

MATERIAL FOR FABRICATION OF DESY LARGE GRAIN/SINGLE CRYSTAL CAVITIES

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Abstract

Material for large grain LG and single crystal SC cavities of TESLA shape has been developed in collaboration with industry. One of the aspects of LG material was electron beam melting of the ingots with required structure. The second was slicing of the discs cost effectively with tight thickness tolerances, high surface quality and high purity. Surface and structural properties of SC on the LG discs are investigated. Measurements of the crystal orientation on the LG discs of three companies have been done by complete penetration using synchrotron radiation. Two LG material features have been stressed in cavity production: the influence of the LG crystal orientation on the anisotropic behavior during deep drawing and the impact of pronounced steps at grain boundaries on cavity behavior. 11 LG 9-cell cavities of XFEL-like shape are fabricated. The procedure of increasing the crystal size by rolling of LG discs and cut out of SC discs, followed by subsequent forming and welding without destroying of the SC structure, was developed. A method of fabrication of single crystal cavities was proposed. Several SC cavities with different crystal orientations were produced.

**CONTRIBUTION NOT
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