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EXPERIMENTS ON THE COMPRESSION BEHAVIOUR OF Ti6Al4V FOR WIDE RANGES OF STRAIN RATE

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Abstract : In this paper, the thermo-viscoplastic behaviour of Ti6Al4V under compression loading is analyzed. Experiments using two different setups have been performed. Tests at low strain rates 10^{-5} to 10^{-1} s⁻¹ were conducted using hydraulic machine. Dynamic tests were carried out for strain rates in the range 10^2 to 10^4 s⁻¹. For that task, it was used a modified Hopkinson bar which is based on direct-impact technique. For strain rate level higher than 10^2 s⁻¹, the process of plastic deformation in most metals and alloys is assumed adiabatic [1]. The heat generated inside the material due to plastic deformation cannot be transmitted. The increase of temperature is dependent on the flow stress of the material. It has particular relevance in titanium alloys, which are characterized by their high flow stress level. In this work, special attention is focused on this phenomenon.

Keywords : le Soudage, cnd, Industrie des Matériaux et Alliages