
Contribution ID: **291** Type: **Poster**

# Bulk texture and microstructure evolution of γ-TiAl alloy during hot compression

*Tuesday 21 March 2023 16:00 (2 hours)*

Owing to low density (3.8-4.0 g/cm3), high specific strength and stiffness, excellent creep resistance and good corrosion resistance, the β-solidifying γ-titanium aluminide with properly aligned (α2+γ) lamellar-structure have been considered as excellent candidates for modern turbine blades. Recently, it has been evidenced that when the γ lamellae are oriented to the load direction the mechanical properties of the alloys can be greatly increased. Thus, lamella orientation control has become an interesting topic for property optimization.
It has been shown that the microstructure of TNM alloys (Ti-43Al-4Nb-1Mo-0.1B(at%)) at the initial state was composed of multiple grains from three different phases. After uniaxial compressive hot-deformation at 1280℃ for different deformations and strain rates, first results showed that (1) the microstructure changed and become mainly composed of the alpha phase and (2) the material can be texturized. Different type of characterization such as the neutron and synchrotron radiation to obtain texture bulk information at our study. For a better understanding of the formation and transformation of microstructure EBSD measurements were conducted and analyzed with respect to orientation relationships and microstructure stability. Bulk texture evolution will be presented in detailed. Results has indicated that texturization of TNM alloy seems to be possible thanks to hot compression, which leads to different type of microstructure depending on the deformation speed and strains as well as the imposed temperature.

Keywords : TNM TiAl alloys, texturization, microstructure, bulk texture

**Authors:** KEITA, Mohamed; SOLIS, Cecilia; ZHANG, Yudong (4. Laboratoire d'Étude des Microstructures et de Mécanique des Matériaux (LEM3), CNRS); GAN, Weimin (Helmholtz-Zentrum Hereon)

**Co-authors:** HOFMANN, Michael; Prof. BOUZY, E. (LEM3, University of Lorraine. Metz, France)

**Presenter:** GAN, Weimin (Helmholtz-Zentrum Hereon)

**Session Classification:** Poster session TUESDAY

**Track Classification:** Engineering applications