

Damage to LCP by the Ratcheting Phenomenon Under Cyclic Motion in Oligocyclic Fatigue

Authors : Aboussalih Amira, Zarza Tahar, Fedaoui Kamel, Baroura Lazhar, Hammoudi Salah

Abstract : 316 L steel is a stainless steel frequently used in orthopedic surgery; in the design of implants (hip, knee, shoulder, ankle, etc.), in dental surgery, cardiology, ophthalmology. Before any use, it is essential to predict the macroscopic phenomenological behavior of the material, and to analyze its response. The behavior of 316 L steel in low cycle fatigue, under uniaxial cyclic loading of tension/compression, producing significant plastic deformations leading to material damage. This investigation allowed us to characterize the behavior of the 316L steel employed in the locking of the compression plates (LCP), of which they are generally used in orthopedics to stabilize the fractured bone parts. And to perceive the phenomenon of Ratcheting leading to the damage of LCP by an excess of plastic deformation under nonsymmetrical alternated imposed constraint in low cycle fatigue.

Keywords : 316L SS, locking compression plate, low cycle fatigue, ratcheting

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