World Academy of Science, Engineering and Technology
International Journal of Materials and Metallurgical Engineering
Vol:10, No:08, 2016

Testing of Small Local Zones by Means of Small Punch Test at Room and Creep Temperatures

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Abstract : In many industrial applications, materials are subjected to degradation of mechanical properties as a result of real service conditions, temperature, cyclic loading, humidity or other corrosive media, irradiation, their combination etc. The assessment of the remaining lifetime of components and structures is commonly based on correlated procedures including numerous destructive, non-destructive and mathematical techniques that should guarantee reasonably precise assessment of the current damage extent of materials in question and the remaining lifetime evaluation of the component under consideration. The answers to demands of customers to extend the lifetime of existing components beyond their original design life must be based on detailed assessment of the current degradation extent, what can be rarely realised by means of traditional mechanical (standardised) tests that need relatively large volumes of representative material for the test specimen manufacturing. This fact accelerated the research of miniaturised test specimen that can be sampled non-invasively from the component.

Keywords : small punch test, correlation, creep, mechanical properties
Conference Title : ICMSMM 2016 : International Conference on Materials Science, Metals and Manufacturing
Conference Location : Venice, Italy
Conference Dates : August 08-09, 2016