

JAMES DERBY
Ceramist /Materials Scientist

Material scientist experienced in forensic and fractographic analysis of glass and ceramic materials. Applies scientific principles of fractography to identify failure origins, mechanisms of glass fracture and cause of failures in families of materials including glass and ceramics. Experienced in analytical methods used for acceptance testing of glass against established standards, including procedures established by ASTM and the National Institute of Standards and Technology. Experienced in glass manufacturing and quality control procedures including glass melting, annealing, and determination of properties of molten glass.

Experienced in failure analysis of materials used in general consumer products, tribological applications and rotating equipment failures. Conducts characterization testing and failure analysis of ceramic, glass, rubber, plastic, and metal materials.

Experienced in corrosion resistant materials, and stress cracking in corrosive environments and material performance applications in the fields of hydrometallurgical processing, oil and gas drilling, transportation, and refinery operations. Experienced in electro chemical corrosion in marine environments, analysis of shaft seals for nuclear submarines, pumping equipment in oil pipeline systems, and high temperature alloys for aerospace applications. Managed a materials characterization laboratory for an international company investigating properties including hardness, strength, chemical resistance and density for quality control purposes on rubber, plastic, metallic, and ceramic materials. Conducted strength testing on single fibers and woven fiber composites involving plastic, metallic, glass, carbon, and ceramic fiber materials. Extensive background in performance testing of rubber, plastic, and metallic components to measure acceptance against established standards. Also experienced in surface coating technologies including chemical vapor deposition, physical vapor deposition and thermal spray coatings, failures of rotating components in refrigeration services, analysis of petro chemical plant start up failures, failures in oil well artificial lift equipment, processing of nano materials, metallurgical preparation techniques, and surface characterization technologies.

PROFESSIONAL EXPERIENCE

2015 to present **Robson Forensic, Inc.**
Associate

Provide technical investigations, analysis, reports, and testimony toward the resolution of litigation involving ceramics, cermets, composites, coatings, and glass. Employ the material sciences of fracture mechanics, fractography, tribology, corrosion, and metallography to identify sources of product failure utilizing characterization technology including the following:

- Scanning Electron Microscopy
- Energy Dispersive Spectroscopy
- Differential Thermal Analysis
- Differential Scanning Calorimetry
- Fourier Transform Infrared Spectroscopy

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- X-Ray Fluorescence
- Design of Experiments
- Surface Texture Analysis

2013 to 2015 **Cee6cubed LLC**, Waukegan, IL
Chief Technology Officer

Process and manufacturing development using nano particles including nano SiC, graphene, nano diamond and other nano materials.

1998 to 2013 **John Crane, Inc.**, Morton Grove, IL
Materials Scientist /Materials Laboratory Manager

With 25 years of career experience, he provided material technology support for a global organization with sales in excess of \$1.3 billion as Manager of Materials Worldwide. Provided the following technical services including hardness testing and inspection of incoming rubber "O Ring" materials including Butyl rubber, Nitrile rubber, Neoprene rubber, Fluorocarbon (Viton), and Perfluorocarbon (FFKM). Worked with rubber suppliers which manufactured rubber materials in cup and bellows geometries for mechanical seals in rotating equipment applications. Built a thermal analysis laboratory dedicated to the analysis of rubber materials, using Thermal Gravimetric Analysis (TGA), Differential Scanning Calorimetry (DSC), and Differential Thermal Analysis (DTA). Conducted failure analysis on many failed mechanical seals where the rubber material had been attacked by chemicals and abrasive media.

1985 to 1998 **EG&G**, Boston, MA
Materials Scientist / Materials Laboratory Manager

EDUCATION

M.S. in Ceramic Science, New York State College of Ceramics - Alfred University;
Alfred, NY
B.A. Physics; Thiel College, Greenville, PA

PROFESSIONAL MEMBERSHIPS

American Ceramic Society
Society of Tribology and Lubrication Engineers (STLE)
ASM International
National Association of Corrosion Engineers (NACE)
American Institute of Aeronautics and Astronautics (AIAA)
American Society of Heating, Refrigerating and Air Conditioning Engineers
North American Thermal Analysis Society.

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PUBLICATIONS/SPEAKING ENGAGEMENTS

Key note address speaker, invited speaker, and author of 20 technical papers at conferences including the following:

Derby, James, Tribological Performance in R134a and POE Oil Refrigeration Applications. EG&G Sealol sponsored refrigeration conference, Shannon, Ireland, 1996.

Derby, James, Effects of Thermal Spray Processing Parameters on Frictional Behavior of Tribaloy T-800 Coatings. Invited Speaker at the American Institute of Astronautics and Astronautics Conference, San Diego, California, 1993.

Derby, James, Tribopair Evaluation of Brush Seal Applications, Joint Propulsion Conference and Exhibit, Nashville, TN, US Air Force sponsored research, July 1992.

Derby, James, Observations on Wear Behavior of Nuclear Submarine Main Shaft Seals, US Naval Academy, Annapolis, Maryland, 1990.

Derby, James, Material Selection Considerations for Mechanical Seal Applications, Keynote Speaker Presentation, Twelfth International Conference on Fluid Sealing, Brighton, England, 1989.

Datta, A. and Derby, J. et al. Metal Bellows Mechanical Face Seals for High Performance Pump applications, Fifth International Pump Users Symposium, Texas A&M, May 1988.

Derby, James, Non-Lubricated Sliding Wear of Al₂O₃, PSZ, and SiC Fourth International Symposium on the Fracture Mechanics of Ceramics, Blacksburg, Virginia, 1986.