



Liquisol bvba
Tom Huysmans
Noorderlaan 147 bus 9
2030 ANTWERPEN
Belgium

Kortrijk, 20/08/2019

Your reference : mail 20/08/2019
Our reference : 20190820
Your contact person : Tom Huysmans
Our contact person : Gaetan Ongenae

Dear Sir/Madam,

Included you can find the results of the performed tests on your products.

We remain available for further information.

Yours faithfully,

Karim El Kassmi
VKC-Centexbel
E. Sabbelaan 49
8500 Kortrijk

Report 2019-2559

<u>Seismic testing</u>	
Customer	Liquisol bvba
Customer address	Noorderlaan 147 bus 9 2030 ANTWERPEN
Customer contact name	Tom Huysmans
Customer contact telephone	+32 03 2560172
Customer contact e-mail	verf@liquisol.com
Task reference	Testing the effect of a coating on ESC of skylight materials
Jobnr	2559
Contact VKC name	Gaetan Ongenae
Contact VKC tel	+32 56 29 27 18
Contact VKC e-mail	gaetan.ongenae@vkc.be
Report date	20/08/2019

**THE RESULTS IN THE REPORT ARE ONLY VALID FOR THE TESTED OBJECTS.
NOTHING OF THIS TEXT AND/OR ITS APPENDICES MAY BE REPRODUCED WITHOUT EXPLICIT AUTHORISATION OF VKC-CENTEXBEL.
TEST SAMPLES ARE STORED FOR 1 YEAR IF NOT RETRIEVED BY CUSTOMER**

Samples of Skylux were provided with a coating of Liquisol (4EVERblue) and subjected to a bending stress through 7 days at 70°C. After this time period, none of the samples showed any signs of environmental stress cracking.

1. Introduction and aim

Liquisol offers coatings for use on skylights. These reduce the amount of permeating heat while still allowing the majority of light to pass through.

Many skylights consist of materials such as PC and PMMA. These amorphous plastics are especially susceptible to environmental stress cracking (ESC). Certain liquids can enter the plastic and disrupt the secondary interactions between the polymer chains. This may lead to sudden failure (cracks) under stresses below the material's strength.

Past experiences show that the coatings do not induce ESC in skylights. However, *Liquisol* now wants to support this claim with test results.

2. Method

Skylux is a producer of skylights.

Three different products of Skylux (dimensions of samples = 26 x 5 cm) were provided:

- PC_3mm
- TOP-x5_16mm
- XT_3mm

4EVERblue by *Liquisol* is applied in two layers using a foam roller (the first layer is allowed plenty of time to fully dry before the second one is applied).

The coated samples are subjected to a continuous bending stress by clamping them on a frame as seen in *figure 1*.



Figure 1: Clamping of the samples PC_3mm en XT_3mm

Remark:

The samples TOP-x5_16mm consist of two thinner sheets interconnected by ridges (total thickness of sample = 16 mm). These ridges make applying a bending stress to the samples difficult. They tend to collapse rather than bend. Because of this, the coated top layer is separated (using a belt saw). The resulting sample is only 0,7 mm in thickness. Compared to the other samples (both of which are 3 mm thick) this thin sheet is much more flexible. Clamping as illustrated in *figure 1* will lead to insufficient stress in the samples. The method of clamping these samples is shown in *figure 2*.



Figure 2: Clamping of the samples TOP-x5_16mm

The frame with the clamped samples is subjected to temperatures of 70°C through 7 days by placing them in an oven.

After this time period, the samples are visually checked for any signs of ESC (cracks) at the locations where a bending stress was applied.

3. Results

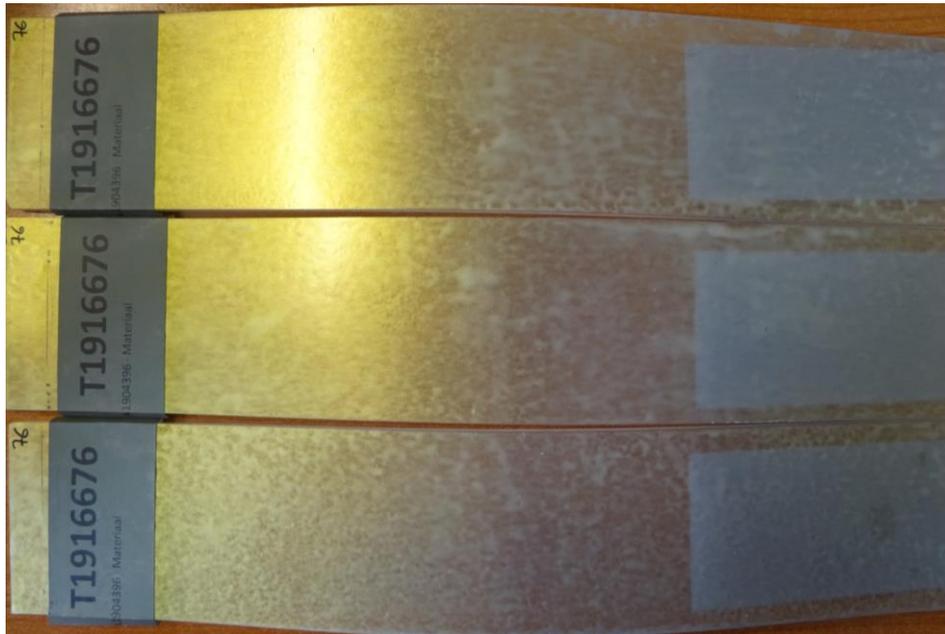


Figure 3: Samples XT_3mm after ageing

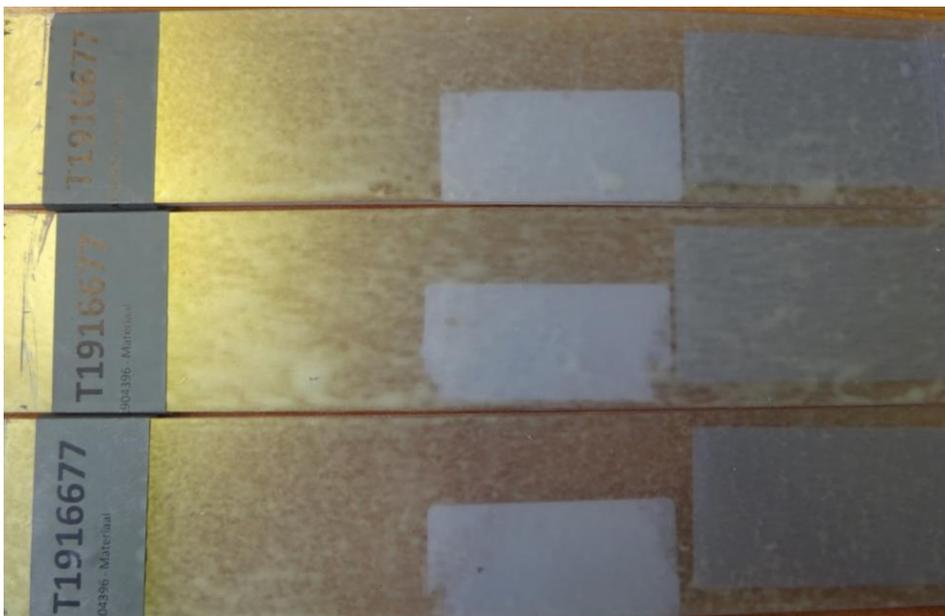


Figure 4: Samples PC_3mm after ageing

VKC-Centexbel disclaims all liability which may arise out of the putting into use of the information contained in this document provided it did not assume control thereof. It also disclaims all liability for infringements of industrial property rights which may arise out of the putting into use of the information contained in this document. All information in this document is based on reasonable research but does not guarantee any result



Figure 5: Samples TOP-x5_16mm after ageing

4. Conclusion

None of the samples show signs of environmental stress cracking after ageing for 7 days in an oven at 70°C.

Be aware however that the samples for TOP-x5_16mm were thinner and thus clamped differently on the frame. These samples experienced a different stress compared to the samples for XT_3mm and PC_3mm (they cannot be compared directly).