Mechanical Metallurgy Testing Facility

Purpose:

To provide mechanical property data and mechanical testing services to customers, payloads, projects and Shuttle elements in support of MSFC's strategic initiatives.

The Mechanical Metallurgy Test Facility (MTF) provides mechanical property data to customers and performs mechanical testing in support of Center payloads, projects, and Shuttle requirements. The test facility is used to investigate materials used by NASA, including design data development and evaluation of process effects. It can support any standard axial tension-compression type test specified by industry and Government standards. Mechanical testing is conducted in air from -423 to 2,000 °F, in liquid helium to –423°F, in liquid nitrogen at -320 °F, and in aqueous salt baths at ambient temperature. The facility operates nine mechanical test systems (with 5-5, 5.5-, 20-, 50-, 60-, and 200-kip capabilities.) Test capabilities include tension, compression, modulus (Young's, tangent, chord, and shear), stress rupture, bending and ductility of metals and welds, three- and four-point bend, plane-strain fracture toughness, high/low cycle fatigue, crack growth rate (da/dN and da/dt), crack-tip opening displacement, fracture toughness (J_{IC}, K_{IC}, and K_{IEAC}), simulated service, and torque-tension testing of fasteners. Special component testing is also available to simulate service loads and environments under extreme conditions. Support equipment includes digitally controlled portable environmental chambers, a digital specimen measuring station, a plunge electro-discharge machine, hardness testers, a bench lathe, a milling machine, a drill press, a tensile specimen fabrication machine, a strain gauge application station, a liquid nitrogen delivery system, and a high pressure hydraulic pump room.

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