Proceedings of the Korean Superconductivity Society Meeting 2000
(KSS 2000), YongPyung, Kangwondo, Korea, Aug. 16-18, 2000

YBCO – film production by thermal co-evaporation for microwave and electrical power applications

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Large area YBCO - films are series produced by thermal co-evaporation using a deposition scheme known as Garching process, which allows intermittent oxygen supply in a high vacuum ambient by an oxygen cup spaced closely underneath the moving substrates. The deposition area of 9" diameter is capable to handle very large wafers up to 8" diam. or numerous smaller wafers. The large distance between substrates and boat sources and an elaborate heater design guarantee excellent film uniformity over the entire deposition area. YBCO - films deposited by this technique are commercially fabricated for a variety of applications – the most prominent are resistive fault current limiters and microwave filters for mobile or satellite communications. IMUX and OMUX - filters are currently space qualified by Robert Bosch GmbH and are expected to be launched and installed on an experimental platform of the international space station ALPHA in 2001.
Both of the above applications require quite different film specifications on the one hand, but at the same time extremely high uniformity and reproducibility on the other hand, since hundreds of YBCO - films are combined to large systems or have to be approved for manned space missions. The success of such projects is direct evidence that the technique of thermal evaporation is readily capable to meet these high demands and has become the major deposition technique to support the emerging HTS market.