

## **TENSILE BEHAVIOR OF CRYOROLLED ZIRCALOY-2**

**P.ADITYA RAMA KAMALANATH<sup>1</sup> & APU SARKAR<sup>2</sup>**

<sup>1</sup> Department of metallurgical and materials engineering,  
NIT Warangal, Warangal, 506004,India.

<sup>2</sup> Mechanical metallurgy section, BARC, Mumbai, 400094,India.

### **ABSTRACT:**

Zircaloy-2 is mainly used in nuclear technology, as cladding of fuel rods in nuclear reactors, especially water reactors (BWRs). Hence high strength of Zircaloy-2 is of prime importance. This investigation deals with the effect of cryorolling on Zircaloy-2 by comparing different tensile properties. For this analysis, four samples with various degrees of cryorolling are taken and tensile tests are conducted on these samples. The obtained results are analyzed and the optimum degree of cryorolling of Zircaloy-2 is obtained. The cryorolling improved the mechanical properties of the material as the dislocations are entangled near the grain boundaries and also due to decrease in the grain size. The microstructure of the sample is analyzed by optical microscope, before and after cryorolling and the grain structure analysis is done.

**KEYWORDS:** Zircaloy-2, Cryorolling, Entanglement of dislocations, Dynamic recovery, Degree of cryorolling