

“Near Conventional” Forging of a β -stabilized γ -TiAl Based Alloy

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Due to the strong demand for higher efficiencies, reduced CO₂ emissions and weight reduction in aircraft engines, the substitution of presently used materials by novel light-weight, high-temperature alloys like γ -TiAl based alloys is at the edge of realization. This paper summarizes detailed investigations on a “near conventional” forging route for the fabrication of TiAl components. γ -TiAl based alloys with high Nb contents exhibit a narrow forging window, which show severe shifts if only slight changes in alloy composition occur. However, when using an alloy with an optimized content of β -stabilizing elements, the forging window can be widened with respect to billet temperature, die temperature and die speed. Forging experiments conducted on this specially developed Nb and Mo containing γ -TiAl based alloy (TNM), demonstrate the feasibility of a robust and economic manufacturing route. Additionally, the results of texture measurements are shown and the mechanical properties of forged TNM material are presented.