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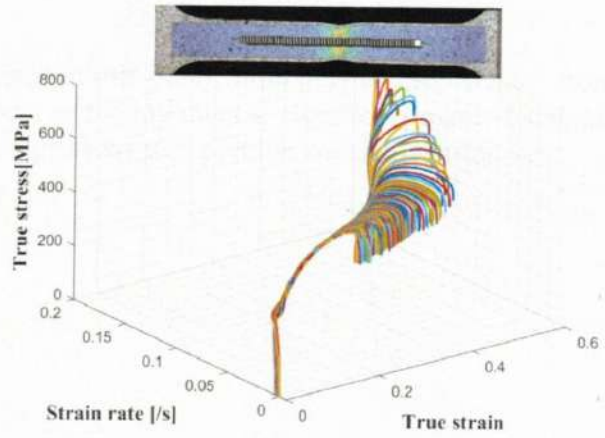

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MECHANICAL BEHAVIOR AND THE RELATED TEMPERATURE CHANGES INVESTIGATED FOR β Ti ALLOY - GUM METAL DURING LOADING IN WIDE RANGE OF THE STRAIN RATES

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Innovative β Ti Alloy - Gum Metal was subjected to loading in quasi-static testing machine and the Hopkinson pressure bar systems. The alloy is characterized by outstanding properties, e.g. a low value of Young's modulus ≈ 60 GPa (similar to bone), a large range of reversible strain up to 2.5% (10 times higher than other alloys), high strength (>1000 MPa) [1]. The unique properties combined to high biocompatibility of the alloy create large application possibilities in biomedical industry, rehabilitation and sport facilities, robotics, automotive and space [2]. The goal of the research was to investigate the impact of the strain rate on the mechanical characteristics, the related temperature changes and the microstructure evolution of the Gum Metal samples subjected to compression loading in a wide spectrum of the strain rates. Using the fast sensitive FLIR X6901sc SLS infrared camera enabled to record the temperature changes accompanying the dynamic deformation of the Gum Metal samples.

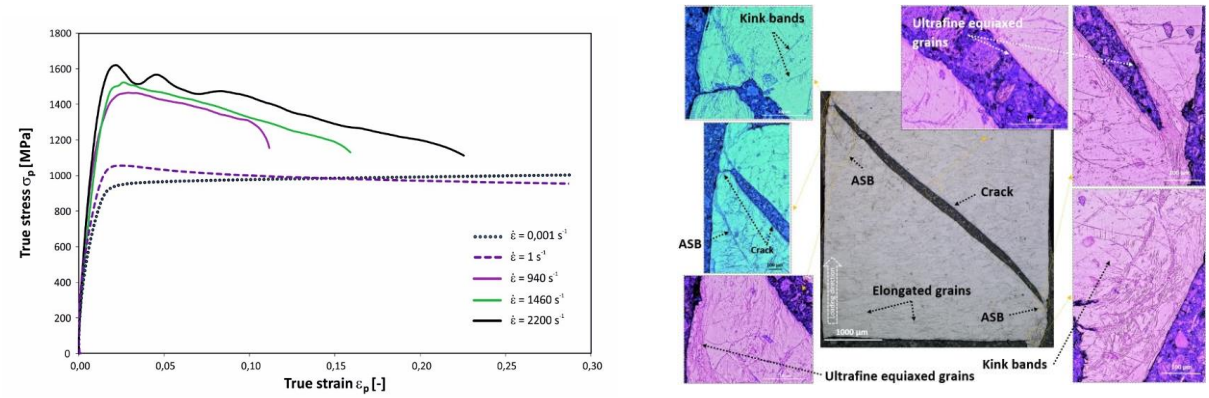

Figure 1. a) True stress vs. strain curves of the Gum Metal under quasi-static and dynamic compression loading; b) microstructure of the sample at the strain rate of 2270 s^{-1} [3].

Acknowledgements

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