

Design of a Stand-alone Weathering Station

SUMMARY

[FormaShape](#) is the leading closed-mould manufacturer of composite water slides in North America. During use, water slides are subjected to challenging outdoor conditions that can decrease their lifetimes. Typical aging data provides an essential tool for improved understand of long-term performance. For this purpose, CRN designed and installed a stand-alone weathering station at the University of British Columbia – Okanagan, capable of generating long-term environmental degradation data. [FormaShape](#) and other CRN members are now testing materials and processes using this facility.

CHALLENGE

Water slides are exposed to challenging outdoor conditions that decrease their lifetimes. Temperature and moisture variations and ultraviolet light cause their mechanical and physio-chemical properties to deteriorate, eventually leading to their discoloration, cracking, delamination, and blistering. Natural aging data is required to help understand the impact of varying process and materials to improve longevity.

Gelcoat colour loss due to ultraviolet degradation is very important to FormaShape's end use waterslide clients. An attractive looking slide is an important marketing and repeat business driver. Understanding long term performance and developing materials and processes to resist ultraviolet colour loss will be a significant differentiator of our products from the competition. The CRN facility allows more extensive sample testing than we could perform on our own.

Tim Boothman, Vice President and General Manager, FormaShape/Whitewater Composites Ltd.



Formashape, a division of WhiteWater Composites Ltd.

Kelowna, British Columbia

FormaShape, with parent company, Whitewater Composites Ltd., is the world's largest manufacturer of fibreglass waterpark attractions.

Client Contact

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APPROACH

CRN staff identified the aging characteristics of polymer matrix composites (resulting in mechanical, and cosmetic deterioration) and researched weathering standards and current best practices in the design of an outdoor weathering station. CRN staff then conceived and built an advanced outdoor exposure rack system and stand-alone weather station.

OUTCOME

A versatile stand-alone outdoor weathering station has been installed at UBCO in Kelowna and is now available to CRN's industrial partners. The weather station is instrumented and allows the measurement and collection of weathering conditions that test parts have been exposed to.



Formashape waterslide products.

IMPACT

The stand-alone weathering station is now used by CRN's members to study the long-term performance of polymer matrix composites and effects of processing conditions. The degradation data will ultimately be used to optimize material configurations and processes in order to increase the lifetime of products, therefore contributing to the competitiveness of the CRN's industrial members.

FormaShape will benefit by using this data to put theoretical QUV data into perspective. This weathering station will (also) eliminate our improvised roof top samples. It will finally allow us to quantify and qualify the exposure hours.

*Steve Binks, Manufacturing Technologist,
FormaShape/Whitewater Composites Ltd. (May, 2014)*



Stand alone weathering station at UBC Okanagan in Kelowna, BC.

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