

## Surface Impedance of $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$ and $\text{SmBa}_2\text{Cu}_3\text{O}_{7-\delta}$ Films on $\text{CeO}_2$ -buffered Nickel Tape

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Flexible HTS superconductor films grown on nickel substrate provide a way to develop long HTS superconductor tapes of high quality, which has been needed for various large scale applications.  $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$  (YBCO) with the critical current density ( $J_C$ ) of  $2 \times 10^5 - 1 \times 10^6 \text{ A/cm}^2$  at 77 K and  $\text{SmBa}_2\text{Cu}_3\text{O}_{7-\delta}$  (SBCO) films with the  $J_C$  of  $2 \times 10^5 \text{ A/cm}^2$  are fabricated on flexible, bi-axially textured Ni tapes with the thickness of  $\sim 70 \mu\text{m}$ . Typical effective surface resistance ( $R_s^{\text{eff}}$ ) of  $\sim 800 \text{ m}\Omega$  are observed at 70 K at 8.6 GHz for both YBCO and SBCO films. A  $\text{TE}_{011}$  mode rutile-loaded resonator is used for obtaining the  $R_s^{\text{eff}}$  values of SBCO films appear to decrease by  $\sim 3 \%$  after the films are wound around a 3 mm-in-diameter rod with the SBCO films pointing outward. The temperature dependence of the  $R_s^{\text{eff}}$  of both YBCO and SBCO films, as well as usefulness of the dielectric-loaded resonator method for investigating the uniformity of the long HTS superconductor tapes are discussed.

keywords : Ni tape, YBCO, SBCO, microwave surface resistance.