Abstract

Precision cast turbocharger wheels were prepared by induction melting of Ti-43.5Al-4Nb-1Mo-0.1B (at.%) alloy in oxide crucibles and gravity casting into ceramic moulds under argon atmosphere. The effect of several processing parameters such as type of melting crucible, ceramic mould temperature and interaction time of the melt with the crucible on surface quality, casting defects, porosity, contamination by oxygen and volume fraction of Y2O3 particles is evaluated. Chemical composition, grain size, interlamellar spacing and volume fraction of coexisting phases are analysed in defined positions of cast turbocharger wheels. Mechanical properties including Vickers microhardness, tensile properties, compression properties and creep are characterised using samples extracted from the cast wheels and compared to those of the ingot material.

Keywords: Titanium aluminides, TiAl, Casting, Microstructure, Mechanical properties