Abstract

A study about the stress relaxation behaviour of carbon steel at different levels of stress in elastic and plastic strain zones is presented. Wire rod of 5.5 mm diameter with contents of carbon between 0.1 and 0.75 percent were tested. A computer-controlled servohydraulic machine (Instron 502) was used, which allows, to maintain constant strain produced once pre-selected load is applied and to register the drop of load in time. Test were made at a cross head speed of 2 mm/min and loads of 30, 40, 50, 70, 80 and 90% of rupture load corresponding with each steel, including elastic and plastic strain conditions. Experimental data is treated according to a potential mechanical equation of state and it is compared with theoretical model referred by Stussi.

Keywords

Stress relaxation behavior, power law, carbon steels