

REDUCING ELECTROPOLISHING TIME WITH CHEMICAL-MECHANICAL POLISHING

C.Z. Antoine, CEA, Gif-sur-Yvette;
R. Crooks, Black Laboratories, L.L.C., Newport News

Abstract

Before reaching optimal results, one needs to remove 150-200 μm by electropolishing inside niobium RF cavities, probably because the existence of a damage layer on the Nb sheet surface. Reducing the amount of electropolishing to a final light treatment would be a way to decrease both costs and risks for large projects such as ILC. We have evaluated the thickness of the damage layer after various deformations steps by observing the density of etching figures after several light chemical etches. Complementary observations with EBSD are also presented. Deep drawing brings further and deeper damage in particular in the equator region where the friction against the forming dye is the highest. Welding also influences the damage distribution. "Chemical-mechanical" polishing, a technique initially developed for the preparation of TEM samples, is a way to prepare surfaces with a very thin damage layer. It is also now applied industrially to wafer preparation and optical lenses. We think that chemical mechanical polishing of half cells before welding would be a way to decrease the thickness of the final etching for the preparation of RF Nb cavities.

**CONTRIBUTION NOT
RECEIVED**