

**STEVENSON-WYDLER
(15 USC 3710)**

**COOPERATIVE RESEARCH AND
DEVELOPMENT AGREEMENT
No. JSA 2009S007**

**BETWEEN
Jefferson Science Associates, LLC
under its U.S. Department of
Energy Contract
No. DE-AC05-060R23 177 AND

Black Laboratories, L.L.C.**

Products: Reports and Publications

The Cooperative Research and Development agreement, No. JSA 2009S00 resulted in collaborations and conference participations on research topics related to high purity (RRR) niobium applications for superconducting radio frequency cavities used by Jefferson Lab. Documented results were shown in Reports and Publications listed below. Reports were issued to The Commonwealth of Virginia, Center for Innovative Technology; to ATI Wah-Chang and several publications were produced with DESY in Hamburg, Germany, with Jefferson Lab and with Christopher Newport University.

The CRDA was beneficial to Black Laboratories, L.L.C. and to Jefferson Lab.

Reports

To CRCF

Processing and Testing of Hydroformed SRF Cavities, CRCF Award Number CP-008
Submitted to the Commonwealth of Virginia, Center for Innovative Technology, 02/23/13.

To ATI Wah-Chang

Review of SRF Testing of Seamless Cavities, July 29, 2014.
Review of Surface Roughness and Iris Crack Evaluation (of Seamless Cavities), June 27, 2015.

Publications:

1. W. Singer, X. Singer, S. Aderhold, A. Ermakov, K. Twarowski, R. Crooks, M. Hoss, F. Schölz and B. Spaniol, "*Surface investigation on prototype cavities for the European X-ray Free Electron Laser*". Physical Review Special Topics - Accelerators and Beams, 2011, 14(5): p. 050702. (CITED BY 12)
2. Xin Zhao, A. M. Valente-Feliciano, C. Xu, R. L. Geng, L. Phillips, C. E. Reece, K. Seo, R. Crooks, M. Krishnan, A. Gerhan, B. Bures, K. Wilson Elliott, and J. Wright, "*Large crystal grain niobium thin films deposited by energetic condensation in vacuum arc*" (CITED BY 22). Journal of Vacuum Science and Technology A: Vacuum, Surfaces, and Films, 2009, 27(4): p. 620-625.
3. Tarek M. Abdel-Fattah and Roy Crooks, "*Surface Characterization of High Purity Niobium Electropolished with an Ionic Liquid*" (CITED BY 10), ECS Transactions, 2010 33(7): p. 571-574.