

Effect of Superficial Atmospheric Corrosion Upon the Internal Stresses in Structural Steel Elements

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Abstract text:

A research program is presented showing the stress status determined by the corrosion phenomenon inside a specimen of a structural steel element. Several stains are studied their diameters ranging from 1~mm to 6~mm and thickness of the corroded layer under 0.5~mm. The physical modeling is the result of testing in laboratory the phenomenon of superficial atmospheric corrosion and the numerical modeling was developed under a FEM program, ALGOR. A number of 3,200 finite elements of BRICK type were created and the evolution of normal and tangential stresses was scrutinized under the process of loosing elementary material transformed into scrap. Stresses in the damaged sphere were graphically put into evidence and determined with accuracy due to the performances of the program, showing the local perturbations and the pattern of stress concentrators. The studies showed the importance of reproducing with both physical and mathematical methods the intricate mechanism and sometimes unpredictable effects of corrosion phenomenon upon the structural steel elements.

Key Words:

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