

Abstract

Corrosion is a widespread issue with significant economic impact. This master's thesis explores the use of X-ray Computed Tomography (XCT) as a non-destructive analytical method to visualize both biofouling organisms and underlying corrosion damage on S235 steel coupons. Following a literature review on crevice corrosion and the role of macrofouling organisms, a field study was conducted in which the coupons were analyzed visually and through XCT imaging.

Although crevice corrosion was not observed in this experiment, pitting corrosion was detected. XCT proved to be a valuable technique for identifying calcareous biofouling organisms such as barnacles and crustaceans, as well as for locating and examining corrosion zones. The technique enables detailed spatial analysis without physically altering the samples.

Nonetheless, some limitations were identified: processing high-resolution data demands substantial computing power, and due to the limited number of analyzed coupons, the findings cannot be considered widely representative.

Despite these restrictions, the study demonstrates that XCT is a promising tool in maritime corrosion analysis and provides a solid foundation for future research and practical applications in the field.