

## Mechanical Properties of Modified JK2LB for Nb<sub>3</sub>Sn CICC Applications

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**Abstract** - Since the introduction of the cable-in-conduit conductor (CICC) concept, a variety of alloys have been proposed for fabricating the conduit in high field magnets. The conduit provides containment of the liquid helium coolant and is typically also the primary structural component for the magnet coils. These functions create requirements for strength, toughness, fatigue crack resistance, and fabricability. When the CICC uses Nb<sub>3</sub>Sn superconductor, the conduit alloy must retain good mechanical properties after exposure to the superconductor's reaction heat treatment. Here we present data from cryogenic tensile, fracture toughness, fatigue crack growth rate, and axial fatigue tests for a modified heat of JK2LB, before and after the exposure to the reaction heat treatment. The alloy is presently being considered as a candidate for use in ITER Central Solenoid (CS) Coils. The direct comparison of the data from the comprehensive test program with earlier versions of JK2LB and another CICC candidate alloy (modified 316LN) is intended to assist design engineers with material selection for CICC applications.

**Keywords** - Cryogenic, Fatigue Crack Growth, Fracture Toughness, Axial Fatigue, Yield Strength, Conduit, CICC

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