Application of Non-destructive Inspection Methods to CFRP Flexible Plate for Traction Motor Shaft Coupling

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On the traction motor shaft coupling which is used for the cardan-type electric railcar, the use of CFRP flexible plate is becoming popular in recent years for the purpose of weight reduction. However, as the inspection method of delamination which occurs inside CFRP laminates is not established, it is common that all flexible plates are replaced with new ones in the dismantle of a coupling. Thus, the needs to select and reuse fine flexible plates are increasing for the purpose of cost cut. In this paper, we focused on three kinds of non-destructive inspection methods such as soft X-ray radiography, X-ray CT and ultrasonic immersion testing, and flexible plate test pieces with artificial flaws were inspected by these methods. It has been found out that the delamination can be clearly detected with the application of ultrasonic immersion testing method and internal flaw extraction process.