



RESUME OF KEITH G. CLINE, P.E.

SUMMARY

Registered Metallurgical Engineer with experience in failure analysis, laboratory testing, consulting, and manufacturing. Failure analysis experience includes metallic, plastic and composite materials from various applications including structural, transportation, aerospace, industrial, industrial piping and residential plumbing. Experienced in heat-treating of numerous metal alloy systems, corrosion failure mechanisms, welded and mechanically fastened joining, and performance testing of materials and products. Forensic experience includes laboratory and on site examinations, depositions, mediations, arbitrations, and trial testimony.

PROFESSIONAL EXPERIENCE

MDE Inc. – Seattle, WA (2002 to Present)

Vice President and Principal – Failure analysis of materials and components used in various systems, as well as material selection and heat-treatment consultation. Forensic investigations include failures of residential plumbing pipe and fixtures, sprinkler pipe and fittings, transportation components, industrial equipment, fasteners and welded joints. Operates and interprets results from analytical equipment including optical and scanning electron microscopes (SEM), mechanical testing, and thermal analysis (thermogravimetric analysis (TGA) and differential scanning calorimeter (DSC)).

The Boeing Company – Seattle, WA (2001 – 2002)

Fastening Technology Engineer – Responsible for development of fasteners and fastening systems and the maintenance of process and part specifications. Projects include development and qualification of wing fastening system for the 777-300ER, design and implementation of repair rivets for fuselage and wing structures, and laboratory fatigue testing of fuselage and wing joint coupons.

Applied Technical Services – Marietta, GA (1997 – 2001)

Materials Engineer – Responsible for failure analysis, physical property, accelerated environmental, flammability and simulated service life testing. Evaluations included mechanical and environmental assisted failure of metallic and plastic components, microstructural evaluations, heat-treatment and material selection consultation, mechanical testing (tensile, flexural, compression, impact and hardness), coating/plating evaluation and accelerated weathering testing (UV, salt spray, chemical exposure and heat aging). Wrote and implemented department test procedures for successful ISO 9002 and ISO Guide 25 accreditation.

Consulting Metallurgical Services – Marietta, GA (1994 – 1997)

Materials Engineer – Responsible for mechanical, metallurgical, and non-destructive testing. Evaluations included the performance and interpretation of mechanical properties, microstructural, and radiographic testing.

Keith G. Cline, P.E.

PROFESSIONAL REGISTRATION & CERTIFICATION

Registered Professional Engineer, State of Washington, #39067

Registered Professional Engineer, State of Alabama, #24046

EDUCATION & TRAINING

Bachelors of Materials Engineering, Auburn University (1991)

Major Testing Methods for Plastics (ASTM) (1997)

Regional Color Seminar, Hunter Color Institute (1998)

Plastics Failure Analysis (ASM) (2000)

Aircraft Structures Engineering, The Boeing Company (2001)

Fire, Arson and Explosion Investigation (NAFI) (2002)

Aerial High Lift Safety and Hazards Confined Space Hazards (2004)

Fracture Analysis of Glass and Ceramics, Alfred University (2006)

PROFESSIONAL ASSOCIATIONS

Member – American Society for Materials (ASM International)

Member – The Materials Society (TMS)

Member – American Society for Testing and Materials (ASTM International)

Member – Society of Plastic Engineers (SPE)

PUBLICATIONS

“Metallurgical Failure of Titanium Wing Attachment Bolts”, M.E. Stevenson, J.L. McDougall, K.G. Cline, Practical Failure Analysis, ASM International, August 2003

“Sprinkler Piping Corrosion and Degradations”, Seattle SFPE, February 2003

“Failure Analysis of High Capacity Fork Lift” 2004 IMS Conference, Savannah, GA

“Pitting Corrosion failure of AISI Type 304 L Stainless Steel Tubing” 2005 MS&T Conference, Pittsburgh, PA

