

## RICHARD SUTHERLIN, PE

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### SUMMARY

*Experienced engineer with over 40 years in metallurgical engineering, corrosion engineering, production processes with reactive metals and materials and applications engineering, viewed as an expert internationally. Leverage the blend of technical expertise and interpersonal skills to drive for business results, develop new products, developing talent and work effectively in cross functional teams to move projects forward. Ability to effectively manage annual budgets up to \$4 million.*

### AREAS OF EXPERTISE

- Registered Professional Engineer
- Experienced technical manager
- Reactive metals expert
- Proven ability to meet revenue and profitability objectives
- Instructor
- Welding expert
- ASME & AWS leadership
- Strong communication, prioritization and organizational skills
- Failure analysis
- Titanium
- Zirconium
- International travel

### PROFESSIONAL EXPERIENCE

#### **RICHARD SUTHERLIN, PE, CONSULTING, LLC, Albany, OR**

**2015 –**

Specializing in titanium, zirconium, niobium and tantalum. Technical services include assistance in materials selection, evaluation of failed components, training seminars on all aspects of reactive and refractory metals, weld training, equipment inspection services, fabrication and heat treatment of reactive metals, assistance on procurement, representation and/or questions on ASME boiler and pressure vessel code processes or on AWS (American Welding Society) processes, corrosion testing recommendations and evaluation of coupons, review of customer specifications and/or order requirements including technical assistance world-wide.

#### **ATI SPECIALTY ALLOYS AND COMPONENTS, Albany, OR**

**1977 – 2015**

Specialty metals producer including titanium, hafnium, zirconium, niobium, tantalum, vanadium alloys.

#### **Manager of Technical Marketing Services**

**2000 - 2015**

Responsible for customer technical assistance, failure analysis, weld training, material selection and development/presentation of 2-day training seminars worldwide on the properties and applications of zirconium, titanium, niobium and tantalum.

- Managed technical services, corrosion laboratory, Lockheed manifold program, and specialty chemicals departments.
- Successfully trained hundreds of technical personnel worldwide on the application, construction and use of titanium, zirconium, niobium and tantalum in chemical processing applications. This training resulted in numerous successful projects with the use of these materials.

- Trained hundreds of welders, weld inspectors, engineers on the welding of titanium and zirconium alloys at domestic and international locations.

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- Conducted numerous failure analyses, technical presentations at international conferences, chaired international technical society committees, planned and chaired technical eight international conferences on corrosion, and provided technical guidance and support for numerous chemical producers and fabricators worldwide.

**Manager, Materials Engineering**

**1994 - 2000**

Management of Product Managers and Product Development Engineers and Technicians for ATI Wah Chang. Support of chemical processing, special products (niobium) and nuclear materials. Responsible for merging WC and Oremet production and their engineering staffs of the two facilities.

- Managed a group of 30+ technical personnel (direct reports).

**Business Unit Manger – Zr & Ti Business Unit**

**1992-1994**

Manager of Production Engineers, Development Engineers and the Outside Fabrication Department of the Zirconium and Titanium Business Unit.

**Manager, Outside Fabrication Department, Teledyne Wah Chang**

**1990-1992**

Development of new fabrication procedures and qualification of new outside vendors and fabricators. Managed the engineering personnel and clerical staff handling the outside-fabricated products.

**Metallurgical Engineer, Technical Services, Teledyne Wah Chang**

**1983-1990**

Responsible to assist Sales, Marketing and Manufacturing to promote the use of zirconium for the chemical industry. Visited customers worldwide to provide assistance for application of reactive metals in their specific plant environments. Taught welding of reactive metals and fabrication of reactive metal components.

**R&D Engineer, Metallurgical Research and Development, Teledyne Wah Chang**

**1980-1983**

Responsible for metallurgical R&D dealing with zirconium wrought product for use in the chemical processing industry. Involved in metallurgical evaluation of customer failures. Visited customers worldwide to promote the use of zirconium in chemical applications. Developed new products and manufacturing methods for zirconium alloys.

**Production / Melting Engineer, Teledyne Wah Chang**

**1977 - 1980**

Responsible to head metallurgical improvement studies on zirconium and niobium products. Assigned as Department Engineer for new equipment installation (electron beam and vacuum arc melt furnaces), improvement/redesign of existing melting and scrap recycle equipment.

**EDUCATION**

**Bachelor of Science, Metallurgical Engineering,**  
Montana School of Mines of the University of Montana, Butte, MT

## **PROFESSIONAL DEVELOPMENT**

**Registered Professional Engineer**, (Oregon)

### **American Welding Society**

Chairman of AWS A5K Committee on Titanium and Zirconium Filler Metal  
Chairman of G2D Committee Reactive Metal Welding;  
Member A5 Committee on Filler Material.

### **American Society of Mechanical Engineers**

Chairman of Subgroup Nonferrous Materials, BPV II  
Member of BPV II Committee on Materials  
Member of BPV VIII, Materials Subgroup  
Member of Materials Database Working Group (BPV II)  
Member of BPV II Executive Committee.

### **National Association of Corrosion Engineers**

General Member

## **PATENTS**

US Patent 23,340, Addition of Alloying Elements to Consumable Electrodes. R.C. Sutherlin, J.A. Megy, R.E. Grammer, inventors. Assigned to Teledyne, Inc.

US Patent 30,352, Columbium Containing Master Alloys, R.C. Sutherlin, R.J. Myers inventors. Assigned to Teledyne, Inc.

US Patent 7922065 B2, April 12, 2011 "Corrosion Resistant Fluid Conduction Parts, Methods of Making Corrosion Resistant Fluid Conduction Parts and Equipment and Parts Replacement Methods Utilizing Corrosion Resistant Fluid Conducting Parts" Richard Sutherlin, Brett Herb, Ron Graham. Assigned to ATI Properties

## **RECOGNITIONS AND AWARDS**

1995 Distinguished Alumni Recognition Award, Metallurgical and Materials Engineering, Montana School of Mines, University of Montana, Butte, MT

Technical Chairman/Technical Editor of Corrosion Solutions Conference and Proceedings for the Years of 2001, 2003, 2005, 2007, 2009, 2011 & 2013.

Best Technical Article of 2005: Tube and Pipe Journal entitled "Welding Zirconium and Zirconium Alloys"

2013 ASTM "Russ Ogden" Award. This peer award is presented by the ASTM B10 committee to an individual for outstanding technical or industrial contribution to the reactive or refractory metal industry.

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## Publications/Presentations

1. Danielson, P, Krueger, B, Sutherlin, R, "**Art the Tells a Story**", The Welding Journal, September 1996, pages 39-55. (Technical Paper)
2. Graham, R, Sutherlin, R, "Niobium **and Niobium alloys in Corrosive Applications**", International Symposium Niobium 2001, Orlando, FL, December 2-5, 2001(Presentation & Paper)
3. Sutherlin, R, "**Zirconium and Zirconium Alloys use in Sulfuric Acid Applications**", ACHEMA 2003, Frankfurt, Germany May 19-24, 2003. (Presentation & Paper)
4. McMaster, J, Sutherlin, R., "**Revision of AWS 5.16-90 Addresses Important Changes in Titanium Industry Practice**", CSC 2003 Corrosion Solutions Conference Proceedings, Sept. 7-12, 2003, Coeur D'Alene, ID, pages 85-92. (Presentation & Paper)
5. Danielson, P, Sutherlin, R, "**Zirconium and Hafnium and Their Alloys**", ASM Handbook Volume 9 Metallography and Microstructure, ASM Materials Park, Ohio, 2004, pages 942-958. (Technical Journal Article)
6. McMaster, J, Sutherlin, R, "**Update: Titanium Specification Revised**", The Welding Journal, May 2004, pages 43 - 51. (Technical Paper)
7. Sutherlin, R, "**The Welding of Zirconium and Zirconium Alloys, Parts 1, 2 & 3**", Tube and Pipe Journal October, November, December 2004. (Technical Paper) **Note: This paper won the year's best article of the Tube and Pipe Journal for 200X.**
8. Sutherlin, R, "**Procedures for Heat Treating Fabricated Equipment of Zirconium Alloys**", Corrosion 95, NACE paper 251, 2005. (Presentation & Paper)
9. Yau, TL, Sutherlin, R, "**Corrosion of Zirconium and Zirconium-Base Alloys**", ASM Handbook Volume 13B, 2005, pages 300-324. (Technical Journal Article)
10. Sutherlin, R, Graham, R, "**Corrosion of Niobium and Niobium Alloys**", ASM Handbook Volume 13B, 2005, pages 325-336. (Technical Journal Article)
11. Sutherlin, R, NAUG (Nitric Acid Producers Group), "**Economic Advantages of Using Zirconium as a Construction Material for Chemical Equipment**", May 22-24, 2006 (Presentation)
12. Sutherlin, R, "**Procedures for Heat-Treating Fabricated Reactive Metal Equipment**", CSC2005 Corrosion Solutions Conference Proceedings, Sept. 11-15, 2005, Sunriver, OR, pages 67-76, (Presentation & Paper).
13. Sarrail, B, Schrupp, C, Babakhanyan, S, Muscare, K, Foyos, J, Ogren, J, Stoyanov, P, Sparkowich, S, Sutherlin, R, Clark, R, "**Quenching methods for Ti-325 Alloy**" ENGINEERING FAILURE ANALYSIS. 2007 Vol. 14 No. 7. (Technical Paper)
14. Sarrail, B, Schrupp, C, Babakhanyan, S, Muscare, K, Foyos, J, Ogren, J, Sparkowich, S, Sutherlin, R, Hilty, J, Clark, R, "**Annealing and Anomalous Bimodal Grain Growth of Zr 702**", ENGINEERING FAILURE ANALYSIS. 2007 Vol. 14 No. 7. (Technical Paper)
15. Richard Sutherlin, "**The Welding of Titanium and Its Alloys**", The Welding Journal, December 2007, pages 40-45. (Technical Paper)
16. Sutherlin, R, "**Zirconium and Zirconium Alloys for Use in Sulfuric Acid Applications**", Eurocorr 2008, Edinburgh, Scotland, Sept 10, 2008 (Presentation & Paper)
17. Holmes, D, Sutherlin, "**Zirconium and It's Alloys in Extreme Sulfuric Acid Applications**", Chemical Engineering Magazine, June 2008. (Technical Paper)
18. Sutherlin, R, NAUG (Nitric Acid Producers Group), "**Nitric Acid Cooler Condenser Failure at Terra's Port Neal facility**", April 14-16, 2008 (Presentation)
19. Sutherlin, R, "**Zirconium and Zirconium Alloy Castings**", ASM Handbook Volume 15, 2008, ASM Materials Park, Ohio, 2004, pages 1143-1148. (Technical Journal Article)

20. Sutherlin, R, ***“Zirconium and Zirconium Alloys for Use in Mineral Acid’s”***,ACHEMA 2009, Frankfurt, Germany, May 11-15, 2009. (Presentation)

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21. Banker, J, Sutherlin, R, Henry, N, ***“Study of Two Metals Heat Exchangers Failures: Design, Fabrication and Environmental Factors”***, CSC 2009 Corrosion Solutions Conference Proceedings, Sept.11-15, 2009, Park City, UT, pages 15-24. (Presentation & Paper)
22. Bartelli, G, Mantovani, P, Testa, G, Timbres, D, Sanders, BJ, Sutherlin, R, Versace, J, ***“High Pressure Zirconium Urea Stripper”***, CSC 2009 Corrosion Solutions Conference Proceedings, Sept. 11-15, 2009, Park City, UT, pages 71-78. (Presentation & Paper)
23. Sutherlin, R, ***“Procedures for Heat Treating Fabricated Reactive Metals Equipment”***, CSC 2005 Corrosion Solutions Conference Proceedings, Sept 11-15, 2009, Sunriver, OR, pages 67-76. (Presentation & Paper)
24. Sutherlin, R, Sanders, BJ, ***“The Formability of Reactive Metals”***, CSC 2009 Corrosion Solutions Conference Proceedings, Sept. 11-15, 2009, Park City, UT, pages 25-36. (Presentation & Paper)
25. Sutherlin, R, NAUG (Nitric Acid Producers Group), ***“Titanium & Zirconium For Use in Nitric Acid Applications”***, May 26, 2010 (Presentation)
26. Sutherlin, R, ***“The Application of Zirconium and Zirconium Alloys for Use in Organic Media”***,ACHEMA Asia 2010, June 4, 2010, Beijing, China (Presentation)
27. Sutherlin, R, Boyd, D, Clift, D, ***“Zirconium and Zirconium Alloys for Use in Nitric Acid Cooler Condenser Applications”***, CSC 2011 Corrosion Solutions Conference Proceedings, Sept 25-30, 2011, Lake Louise, Alberta, Canada, pages 35-44. (Presentation & Paper)
28. Sutherlin, R, NAUG (Nitric Acid Producers Group), ***“Materials for Use in Nitric Acid, Materials Selection Considerations”***, April 10-13, 2011 (Presentation)
29. Sutherlin, R, Boyd D, Clift, D, ***“Zirconium and Zirconium Alloys for Use in Nitric Acid Cooler Condenser Applications”***, 2012 ANNA Conference, London, Ontario, Canada. (Presentation & Paper)
30. Sutherlin, R, ***“Zirconium and Zirconium Alloys for Use in Alcohol Production”***,ACHEMA 2012, Frankfurt, Germany, June 21, 2012 (Presentation)
31. Sutherlin, R, ***“Use of Zirconium to Combat Corrosive Environments”***, European Process Engineering magazine, Engineer Live, May 21, 2012 (Technical Article)
32. ***Companion Guide to the ASME Boiler and Pressure Vessel Code***, Volume 1, Fourth Edition, 2012 by ASME Three Park Avenue, NYC, NY, Authored portions of Chapter 2. Part 2, Section II – Materials and Specifications, pages 3-1 - 3-51. (Technical Journal Article)
33. Abdulmunem, A, Goin, D, Ahmed, N, Sutherlin, R, Serrafiero, A, ***“The First OmegaBond® Tubing Technology HP Urea Stripper in Snamprogetti’s licensed Urea plant at GPIC’s plant-site in the Kingdom of Bahrain”***, 5-8 March, 2013, Nitrogen-Syngas 2013, Berlin, Germany. (Presentation & Paper) Note: Also presented at Asian Nitrogen-Syngas, Singapore (Presentation & Paper); Nitrogen-Syngas, Paris, France 2014 (Presentation & Paper); Middle East Petrotech, Bahrain, 2014 (Presentation & Paper).
34. Sutherlin, R, NAUG (Nitric Acid Producers Group), ***“Zirconium for Use in Nitric Acid Cooler Condenser Applications”***, April 22, 2013 (Presentation)
35. Sutherlin, R. ***“Zirconium Welding”*** Institut du Soudure, Paris, France, 2013. (Presentation)
36. Austin, B, Piggot, C., Sutherlin, R., ***“The Use of Zirconium for 46 Years in CF Industries, Yazoo City Nitrogen’s Urea Reactor”***, CSC13 Corrosion Solutions 2013, Sept. 2013, San Diego, CA.
37. Sutherlin, R, NAUG (Nitric Acid Producers Group), ***“The Use of Reactive Metals in Nitric Acid”***, April 28-30, 2014 (Presentation)
38. Sutherlin, R, ***“The Use of Zirconium in Hydrochloric Acid Environments”***ACHEMA 2015 (Presentation)