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M1Or2C-02: The Low Temperature Mechanical Properties of a Nitronic 40 Forging

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Nitronic 40 forged tubes are typically used for structural reinforcement in high field pulse magnet design and applications. To better understand the mechanical performance of this versatile high strength austenitic steel a series of mechanical tests were conducted. Tensile were performed at 295 K, 77 K and 4 K, and cryogenic fracture mechanics tests were performed at 77 K and 4 K. The effect of temperature on strength, ductility, toughness and fatigue crack growth rate are evaluated. Microstructure and composition effects are also presented and discussed.

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