AEGIS TECHNOLOGY, INC.

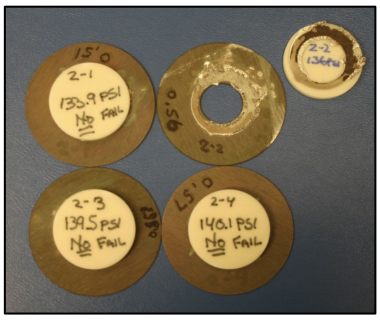
Case Study
Research and Development in Nanomaterials used for Brazing Applications

CUSTOMER: U.S. Department of Energy (DoE)
CONTRACT #: DE-SC-0000940
PROJECT NAME: SBIR Project, "A Reliable High Temperature Sealing Technology for Gas Separation Devices"
PROJECT DURATION: 2009-2010

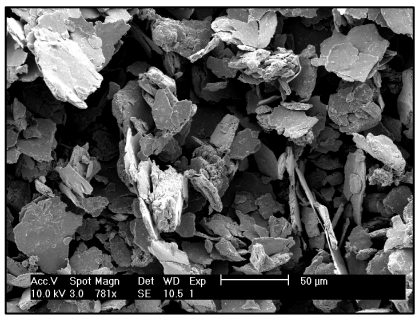
OVERVIEW
The US Department of Energy solicited a SBIR/STTR request for proposal (RFP) for the development of new sealing methods for the joining of ceramics to metals. In this project, Aegis Technology developed a proprietary process known as reactive air brazing (RAB) that uses Ag-CuO nanomaterials as the brazing material, for joining ceramics to metals. The ceramics included Al_2O_3 (alumina), YSZ, and LSCF. Metals included Fecralloy and Croffer-22APU. Aegis Technology was awarded the project in 2009 and completed the project in 2010.

DELIVERABLES
Aegis Technology delivered several brazed parts. In the process, Aegis Technology conducted:

- Processing
- Scanning Electron Microscope (SEM) Characterization
- Energy-dispersive X-Ray Spectroscopy (EDS)
- Mechanical Testing (four-point bend and hermeticity testing)



(a)



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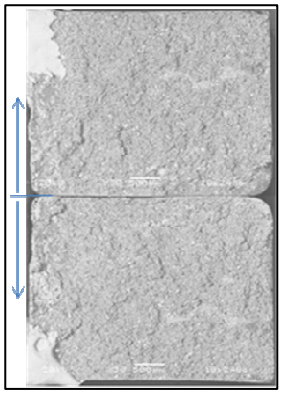

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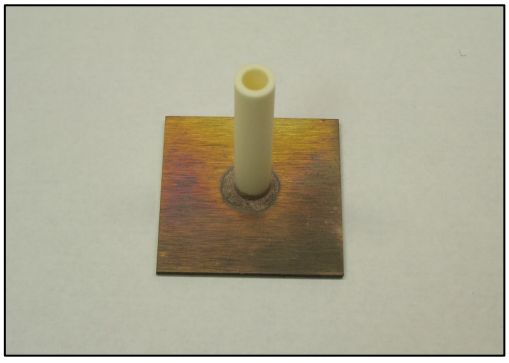

(d)

(a) Alumina (Al_2O_3) joined to fecralloy for hermeticity testing, (b) SEM of braze filler powder, (c) Fractography after 4 point testing of brazed components, (d) Porous alumina tube joined to fecralloy plate

CONTACT
For more information, please contact:
Dr. Timothy Lin, Technical Director, Aegis Technology Inc.
(714) 554-5511
timlin@aegistech.net
www.aegistech.net