

Abstract

Pitting corrosion and uniform corrosion in the Ghent-Terneuzen Canal pose significant safety risks for maritime infrastructure. In 2021, microbial corrosion was detected in the Ghent-Terneuzen Canal. Measuring these types of corrosion is complex, especially in field conditions.

In this thesis, four electrochemical tests were conducted to characterize pitting corrosion and uniform corrosion in the canal and to evaluate the feasibility of these tests: the Linear Polarization Resistance (LPR) method, the Linear Polarization Curve (LPC) method, the Cyclic Polarization Curve (CPC) method, and the Critical Pitting Temperature (CPT) method. These tests were performed on two types of steel, S235 and 316L, with varying immersion times. The varying conditions at the three locations provided a detailed insight into the effects of local factors on both uniform corrosion and pitting corrosion.

The results of the measurements were analyzed and compared to assess the performance and issues of the different methods. This research also demonstrates a clear difference in corrosion patterns within a single body of water and contributes to a better understanding of uniform corrosion and pitting corrosion in the Ghent-Terneuzen Canal.