

## I-BSCCO TypeHT-NX : The Strongest Bi2223 Wire

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**Abstract** — Sumitomo Electric has been commercially producing the silver-sheathed Bi2223 multi-filamentary wires, especially under the name of DI-BSCCO (Dynamically-Innovative BSCCO). DI-BSCCO wire is the name of various types of BSCCO wire. Type H is silver sheathed bare wire, Type HT is reinforced wire, Type G uses gold-silver alloy for sheath metal. For customers in the field of power cable and coil application, Type HT wire is most popular because of its strength and easiness of handling. For long time, we produce two types of Type HT wire. Type HT-SS uses stainless steel for reinforcement metal, and Type HT-CA uses copper alloy. Their critical tensile strength is more than 250 MPa and enough for the power cable and low magnetic field application like motor, generator, MRI and so on.

Recently so many researchers are trying to use HTS wire in the field of higher magnetic field application, for example compact high field NMR and around 30T magnet. For such higher field application, our conventional reinforced wires don't have enough strength. So many customers have requested us to develop stronger wire. To satisfy these requests, we have been developing stronger Type HT wire and finally succeeded to produce Type HT-NX with critical tensile strength over 400MPa. Reinforcement metal of Type HT-NX nickel alloy that is much stronger than stainless steel. Additional to the change of material, we also made change on lamination process. That is so called pre-tension process.

Following to the development of Type HT-NX wire, we have performed various kinds of test to confirm that our wire is really practical one in the field of high field application. In the presentation, production process of this wire and the result of various tests, for example tensile strength at 77K, bending diameter, durability on hoop stress and so on, will be presented and its practicability will be proved.

**Keywords (Index Terms)** — Bi2223, DI-BSCCO, Type HT-NX, NMR.