

## Strictly Application-oriented REBCO Bulk Fabrication

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**Abstract** – The ability to produce large-grain REBCO (RE= Y, Rare Earth) bulk superconductors by melt texturing growth has been improved and refined significantly over the last 20 years. Magnetic bearings, transportation systems, and scientific instrumentation are becoming major innovations of HTS bulk materials. Large grain production is dominated by cold top-seeding melt growth (TSMG). For material optimizing we demonstrate strictly application-oriented fabrication close to the final geometry and thus reducing mechanical machining and assembling work. YBCO hollow cylinder design for journal bearings with radial c axes orientation are obtained by radial-seeding geometry (RSMG). YBCO ring tiles up 120 mm show a perfect cylinder geometry with in-wall a, b orientation and radial c axes. We report improved electric and mechanical bulk properties and demonstrate great production effectiveness. For achieving high field permanent magnets up to 10 T we compare YBCO bulk and ring geometry. Top/bottom double seeded melt growth (DSMG) grain samples provide better magnetic flux trapping capability and show more homogenous properties.

**Keywords (Index Terms)** – HTS, bulk REBCO, melt texturing growth, top/bottom seeding melt growth, radial seeding, trapped magnetic fields.

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