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M2Or2E-02: [Invited] Mechanical property evaluation of 2G HTS tapes at Fujikura

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Since 2G HTS tapes have excellent features such as high in-field critical current (I_c) and tensile strength, they are suitable for various applications including high-field magnets. Fujikura Ltd. has developed high-performance 2G HTS tapes using IBAD and PLD techniques, and has supplied to many customers for years. In particular, the hot-wall PLD system that we have developed enables highly homogeneous I_c properties of the HTS tapes due to its very stable heating method. Also, we have succeeded in improving the in-field I_c by introducing artificial pinning centers to the superconducting layer.

In parallel with the development of the tapes, we have been evaluating various properties of the tapes and feeding them back into the manufacturing process. Especially, mechanical strength is an important factor, since it is often critical in high field magnet applications. Thus, we have focused on the evaluation of mechanical properties as well as (in-field) I_c evaluation. In magnet applications, the 2G HTS tapes are exposed to various electromagnetic and thermal stresses. Therefore, we have evaluated various strength parameters such as bending, compression, fatigue, and delamination, etc. in addition to tensile strength. Then we have worked to improve the strengths including introduction of a laser slitting technique.

In this presentation, the results of various characterizations we have performed are introduced.

Primary author: KIKUCHI, Kunihito (Fujikura Ltd.)

Co-authors: DAIBO, Masanori (Fujikura Ltd.); FUJITA, Shinji (Fujikura Ltd.); MUTO, Shogo (Fujikura Ltd.); HIRATA, Wataru (Fujikura Ltd.); Dr IJIMA, Yasuhiro (Fujikura Ltd.)

Presenter: KIKUCHI, Kunihito (Fujikura Ltd.)

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