

January 31, 2005

Mr. Marcus Jablonka
Cösella-Dorcken Products Inc.
4655 Delta Way
Beamsville, ON
Canada, L0R 1B4

File : S356-017

Re: Stress-cracking resistance of two HDPE dimpled sheets identified 'Delta MS' and 'System Platon'.

Dear Mr. Jablonka,

Following your questions regarding the significance of the test results gathered within file S356-017, please find below brief responses to common questions associated to stress-cracking resistance of high density polyethylene (HDPE), a short description of the testing procedure used, the test results obtained, as well as a few comments regarding the relative performance of the tested products.

Description of stress-cracking

Environmental stress-cracking of high density polyethylene (HDPE) consists in a slow propagation of a fracture in a material in contact with a sensitizing agent, which can eventually lead to a brittle failure. Stress-cracking typically occurs at low stress levels, i.e. below 50 % of the material yield stress resistance.

Stress-cracking potential is essentially a function of material molecular properties, some HDPE resins being much more sensitive to stress-cracking than other. However, occurrence of stress-cracking will also be highly influenced by the stress level, the temperature and the nature of the chemicals in contact with the material. For dimpled sheets, the geometry of the dimples as well as the manufacturing process will also influence the material behaviour.

Test method for laboratory evaluation of the stress-cracking resistance of a dimpled sheet

The method used within this project to evaluate the stress-cracking resistance of HDPE dimpled sheets was inspired from a test developed by the Swedish Construction Authorities with local manufacturers ('Sweden Test'). It appears to be used in Sweden as a key element to compare HDPE dimpled sheets with regard to their long-term durability.

Essentially, the dimpled sheet is exposed to a compression stress of 5000 kg/m² between two concrete blocks and immersed at 55°C in a chemical favoring occurrence of stress-cracking. Specimens are periodically inspected for cracks and other degradations. The time needed to observe the first occurrence of a crack as well as to observe a severe failure of the products are reported.

Test Results

Two products identified 'Delta MS' and 'System Platon' were provided to run the stress-cracking resistance test. For each product, four specimens were tested and the associated results are presented in Table 1 and Figures 1 to 4 of Appendix 1.

Table 1 Time of exposure (hours) for the observation of the first occurrence of a crack and severe failure.

Observation (*)	Delta MS (Figures 1 and 2)	System Platon (Figures 3 and 4)
First crack	No cracking	45
Severe failure		163

(*): the information reported is the first occurrence of a crack or a severe failure observed on any of the four tested specimens within the test duration (390 hours).

Conclusion

Based on the results obtained within this project, we believe that the product identified 'Delta MS' has a significantly better stress-cracking resistance than the product identified 'System Platon'.

We hope this information will be helpful to you. Do not hesitate to contact us if you need additional information.

Sincerely yours,

Eric Blond, eng., M.Sc.A.
Technical Director

Att. (Appendix, 2 pages)



Figure 1: Delta MS – unexposed specimen.



Figure 2: Delta MS – specimen #1 – 390 hours.



Figure 7 – System Platon - specimen #3 – 45 hours.

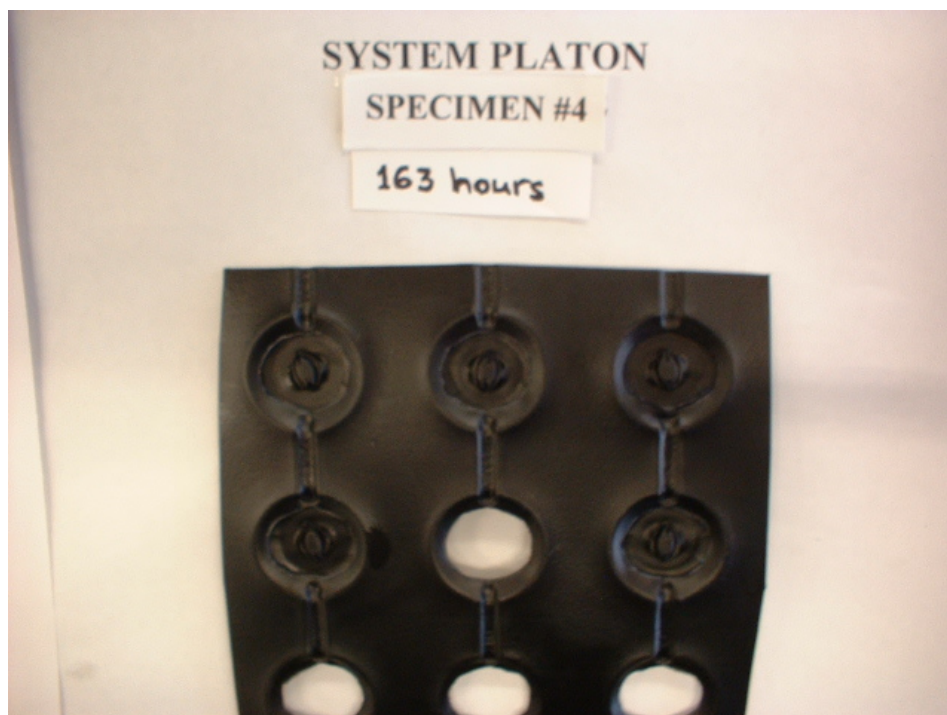


Figure 8 – System Platon - specimen #4 – 163 hours.