

Residual Stress of Hoop-Wound CFRP Composites Manufactured with Simultaneous Heating

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Carbon-fiber-reinforced plastic (CFRP) is used to strengthen high-pressure hydrogen composite vessels. However, the existence of excessive resin between CFRP layers and a drop in the strength of CFRP resulting from the fiber tension during the layer stacking of CFRP composites are the points at issue. To solve them, a curing method using simultaneous heating has been proposed. The purpose of this paper is to evaluate the influence of the simultaneous heating on the residual stress of the CFRP composite. CFRP test specimens were manufactured with simultaneous heating, and strains from their stress releases were measured. As a result, with the simultaneous heating method, the difference in residual stresses between the CFRP inner and outer surfaces is smaller than that with the conventional filament winding (FW) method. We conclude that the simultaneous heating method has an advantage to increase the pressure capacity of composite pressure vessels.

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