**Prof. Dr.-Ing. Thomas Böllinghaus**

Editor in Chief of Materials Testing

July 2024

Dear Prof. Dr.-Ing. Thomas Böllinghaus,

I am pleased to submit our manuscript titled **“Influence of seawater condition on shear strength of CFRP single lap bonded joints with various fiber orientation”** for consideration in Materials Testing. This study provides significant insights into the mechanical performance and environmental durability of carbon fiber-reinforced vinyl ester resin (CFRP) single-lap joints subjected to seawater conditions. The three most important features of our contribution are highlighted below:

1. **Impact of Fiber Orientation on Shear Strength and Water Absorption:** Our research demonstrates that fiber orientation significantly affects the shear strength and water absorption of CFRP joints. The 0° orientation exhibited the highest shear strength and the least water absorption, while 45° and 90° orientations experienced substantial reductions in strength and higher water absorption rates. This finding emphasizes the critical role of fiber orientation in joint design for optimal performance and durability.
2. **Effect of Seawater Immersion and Post-Immersion Drying:** Seawater immersion reduced the shear strength across all fiber orientations, with the most significant absorption observed in 45° specimens. Remarkably, post-immersion drying restored and even enhanced shear strength in 0° specimens, provided partial recovery in 45° specimens, and had limited effect on 90° specimens. These results highlight the potential of drying processes to mitigate seawater-induced degradation and restore the mechanical properties of CFRP joints.
3. **Surface Treatments and Chemical Stability:** Our study shows that surface treatments improved the bonding quality of CFRP joints. Additionally, FTIR analysis indicated no significant permanent chemical changes due to seawater exposure, suggesting that physical rather than chemical changes drive the observed performance variations. This insight underscores the importance of advanced surface treatments in enhancing the durability and performance of CFRP joints in marine environments.

Our findings underscore the importance of considering fiber orientation, environmental effects, and surface treatments in the design of CFRP joints for aerospace and marine applications. We believe that our research provides valuable insights that align well with the scope and readership of Materials Testing.

We look forward to your positive response.

Sincerely,

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