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What is Vacuum Insulated Glass – and is it ready for market?

Not many people know this however vacuum Insulated Glass (VIG) is not new technology. In 1893, Mr. James Dewar invented the vacuum flask and as early as 1913, there was a vacuum patent registered in Germany. More recently, manufacturers such as LandGlass have developed and patented insulating glass. “It took a hundred scientists and eight years to develop,” Art Huard of GlassCan Corporation told attendees at Fen-BC’s annual technical conference. LandVac is exclusively represented in North America by Florida based VIG Technologies and GlassCan Corporation in Canada.

VIG is an insulating glass unit with a .3mm vacuum gap between the glass panes which replaces the space for air or gas. “The first thing we talk about is the proprietary edge seal with a super long life cycle which has been tested to last at least 25 years,” said Huard. “It is a proprietary low temperature sealing technology which is extremely important in the vacuum insulating glass process because you are dealing with tempered glass and if the edge seal is too hot, you can take the temper out of the glass.”

The edge seal has a very high compression to it. According to Huard, if you have a low compression seal between the two layers of tempered glass, you can have transfer of energy and cause catastrophic failure of your IG. VIG has a very high compression flexible seal that is four times higher in compression than the glass itself with no transfer of energy through the seal or catastrophic failure.

0.3 millimeter proprietary shaped micro-support pillars are spaced 60 millimetres apart. “You can see them if you look at them closely but basically disappear if you stand back a couple of feet,” said Huard. “We make sure everybody's aware of it when we show it to them. But we also make sure that they realize that unless you're looking at it they basically disappear.”

The only way to make a VIG is to use fully tempered glass. Annealed glass won’t cut it. “We had meetings with the NRC in Ottawa,” said Huard. “The first question they asked us was is this fully tempered glass. Because if it wasn't they weren't interested in it. Fully tempered glass handles wind load. We need to have glass in contact with the pillars for this to all work so the glass has to be tempered extremely flat. Which was one of the major breakthroughs that allowed this to be able to be marketable at this time. It’s also an SGCC certified product.”

Not all VIG's are equal. They have different u-values. And a lot of that performance is based on the level of vacuum that you can create and maintain. Huard told attendees that the VIG Technologies product is designed with a proprietary evacuation port and has a tested life expectancy of more than 25 years.

There is a low-e coating in every VIG which helps to improve the u-value and SGHC. “Single, double and triple silver low-e, reflectivity. It depends the look and performance you're trying to achieve,” said Huard.

A “getter” is a depositor of reactive material that is placed inside of a vacuum system for the purpose of completing and maintaining the vacuum. “When you evacuate all the air in the vacuum space, you're going to have some stray molecules. Just picture them as tennis balls bouncing around the room. The getter’s job is to absorb any stray molecule that lands on it.”

LandGlass has a fully functioning VIG factory in China that has been operating since 2015. “The maximum size available today out of that factory is 1.5 metres wide by 2.5 metres high,” said Huard. “You can order thousands upon thousands of units tomorrow with delivery about eight to ten weeks from now. Maybe twelve with shipping, but no more.”

“There is currently a line under construction by LandVac that will manufacture VIG up to 2.0 metres wide by 3.2 metres high. And after 44 years in the glass business I can tell you that is going to cover at least 95% of your needs. We have millions of square feet of capacity available today with more on the horizon.

According to Huard, the product holds 182 of the 240 plus patents that are held by LandGlass and LandVac. “We have a patented convection tempering technology for super flat glass. This is one of the integral parts to VIG manufacturing,” said Huard.

Hybrid insulating glass units are where we take the VIG unit and use it as a component in a traditional IG. According to Huard, you can literally use any glass product on the outboard lite and a VIG on the inboard light. “Look at the numbers using a hybrid IGU with double silver such as Solarban 60 or SN68 on the outboard and VIG on the inboard,” said Huard. “Now you're up to an R-Value of 18 with still the same kind of high visible light.”

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