

A study into changing manufacturing processes from Resin Infusion to SPRINT™



Project Aims

- To identify any performance differences between the two processes through mechanical testing.
- Analyse the cost implications if any of changing process, with a look into labour and material costs for a Princess Yachts V40 Garage roof component.
- Investigate the impact of reducing the number of plies in the laminar.

Cost/Weight Analysis

Based on the information gathered by the composites department on this singular part, the SPRINT™ could save 32.81kg (53.39%) of the weight for a cost increase of £553.53 (40.3%).

Laminate Specification			
Resin Infusion		SPRINT™	
600micron Gelcoat	LS31 PA	RC200	Gurit 0/90
2 x 300CSM Glass	Vinylester 697PA	RC200	Gurit +/-45
800gsm Quad Carbon	Infused Polyester 703PA	UD300	Gurit 90
1200gsm UD Carbon	Infused Polyester 703PA	12mm SAN Foam Core	
12mm H80 PU Core	Infused Polyester 703PA	UD300	Gurit 90
1200gsm UD Carbon	Infused Polyester 703PA	RC200	Gurit +/-45
800gsm Quad Carbon	Infused Polyester 703PA	RC200	Gurit 0/90

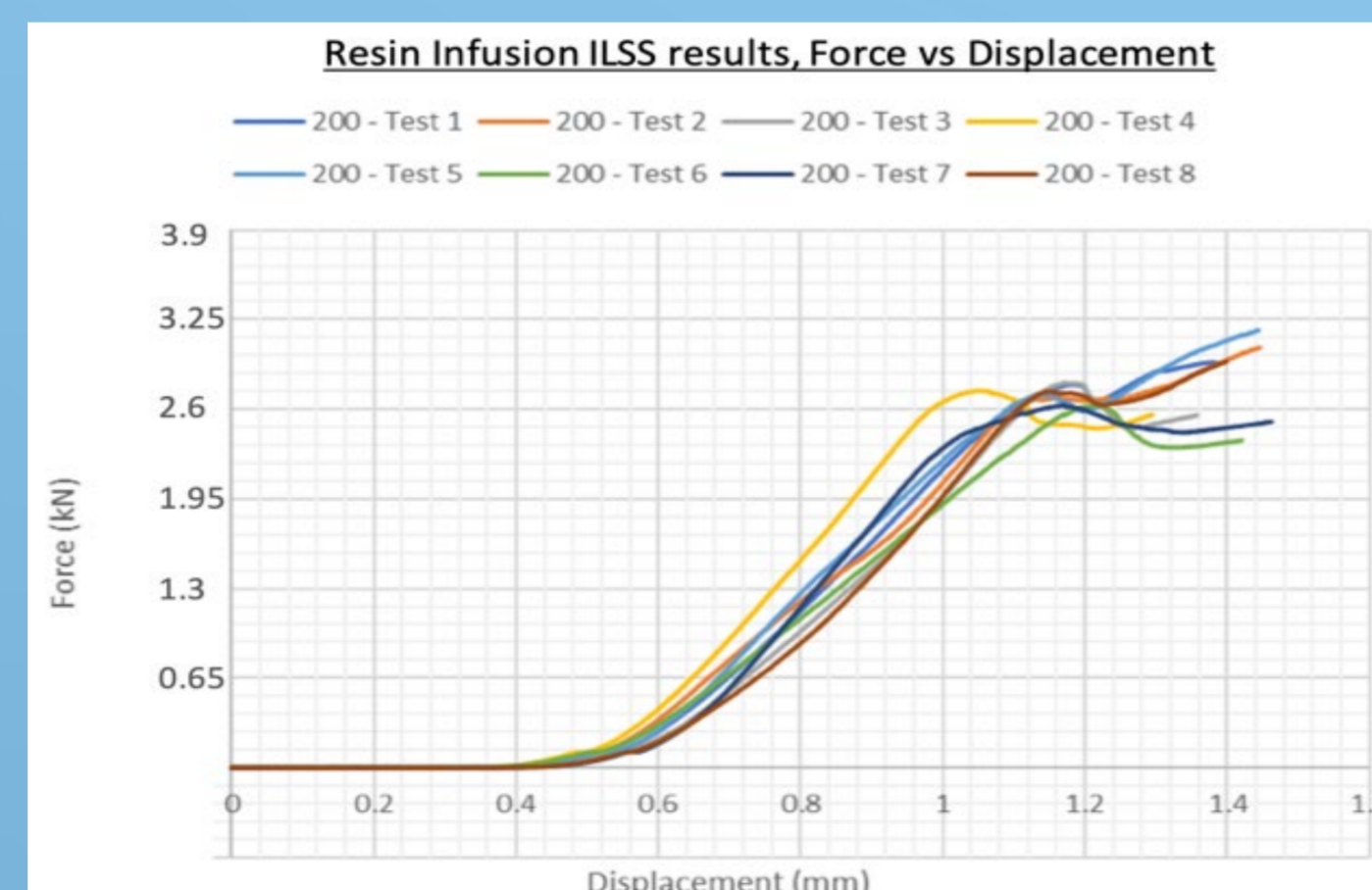
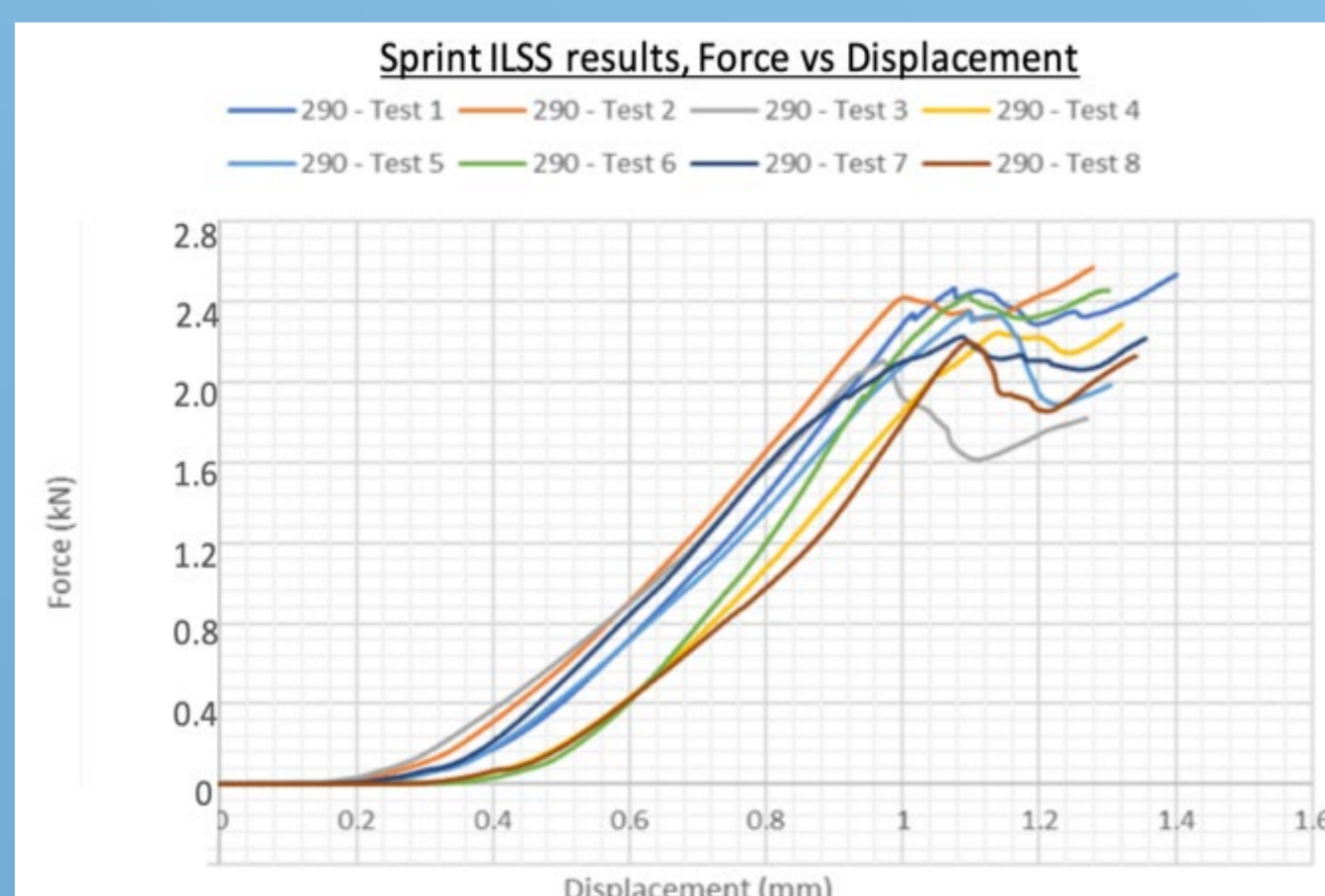
4-Point Testing Results

The results from the 4 point test conducted within the paper are shown below, these show the force needed to deflect a beam to failure.



ILSS Testing Results

To establish whether or not changing manufacturing process and subsequent layup affects how strong the bond is between the plies interlaminar shear strength test was conducted in accordance with BS ISO 14130:1997. on 8 samples of each, the results are shown below.



Conclusion

This study produced the following conclusions:

- The mechanical testing of the individual process components shows that the SPRINT™ laminate lacks the ultimate strength and the stiffness of the current Resin Infusion laminate but has an increased ILSS.
- A force criterion should be established by Princess Yachts to ascertain whether the performance reduction is acceptable. These steps will allow Princess Yachts to make an informed decision to either change the process, develop a new laminate or stay with the existing production.