Welding is commonly used for shipbuilding. In the ship’s construction that has been operated, defect such as cracks often occurred in the coated weld joint. Ultrasonic testing are sometimes applied to examine the extent of the cracks without removing the paint.

The purpose of this research is to analyze the effect of nonconductive coating thickness to the length and depth of the crack on fillet joint of aluminium ship’s bracket using Ultrasonic testing method. Four test samples of fillet joint of 5083 aluminium alloy to model ship’s bracket were manufactured. Artificial cracks were made on the toe area of the fillet joint, i.e. 70, 30, 20, and 10 mm length, with 2, 4, 6, and 8 mm depth. Scanning were carried out from face C of the test sample. The thickness of nonconductive coatings are 100, 200, 250, and 300 microns.

Result of the experiments showed that the detectability of the Ultrasonic testing reduced by the increase of the coating thicknesses, where the detectability of Ultrasonic testing of the crack length with nonconductive coating thickness of 100 microns is 95.814 %, 200 microns is 89.510 %, 250 microns is 87.140 %, and 300 microns is 85.629 % from the actual crack length. While the detectability of Ultrasonic testing of crack depth with nonconductive coating thickness of 100 microns is 99.219 %, 200 microns is 98.167 %, 250 microns is 97.396 % and 300 microns is 96.625 % from the actual crack depth. Reduction of the detectability was caused by the attenuation factor when the ultrasonic waves propagate through the interface of the material that have different acoustic impedance. The ultrasonic waves will be refracted and reflected because of this condition.

**Keywords:** Crack, Nonconductive coating, Ultrasonic Testing.