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# High Strain and Twisting Tolerance in AIMI and PIT MgB2 Strands

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The influence of strand bending and twisting on the critical current density, Jc, and n-value of MgB2 multifilamentary strands were evaluated, and the field and temperature dependence of the transport properties was evaluated for MgB2 strands. Two types of MgB2 strands were fabricated; (i) advanced internal magnesium infiltration method (AIMI) strands, and (ii) powder in tube method (PIT) type strands. The bending strain tolerance of MgB2 strands was studied by applying a series of bending strains (0.0% to 0.8%) at room temperature, and then measuring transport properties at cryogenic temperatures. In order to study the effect of twisting, six twist pitch levels (10 mm to 100 mm) were applied on PIT MgB2 strand with 54 sub-filaments. Critical current densities of all samples in this study were measured on 5 cm long samples at 4.2 K in fields of up to 12 T. The n-values (or index number) were extracted from the V-I curve at all measured fields. The bending strain tolerances on the transport properties of both AIMI and PIT strands were measured and discussed. The influence of twisting on multifilamentary PIT strand was studied. Transport measurements were performed on the AIMI strand as a function of T from 4.2 K to 30 K. For AIMI strands, the strain dependence of Jc and n–value were undegraded out to 0.4%, with a reduction of only 10% at 0.6% bending strain. For PIT strands, both Jc and n–value were independent with bending strain up to 0.4%. Twisting down to Lt = 10 mm did not degrade the 4.2K transport properties of the MgB2 multifilamentary PIT strand (sub-filament size of ~ 20 ⊠m).

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