

Titomic USA, Inc. Titomic Kinetic Fusion

PROBLEM STATEMENT

Department of War sustainment and production teams need faster, more adaptable methods to manufacture, repair, and qualify high-value metallic components when legacy supply chains, thermal joining processes, and long fabrication cycles cannot keep pace with mission requirements. This is especially important for propulsion and aerospace hardware, where design changes, dissimilar-metal interfaces, and performance requirements can delay test and fielding.

TECHNOLOGY SOLUTION

Titomic Kinetic Fusion™ (TKF)™ is a solid-state, non-thermal cold spray additive manufacturing process that accelerates metal powders to supersonic velocity and bonds them through kinetic energy rather than melting. For the demonstrated solid rocket motor application, TKF™ was incorporated into two primary hardware elements: a steel nozzle with copper facing and a titanium casing. The approach used robotic cold spray path planning for complex geometries, direct bonding of dissimilar metals, and targeted mechanical properties comparable.

BENEFITS

TKF™ enables rapid design iteration, repair, and life extension of mission-critical metallic components with minimal distortion and no heat-affected zones. The demonstrated program showed approximately 95% deposition efficiency, reducing waste while supporting lower fabrication cost, shorter production time, and more resilient supply chains. For Warfighter readiness, those reductions translate into faster support to theater operations and a credible path toward point-of-need manufacturing.

GRAPHIC

