

**SuNAM Developed New Process Named RCE-DR:
the Practical Highest Throughput Process**

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Abstract - For practical application of HTS (high T_c superconductor) ceramic material, high performance and low-cost conductor is essential. It's a big challenge to make a km long tape using coating technology, but almost all obstacles are solved through years. And now cost is the real issue for industrialization. Not only material cost, but throughput and yield is the very important factors for practical wire production.

We develop a new high throughput RCE method so called RCE-DR (Reactive Co-Evaporation by Deposition & Reaction). In this method, you deposited a glassy precursor first and this precursor converted to single crystalline 123 phase within a minute at reaction stage. In our case, 1000m long GdBCO 2G wires derived from automatically controlled 30 kW electron beam deposited RCE-DR system. Minimum process speeds in excess of 360 m/hr (4 mm width equivalent) are attained for RCE DR system.

Our 2G wire consists of GdBCO superconducting layer which is deposited by RCE DR on IBAD template the architecture of which is $\text{LaMnO}_3/\text{Epi-MgO}/\text{IBAD-MgO}/\text{Y}_2\text{O}_3/\text{Al}_2\text{O}_3/\text{Electro-polished metal substrate}$.

Some typical characteristics of our highly textured 1.5 μm -thick ReBCO layer include; in-plane FWHM is less than 4° , and critical current exceeds 500 A/cm-width. And some mechanical properties and application demonstration results will be presented. Finally, remaining issues for large commercial market will be discussed.

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