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IN THE WAKE OF FAILURE: INSIGHTS FROM SETBACKS IN HIGH-PERFORMANCE SAIL MANUFACTURING

In the pursuit of innovation, failures often reveal the limits of knowledge. This study recounts the unexpected delamination of high-performance membrane sails manufactured with a new generation of heat-sealable, fiber-reinforced adhesive films during an offshore regatta. Despite promising results from laboratory and onshore tests, the adhesive —a blend of ethylene-acrylic acid copolymer and polyether-polyurethane— proved vulnerable to alternating climate cycles at high seas.

Systematic testing demonstrated that the polyether-polyurethane component, which performed well under controlled conditions, experienced an 80% loss in performance after repeated exposure to temperature and humidity. This outcome highlighted the limitations of the preliminary laboratory validation processes. The lessons learned from this setback have led to the development of new heat-sealable, crosslinking adhesive films for sail manufacturing that are robust in the harsh conditions of the ocean.

This experience reminds us that progress is defined not only by our successes but also by our willingness to confront and learn from our failures and our determination to transform failure into understanding.