

True Divided Lites (TDL) and Authentic Divided Lite (ADL) vs. Superior Divided Lites (SDL)

For years window companies have used True Divided or Authentic Divided insulating glass units in doors, side lites, and windows. The TDL and ADL window units usually consist of 6 to 24 insulating glass unit per panel. The SDL uses only one insulating glass unit with the dividers inside the insulating glass unit to create a similar look as a TDL or ADL product.

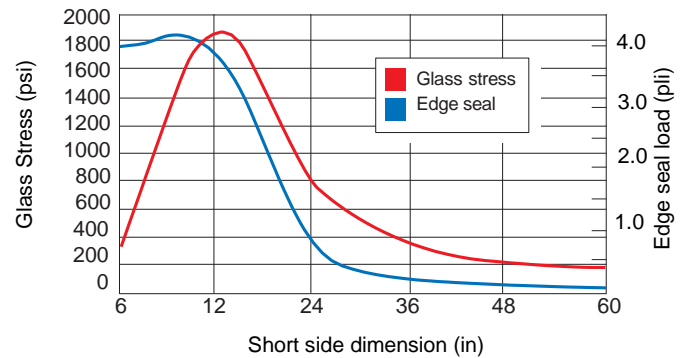
The SDL product is significantly more beneficial than the authentic or TDL product in many ways. From a window manufacturer's standpoint, the following benefits arise from using an SDL product over a TDL product:

- Reduced labor costs
- Reduced material costs (sealant and glazing materials)
- Reduced glazing time per sash
- Reduced number of stops to nail or adhere
- Reduced material (wood/aluminum in sash)

In addition to the above, SDL IG units have the following advantages from a design consideration standpoint over TDL and ADL insulating glass units.

- Reduced opportunities for air and water infiltration as there are no joints to make between insulating glass units.
- Improved overall window thermal performance because of the reduced amount of sash or framing materials used around TDL units.
- Reduction in glass breakage due to the reduced edge seal area.
- Reduction in sealant and glass stress due to the larger glass size compared to a TDL glass size.

It has been determined that the seal failure rate of TDL units is higher than standard larger insulating glass units of the same edge seal construction. The reason for this is that the glass and edge seal stresses on small unit sizes are significantly higher than for glass units having larger sizes. This can be seen in Figure IG 19-1 on the structural response to glass products with small short side dimensions. The high edge seal stresses in small IG units can cause premature seal failures in TDL units.



Notes: Glass stress and edge seal loads were determined based on an airspace temperature of 110°F. Insulating glass aspect ratio of 1. Edge seal load based on IG construction of 5.7/13.0/5.7. Glass stress based on IG construction of 3.0/19.5/3.0.

Cardinal's field data indicates that seal failure rates with TDL units could be approximately 2% after 10 years and approximately 4% after 20 years. This failure rate is 8 to 12 times higher than the expected failure rate of SDL units using Cardinal's XL Edge® system. Having a seal failure in a window or door assembly that has 6 to 24 TDL units multiplies the opportunity for a service call or replacement of the door or window by a factor of 48 to 290 times compared to SDL units.

This is obtained by comparing the TDL failure rate to the SDL failure rate, (8 to 12 times per unit) and multiplying this failure rate by the number of units in the TDL window or door (6 to 24 IG units). In addition, TDL products sent to high altitudes at times will require capillary tubes. Using capillary tubes for these small sizes can also contribute to premature condensation in the airspace.



With SDL units, the condensation potential around the periphery is significantly reduced compared to TDL units because of the lack of contact between edge seal materials and the glass in the center of the units.

Another benefit of using SDL units in lieu of TDL units is that only one logo will be required for the SDL unit where each TDL unit would require a logo indicating that the glass meets the requirements for certification (IGMA or IGCC) and tempering (SGCC).

When units are sent to altitude, SDL units offer the benefit of only one required capillary tube and a dispersion of any deflection over the entirety of the unit. Additionally, some sizes of TDL units are not allowed to be tubed or sent to altitude due to the stress that they would experience. This is up to the individual manufacturing plants.

The SDL product has significant advantages over the TDL products as seen by the information above. Because of these significant advantages, Cardinal recommends from a window manufacturer's costs, the design consideration to reduce the field seal failures and breakage potential, and aesthetic considerations, (IG unit site-line and logos), that SDL's be used in lieu of TDL products.

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