

Effect of rusting of reinforcing steel on its mechanical properties and bond with concrete

Maslehuddin, Mohammed, Allam, Ibrahim M., Al-Sulaimani, Ghazi J., Al-Mana, Abdulaziz, Abduljawwad, Sahel N.

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Abstract: Reinforcing steel samples of six different sizes, each of three varying compositions, were exposed to the atmosphere for periods up to 16 months. The effect of rusting on the yield strength, ultimate tensile strength, and bond strength was investigated. Results indicate that rusting of reinforcement due to atmospheric exposure for periods up to 16 months does not affect the strength properties. The bond stress values for the rusted reinforcing steels after 16 months of atmospheric exposure were greater than the allowable ACI 318-63 and BS CP 110 values. The maximum weight loss after 16 months of atmospheric exposure was 16 mg/cm² (0.033 lb/ft²), which corresponded to an average reduction in diameter of 0.53 percent.