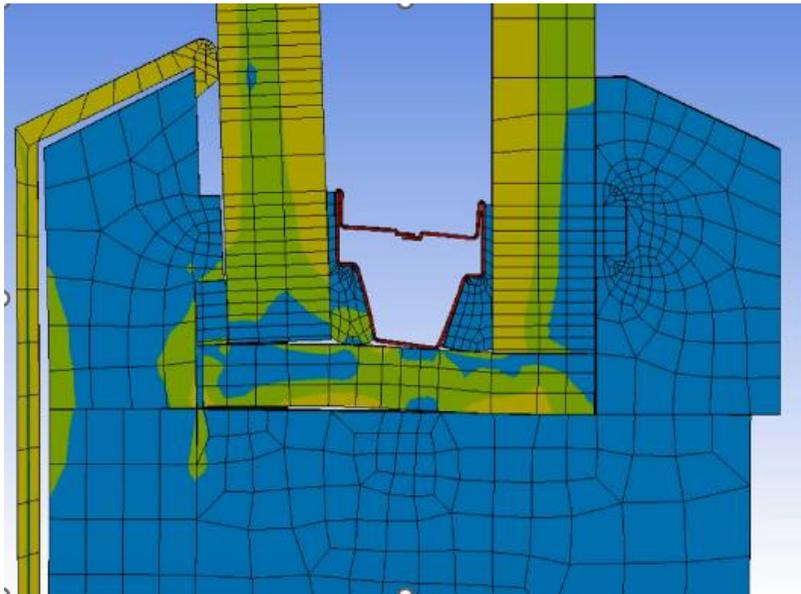
Benefits:

- Stresses are accurately determined. Areas where strengthening are required are suggested and achieved.
- We ensure, the maximum allowable deformation limits are not exceeded.
- Locations of Locks, brackets, hinges, screws and other hardware are optimally placed so that all members are loaded appropriately.

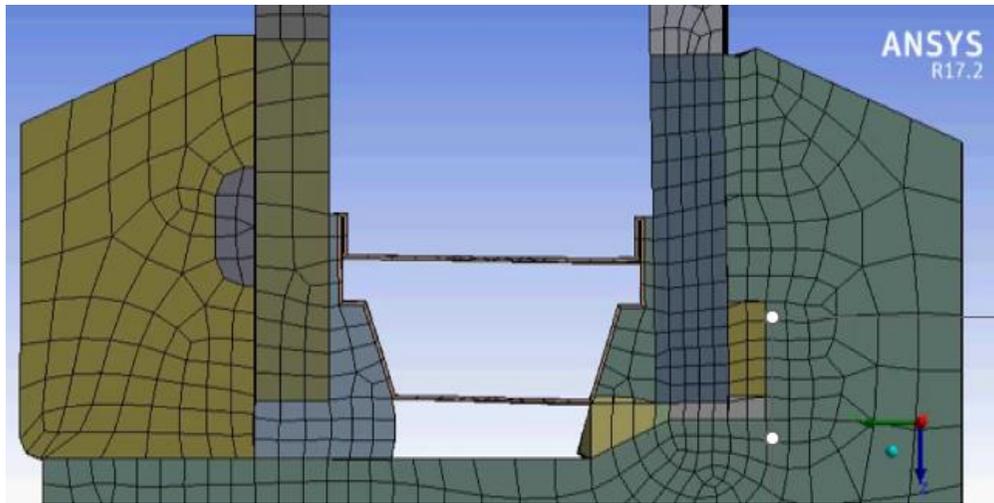


Structural Analysis and performance study of IG as per ASTM E330-14.

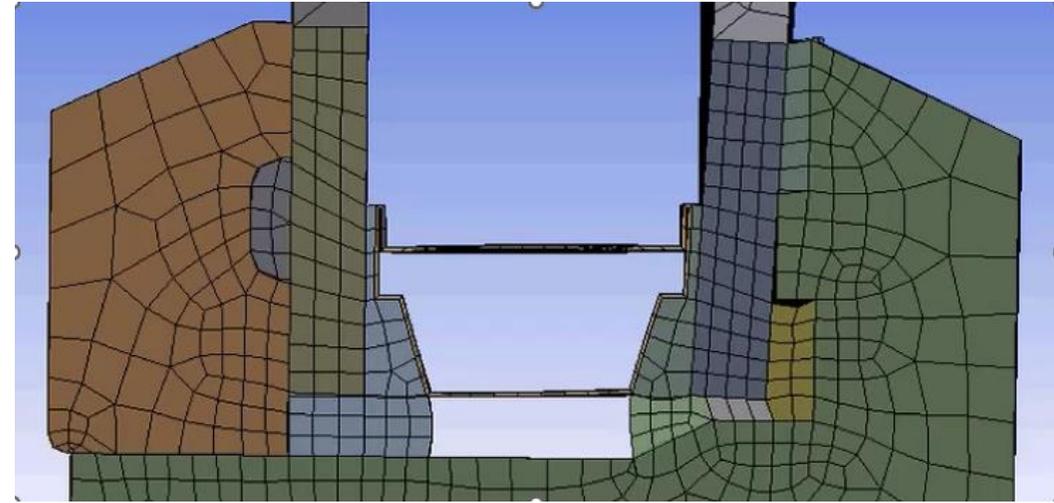
- IG Analysis is performed to ensure the Glass, spacer and spacer sealant are adequate to withstand testing under design pressure.
- Stresses were reduced by proposed viscoelastic and hyper elastic material and found components are safe except the sealant.
- Sealant failure due to high overall deformations in the glasses.



Total deformation Plot



Simulation shows Positive pressure Impact on ***** model



Simulation shows Negative pressure Impact on ***** model

Benefits:

- The quantity of sealants are optimized.
- The thicknesses of reinforcements and frames are optimized.
- Hardware components location are properly determined so as to take evenly distributed forces.

Temperature (°F)	Deformation in Z direction for Glass (in)	Max. Equivalent Stress (psi)					Stress on Glass face over rabbit (psi)
		Glass	Spacer	Spacer Sealant	Wood	Dow Corning	
78.8							
86.0							
93.2							
100.4							
107.6							
114.8							
122.0							
129.2							
136.4							
143.6							
150.8							

Stress table at various outside temperatures