

ABSTRACT

METHODS FOR PROCESSING TITANIUM ALLOYS

Methods of refining the grain size of a titanium alloy workpiece include beta annealing the workpiece, cooling the beta annealed workpiece to a temperature below the beta transus temperature of the titanium alloy, and high strain rate multi-axis forging the workpiece. High strain rate multi-axis forging is employed until a total strain of at least 1 is achieved in the titanium alloy workpiece, or until a total strain of at least 1 and up to 3.5 is achieved in the titanium alloy workpiece. The titanium alloy of the workpiece may comprise at least one of grain pinning alloying additions and beta stabilizing content effective to decrease alpha phase precipitation and growth kinetics.

[Figure 2]