

Article ID: 1003-7837(2005)02,03-0051-01

Research and development activities on technical superconductors in Russia

Shikov A. B.

(A. A. Bochvar Institute of inorganic Materials, Moscow 123060, Russia)

The overview of main current practical application of superconducting materials is given with emphasis on their technical parameters. The long-term perspectiveness and economical efficiency of the use of low temperature superconductors on the base of deformable alloy NbTi and on the base of intermetallic compound Nb₃Sn has been underlined and confirmed for the wide range of applications in science and industry, in particular in the high energy physics, medicine, fusion energy systems. The level of superconducting properties in the modern low temperature superconducting wires has been analyzed, the dynamic of increase of these properties has been shown and the evaluation of the potential for further improvement has been done. For the technical Nb₃Sn superconducting strands produced by the most wide spread commercial methods-bronze process and internal tin process the attainment of high critical current density at the level of 800 A/mm² and 2000 A/mm² (at 12 T, 4.2K) accordingly has been shown. The main features of interrelations between microstructural parameters of the superconducting phases and their critical properties such as critical current density has been highlighted for the modern composite superconductors. The peculiar features of the performance of the technical Nb₃Sn superconducting strands in the scope of large complicated multistrands CICC for large magnetic systems has been described on the base of experience of participation of RF in the ITER international project.

Received date: 2005-08-29