

Comparison of corrosion behavior and effects of corrosion on TMT and 60 grade steel bars

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Steel reinforcement bars are used extensively in construction industries. Bars used in underwater or marine structures are subjected to corrosion which can change the properties of the reinforcement over time. Thermo-Mechanically Treated (TMT) bars have gained popularity in the recent decades in construction industries. Corrosion behavior of the TMT steel bars and 60 grade steel bars were studied by accelerated corrosion test by impressing a DC voltage between steel bars (anode) and Stainless Steel plates (cathodes) in a 5% NaCl bath for specific time periods ranging from 10 minutes to 40 minutes at an interval of 10 minutes and one at 135 minutes. The samples were tested to determine the effect of corrosion

time on weight loss, corrosion rate, mechanical properties, fracture mode and microstructure. Both types of steel exhibited decreasing corrosion rate with time but the TMT steel exhibited a greater weight loss and corrosion rate than the 60 grade steel. TMT steel lost a significant amount of the outer case with increased corrosion time. The microstructures of both of the steels were unchanged after corrosion. The effects on the mechanical properties and fracture mode were not significant at such corrosion time. Corrosion tests with longer time duration are needed to observe the effects on the mechanical properties

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