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Interaction between yttria fully stabilized zirconia or yttria-zirconia blended face-coat with Ti6Al4V during investment casting

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Abstract

The interaction between a Ti6Al4V alloy and mould materials was investigated. The alpha-case was revealed and characterized by a Vickers hardness tester, optical and scanning electron microscopy equipped with electron dispersive X-ray spectrometry (EDX). X-ray diffraction (XRD) was performed on as cast and on yttria fully stabilized zirconia (YFSZ) or yttria-zirconia blended (YZ-Blended) face-coats. The YFSZ led to a thicker and harder alpha-case than the YZ-Blended face-coat. The EDX revealed the presence of Zr and Si in both alpha-cases. From experimental results and thermodynamic calculations, pure ZrO_2 and SiO_2 may react with Ti6Al4V.