John N. DuPont, PhD, FASM, FAWS

R.D. Stout Distinguished Professor, Materials Science & Engineering

Lehigh University, Bethlehem, PA

Dr. DuPont graduated Cum Laude with a B.S. Degree in Metallurgical Engineering from Ohio State University and with M.S. and Ph.D. Degrees in Materials Science and Engineering from Lehigh University. He is currently the R.D. Stout Distinguished Professor of Materials Science & Engineering at Lehigh University. He is also Associate Director of Lehigh's Energy Research Center, holds a joint appointment in the Mechanical Engineering Department, and is the Site Director for the National Science Foundation Manufacturing and Materials Joining Innovation Center, which is one of the largest welding research centers in the world. Prior to obtaining his formal education, Dr. DuPont earned a Diploma in Welding, a Certificate in Welding Technology, and worked as a certified welder in a variety of fabrication facilities. His current research, teaching, and consulting activities cover areas of welding metallurgy, failure analysis and product litigation, solidification, Laser Engineered Net Shaping, alloy development, and high temperature corrosion. He has published over 300 technical articles and graduated over 31 MS and PhD students in these areas. He teaches courses in Welding Metallurgy, Failure Analysis, Introduction to Materials, Diffusion and Phase Transformations, Materials Selection, and Advanced Solidification. He has written one book, edited seven books, authored four book chapters, has two patents, and has organized seven international conferences in these areas. He has raised over $15 million in research, and his programs are supported by a variety of organizations, including National Science Foundation, Knolls Atomic Power Laboratory, Office of Naval Research, industrial consortia, Defense Logistics Agency, and Department of Energy (including DOE Fossil Energy Materials Program, DOE National Spent Nuclear Fuel Program, DOE University Coal Research Program, and DOE Industries of the Future Program).

Prof. DuPont was an ASM scholar in 1990 and received an American Welding Society (AWS) National Fellowship Award in 1995. He was the recipient of the AWS Harold H. Jennings Award in 1996 and 2000 and the AWS William Sparegan Award in 1999, 2000, 2008, and 2010 for the best research paper written in the *Welding Journal*. He received the A.F. Davis Silver Medal Award from AWS in 2001, 2002, and 2004 and the Warren F. Savage Award in 2004. In 1999 he was awarded the AWS Prof. Koichi Masubuchi Award, which is sponsored by the Massachusetts Institute of Technology and made to "the outstanding scientist under the age of 40 who has made significant contributions to advance the science and technology of welding materials through research and development". In 2000, he received a Young Investigator Award from the Office of Naval Research for work on laser welding of super austenitic stainless steels in advanced double hull combatant ships, and a CAREER award from the National Science Foundation for research on Laser Engineered Net Shaping. In October of 2000, Dr. DuPont received the National Science Foundation Presidential Early Career Award for Scientist and Engineers (PECASE) from President Clinton, which is the highest honor bestowed by the US government on outstanding scientist and engineers. In 2002 he received the AWS Adams Memorial Award for outstanding teaching activities at the undergraduate and post-graduate level and in 2003 received the Lehigh University College of Engineering Teaching Excellence Award. Dr. DuPont was named a Fellow of the American Society for Materials in 2006 and received the Lehigh University Eleanor and Joseph F. Libsch Early Career Research Award for recognizing faculty for high quality research in their career. Dr. DuPont was awarded the American Welding Society William Irrgang Award, which is presented to the individual who has done the most to

enhance AWS's goal of advancing the science and technology of welding and joining over the last five years. In 2007, he was awarded the Bradley Stoughton Award of the Lehigh Valley Chapter of ASM International, which is given to an individual for outstanding contributions to metallurgy and/or materials science and engineering, and is the most prestigious award given by the Chapter. He was elected a Fellow of the American Welding Society in 2008. He was recently selected to receive the 2013 AWS Comfort A. Adams Memorial lecture, which is the highest technical award made by AWS. IN 2015 he was awarded the Department of Defense Manufacturing Technology Achievement Award for project entitled "Welding of High Strength Steels". This award recognizes and honors individuals most responsible for outstanding technical accomplishments that further the achievement of the vision of the Department of Defense Manufacturing Technology Program.

Dr. DuPont is currently a Principal Reviewer for the *Welding Journal,* on the editorial board for the *Science & Technology of Welding and Joining*, and a reviewer for the *Journal of Materials Engineering and Performance*. He is a past Chairmen of the American Society for Materials (ASM) Committee on Fusion Welding, past Vice Chairman of the ASM Committee on Joining, on the AWS Awards Committee, the AWS Research & Development Committee, the AWS Handbook Committee, the AWS Conference Committee, the AWS Technical Papers Committee, and the Edison Welding Institute Navy Joining Center Technical Advisory Board.

A. BIOGRAPHICAL INFORMATION

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Education

1990 B.S. Metallurgical Engineering, Cum Laude, 1st in Department, Ohio State University
1994 M.S. Materials Science & Engineering, Lehigh University
1997 Ph.D. Materials Science & Engineering, Lehigh University

Professional Experience

1990-1993 Assistant Research Engineer, Energy Research Center, Lehigh University
1993-1995 Associate Research Scientist, Energy Research Center, Lehigh University
1995-1999 Research Scientist, Energy Research Center, Lehigh University
1997-1999 Associate Director, Energy Liaison Program, Lehigh University
1999-2002 Assistant Professor, Materials Science & Engineering, Lehigh University
2002-2005 Associate Professor, Materials Science & Engineering, Lehigh University
2005-2007 Professor, Materials Science & Engineering, Lehigh University
Associate Director, Energy Research Center
2007-Present R.D. Stout Distinguished Professor, Materials Science & Engineering
2008-Present Associate Director, Energy Research Center
2008-Present Joint Appointment, Mechanical Engineering and Mechanics
2010-Present Site Director, National Science Foundation Center on Integrated Materials Joining Science for Energy Applications

B. HONORS AND AWARDS:

1989 ASM (American Society for Materials) International Scholar

1990 Ohio State University Presidents Academic Excellence Award

1990 Ohio State University Mars G. Fontana Award (Awarded to top undergraduate student in Department of Materials Science & Engineering)

1995 American Welding Society National Fellowship Award (One award made each year by AWS to graduate students from a North American university. Award carried a $60,000 research grant over three years.)

1996 American Welding Society Harold Jennings Award for the Best University Research Paper published in the *Welding Journal.* Article was entitled "Thermal Efficiency of Arc Welding Processes"

1999 1st Place, Professional Poster Competition, American Welding Society 79th Annual Conference, "Microstructural Evolution and Solidification Cracking Susceptibility of Fusion Welds in Nb Bearing Superalloys"

1999 American Welding Society William Sparagen Award for Overall Best Research Paper published in the *Welding Journal.* Article was entitled "Solidification and Weldability of Nb-Bearing Superalloys"

1999 Prof. Masubuchi Award – This award is made annually by the American Welding Society and is sponsored by the Massachusetts Institute of Technology to recognize Professor Masubuchi's significant contributions in advancing the science and technology of welding. ***The award is made to "the outstanding scientist under the age of 40 who has made significant contributions to advance the science and technology of joining of materials through research and development"***

2000 National Science Foundation CAREER Award – Interdisciplinary Research and Education in Solid Freeform Fabrication Using Laser Engineered Net Shaping

2000 American Welding Society William Sparagen Award for Overall Best Research Paper published in the *Welding Journal.* Article was entitled "Microstructural Development and Solidification Cracking Susceptibility of Stabilized Stainless Steels"

2000 American Welding Society Harold Jennings Award for the Best University Research Paper published in the *Welding Journal.* Article was entitled "Welding Metallurgy of Alloy HR-160"

2000 Office of Naval Research Young Investigator Award, Laser Welding and Surface Treatment of Super Austenitic Stainless Steels for Advanced Double Hull Combatant Ships

2000 National Science Foundation Presidential Early Career Award for Scientist and Engineers (PECASE), ***the PECASE award is the highest honor bestowed by the US government on outstanding scientists and engineers beginning their independent careers. The award was presented "for initiating a highly interdisciplinary and collaborative research and education effort in solid freeform fabrication using Laser Engineered Net Shaping (LENS) processing"***

2001 AWS A.F. Davis Silver Medal Award. Presented to the best paper published in the current calendar year of the *Welding Journal* dealing with joining of structural materials. Article was entitled "Stress Relief Cracking Behavior of Cr-Mo Steels; Part I, Single Pass HAZ Simulations".

2001 Inducted into the Pennridge High School Wall of Fame for Outstanding Graduates

2001 Invited to the National Academy of Engineering Conference on "Frontiers in Engineering" held in Irvine, CA, September 13-15, 2001. The purpose of this NAE conference is to "bring together a select group (100) of the nation's outstanding engineers, ages 35-40, from industry, academia, and government to discuss pioneering technical work and leading edge research in various engineering fields and industry sectors".

2002 American Welding Society Adams Memorial Award. This award is made in "recognition of educators for outstanding teaching activities in their undergraduate and post-graduate engineering institutions".

2002 American Welding Society A.F. Davis Silver Medal Award. Presented to the best paper published in the current calendar year of the *Welding Journal* dealing with weld cladding. Article was entitled "Experimental Evaluation of Fe-Al Claddings in High Temperature Sulfidizing Environments".

2003 Lehigh University College of Engineering Teaching Excellence Award

2005 American Welding Society A.F. Davis Silver Medal Award. Presented to the best paper published in the current calendar year of the *Welding Journal* dealing with welding of structural materials. Article was entitled "The Influence of Microstructure on Fatigue Crack Propagation Behavior of Stainless Steel Welds".

2005 American Welding Society Warren F. Savage award for best paper published in the Welding Journal dealing with welding metallurgy. Article was entitled "Physical and Welding Metallurgy of Gd-enriched Austenitic Alloys for Spent Nuclear Fuel Applications – Part II: Nickel Based Alloys.

2005 Elected a Fellow of American Society for Materials International and cited for "sustained research contributions to the field of solidification and welding metallurgy."

2006 American Welding Society William Irrgang Award. Sponsored by the Lincoln Electric Company and presented to the individual who has done the most to enhance AWS's goal of advancing the science and technology of welding and joining over the last five years.

2006 American Welding Society McKay-Helm award for the best research paper published in the *Welding Journal* dealing with stainless steels. Article was entitled "Microstructural Characterization of a Double-Sided Friction Stir Weld on a Superaustenitic Stainless Steel"

2006 Lehigh University Eleanor and Joseph F. Libsch Early Career Research Award for recognizing faculty for high quality research in their career

2007 Bradley Stoughton Award of the Lehigh Valley Chapter of ASM International. This award is given to an individual for outstanding contributions to metallurgy and/or materials science and engineering, and is the most prestigious award given by the Chapter. The award also includes a lecture presented at the "Bradley Stoughton Night" of the Chapter.

2008 Elected Fellow of American Welding Society, "In recognition of outstanding and distinguished contributions that have enhanced the advancement of the science, technology, and application of welding"

2008 William Sparagen Memorial Award, for Overall Best Research Paper published in the *Welding Journal.* Article was entitled, The Influence of Mo on Stainless Steel Weld Microstructures".

2010 William Sparagen Memorial Award, for Overall Best Research Paper published in the *Welding Journal.* Article was entitled, "Metallurgical Investigation into Ductility Dip Cracking in Ni Based Alloys, Part II – Microstructural and Microchemical Development During the First Thermal Cycle"

2013 American Welding Society Comfort A. Adams Memorial lecture. This is the highest technical award made by AWS.

2014 AWS McKay-Helm award for the best contribution to the advancement of knowledge of low-alloy steel, stainless steel or surfacing welding metals, involving the use, development or testing of these materials, as represented by the article published in the *Welding Journal* entitled "High Temperature Corrosion Behavior of Alloy 600 and 622 Weld Overlay and Coextruded Coatings".

2015 Department of Defense Manufacturing Technology Achievement Award for project entitled "Welding of High Strength Steels". This award recognizes and honors individuals most responsible for outstanding technical accomplishments that further the achievement of the vision of the Department of Defense Manufacturing Technology Program.

2016 Gilbert Doan Award for outstanding undergraduate teaching, Department of Materials Science and Engineering, Lehigh University

2017 Northampton Community College Outstanding Alumni Award

2018 Gilbert Doan Award for outstanding undergraduate teaching, Department of Materials Science and Engineering, Lehigh University

2018 American Welding Society Honorary Membership Award. This award is sponsored by AWS and is presented to a person of acknowledged eminence in the welding profession or who is credited with exceptional accomplishments in the industry.

2019 American Welding Society Warren F. Savage award for best paper published in the Welding Journal dealing with welding metallurgy. Article was entitled "Influence of Multi-Pass Weld Thermal Cycles on the Microstructure and Hardness of Maraging Steels 17-4 and 13-8+M".

2020 Albert Sauveur Award presented by the Philadelphia Chapter of the American Society for Metals for outstanding achievement in the Science of Metals

2020 American Welding Society Warren F. Savage award for best paper published in the Welding Journal dealing with welding metallurgy. Article was entitled "Stress Relief Cracking Susceptibility in High-Temperature Alloys".

2020 American Welding Society A.F. Davis Silver Medal Award. Presented to the best paper published in the current calendar year of the *Welding Journal* dealing with weld cladding. Article was entitled "Effect of Multiple Weld Thermal Cycles on HSLA-100 Steel".

2020 Gilbert Doan Award for outstanding undergraduate teaching, Department of Materials Science and Engineering, Lehigh University

2021 Gilbert Doan Award for outstanding undergraduate teaching, Department of Materials Science and Engineering, Lehigh University

2022 Steel Founders Society of America Thomas E. Barlow Award of Honor. This award is one of the Society's top three honors and is given to individuals who have made significant contributions to the casting industry and have gone above and beyond the call to support the industry.

C. PUBLICATIONS

Books Authored

1. J.N. DuPont (primary author), J.C. Lippold, and S.D. Kiser, Welding Metallurgy and Weldability of Nickel Base Alloys, John Wiley & Sons, Hoboken, NJ, 2009.

Edited Books and Conference Organization

2. Joining of Advanced and Specialty Materials - II, Proceedings of the International Conference, Cincinnati, OH, November 1-4, 1999, M. Singh, J.E. Indocochea, J. N. DuPont, K. Ikeuchi, and J.Martinez-Fernandez, editors, published by ASM International, Materials Park, Ohio.
3. Joining of Advanced and Specialty Materials - III, Proceedings of the International Conference, St. Louis, Mo, October 9-11, 2000, M. Singh, J.E. Indocochea, J. N. DuPont, and T.J. Lienert, editors, published by ASM International, Materials Park, Ohio.
4. Joining of Advanced and Specialty Materials - IV, Proceedings of the International Conference, Indianapolis, IN, Nov. 5-7, 2001, J.E. Indocochea, J. N. DuPont, T.J. Lienert, W. Tillman, and M. Singh, editors, published by ASM International, Materials Park, Ohio.
5. Joining of Advanced and Specialty Materials - V, Proceedings of the International Conference, Columbus, OH, October 7-9, 2002, J.E. Indocochea, J.N. DuPont, T.J. Lienert, Wolgang Tillman, and Mrityunjay Singh, published by ASM International, Materials Park, Ohio
6. Joining of Advanced and Specialty Materials - VI, Proceedings of the International Conference, Pittsburgh, PA, Oct. 13-15, 2003, T.J. Lienert, V.L. Acoff, J.E. Indocochea, and J.N. DuPont, published by ASM International, Materials Park, Ohio
7. Trends in Welding Research, June 1-6, 2008, Pine Mountain, GA, S.A. David, T. DebRoy, J.N. DuPont, T. Kosecki, and H.B. Smartt, editors, ASM International, Materials Park, OH.
8. Trends in Welding Research, June 4-8, 2012, Chicago, IL, S.A. David, H. Bhedeshia, T. DebRoy, J.N. DuPont, T. Kosecki, and H.B. Smartt, editors, ASM International, Materials Park, OH.

Book Chapters

9. R.W. Richardson, J.N. DuPont, D.F. Farson, K.A. Lyttle, and D.W. Myer, Physics of Welding and Cutting, Chapter Two of AWS Welding Handbook, Volume 1, American Welding Society, 2001, pp. 51-84.
10. J.N. DuPont, Chapter 1 - Selection of Weld Crack Resistant Stainless Steels, in “Weld Cracking in Ferrous Alloys”, Edited by Raman Singh, published by Woodhead Publishing Limited, Daryaganj, New Delhi, India, 2010.
11. J.N. DuPont, Dilution in Fusion Welding, ASM Handbook Vol. 6, Welding, Brazing, and Soldering, 2012.
12. J.N. DuPont, Fundamentals of Weld Solidification, ASM Handbook Vol. 6, Welding, Brazing, and Soldering, 2012.

Review Articles

13. John N. DuPont, Microstructural Evolution and High Temperature Failure of Ferritic to Austenitic Dissimilar Welds, *International Materials Reviews*, Vol. 57, No 4, 2012, pp 208-234.
14. J.N. DuPont, Welding of Nickel Alloys for Energy Applications, *Welding Journal*, v 93, n 2, February 2014 p 31s-45s
15. J.N. DuPont, S. Liu, and S. Babu, Welding of Materials for Energy Applications (Review), *Metallurgical and Materials Transactions*, July 2013, Vol. 44, No. 7, pp 3385-3410.
16. S. A. David, J. A. Siefert, J. N. DuPont and J. P. Shingledecker. "Weldability and Weld Performance of Candidate Nickel Based Superalloys for Advanced Ultrasupercritical Fossil Power Plants Part I: Fundamentals." *Science and Technology of Welding and Joining* 2015 (7), 2015. pp. 532 to 552.
17. J. A. Siefert, J. P. Shingledecker, J. N. DuPont and S. A. David. "Weldability and Weld Performance of Candidate Nickel Based Superalloys for Advanced Ultrasupercritical Fossil Power Plants Part II: Weldability and Cross-weld Creep Performance." *Science and Technology of Welding and Joining*, 2015. DOI: 10.1179/1362171815Y.0000000094.
18. John N. DuPont, J. A. Siefert, and J. P. Shingledecker, Microstructural Evolution and Mechanical Properties of Grades 23 and 24 Creep Strength Enhanced Ferritic Steels, International Materials Reviews, Vol. 62, No. 1, 2017, pp. 32-56.

Articles in Refereed Journals

19. J.N. DuPont and A.R. Marder, Thermal Efficiency of Arc Welding Processes, *Welding Journal*, December, Vol. 74, 1995, pp.406s-416s, ***American Welding Society Harold Jennings Award for the Best University Research Paper published in the Welding Journal in 1995***.
20. J.R. Kosek, J.N. DuPont, and A.R. Marder, Effect of Porosity on the Resistance of Epoxy Coatings to Cold-Wall Blistering, *Corrosion*, November, 1995, pp 861-871.
21. B.F. Levin, J.N. DuPont, and A.R. Marder, Weld Overlay Coatings for Erosion Control, *Wear of Materials*, 1995, pp. 810-820.
22. J.N. DuPont and A.R. Marder, Dilution in Single Pass Arc Welds, *Metallurgical and Material Transactions B*, Vol. 27B, 1996, pp. 481-489.
23. J.N. DuPont, Solidification of an Alloy 625 Weld Overlay, *Metallurgical and Material Transactions A*, Vol. 27A, 1996, pp. 3612-3620.
24. B.F. Levin, J.N. DuPont, and A.R. Marder, Solid Particle Erosion Resistance of Ductile Wrought Superalloys and Their Weld Overlay Coatings, *Journal of Materials Science*, Vol. 33, 1998, pp. 2153-2163.
25. J.N. DuPont, Microsegregation and Solidification Cracking of an HR160 Weld Overlay, *Journal of Materials Science*, Vol. 32, 1977, pp. 4101-4107.
26. J.N. DuPont, C.V. Robino, A.R. Marder, M.R. Notis, and J. R. Michael, Solidification of Nb-Bearing Superalloys: Part I. Reaction Sequences, *Metallurgical and Material Transactions A*, 1998, Vol. 29A, pp. 2785-2796.

27. J.N. DuPont, C.V. Robino, and A.R. Marder, Solidification of Nb-Bearing Superalloys: Part II. Pseudo Ternary Solidification Surfaces, *Metallurgical and Material Transactions A*, 1998, Vol. 29A, pp. 2797-2806.
28. J.N. DuPont, C.V. Robino, and A.R. Marder, Modeling Solute Redistribution and Microstructural Development in Fusion Welds of Nb Bearing Superalloys, *Acta Materialia*, 1998, vol. 46 (13), pp. 4781-4790.
29. J.N. DuPont, C.V. Robino, and A.R. Marder, Solidification and Weldability of Nb-Bearing Superalloys, *Welding Journal*, 1998, Vol. 77, pp. 417s-431s, ***American Welding Society William Sparagen Award for Overall Best Research Paper published in the Welding Journal in 1998*.**
30. J.N. DuPont, C.V. Robino, and A.R. Marder, Modeling Mushy Zones in Welds of Multi-Component Alloys: Implications to Solidification Cracking, *Science and Technology of Welding and Joining*, 1999, Vol. 4, No. 1, pp. 1-14.
31. J.N. DuPont, A Combined Solubility Product/New PHACOMP Approach for Estimating Temperatures of Secondary Solidification Reactions in Superalloy Weld Metals, Metallurgical *and Material Transactions*, Vol. 29A, 1998, pp. 1449-1456.
32. S.W. Banovic, J.N. DuPont, and A.R. Marder, The Role of Aluminum on the Weldability and Sulfidation Behavior of Iron-Aluminum Claddings, *Welding Journal*, Vol. 78, 1999, pp. 23s-30s.
33. J. N. DuPont, On Optimization of the Powder Plasma Arc Surfacing Process, *Metallurgical and Material Transactions B*, 1998, Vol. 29B, pp. 932-934.
34. S.W. Banovic, J.N. DuPont, and A.R. Marder, High Temperature Sulfidation Behavior of Low Al Iron-Aluminum Compositions, *Scripta Metallurgica*, Vol. 38, 1998, pp. 1763-1767.
35. B.F. Levin, K.S. Vecchio, J.N. DuPont, and A.R. Marder, Modeling Solid Particle Erosion of Ductile Alloys, *Metallurgical and Material Transactions*, Vol. 30A, 1999, pp. 1763-1774.
36. B.F. Levin, J.N. DuPont, and A.R. Marder, Indentation Analysis of Sub-Surface Deformation in Ductile Materials After Solid Particle Erosion, *Materials Science and Engineering A*, 283, 2000, p. 203.
37. B.F. Levin, J.N. DuPont, and A.R. Marder, Effect of Volume Fraction and Size of Second Phase Particles on Erosion Resistance of Metal-Matrix Composites, *Wear of Materials*, 238, 2000, p.160.
38. J.N. DuPont and C.V. Robino, The Influence of Nb and C on the Solidification Microstructures of Fe-Ni-Cr Alloys, *Scripta Metallurgica*, Vol. 41, No. 4, 1999, pp. 449-454.
39. J.N. DuPont, Microstructural Development and Solidification Cracking Susceptibility in the Fusion Zone of a Stabilized Stainless Steel, *Welding Journal*, Vol 78, 1999, pp. 253s-263s, ***American Welding Society William Sparagen Award for Overall Best Research Paper published in the Welding Journal in 1999***.
40. J.N. DuPont and A.W. Pense, Welding Research Rejuvenated at Lehigh University, *Welding Journal*, Vol. 78, p. 39-42, 1999.
41. S.W. Banovic, J.N. DuPont, and A.R. Marder, Corrosion Behavior of Weldable Fe-Al Alloys in Oxidizing-Sulfidizing Environments, *Materials at High Temperatures*, Vol. 16, pp. 195-199, 1999.
42. K.R. Luer, J.N. DuPont, and A.R. Marder, High Temperature Sulfidation of Fe_3Al Thermal Spray Coatings at 600 ^oC, *Corrosion*, Vol. 56, 2000, no. 2, pp. 189-198.

43. J.N. DuPont, J.R. Michael, and B.D. Newbury, Solidification and Welding Metallurgy of Alloy HR-160, Welding Journal, Vol. 78, 1999, pp. 408s-415s, ***American Welding Society Harold Jennings Award for the Best University Research Paper published in the Welding Journal in 1999***.
44. K.R. Luer, J.N. DuPont, A.R. Marder, and C.K. Skelonis, Corrosion Fatigue of Alloy 625 Weld Claddings Exposed to Combustion Environments, *Materials at High Temperatures*, Vol. 18, 2001, pp. 11-19.
45. G. Nawrocki, J.N. DuPont, and A.R. Marder, Stress Relief Cracking Behavior of Cr-Mo Steels; Part I, Single Pass HAZ Simulations, *Welding Journal*, Vol. 79, 2000, pp. 355s-362s, ***AWS A.F. Davis Silver Medal Award for best paper published in the Welding Journal dealing with joining of structural materials***.
46. J.G. Nawrocki, J.N. DuPont, and A.R. Marder, Stress Relief Cracking Behavior of Cr-Mo Steels; Part II, Multi- Pass HAZ Simulations, *Welding Journal*, Vol. 80, 2001, pp. 18s-24s.
47. J.N. DuPont, J.R. Michael, and C.V. Robino, Application of Backscattered Electron Diffraction to Understanding Weldability Phenomena, *Welding Journal*, Vol. 79, 2000, pp. 43-48.
48. S.W. Banovic, J.N. DuPont, and A.R. Marder, Growth of Nodular Corrosion Products on Fe-Al Alloys in Various High Temperature Gaseous Environments, *Oxidation of Metals*, Vol. 54, No.3/4, 2000, pp. 339-369
49. S.W. Banovic, J.N. DuPont, and A.R. Marder, Metallographic preparation and degradation of the Tau-phase ($FeAl_2S4$) formed after high temperature oxidation-sulfidation of Fe-Al alloys, *Materials Characterization*, Vol. 45, 3, 2001, pp 241-249
50. S.W. Banovic, J.N. DuPont, and A.R. Marder, The use of ternary phase diagrams in the study of high temperature corrosion products formed on Fe-Al alloys in oxidizing and reducing environments, *Acta Materialia*, Vol. 48, June, 2000, pp. 2815-2822.
51. S.W. Banovic, J.N. DuPont, and A.R. Marder, The effect of aluminum content on the corrosion behavior of Fe-Al alloys in reducing environments at 700 C, *Metallurgical Transactions*, Vol. 31A, July, 2000 pp. 1805-1817.
52. S.W. Banovic, J.N. DuPont, and A.R. Marder, Corrosion Behavior of Weldable Fe-Al Alloys in Oxidizing-Sulfidizing Environments, *Materials at High Temperatures*, Vol. 16, No. 4, pp. 195-199.
53. S.W. Banovic, J.N. DuPont, and A.R. Marder, Experimental Evaluation of Fe-Al Claddings in High Temperature Sulfidizing Environments, *Welding Journal*, Vol. 80, 2001, pp. 62s-70s., ***American Welding Society A.F. Davis Silver Medal Award for best research paper published in the Welding Journal dealing with weld cladding.***
54. J.G. Nawrocki, J.N. DuPont, D.W. Ackland, and A.R. Marder, Identification of Nano-Precipitates in a Ferritic Alloy Steel Using Secondary Electron STEM Imaging, S*cripta Materialia*, Vol. 45, (2), July, 2001, pp. 139-144.
55. J.G. Nawrocki, J.N. DuPont, C.V. Robino, and A.R. Marder, The Post Weld Heat Treatment Response of Simulated Coarse Grained Heat Affected Zones in a New Ferritic Steel, *Metallurgical and Materials Transactions A*, October, 2001, pp. 2585-2594.
56. S.W. Banovic, J.N. DuPont, and A.R. Marder, Dilution Control in GTA Welds Involving Super Austenitic Stainless Steels and Nickel Base Alloys, *Metallurgical and Materials Transactions B*, May 2001, pp. 1171-1176.
57. J.G. Nawrocki, J.N. DuPont, C.V. Robino, J.D. Puskar, and A.R. Marder, The Mechanism of Stress Relief Cracking in a Ferritic Alloy Steel, *Welding Journal*, Vol. 82, Feb, 2003, pp. 25s-35s.

58. S.W. Banovic, J.N. DuPont, and A.R. Marder, Dilution and Microsegregation in Dissimilar Metal Welds Between Super Austenitic Stainless Steels and Ni Base Alloys, *Science & Technology of Welding and Joining*, Vol. 6, No. 6, pp. 374 - 383, 2003.
59. C.V. Robino, J.N. DuPont, R.E. Mizia, J.R. Michael, D.B. Williams, and E. Shaber, Development of Gd Enriched Alloys for Spent Nuclear Fuel Applications – Part I: Preliminary Characterization of Small Scale Gd Enriched Stainless Steels, *Journal of Materials Engineering and Performance*, Vol. 12, No. 2, April 2003, pp. 206-214.
60. J.N. DuPont, S.W. Banovic, and A.R. Marder, Microstructural Evolution and Weldability of Dissimilar Welds between a Super Austenitic Stainless Steel and Nickel Base Alloys, *Welding Journal*, June, Vol. 82, 2003, pp. 125s-135s.
61. M.J. Perricone, J.N. DuPont, and M.J. Cieslak, Solidification of Hastelloy Alloys: An Alternative Interpretation, submitted to *Metallurgical and Materials Transactions*, Vol. 34A, May, 2003, pp. 1127-1132.
62. R.R. Unocic and J.N. DuPont, Process Efficiency Measurements in the Laser Engineered Net Shaping (LENS) Process, *Metallurgical and Materials Transactions*, Vol. 35B, Feb. 2003, pp. 143-152.
63. R.R. Unocic and J.N. DuPont, Composition Control in the Direct Laser Deposition Process, *Metallurgical and Materials Transactions*, Vol. 34B, August, 2003, pp. 439-445.
64. Weiping Liu and J.N. DuPont, In-Situ Reactive processing of Nickel Aluminides by Laser Engineered Net Shaping, *Metallurgical and Materials Transactions*, Vol. 34A, Nov. 2003, pp. 2633-2641.
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288. R. R. Unocic and J.N. DuPont, Composition Control in Direct Metal Deposition, 84th AWS Annual Conference, Detroit, MI, 2003.
289. J.R. Regina, J.N. DuPont, and A.R. Marder, The Effect of Cr on the Weldability and Corrosion Resistance of Fe-Cr-Al Weld Overlays, 85th AWS Annual Conference, Chicago, IL, April 6-8, 2004.
290. M.J. Perricone and J.N. DuPont, Effect of HED Welding Parameters on Microstructural Development of Super Austenitic Stainless Steels, 85th AWS Annual Conference, Chicago, IL, April 6-8, 2004.
291. R. Noecker and J.N. DuPont, Direct Deposition of Copper onto Steel Using a Ni Interlayer, 85th AWS Annual Conference, Chicago, IL, April 6-8, 2004.
292. C. V. Robino, J. N. DuPont, Z. Feng, G. A. Knorovsky, and M. Reece, High-Speed High-Resolution Imaging of Crack Formation in the Varestraint Test, 85th AWS Annual Conference, Chicago, IL, April 6-8, 2004
293. W. Liu and J.N. DuPont, Effect of Processing Parameters on the Fabricability of Single Crystal Ni Base Alloy Deposits by Laser Engineered Net Shaping, 85th AWS Annual Conference, Chicago, IL, April 6-8, 2004.
294. J.N. DuPont, Development of FeCrAl Weld Overlay Coatings for Corrosion Protection in Boilers with Low Nox Burners, 86th AWS Annual Conference, Dallas, TX, April 26-88, 2005.
295. T. Anderson, M.J. Perricone, and J.N. DuPont, Development of Filler Metals for Superaustenitic Stainless Steels, 86th AWS Annual Conference, Dallas, TX, April 26-88, 2005.
296. F.F. Noecker and J.N. DuPont, Ductility Dip Cracking Behavior of Ni Base Welds, 86th AWS Annual Conference, Dallas, TX, April 26-88, 2005.

297. T.D. Anderson, J.N. DuPont, M.J. Perricone, Microstructural Development of Mo-Bearing Stainless Steels, FABTECH International/AWS Welding Show. Atlanta, GA, Nov. 2, 2006.
298. T.D. Anderson and J.N. DuPont, Realization of an Fe-based Filler Metal for Superaustenitic Stainless Steels. FABTECH International/AWS Welding Show, Atlanta, GA, Oct. 31, 2006.
299. M.J. Perricone, T.D. Anderson, C.V. Robino, J.R. Michael, and J.N. DuPont, Predicting Sigma Formation in Mo-Bearing Stainless Steels, FABTECH International/AWS Welding Show, Atlanta, GA, Oct. 31, 2006.
300. M.J. Perricone, C.V. Robino, M. Reece, P.S. Duran, T.D. Anderson, and J.N. DuPont. Controlling Massive Transformations in Laser Welded Stainless Steels, FABTECH International/AWS Welding Show, Atlanta, GA, Oct. 31, 2006.
301. T.E. Capobianco, G.A. Young, F.F. Noecker II, and J.N. DuPont, Improving the Weldability of High Chromium Nickel Alloys, EPRI Alloy 690 Workshop, October 31 – November 1, 2006, Atlanta Georgia.
302. F.F. Noecker II, J.N. DuPont, T.E. Capobianco, G.A. Young, Microstructural Insight into the Metallurgical Mechanism of Ductility Dip Cracking in Ni based filler metals, FABTECH International/AWS Welding Show, Atlanta, GA, Oct. 31, 2006.
303. F.F. Noecker II and J.N. DuPont, Microstructural and Mechanical Characterization of Friction Stir Welded (FSW) Alloy 690, FABTECH International/AWS Welding Show, Atlanta, GA, Oct. 31, 2006.
304. J.N. DuPont, C.V. Robino, and T.D. Anderson, The influence of Gd and B on the solidification and weldability of a Ni-Cr-Mo Alloy, 88th Annual American Welding Society Conference, Chicago, IL, November 11-14, 2007.
305. K.D. Adams and J.N. DuPont, Influence of Ti and C Additions on the Microstructure of Fe-Al-Cr Weld Overlay Coatings, 88th Annual American Welding Society Conference, Chicago, IL, November 11-14, 2007.
306. Jeff Farren and John DuPont, Heat Treatment Optimization of High Alloy Stainless Steel Castings and Welds, 88th Annual American Welding Society Conference, Chicago, IL, November 11-14, 2007.
307. F.F. Noecker II and J.N. DuPont, Microstructural Insights Into Ductility Dip Cracking In Ni Based Filler Metals, 88th Annual American Welding Society Conference, Chicago, IL, November 11-14, 2007.
308. Timothy D. Anderson and John N. DuPont, Laser Weld Repair of Single Crystal Superalloys, 88th Annual American Welding Society Conference, Chicago, IL, November 11-14, 2007.
309. John N. DuPont, Development and Application of Ternary Solidification Models for Understanding Weldability Phenomena in Engineering Alloys, 88th Annual American Welding Society Conference, Chicago, IL, November 11-14, 2007.
310. John N. DuPont, T.D. Anderson, M.J. Perricone, and S.W. Banovic**,** Fusion Welding of High Mo Austenitic Stainless Steels – An Overview**,** 88th Annual American Welding Society Conference, Chicago, IL, November 11-14, 2007.
311. J.N. DuPont, J.R. Regina, and K. Adams, Improving the Weldability of FeCrAl Weld Overlay Coatings, 2007 Fossil Energy Materials Conference, Knoxville, TN, April 30 – May 2, 2007.
312. A. Stockdale and J.N. DuPont, Optimizing Corrosion Performance in Welds of 6 wt% Mo Stainless Steels, 89th Annual American Welding Society Conference, Las Vegas, NV, October 6-8, 2008.

313. J.D. Farren and J.N. DuPont, Microstructural Evolution and Mechanical Properties of a New High Strength Steel for Defense Applications, 89th Annual American Welding Society Conference, Las Vegas, NV, October 6-8, 2008.
314. K. D. Adams and J.N. DuPont, Influence of TiC Additions on the Microstructure, Corrosion Resistance, and Hydrogen Cracking Susceptibility of Fe-Al-Cr Weld Overlay Coatings, 89th Annual American Welding Society Conference, Las Vegas, NV, October 6-8, 2008.
315. T. Anderson and J.N. DuPont, Microstructural Development of Single Crystal Welds, 89th Annual American Welding Society Conference, Las Vegas, NV, October 6-8, 2008.
316. A. Stockdale and J.N. DuPont, Fusion Welding and Corrosion Behavior of High Alloy Stainless Steel Welds, American Welding Society Conference, Chicago, IL, Nov. 16-18, 2009.
317. J.N. DuPont and W. Van Gertrudeen, A comparison of the high temperature corrosion resistance of co-extruded and weld overlay coatings for corrosion protection in coal fired boilers, American Welding Society Conference, Chicago, IL, Nov. 16-18, 2009.
318. G. Brentrup, B. Leister, and J.N. DuPont, Preventing Dissimilar Metal Weld Failures with Functionally Graded Transition Joints, American Welding Society Conference, Chicago, IL, Nov. 16-18, 2009.
319. J. Farren and J.N. DuPont, Welding of a High Strength Copper Precipitation Strengthened Steel, American Welding Society Conference, Chicago, IL, Nov. 16-18, 2009.
320. J.N. DuPont and G. Brentrup, Preventing Dissimilar Metal Weld Failures: Development of Functionally Graded Transition Joints, AWS Conference, Atlanta, GA, Nov. 2, 2010.
321. A. Stockdale and J. DuPont, Corrosion Behavior of Nickel Based Alloy Coatings Co-Extruded and Weld Overlay Coatings, AWS Conference, Atlanta, GA, Nov. 2, 2010.
322. A.W. Stockdale and J.N. DuPont, Corrosion Behavior of Nickel Based Weld Overlay and Coextruded Coatings, AWS Conference, Chicago, IL, Nov. 14-17, 2011.
323. B. Leister and J. DuPont, Fracture Toughness of Simulated Heat Affected Zones in NUCu-140 Steel, AWS Conference, Chicago, IL, Nov. 14-17, 2011.
324. Gregory J. Brentrup, John N. DuPont, Brett M. Leister, Brett S. Snowden, Joachim L. Grenestedt, Preventing Dissimilar Metal Weld Failures: Development of Functionally Graded Transition Joints, AWS Conference, Chicago, IL, Nov. 14-17, 2011.
325. D. Bechetti and J. DuPont, Microstructural Evolution and Mechanical Properties of Fusion Welds in Ultra-High Strength Eglin Steel, AWS Conference, Chicago, IL, Nov. 14-17, 2011.
326. Bechetti, D.H. and DuPont, J.N. Creep Behavior of Inconel 740 Welds [extended abstract]. AWS Conference 2012, November 12, 2012, Las Vegas, NV, American Welding Society, Doral, FL.
327. Andrew Stockdale and John DuPont. "Corrosion Fatigue Behavior of Ni-Based Coatings: Weld Overlay and Coextruded Coatings" AWS Conference. Las Vegas, NV. November 12-14 2012. Abstract.
328. B.M. Leister and J.N. DuPont, Microstructural Evolution and Mechanical Properties of Thermally Simulated Heat Affected Zones in Eglin Steel, AWS Conference 2012, November 12, 2012, Las Vegas, NV, American Welding Society, Doral, FL
329. Andrew Stockdale and John DuPont. "Corrosion Fatigue Behavior of Nickel Based Alloy Weld Overlay and Coextruded Coatings" AWS Conference. Chicago, IL. November 18-21 2013.

330. B.M Leister and J.N. DuPont, Microstructural Evolution and Mechanical Properties of Thermally Simulated Heat Affected Zones in Eglin Steel, AWS Annual Conference, November 19, 2013, Chicago, IL.
331. Bechetti D. H. and DuPont J. N., Microstructural Evolution and Creep Rupture Behavior of INCONEL® Alloy 740H® Welds, AWS Conference 2013, November 21, 2013, Chicago, IL.
332. Jason Bono and John DuPont, Welding of Advanced Naval Steels, AWS Conference, November 20, 2013, Chicago, IL.
333. R.J. Hamlin and J.N. DuPont, Microstructural Evolution and Aging Response of Dissimilar Metal Welds Involving Alloy N, AWS Conference 2013, November 18,2013, Chicago, IL.
334. Jon Galler and John DuPont, The Assessment of the Satoh Test for Understanding Residual Stress Evolution in Welds, American Welding Society Annual Conference, Atlanta, Georgia, November 10-13, 2014.
335. Robert Hamlin and John DuPont, Microstructural Evolution and Mechanical Properties of the Simulated Heat Affected Zones in Precipitation Hardened Stainless Steels 17-4, 17-4+Co, and 13-8+Mo, American Welding Society Annual Conference, Atlanta, Georgia, November 10-13, 2014.
336. Daniel Bechetti and John DuPont, Microstructural Evolution and Creep Rupture Behavior of INCONEL® Alloy 740H® Welds, American Welding Society Annual Conference, Atlanta, Georgia, November 10-13, 2014.
337. Brett Leister and John DuPont, Microstructural Evolution and Mechanical Properties of Thermally Simulated Heat Affected Zones in Eglin Steel, American Welding Society Annual Conference, Atlanta, Georgia, November 10-13, 2014.
338. John N. DuPont, Investigations into the Service Weldability of Structural Alloys, AWS Annual Conference, Chicago, IL, November 9-12, 2015, American Welding Society, Miami, FL.
339. D. Bechetti and J. DuPont, Assessment and Mitigation of Grain Boundary Discontinuous Coarsening in INCONEL® Alloy 740H® Fusion Welds, AWS Annual Conference, Chicago, IL, November 9-12, 2015, American Welding Society, Miami, FL.
340. R. Hamlin and J. DuPont, Phase Transformations and Mechanical Properties of Fusion Welds in 10 wt% Nickel Steel, AWS Annual Conference, Chicago, IL, November 9-12, 2015, American Welding Society, Miami, FL.
341. J. Galler and J. DuPont, Development of Novel Functionally Graded Transition Joints for Improving the Creep Strength of Dissimilar Metal Welds in Nuclear Applications, AWS Annual Conference, Chicago, IL, November 9-12, 2015, American Welding Society, Miami, FL.
342. Erin Barrick and John DuPont, Phase Transformations and Mechanical Properties of Fusion Welds in 10 wt% Nickel Steel, Annual American Welding Society Conference, Las Vegas, NV, November 16-18, 2016.
343. Daniel Bechetti and John DuPont, Evolution of Grain Boundary Coarsened Zones in INCONEL® Alloy 740H® Fusion Welds, Annual American Welding Society Conference, Las Vegas, NV, November 16-18, 2016.
344. Robert Hamlin and John DuPont, Welding Metallurgy of 17-4 and 13-8 Martensitic Stainless Steels, Annual American Welding Society Conference, Las Vegas, NV, November 16-18, 2016.
345. Jon Galler and John DuPont, Development of Novel Functionally Graded Transition Joints for Improving the Creep Strength of Dissimilar Metal Welds in Nuclear Applications, Annual American Welding Society Conference, Las Vegas, NV, November 16-18, 2016.

346. John DuPont, Understanding The Link Between Microstructural Evolution And Weld Strength Reduction Factors In New Superalloys Designed For Advanced Power Plants, Annual American Welding Society Conference, Las Vegas, NV, November 16-18, 2016.
347. Rishi Kant and John DuPont, Stress Relief Cracking of High Temperature Alloys, Annual American Welding Society Conference, Las Vegas, NV, November 16-18, 2016.
348. Robert J. Hamlin and John N. DuPont, Strength Restoration of Welds in Precipitation Hardened Stainless Steels, Steel Founders Society of America T&O Conference, Chicago, IL, December 8-9, 2016.
349. Jonah Duch, John DuPont; Influence of Multiple Weld Thermal Cycles On Mechanical Properties Of HSLA-100 Steel; MS&T Conference; October 16th 2018.
350. Jonah Duch, John DuPont; Influence of Multiple Weld Thermal Cycles On Mechanical Properties Of HSLA 100; AWS Conference; November 6th 2018.
351. Allison E. Fraser, John N. DuPont; Modeling and Advanced Characterization of Nickel Base Alloys for Nuclear Propulsion Applications; Materials Science and Technology Conference; October 16th 2018.
352. Allison E. Fraser, John N. DuPont; Modeling and Advanced Characterization of Nickel Base Alloys for Nuclear Propulsion Applications; American Welding Society Conference; November 6th 2018.
353. Rishi Kant, John DuPont; Stress Relief Cracking Susceptibility in High Temperature Alloys, Materials Science & Technology 2018, October 16th 2018.
354. Rishi Kant, John DuPont; Stress Relief Cracking Susceptibility in High Temperature Alloys, American Welding Society Annual Conference, November 6th 2018.
355. Erin Barrick, John DuPont, Phase Transformations and Mechanical Properties of Welds Produced with a 10 wt% Ni Steel Welding Consumable, MS&T Conference, October 17, 2018.
356. Erin Barrick, John DuPont, Matthew Sinfield, Daniel Bechetti, Jeffrey Farren, Patrick Ray, Microstructure Characterization and Mechanical Property Evaluation of Fe-10Ni Steel Weld Metal, American Welding Society Annual Conference, November 6, 2018.
357. Sean Orzolek, John DuPont; Microstructural Evolution of Dissimilar Metal Welds Involving Grade 91; MS&T Conference; October 18th 2018.
358. Sean Orzolek, John DuPont; Microstructural Evolution of Dissimilar Metal Welds Involving Grade 91; AWS Conference; November 6th 2018.
359. R. Kant and J. N. DuPont, Investigation of Heat Affected Zone Mechanical Property Variations due to Welding Thermal Cycles in Low Density Fe-Mn-Al-C Steels, FABTECH 2019, Chicago, Illinois, 12-Nov 2019.
360. Orzolek and J. DuPont, Influence of Composition on the Microstructure of Cast Austenitic Stainless Steels American Welding Society Conference, FABTECH 2019, Chicago, Illinois, 12-Nov 2019.
361. J. Duch and J. DuPont, Stress Relief Cracking and Strain Ageing of 347H and IN-740H, AWS Professional Program, Chicago, November 13 2019.
362. E. Barrick, J. DuPont, M. Sinfield, J. Farren, and D. Bechetti, Phase Transformations and Mechanical Properties in the Fusion Zone of 10 wt% Ni Steel Welds, *FABTECH American Welding Society Professional Program*, November 12, 2019, Chicago, IL.

D. RESEARCH FUNDING HISTORY

Prof. DuPont has raised over $18 million in research, and his programs are supported by a variety of organizations, including National Science Foundation, Knolls Atomic Power Laboratory, Office of Naval Research, industrial consortia, Defense Logistics Agency, and Department of Energy (including DOE Fossil Energy Materials Program, DOE National Spent Nuclear Fuel Program, DOE University Coal Research Program, and DOE Industries of the Future Program). Examples of some of the completed projects are provided below.

Completed Research Projects

1. Principal Investigator – Evaluation of Corrosion Resistant Polymer Coatings, Consortium of electric utility companies, $78,000/18 months, 1991.
2. Principal Investigator – Microstructural and Heat Treatment Evaluation of Intake Casing and Associated Components, CONMEC, $18,000, 1993.
3. Principal Investigator - Evaluation of Iron Aluminide Weld Overlays for Erosion-Corrosion Resistant Boiler Tube Coatings in Low NOx Boilers, Department of Energy Fossil Energy Material Program, A.R. Marder, Co-PI, $120,700/ 3 years, 1994.
4. Principal Investigator – The Influence of Heat Input and Preheat Temperature on the Micro-fissuring Susceptibility of Alloy 20Cb-3 Weld Metal, $15,665, Pennsylvania Power & Light Company, 1994.
5. Principal Investigator – The Effect of Preheat Temperature on the Mechanical Properties of Carbon Steel and Cr/Mo Steel Welds, $16,937, Pennsylvania Power & Light Company, 1994.
6. Principal Investigator - Effect of Selective Non-catalytic Reduction on Corrosion of Boiler Components, Delmarva Power, $59,000, 1995.
7. Principal Investigator – Evaluation of Monolithic Materials for Boiler Tubes, $30,100, Allegheny Power, 1996.
8. Principal Investigator – Microstructural Characterization of Service Aged Turbine Components, $14,500, CONMEC, 1995.
9. Principal Investigator - Solidification Modeling of Laser Welds in Multicomponent Alloys, Sandia National Laboratory, $120,000/2 years, 1997.
10. Principal Investigator - Evaluation of a New Ferritic Steel with Improved Weldability and Mechanical Properties, Pennsylvania Power & Light Co., Foster Wheeler Corp., Mitsubishi Heavy Industries, Sumitomo Metal Corp, Innovative Steam Technologies, A.R. Marder, Co-PI, $190,000/3 years, 1997.
11. Co-Principal Investigator - Minimizing Residual Stresses, Distortion, and Thermal Fatigue Cracking in Weld Overlay Applications, H.F. Nied, Mechanical Engineering Dept. (Co-PI) and A.R. Marder (PI), Allegheny Power Co., Virginia Power Co., Delmarva Power Co., Ohio Edison Co., and Pennsylvania Power & Light Co., $250,000/2.5 years, 1997.
12. Co-Principal Investigator – Minimizing Failures of Burner Tip Components, with A.R. Marder and E.K. Levy (PI), consortium of electric utility companies, $65,000/18 months, 1997.
13. Principal Investigator - The Effect of Nitrogen on the Mechanical Properties of Vanadium-Alloyed High Strength Low Alloy Steel Weld Metals, Vanadium Corporation of America, $75,000/1.5 years, 1997.
14. Principal Investigator - Fe/Al Weld Overlay and HVOF Thermal Spray Coatings for Corrosion Protection of Waterwalls in Fossil Fired Power Plants with Low NOx Burners,

Department of Energy Fossil Energy Materials Program, A.R. Marder, Co-PI, $124,600/2 years, 1998.

15. Co-Principal Investigator - Weld Overlays for Minimizing Wastage in Boilers with Low NOx Burners, with A.R. Marder (PI), Southern Company Services, Pennsylvania Power & Light Co., Allegheny Power Co., Virginia Power Co., First Energy Corp., INCO Alloys, Public Service Electric & Gas Co., Ontario Hydro Co., and Nova Scotia Power, $512,500/ 2.5 years, 1998.
16. Principal Investigator - Measuring Residual Stresses in Dissimilar Welds Using Neutron Diffraction, Oak Ridge National Laboratory User Facility, $20,000/6 months, 1998.
17. Principal Investigator – Evaluation of Weldability and Corrosion Performance of AL-6XN Welds, Office of Naval Research, A. R. Marder and L. E. Friedersdorf, Co-PIs, $282,500/18 months, 1999.
18. Principal Investigator - Investigation of 316L Stainless Steel Containing Gadolinium for Storage Containers of Spent Nuclear Fuel, Department of Energy Spent Nuclear Fuel Program, D.B. Williams, Co-PI, $135,000/1 year, 1999.
19. Principal Investigator - Investigation of the Weldability and Corrosion Performance of Stainless Steels for Advanced Double Hull Designs, Pennsylvania Infrastructure Technology Alliance, A.R. Marder and L.E. Friedersdorf, Co-PI, $17,000/1 year, 1999.
20. Principal Investigator - Development of an Annually-Funded Weld Overlay Users Group, industrial consortium, $30,000, 1999.
21. Principal Investigator - Investigation of the Weldability and Corrosion Performance of Stainless Steels for Advanced Double Hull Designs, Pennsylvania Infrastructure Technology Alliance, A.R. Marder and L.E. Friedersdorf, Co-PIs, $51,000/1 year, 1999.
22. Principal Investigator – Presidential Early Career Award for Scientists and Engineers, Interdisciplinary Research and Education in Solid Freeform Fabrication with Laser Engineered Net Shaping, National Science Foundation, $500,000/5 years, 1999.
23. Principal Investigator – The Influence of Gadolinium on the Microstructure of Nickel Base Alloys for Use in Storage and Transportation of Spent Nuclear Fuel, Department of Energy Spent Nuclear Fuel Program, D.B. Williams, Co-PI, $310,000/3 years, 1999.
24. Principal Investigator – Young Investigator Award, Laser Welding and Surface Treatment of Super-Austenitic Stainless Steels for Advanced Double Hull Combatant Ships, Office of Naval Research, $365,000/3 years, 2000
25. Principal Investigator - Remaining Life Assessment of Circumferentially Cracked Weld Overlay Coatings, with A.R. Marder (PI), consortium of power generation companies, September, $250,000/30 months, 2000
26. Principal Investigator – Acquisition of a Solid Freeform Fabrication Laboratory for Interdisciplinary Research and Education in Manufacturing through a University/Industry Consortium, National Science Foundation, Co-PI's: Herman Nied and John Ochs of ME Department, Mikkel Groover of IE Department, Scott Hummel of ME Department Lafayette College, and Randall German of ME Department Penn State University, $365,000/ 2 years, 2000.
27. Principal Investigator - Fatigue Behavior of Austenitic Dissimilar Welds, A.R. Marder, Co-PI, Office of Naval Research, $161,604/2.5 years, 2001.
28. Principal Investigator - Corrosion, Fatigue, and Weldability of GTA Welds Prepared with Surface Active Fluxes, A.R. Marder, Co-PI, Office of Naval Research, $212,466 /2.5 years, 2001.

29. Co-Principal Investigator - Evaluation of the Susceptibility of AL-6XN Weldments to Localized Corrosion, with L.E. Friedersdorf (PI) and A.R. Marder (Co-PI), Office of Naval Research, $251,529/2.5 years, 2001.
30. Principal Investigator - Development of Low Cost Weld Overlay Coatings for Low NOx Waterwall Tubes, Pennsylvania Infrastructure Technology Alliance, A.R. Marder, Co-PI, $75,000/2years, September, 2001
31. Principal Investigator - Microstructural Analysis of Super Austenitic Stainless Steel Friction Stir Welds, Office of Naval Research, $65,881 /9 months, 2002.
32. Co-Principal Investigator - Large Scale Finite Element Modeling of Welding Residual Stresses and Distortion for Stainless Steel Advanced Double Hull Combatant Ships, with H.F. Nied, PI, Office of Naval Research, $204,500 /2.5 years, 2002.
33. Co-Principal Investigator - The Effect of Chromium on the Corrosion Resistance and Weldability of Fe-Al Weld Overlays, Department of Energy Fossil Energy Materials Program, A.R. Marder, PI, $180,000/3 years, 2001.
34. Principal Investigator – Sensitivity Analysis for Large Welded Structures, H.F. Nied, Co-PI, Mechanical Engineering and Mechanics, Lehigh University, and A.F. Noor, NASA Langley Research Center, Office of Naval Research, $301,400/2years, 2001.
35. Co-Principal Investigator – Corrosion Behavior of Friction stir Welds, Office of Naval Research, with A.R. Marder, PI, 2001, $309,910/ 2.5 years, 2002.
36. Principal Investigator - Optimization of filler metals for welding of super austenitic stainless steel advanced double hull combatant ships, ONR, $534,000/3 years, 2002
37. Principal Investigator - Ductility Dip Cracking in Ni Base Weld Metals, Knolls Atomic Power Laboratory, $140,000/1 year, 2003.
38. Co-Principal Investigator - Development of Low Cost Weld Overlay Coatings for Low Nox Waterwall Tubes, with A.R. Marder (PI), consortium of power generation companies, September, $375,000/30 months, 2003.
39. Principal Investigator – Corrosion Behavior of High Alloy Castings – Department of Energy, $255,000/3 years, 2004...
40. Principal Investigator – Direct Fabrication of Dies Using Laser Engineered Net Shaping, Department of Energy, $190,000/2 years, 2004.
41. Principal Investigator - Pennsylvania Infrastructure Technology Alliance, Development of Filler Metals for Welding Super Austenitic Stainless Steels, $36,000/1 year, 2004.
42. Co-Principal Investigator - Fe-Cr-Al Weld Overlay Alloys for Ultra-supercritical Coal Fired Boilers, Department of Energy Fossil Energy Materials program, $300,000/3 years, with A.R. Marder, 2004.
43. Principal Investigator - Repair of Single Crystal Turbine Blades Using Laser Engineered Net Shaping, with Herman Nied, National Science Foundation, $350,000/3 years, 2005.
44. Principal Investigator – Development of filler metals for welding of super austenitic stainless steel advanced double hull combatant ships, ONR, $94,000/1 year, 2005
45. Co-Principal Investigator - Acquisition of a High-Performance Scanning Electron Microscope for Advanced Materials Research, with Alwyn Eades, Rick Vinci, Dave Williams, and Chris Kiely, $499,000, National Science Foundation, 2005.
46. Principal Investigator - Pennsylvania Infrastructure Technology Alliance, Optimizing Heat Treatment Procedures for High Alloy Castings, $41,915/1 year, 2005.
47. Principal Investigator – Optimizing Corrosion Performance of Welds on 6 wt% Molybdenum (Mo) Super Austenitic Stainless Steel Castings, Defense Logistics Agency, $450,000/3 years, 2006.

48. Principal Investigator - Thermal Analysis and Weldability of Ni-Cr-Mo-Gd and Ni-Cr-Mo-Gd-B Alloys for Spent Nuclear Fuel Applications, Department of Energy Spent Nuclear Fuel Program, $43,000/1 year.
49. Co-Principal Investigator - Enhanced High Temperature Corrosion Resistance in Advanced Fossil Energy Systems by Nano-Passive Layer Formation, with A.R. Marder (PI) and C. J. Kiely, Department of Energy University Coal Research Program, $210,000/3 years.
50. Principal Investigator - Design and Fabrication of Graded Materials with the laser Engineered Net Shaping Process, National Science Foundation, 07/08 to 07/11, $299,000.
51. Principal Investigator - Design And Fabrication Of Graded Transition Joints For Avoiding Dissimilar Metal Weld Failures, Pennsylvania Infrastructure Technology Alliance, $52,470
52. Principal Investigator - Development of Joining Science and Technology for NUCu-150 Steels, Office of Naval Research, $339,000, with Chris Kiely.
53. Principal Investigator – Acquisition of a Gleeble 3500 Thermo-Mechanical Simulator for DoD Supported Research on Engineering Materials, $365,000, Office of Naval Research, with David Williams, Helen Chan, and Rick Vinci, 2009.
54. Principal Investigator - Optimizing Corrosion Performance Of Welds On 6 Wt% Molybdenum Super Austenitic Stainless Steel Castings, Pennsylvania Infrastructure Technology Alliance, $44,300, 20010.
55. Principal Investigator - Casting and Advanced Steel Technology (CAST), Steel Founders Society of America, 7/1/2012 to 1/31/2013,$30,000
56. Principal Investigator - Continuous Cooling Diagram Development and Fusion Welding of Eglin Steel SOW, Air Force, $99,987, 6/12/2012 to 4/30/2013
57. Principal Investigator - Development of Transition Joints for Eliminating Dissimilar Metal Weld Failures, PPL Generation LLC, $90,000, 6/1/2008 to 08/25/2013.
58. Principal Investigator - Casting Solutions for Readiness, Defense Logistics Agency, $475,000, 7/2/2012 to 6/20/2017.
59. Principal Investigator - Fundamental Studies on Phase Transformation and Mechanical Properties of Fusion Welds in Advance Naval Steels, Collaboration with Northwestern University, Office of Naval Research, $318,353, 6/1/2012 to 5/31/2015.
60. Principal Investigator - Fundamental Understanding of Localized Deformation under Severe Microstructural Gradients, National Science Foundation, with Ohio State University, $200,000, 6/8/2013 to 6/9/2014
61. Principal Investigator - Gradient Additive Manufacturing of Wear Resistant Alloys for Forging Tooling Applications, Research for Advanced Manufacturing in Pennsylvania, Collaboration with Case Western Reserve University, 6/2014 to 5/2015, $150,000
62. Principal Investigator - Development of Novel Functionally Graded Transition Joints for Improving the Creep Strength of Dissimilar Metal Welds in Nuclear Applications, Department of Energy, Collaborations with University of Tennessee Knoxville and Oak Ridge National Laboratory, 10/2014 to 9/2017, $800,000.
63. Principal Investigator and Site Director - National Science Foundation Industry/University Collaborative Research Center on Integrated Materials Joining Science for Energy Applications, Sponsored by National Science Foundation and 33 Companies/National Laboratories, Collaborations with Ohio State University, Colorado School of Mines, University of Wisconsin-Madison), Total Center funding to date: $6,822,000, Total Lehigh funding to date: $1,090,000, 5/1/2013- 4/30/2015, Phase II proposal to be submitted 3/2015.

64. Manufacturing and Materials Joining Innovation Center (Ma2JIC), Special Metals Corporation, $435,000, June 2011 - December 2022.
65. Manufacturing and Materials Joining Innovation Center (Ma2JIC), PETROLEO BRASILERIO S.A., $90,000, December, 2014 - June 2022.
66. Stress Relief Cracking of High Temperature Alloys, Electric Power Research Institute, Inc., $272,500, January 2015 – December 2022.
67. I/UCRC Full Grant - Manufacturing and Materials Joining Innovation Center (Ma2JIC), NSF-Directorate for Engineering, $400,000, September 2016 – November 2022.
68. Manufacturing and Materials Joining Innovation Center (Ma2JIC) - Lincoln Electric, $50,000, December 2015 – December 2022.
69. Membership - Phase II Lehigh U Site: I/UCRC for Manufacturing and Materials Joining Innovation, Thermo-Calc Software Inc., $130,000, August 2016 – December 2022.
70. Manufacturing and Materials Joining Innovation Center (Ma2JIC) - Bechtel Marine Propulsion Corporation (KAPL) Membership, $300,000, June 2017 – December 2022.
71. Digital Innovative Design Proposal, Steel Founders' Society of America, $725,737.
72. Improving Mechanical Properties of Heavy Section Austenitic Steel Castings, Advanced Technology International, $500,000, April 2018 – May 2023.
73. 10Ni Filler Metal for Welding, Steel Founders' Society of America, $371,563, January 2021 – March 2024.
74. Welding Metallurgy and Weldability of Naval Structural Damping Steels, Office of Naval Research, $415,000,July 2022 – June 2025.
75. Welding of Cast Stainless Steels without Post Weld Heat Treatment, Steel Founders' Society of America, $90,667, October 2023 – March 2024.

E. INDUSTRIAL CONSULTING

Prof. DuPont provides consulting to industry, government laboratories, and professional societies in the areas of failure analysis, product liability and litigation, fabrication, welding, corrosion, and materials selection. He often provides expert testimony to industry in high profile cases involving failure analysis and product litigation. He has conducted over 300 industrial consulting projects and written over 300 reports in these areas. Some of the companies and law firms he has consulted for in these areas is shown below:

Companies

General Electric
Shell
DuPont
Special Metals (INCO Alloys)
Siemens
Public Service Electric and Gas Co.
Welding Services
Gibson Tube Company/Draka
ABEC Pharmaceuticals, Inc.
ArcelorMittal Steel Company
Plymouth Engineered Shapes
Lehigh Heavy Forge
ExxonMobil
Honeywell
Air Products and Chemicals
Electric Power Research Institute
Idaho National Laboratory
Knolls Atomic Power Laboratory
Arrow Medical Devices
LaFarge Corporation
Advanced Environmental Recycling
Steel Founders Society of America
Foster Wheeler
Lincoln Electric

Hobart Brothers
McKinney Construction
Specialty Minerals
Ocean Power Technology
Asea Brown Boveri
Westinghouse
Effort Foundry
Krupp VDM Alloys
Union Tank Car Company
Winner Aviation
Viega Fittings
MACtac, Inc.
Pennsylvania Power and Light
Polymer Dynamics, Inc.
Great River Energy
Bustin Industrial Products
Dominion Power Company
Specialty Mineral
UGI Gas Company
Evergreen Restoration
SCM Metals
Curtis Aerospace

Law Firms

Evert Weathersby Houff
Cozen O'Conner
Distasio
Blank Rome
Rasmussen Willis Dickey and Moore
Eckert Seamans Cherin and Melliot
Ward Greenberg Heller & Reidy
Devlin and Associates
McKissock and Hoffman
Day Pitney
Foley and Lardner
Rawle & Henderson
Rosenn Jenkins and Greenwald
Marshall Dennehey
Thomas, Thomas & Hafer
Litchfield Cavo

Typical Examples of Industrial Consulting:

- Lead the failure investigation of the Delaware River I-276 Turnpike Bridge. The team for this project was recognized by the North-Central and Southern New Jersey Sections of the American Society of Highway Engineers (ASHE) with the Project of the Year Award for the over $5M total construction cost category.
- Shell Oil Company – Devised and conducted a test program to determine if welded pressurized tubes were susceptible to premature failure, and provided recommendations on future inspections.
- McKissock and Hoffman/PDI – Served as an expert witness on a $250 million lawsuit involving premature failure of tool steel pintels used in manufacturing rubber parts.
- Knolls Atomic Power Laboratory – Designed and conducted a test program to identify the cause of cracking that occurred in welds used for nuclear submarine applications.
- Public Service Electric and Gas – Served as expert witness in legal case on fatigue failures in welds in hydro runners at the Yards Creek Power Station. Designed and conducted a test program on fatigue of weldments that was used to demonstrate that improper design caused premature of hydro runners. Case settled in PSE&G favor before going to trial.
- McKissock and Hoffman/Global Ground Support – Served as expert witness in failure of large structural boom member that failed prematurely at Philadelphia International Airport.

Failure caused personal injury to boom operator and significant structural damage to Boeing aircraft.

- Arrow Medical Device Company – Designed and conducted a project to determine cause of premature failure of spring wire guides used for catheters and developed a revised fabrication process to avoid repeat failures.
- Devlin and Associates – Served as an expert witness in failure of industrial chairs that were causing multiple injuries.
- Gibson Tube Company – Developed and experimentally verified models for homogenization of fusion welds in duplex stainless steels to restore corrosion and mechanical properties so that the company could introduce a new seam-welded tube product to the market.
- US Vanadium Corporation - Literature review on the influence of nitrogen on the microstructure and mechanical properties of high strength low alloy steel base metal and welds.
- Advanced Environmental Recycling Company – Failure analysis of a rotary kiln due to corrosion. This project also included selection of an alternate materials to avoid repeat failures.
- Chalks Ocean Airways – Served as expert witness in failure and crash of Chalks Flight 101 off the coast of Florida.
- Lafarge Corporation - Failure Analysis and Prevention of Concrete Handling Equipment.

Testimony History (2007-Present)

1. Trial Testimony: *Polymer Dynamics, Inc. v. Bayer Corporation*, US Sates District Court for the Eastern District of Pennsylvania, August 14, 2007.
2. Trial testimony: *Nelson v. American Standard, et. al.*, Philadelphia Court of Common Pleas, March 15, 2010.
3. Trial testimony: *Beausejour v. The Lincoln Electric Company, et al*., Philadelphia Court of Common Pleas, March 26, 2010.
4. Trial testimony: *Campbell v. Allied Signal, et al., Ottoviani v. The Lincoln Electric Company, et al., Russo v. A.W. Chesterton, Inc., et al.*, Philadelphia Court of Common Pleas, March 31, 2010.
5. Trial testimony: *Morrison v. Hobart Brothers Company, et al.*, Philadelphia Court of Common Pleas, April 29, 2010.
6. Deposition testimony: *Jade Management Corp. v. IMI Cornelius, Inc., et al.* United States District Court for the Middle District of Pennsylvania, May 3, 2010.
7. Trial testimony: *Fitzpatrick v. Lincoln Electric and Hobart Brothers Company, et al.*, Philadelphia Court of Common Pleas, January 12, 2010.
8. Trial testimony: *Marsico and Moran v. Winner Aviation Corporation, et al*., Philadelphia Court of Common Pleas, December 8, 2011.
9. Trial testimony, *Donald R. Dimmick v. Lincoln Electric, et al*, Philadelphia, PA, February 28, 2012.
10. Deposition testimony: *Doss v. Lincoln Electric, Airco, and Hobart Brothers Company, et al.*, Joplin, MO, July 2, 2013.
11. Trial testimony: *Doss v.Lincoln Electric, Airco, and Hobart Brothers Company, et al.*, Joplin, MO, August 20, 2013.

12. Trial testimony: *Matkowsy v. Lincoln Electric Co. and Airco et. al.,* Philadelphia, PA, December 16, 2013.
13. Deposition testimony: *Stephens v. Lincoln Electric and Hobart Brothers Company, et al.,* Philadelphia, PA,July 23, 2014.
14. Deposition testimony: *McKinney v. Lincoln Electric and Hobart Brothers Company, et al.,* Philadelphia, PA, September 12, 2014.
15. Deposition testimony, *Eric Heggie v. Honeywell International, et al,* McLean County, IL, July 6, 2015.
16. Trial testimony: *McKinney v. Hobart Brothers Company,* Bloomington, IL, October 18, 2016.
17. Deposition Testimony, *Picuri v. Hamilton Beach*, Philadelphia, PA, November 22, 2016.
18. Deposition testimony, *Donald Laningham v.Lincoln and Hobart*, Philadelphia, PA, April 7, 2017.
19. Trial Testimony, *Donald Laningham v.Lincoln and Hobart*, Kansis City, MO, May 10, 2017.
20. Trial Testimony, Frederick Woodley and Patricia Woodley *v. Lincoln and Hobart*, June 14, 2017, Philadelphia County, PA.
21. Deposition Testimony, *Parsons Xtreme Golf, LLC, Petitioner, v. Taylor Made Golf Company, Inc., Patent Owner*, July 11, 2018.
22. Deposition Testimony, Denver D. Taylor And Janice Taylor *v. Lincoln and Hobart*, February 20, 2019, Allentown, PA.
23. Deposition Testimony, William Sallee *v. Lincoln Electric*, June 21, 2022, Philadelphia, PA.

Patents

US Patent 6,730,180 B1, May 4, 2004, Neutron Absorbing Alloys (for Storage and Transportation of Spent Nuclear Fuel), J.N. DuPont, C.V. Robino (Sandia National Laboratory), R.E. Mizia (Idaho National Engineering and Environmental Laboratory), J. Michael (Sandia National Laboratory), and D.B. Williams (Lehigh University).

US Patent 8281976 B2, Method of making multi-component composite metallic tube, Anthony Caizza, Antonio Esposito, William Van Geertruyden, John DuPont, October 9, 2012.