



## Heat Resistance of VISTASAFE™ VS103

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## Content

	Page
1. Purpose and scope	3
2. Experimental	3
3. Results and discussion	4
3.1 Bake Test at 200°C for 2 hours	
3.2 TPI Test Standard 150°C for 4 days	
4. Summary	5



## 1. Purpose and scope

This study is to determine whether the laminated glass is able to tolerate an exposure to high temperature over long period of time without any change in quality. The changes are verified by visual inspection such as the occurrence of bubble or haziness, discoloration, and delamination.

In this report, the resistance to heat of VS103, a super clear and premium architectural series was studied using two different test methods (200°C for 2 hours and 150°C for 4 days) and compared to PVB (PVB-S).

## 2. Experimental

**Sample:** Specimens size 300 mm x 100 mm with float glass 66.4 system.

**Test method:**

**Bake Test at 200°C** The resistance to heat was carried out in the hot air oven at 200°C for 2 hours. The specimen was removed and allowed to cool to room temperature under air by placing it in vertical orientation.

**TPI Test Standard** Sample was placed in the hot air oven at 150°C for 4 days. The specimen was removed and allowed to cool to room temperature under air by placing it in vertical orientation.

**Sample preparation:** For EVA, all samples were prepared by using vacuum bag in hot air oven. The average gel rate was > 90 %.

For PVB, all samples were prepared by a local customer using a commercial scale nip-roll/ autoclave machine and its processing condition.



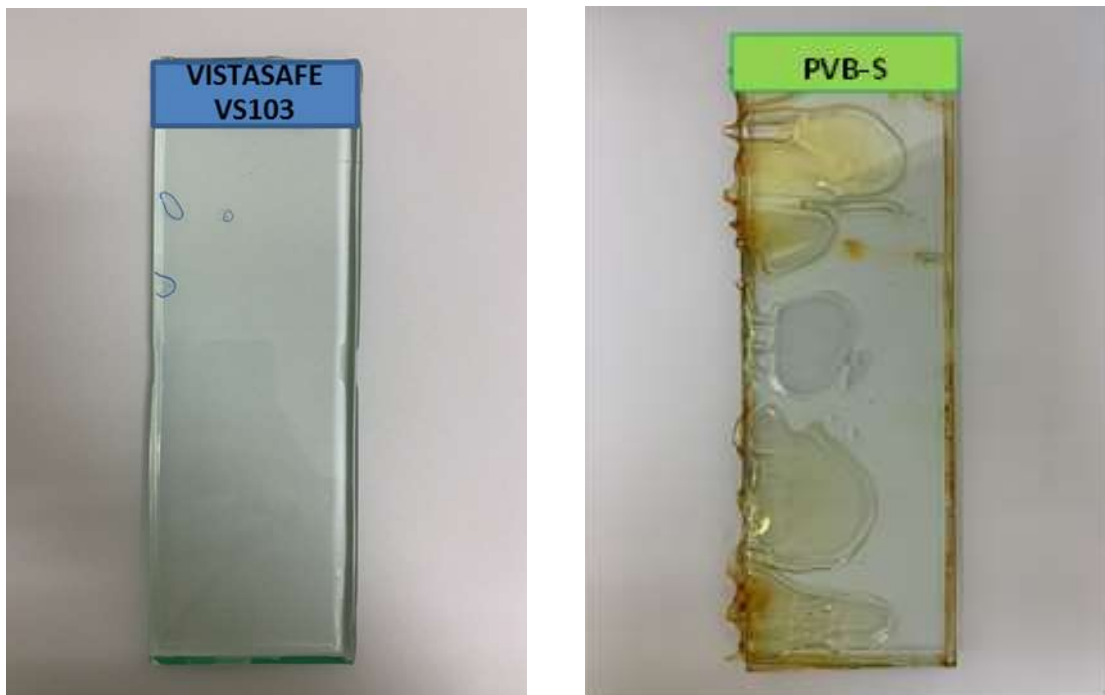
**Picture 1.** Sample (size 300 mm x 100 mm) before testing

### 3. Results and discussion

#### 3.1 Bake Test at 200°C for 2 hours

**Table 1.** Visual inspection of laminated glass samples after baking at 200°C for 2 hours

Sample	Visual inspection result
VISTASAFE VS103	- No discoloration - Small spots of delamination occurred
PVB-S	- Severe discoloration - large areas of delamination occurred



**Picture 2.** Samples of laminated glass of VISTASAFE VS103 PVB-S [66.4] under 200°C for 2 hours

#### 3.2 TPI Test Standard, 150°C for 4 days

However, according to the Bake Test at 150°C for 4 days, an in-house test method of TPI, sample of laminated glass using **VISTASAFE VS103** with the system of **66.4** showed good result while the sample of PVB showed a big spot delamination after 2 and gradually turned yellow around the edge of glass throughout the experiment (**Picture 3**).



**Table 2.** Visual inspection results of VISTASAFE VS103 and PVB-S samples after baking at 150°C for 4 days

Sample	Visual inspection result
VISTASAFE VS103	- No discoloration - No delamination
PVB-S	- Edge discoloration - Big spot of delamination



**Picture 3.** Samples of laminated glass of VISTASAFE VS103 vs PVB-S [66.4]

after baking at 150°C for 4 days

#### 4. Summary

VISTASAFE VS103 interlayer showed small spots of delamination after baking at 200°C for 2 hours while PVB-S provided severe discoloration and delamination. However, VS103 showed good result of visual inspection after baking at 150°C for 4 days (TPI Internal Standard) but PVB sample also showed both delamination and discoloration.