

Outdoor Storage of Glass Fibre Reinforced Polymer (GFRP) Moulds

SUMMARY

Campion Marine is the last remaining open-mould glass fibre reinforced polymer (GFRP) manufacturer of luxury boats in Canada, and has been active for over 36 years. It has released numerous product lines, ranging from closed-deck speedboats to open-deck pontoons, and now has an extensive catalogue of legacy moulds for each product; some have been in use for over 10 years. Each mould is a significant investment in terms of capital, and so maximizing usable lifespan is a high priority. CRN revealed that storage conditions are of great importance, with outdoor storage leading to a significant degradation of surface quality over time. In this project, CRN recommended that participating companies track the surface roughness of moulds stored outdoors and under other conditions. The collected data can be used to establish better mould management programs.

CHALLENGE

Campion has traditionally stored its moulds outdoors, due to a lack of indoor space. Each time a mould is brought back into service, it requires extensive refurbishment. For some larger moulds stored for several years, maintenance costs may exceed CAD\$1800. Through a better understanding of how moulds degrade outdoors, and by investigating options to mitigate the effects, Campion will be able to make better decisions concerning mould storage.

Much time and effort is spent on repairing tools returning to service from outdoor storage. For larger moulds, estimates are in the order of \$1800 for materials and labour per event.

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Campion Marine is Canada's premier and largest independent builder of fiberglass power boats.



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APPROACH

Prior to this project, CRN researchers had already undertaken laboratory-scale experiments to clarify the mechanisms of mould degradation. CRN staff engaged directly in a production solution, monitoring the surface quality of a *Campion* specimen mould stored outdoors without protection over a ten-week period. From this study, rates of degradation were determined. Subsequently, a second phase of the project was initiated that compared typical indoor degradation data with surface quality data for another mould stored outdoors, but with a protective coating. The results allowed *Campion* to make better decisions, in terms of selecting storage methods based on costs, time and quality.



Boat hull mould stored outdoors.

OUTCOME

CRN staff observed that after a period of approximately six weeks, the specimen mould stored outdoors degraded below a previously defined threshold for Class A surface finish. The degradation rate was slower than researchers expected; even when outdoor storage time is short, extensive maintenance is still typically performed when moulds are brought back into service. The results indicate that some costly maintenance steps may be avoided with more careful tracking and monitoring regimens



Mould with polymeric storage film brushed on prior to storage outdoors.

IMPACT

After the first phase of the project, *Campion* had better information about maintenance requirements for moulds that are only temporarily stored outdoors. The second phase provided cost-saving information about suitable storage procedures for moulds that are in use less frequently.

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