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ENLARGING THE PALETTE OF MECHANICAL PROPERTIES OF TI64 BY A QUENCHING AND PARTITIONING APPROACH

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☒ Oral presentation

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ABSTRACT

The usual bimodal microstructure of wrought Ti64 is known to provide an excellent yield strength to density ratio. However, its poor work-hardening capacities brings about limited ductility. Moreover, the post-uniform elongation is also very limited. In the present work, we report the beneficial influence of dual-phase microstructures obtained by quenching from the alpha+beta phase field. Under certain circumstances, such dual-phase microstructure exhibit martensite reorientation induced plasticity, that was never reported in this well-known industrial alloy. The dual-phase microstructures are further annealed allowing the partitioning of V from the supersaturated martensite. Depending on the initial dual-phase microstructure and the parameters of the annealing treatments, a very large palette of mechanical properties is obtained. The strength levels, work-hardening behaviors, ductilities and post-uniform elongations are discussed.