Richard Lee Bodnar

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PROFESSIONAL ACTIVITIES AND AWARDS

ASM INTERNATIONAL (1977-present)

Lehigh Valley Chapter, Technical Program Committee (1986-87)
Chairman of Young Member's Committee (1989-90)
Member of Historic Landmarks Committee (1990-97)
Chairman of Historic Landmarks Committee (1991-92)

Two historic landmarks were successfully nominated and granted, viz., (1) BethForge Division of Bethlehem Steel, where in 1898 a heat treatment practice was developed that permitted the widespread use of high-speed steel (1992). (2) 48" Grey Mill of Bethlehem Steel, which operated from 1908 to 1995 and revolutionized the making of structural beams by increasing their efficiency (1996).

Member of the Outstanding Young Member Award Committee (1992)
Member ASM Heat Treating Society (1994-present)
Member ASM Ad hoc Ferrous Committee (1995-1999)
Named Outstanding Young Member - Lehigh Valley Chapter of ASM (Nov.'87)
Certificate of Appreciation for Contributions to the ASMI-LVC Executive Committee as Chairman of the Young Members Committee (May 1990)
Certificate of Appreciation for Contributions to the ASMI-LVC Executive Committee as 25-year ASMI Membership silver and sapphire lapel pin (May 2002)
Elected Fellow of ASMI "For outstanding contributions to the mechanical working, processing, and applications of heavy-section low-alloy steels" (Oct. 2002)
Elected Fellow of Alpha Sigma Mu (Oct. 2012)

ISS-AIME – Iron and Steel Society (1987-2003)

Mechanical Working and Steel Processing Division Executive Committee (1986-1998)
Secretary of the MWSP Executive Committee (1989-90)
Chairman-Elect of the MWSP Executive Committee (1990-91)
Chairman of the Nominating Committee – MWSP Division (1991)
Chairman of the MWSP Executive Committee (1991-92)
Chairman of the Heavy Forgings Committee (1987-89)
Founder of the Heavy Forgings Committee (1987)
Member of Heavy Forgings Committee (1987-90)
Organized "Heavy Forgings Sessions" for the 29th thru 32nd MWSP Conf.
Director on ISS Board of Directors (1991-93)
Member Robert W. Hunt Award Committee (1992-93)
Member ISS Nominating Committee (1992-93)
Member of Product Physical Metallurgy Committee (1993-2003)
Co-chairman of the Product Physical Metallurgy Committee (1993-95)
Organized "PPM Sessions" for the 35th through 38th MWSP Conf.
Member of MWSP Division Nominating Committee (1996-97)
Member-at-Large MWSP Division (1996-98)

Member Ambassador (1999-2003)
Michael Tenenbaum Award for best MWSP Paper (1987 and 1994)
ISS-AIME Recognition Award for Leadership and Service (Oct. 1989)
Meritorious Award for best Roll Technology paper (1990 and 1992), best Product Physical Metallurgy paper (1999), and best Tubular Products paper (1999)
Gilbert R. Speich Award for best paper on the application of physical metallurgy principles (1992 and 1999)
1992 MWSP Division Past Chairman Award and Perpetual Conference Registration Card (Oct. 1992)
Certificate of Appreciation for Leadership and Devoted Service as a Member of the ISS Board of Directors (April 1993)
ISS-AIME Special Service Appreciation Award in recognition of ten years of dedicated service to the MWSP Division (Oct. 1995)
Certificate of Appreciation for Outstanding Service to the Mechanical Working and Steel Processing Division of ISS-AIME (October 1998)
Robert W. Hunt Silver Medal for best original paper on iron and steel (October 2001)

Association for Iron & Steel Technology (2004 – present)

Member Metallurgy: Processing, Products & Applications Technology Committee (2004 – present)
Member of the Plate Rolling Technology Committee (2015 to present)
Member of the Kent D. Peaslee Junior Faculty Award Committee (2015 – 2021)
Gilbert R. Speich Award for best paper on the application of physical metallurgy principles (2008 and 2019)
Norman D. Hodgson Award for significant technological enhancement to the production of steel plate (May 2013)
AIST 2016 Continuous Casting Best Paper Award (May 2016)
AIST 2017 Computer Applications Best Paper Award (May 2017)
Organized International Plate Symposia in 2011 and 2018
AIST Distinguished Member and Fellow "For his sustained contributions to the advancement of the metallurgy of rolled and forged steel products, and for outstanding service to AIST. Mr. Bodnar's prolific career has resulted in the development of new steel products and more than 100 published technical papers, many of which have received the steel industry's top honors. His leadership in AIST Technology Committees and in the organization of special programs and symposia has created invaluable opportunities for educational and technical exchange." (May 2018)
AIST Hunt-Kelly Outstanding Paper Award Selection Committee (December 2018 – 2021)
AIST 2019 Computer Applications Best Paper Award (May 2019)
AIST 2020 Hunt-Kelly Outstanding Paper Award (February 2021)
AIST 2020 Ladle & Secondary Refining Best Paper Award (June 2021)
AIST 2020 representative in the AIME Oral History Project (interviewed June 2021 and posted May 2022)
AIST 2021 Hunt-Kelly Outstanding Paper Award – Third Place (June 2021)
AIST Life Member Status achieved (January 2022)
AIME 2022 Honorary Member Award "Four his significant technical contributions to the iron and steel industry, and for his leadership and enduring support of AIST, AIME and the former Iron & Steel Society. His commitment to developing the next generation of steelmakers, his support of junior faculty and his organization of advanced symposia have fostered a sustainable future for steel." (May 2022)

International Metallographic Society

Honorable Mention for Class 6, Unique, Unusual or Other Techniques for poster paper at the IMS 23rd Annual Convention (July 1990)
Jacquet-Lucas Award for Excellence in Metallography for poster paper at the IMS 29th Annual Convention (July 1996)
IMS 1st Place Class 2 (Electron Microscopy – All Materials) for a poster paper displayed at M&M'15 (August 2015).

American Iron and Steel Institute

AISI HPS Advisory Group (2001 to 2009)
Institute Medal for paper with special merit and importance in connection with the activities and interest of the iron and steel industry (2000, 2014, and 2017)
Institute Finalist Medal (September 2020 and November 2021)

National Society of Professional Engineers

Engineers Week Joint Planning Council (EWJPC) (1989-90)
Professional Engineer in Pennsylvania (no. 33204-E) (1984-present)
Qualified as an EIT in Pennsylvania (8/16/82)
Passed P. E. Test (10/28/83)
Qualified as a P. E. in Pennsylvania (3/23/84)
Named 1988 Engineer of the Year by Lehigh Valley Chapter of PSPE (Feb. 1989)
Recognition Award for Outstanding Participation in National Engineers Week 1990 (March 1990)

Other Awards

IOM^3 Charles Hatchett Award for best paper on the use of niobium (July 2012)

1997 Civil Engineering Research Foundation (CERF) Charles Pankow Innovative Applications Award (Dec. 1997) (team award for contributions to the development of high performance steels for bridge applications)

Association for Women in the Metals Industry

Member 2009-2019 – 10-Year Member Award

Papers and Articles

1. R. L. Bodnar, "The Effects of Impurities on the Creep Rupture Properties of Martensitic 2¼Cr-1Mo Steel", Master Thesis, U. of Penn., December 1977.
2. K. A. Abiko, R. L. Bodnar, and D. P. Pope, "Impurity, Grain Size and Hardness Effects on the Notched Bar Creep Rupture Ductility of 2¼Cr-1Mo Steel", in Ductility and Toughness Considerations in Elevated Temperature Service, G. V. Smith, ed., ASME/MPC-8, 1978, pp. 1-10.
3. D. P. Pope, K. A. Abiko, R. L. Bodnar, D. S. Wilkinson, C. J. McMahon, Jr., R. Dobbs, and D. Gentner, "Elimination of Impurity-Induced Embrittlement in Steel; Part 2: High-Temperature Cracking - Stress Relief and Creep Cracking", EPRI Interim Report NP-1501, Part 2, RP559, September 1980.

4. R. L. Bodnar and R. F. Cappellini, expanded abstract for EPRI RP2060-2, "High Purity Steels for Utility Components", in Seventh Annual Conference on Materials for Coal Conversion and Utilization, proceedings, Washington, D. C., 16-18 November 1982.

5. R. L. Bodnar, V. E. McGraw, and A. V. Brandemarte, "Technique for Revealing Prior Austenite Grain Boundaries in CrMoV Turbine Rotor Steel", Metallography, vol. 17, no. 1, February 1984, pp. 109-114.

6. R. L. Bodnar, D. C. Ronemus, B. L. Bramfitt, and D. C. Shah, "Physical Modeling of Hot-Deformation Processes - Using Plasticine", in 26th Mechanical Working and Steel Processing Conference Proceedings, ISS-AIME, vol. XXII, 1985, pp. 29-45, and Iron and Steelmaker, vol. 13, no. 8, August 1986, pp. 35-46, and Trans. ISS, vol. 8, 1987, pp. 11-22.

7. R. L. Bodnar, R. F. Cappellini, and R. I. Jaffee, "The Effects of Manganese and Silicon in Heavy Forging Steels", in 10th International Forging Conference Proceedings, The Institute of Metals, 1985, pp. 45-1 – 45-10.

8. R. L. Bodnar, "Evaluation of the First Superclean Prototype Forging", presented at the EPRI Conference on Properties of a High Purity LP Rotor Forging, Kapfenberg, Austria, June 30 - July 2, 1986 (paper distributed at the conference).

9. T. Ohhashi, R. L. Bodnar, H. S. Reemsnyder, and R. E. Steigerwalt, "High Purity Steels for Utility Components", EPRI Final Report, NP-5399, RP2060-1/2, September 1987.

10. R. L. Bodnar, R. F. Cappellini and R. I. Jaffee, "The Effects of Manganese and Silicon on Bainitic Hardenability and Properties of Heavy Forging Steels", Ironmaking and Steelmaking, vol. 14, no. 4, 1987, pp. 185-194.

11. R. L. Bodnar and B. L. Bramfitt, "Physical Modeling of Centerline Consolidation in Heavy Forgings Using Plasticine", in 28th Mechanical Working and Steel Processing Conference Proceedings, ISS-AIME, vol. XXIV, 1987, pp. 237-256, and Iron and Steelmaker, vol. 14, no. 9, September 1987, pp. 51-66, and Trans. ISS, vol. 9, 1988, pp. 95-110.

12. R. L. Bodnar and R. F. Cappellini, "Effects of Residual Elements in Heavy Forgings - Past, Present, and Future", in MiCon 86: Optimization of Processing, Properties, and Service Performance Through Microstructural Control, ASTM STP 979, B. L. Bramfitt, R. C. Benn, C. R. Brinkman, and G. F. VanderVoort, eds., ASTM, Philadelphia, 1988, pp. 47-82.

13. R. F. Cappellini, R. L. Bodnar, T. D. Nelson and K. F. Reppert, "The Production of 12Cr Rotor Forgings - A Forgemaster's Perspective", in First International Conference on Improved Coal-Fired Power Plants, A. Armor, W. Bakker, R. Jaffee and G. Touchton, eds., EPRI CS-5581-SR, 1988, pp. 5-255 – 5-285.

14. R. C. Nester and R. L. Bodnar, "Microstructural Characterization of 10Cr2MoVCbB Steels", poster paper, exhibited at the 21st Annual Convention of the IMS, Toronto, Ontario, Canada, July 24-27, 1988 and the ASM World Materials Congress, Chicago, Illinois, September 24-30, 1988.

15. R. L. Bodnar, K. A. Taylor, K. S. Albano and S. A. Heim, "Improving the Toughness of 3½NiCrMoV Steam Turbine Disc Forgings", in 29th Mechanical Working and Steel Processing Conference Proceedings, ISS-AIME, vol. XXV, 1988, pp. 157-169, and Trans. ASME, J. of Engineering Materials and Technology, vol. 111, January 1989, pp. 61-70.

16. R. L. Bodnar, E. Erman, A. K. Khare and N. M. Medei, "Open-Die Forging", in Forming and Forging, ASM International Metals Handbook, vol. 14, 9th Edition, May 1988, pp. 61-74.

17. R. L. Bodnar, J. R. Michael, S. S. Hansen and R. I. Jaffee, "Progress in the Design of an Improved High-Temperature 1%CrMoV Rotor Steel", 30th Mechanical Working and Steel Processing Conference Proceedings, ISS-AIME, vol. XXVI, 1989, pp. 173-194 and Trans. ASME, J. of Engineering Materials and Technology, vol. 112, January 1990, pp. 99-115.

18. R. L. Bodnar, B. L. Bramfitt and R. F. Cappellini, "The Influence of Residual Copper in Annealed and Postweld Heat Treated 2¼Cr-1Mo Steel", Residual and Unspecified Elements in Steel, ASTM STP 1042, A.S. Melilli and E. G. Nisbett, eds., ASTM, Philadelphia, 1989, pp. 202-231.

19. R. L. Bodnar, T. Ohhashi and R. I. Jaffee, "Effects of Mn, Si and Purity on the Design of 3½NiCrMoV, 1CrMoV and 2¼Cr-1Mo Bainitic Alloy Steels", Metallurgical Transactions A, vol. 20, no. 8, 1989, pp. 1445-1460 and corrected in no. 10, 1989, pp. 2197-2212.

20. R. L. Bodnar and S. S. Hansen, "Effects of Heat Treatment Parameters and Prior Structure on the Final Structure/Properties of 12Cr Rotor Steel", 31st Mechanical Working and Steel Processing Conference Proceedings, ISS-AIME, vol. XXVII, 1990, pp. 191-205 and Iron and Steelmaker, vol. 17, no. 6, June 1990, pp. 23-34.

21. R. L. Bodnar and K. A. Taylor, "Structure/Property Relationships in Medium-Carbon Bainitic Steels for Thick Sections", 31st Mechanical Working and Steel Processing Conference Proceedings, ISS-AIME, vol. XXVII, 1990, pp. 483-504, and Iron and Steelmaker, vol. 17, no. 8, August 1990, pp. 47-63, and Trans. ISS, vol. 12, 1991, pp. 145-161.

22. S. A. Heim, J. E. Fielding and R. L. Bodnar, "Avoiding Overheating and Burning in Forged Roll Steels", 31st Mechanical Working and Steel Processing Conference Proceedings, ISS-AIME, vol. XXVII, 1990, pp. 319-328 and Iron and Steelmaker, vol. 17, no. 9, September 1990, pp. 26-34.

23. R. L. Bodnar, S. S. Hansen and R. I. Jaffee, "Further Progress in the Design of an Improved High-Temperature 1%CrMoV Rotor Steel", presented at the EPRI Workshop on Superclean Rotor Steels, Sapporo, Japan, August 30-31, 1989 (paper distributed at the conference).

24. R. L. Bodnar and T. D. Nelson, "Heavy Forgings Sessions - Conference Review", Iron and Steelmaker, vol. 17, no. 1, January 1990, pp. 27-29.

25. R. L. Bodnar, S. S. Hansen, J. R. Michael, and R. E. Steigerwalt, "Improved SuperClean NiCrMoV Rotor Steel", Final Report, EPRI ER-6887, July 1990.

26. R. L. Bodnar, S. S. Hansen and R. I. Jaffee, "The Design of an Improved High-Temperature 1%CrMoV Rotor Steel", in Superclean Rotor Steels, workshop proceedings, R. I. Jaffee, ed., Pergamon Press, 1991, pp. 331-401.

27. T. D. Nelson, R. L. Bodnar and J. E. Fielding, "A Critical Assessment of ASTM A508 Class 2 Steel for Pressure Vessel Applications", 32nd Mechanical Working and Steel Processing Conference Proceedings, ISS-AIME, vol. XXVIII, 1991, pp. 323-341.

28. R. L. Bodnar and S. S. Hansen, "Metallurgical Development of Rolled-Steel Channels for Truck Frames", 32nd Mechanical Working and Steel Processing Conference Proceedings, ISS-AIME,

vol. XXVIII, 1991, pp. 61-72, and Iron and Steelmaker, vol. 19, no. 4, April 1992, pp. 47-55, and Trans. ISS, vol. 14, January 1993, pp. 23-31.

29. K. E. Downey and R. L. Bodnar, "A Technique for Establishing the Cause of a Casting Defect", poster paper, exhibited at the 23rd Annual Convention of the IMS, Cincinnati, Ohio, July 22-25, 1990 and ASMI Materials Week '90, Detroit, Michigan, October 8-11, 1990.

30. R. L. Bodnar, T. D. Nelson, and R. F. Cappellini, "Enhancements in the Integrity of Heavy Forgings", 11th International Forgemasters Meeting, conference proceedings, Federacciai, June 1991, paper no. V.1, pp. 1-14, and Iron and Steelmaker, vol. 18, no. 7, July 1991, pp. 26-36.

31. R. L. Bodnar, M. Lin, and S. S. Hansen, "The Physical Metallurgy of Forged Cold-Mill Work-Roll Steels", 33rd Mechanical Working and Steel Processing Conference Proceedings, ISS-AIME, vol. XXIX, 1992, pp. 171-185, and Research and Technology 1990 - 1991, Bethlehem Steel Corporation, March 1992, pp. 45-57, and Iron and Steelmaker, vol. 20, no. 6, June 1993, pp. 65-75, and Trans. ISS, vol. 15, January 1994, pp. 79-89.

32. R. L. Bodnar and G. J. Roe, "Microstructural Development by Controlled Cooling - Conference Review", Iron and Steelmaker, vol. 18, no. 1, January 1991, pp. 24-27.

33. R. L. Bodnar, "Metallurgical Tidbits on St. Louis", 33rd Mechanical Working and Steel Processing Conference Preliminary and Final Programs, August and October 1991, respectively.

34. Minfa Lin, R. L. Bodnar, and S. S. Hansen, "Tempering Behavior of High-Carbon Roll Steels Containing 3 to 5% Chromium", Gilbert R. Speich Symposium Proceedings: Fundamentals of Aging and Tempering in Bainitic and Martensitic Steel Products, G. Krauss and P. E. Repas, eds., ISS-AIME, October 1992, pp. 77-91, and Research and Technology 1992, Bethlehem Steel Corporation, March 1993, pp. 39-51.

35. R. L. Bodnar and E. J. Watkins, "Recent Developments in V-Steel Structural Shapes", 34th Mechanical Working and Steel Processing Conference Proceedings, ISS-AIME, vol. XXX, 1993, pp. 279-290.

36. R. L. Bodnar and S. S. Hansen, "Development of Rolled-Steel Truck Channels", Heat Treating, January 1993, pp. 22-29.

37. R. L. Bodnar and S. S. Hansen, "Effects of Austenite Grain Size and Cooling Rate on Widmanstätten Ferrite Formation in Low-Alloy Steels", Metall. and Mater. Trans. A, vol. 25A, April 1994, pp. 665-675.

38. R. L. Bodnar and S. S. Hansen, "Effects of Widmanstätten Ferrite on the Mechanical Properties of a 0.2 Pct C - 0.7 Pct Mn Steel", Metall. and Mater. Trans. A, vol. 25A, April 1994, pp. 763-773.

39. R. L. Bodnar and S. S. Hansen, "Effects of Ti, V, and N in Hot-Rolled Structural Steels", 35th Mechanical Working and Steel Processing Conference Proceedings, ISS-AIME, vol. XXXI, 1994, pp. 495-509, and Research and Technology 1994, Bethlehem Steel Corporation, April 1995, pp. 35-48.

40. R. L. Bodnar, "Applications of Titanium Nitride Technology to Steel Products - Symposium Summary", Iron and Steelmaker, vol. 21, no. 4, 1994, pp. 19-24.

41. R. L. Bodnar and S. S. Hansen, "Effects of Deformation Below the Ar_3 Temperature on the Microstructure and Mechanical Properties of Structural Steels", 36th Mechanical Working and Steel Processing Conference Proceedings, ISS-AIME, vol. XXXII, 1995, pp. 503-517, and Research and Technology 1995, Bethlehem Steel Corporation, May 1996, pp. 36-49.

42. R. L. Bodnar, "History of the Mechanical Working and Steel Processing Division", Iron and Steelmaker, vol. 22, no. 4, April 1995, pp. 20-24, and Index of MWSP Conference and Related Papers, 1959-1994, ISS-AIME, 1995, pp. i-iv.

43. R. L. Bodnar and S. S. Hansen, "Progress in the Development of an As-Rolled Nb-V Weathering Steel for Bridge Applications", High Performance Structural Steels, R. Asfahani, ed., ASMI, 1995, pp. 85-97, and Research and Technology 1995, Bethlehem Steel Corporation, May 1996, pp. 50-62.

44. R. O. Adebanjo and R. L. Bodnar, "Computer Modeling of the Microstructure Evolution Process During Hot Rolling", Recent Advances in Heat Transfer and Microstructure Modeling for Metal Processing, R. M. Guo and J. J. M. Too, eds., ASME, New York, NY, MD-vol. 67, 1995, pp. 15-25, and Research and Technology 1995, Bethlehem Steel Corporation, May 1996, pp. 71-77.

45. R. L. Bodnar, R. O. Adebanjo, and S. S. Hansen, "Determination of the T_R and Ar_3 Temperatures From Roll Force Measurements", 37th Mechanical Working and Steel Processing Conference Proceedings, ISS-AIME, vol. XXXIII, 1996, pp. 743-757, and Research and Technology 1996, Bethlehem Steel Corporation, May, 1997, pp. 21-34.

46. R. L. Bodnar, "Recovery and Recrystallization in Hot-Rolled Steels - A Symposium Review", Iron and Steelmaker, vol. 23, no. 5, 1996, pp. 59-62.

47. S. J. Lawrence and R. L. Bodnar, "Failure Analysis of Admiralty Brass Tubes in a Turbo-generator Oil Cooler", poster paper, exhibited at the 29th Annual Convention of the IMS, Pittsburgh, PA, July 21, 1996, and ASMI Materials Week '96, Cincinnati, OH, October 7-10, 1996.

48. S. J. Lawrence and R. L. Bodnar, "Failure Analysis of Admiralty Brass Tubes in a Turbogenerator Oil Cooler", Advanced Materials and Processes, vol. 151, no. 2, February 1997, pp. 29-31, and Research and Technology 1996, Bethlehem Steel Corporation, May 1997, pp. 35-38, and Copper Topics, vol. 22, no. 2, June 1997, pp. 6-8.

49. R. L. Bodnar and S. S. Hansen, "Effects of Composition and Processing in Hot-Rolled, Nb-Microalloyed Structural Steels", 38th Mechanical Working and Steel Processing Conference Proceedings, ISS-AIME, vol. XXXIV, 1997, pp. 513-525.

50. R. L. Bodnar, Y. Shen, M. Lin, D. W. Elwood, F. C. Feher, and G. J. Roe, "Accelerated Cooling on Burns Harbor's 160" Plate Mill", Accelerated Cooling/Direct Quenching of Steels, keynote paper, R. Asfahani, ed., ASMI, 1997, pp. 3-14, and Research and Technology 1997, Bethlehem Steel Corporation, April 1998, pp. 93-103.

51. R. L. Bodnar and M. Lin, "Development of a Multi-Purpose Structural Plate Grade: T-Star®", 39th Mechanical Working and Steel Processing Conference Proceedings, ISS-AIME, vol. XXXV, 1998, pp. 511-525, and Research and Technology 1998, Bethlehem Steel Corporation, May, 1999, pp. 28-42.

52. M. Lin and R. L. Bodnar, "Effects of Composition and Processing Conditions in a 0.03%C-0.09%Nb X70 Linepipe Steel", 40th Mechanical Working and Steel Processing Conference Proceedings, ISS-AIME, vol. XXXVI, 1998, pp. 573-589, and to be published in Niobium-Bearing Steels for Pipe Applications (translated to Russian), 2016?

53. R. L. Bodnar, Y. Shen and W. Furdanowicz, "An Assessment of the Application of TiN Technology to Controlled-Rolled, Low-Carbon Nb and Nb-V Steels", 40th Mechanical Working and Steel Processing Conference Proceedings, ISS-AIME, vol. XXXVI, 1998, pp. 929-945, and Iron and Steelmaker, vol. 26., no. 9, 1999, pp. 45-58, and Research and Technology 1999, Bethlehem Steel Corporation, April 2000, pp. 29-46.

54. M. Lin, R. L. Bodnar, Y. Shen, G. A. Brown, and F. C. Feher, "Some Fundamentals for the Accelerated Cooling of Plate Products", International Symposium on Steel for Fabricated Structures, R. Asfahani and R. L. Bodnar, eds., ASMI, 1999, pp. 95-103, and Research and Technology 1999, Bethlehem Steel Corporation, April 2000, pp. 47-55.

55. R. L. Bodnar and R. Asfahani, "Steel for Fabricated Structures", Advanced Materials and Processes, vol. 156, no. 3, September 1999, pp. 42-43.

56. A. Sjong, R. L. Bodnar, M. J. Merwin, D. K. Matlock, and J. G. Speer, "Fracture Behavior of Nb-V-Ti Microalloyed TMCP Plates Processed With and Without Intermediate Cooling," R. I. Asfahani, R. L. Bodnar, and M. J. Merwin, eds., Microalloyed Steels 2002, ASMI, 2002, pp. 92-100.

57. P. J. Kyed, M. Manohar, and R. L. Bodnar, "Effects of Niobium Content and Heat Treatment on the Microstructure and Mechanical Properties of Railroad Pressure Tank Car Steel Plates," 45th Mechanical Working and Steel Processing Conference Proceedings, ISS, vol. XLI, 2003, pp. 43-55.

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59. R. L. Bodnar, "Fabricated Steel Structures," guest editorial, Advanced Materials & Processes, vol. 162, no. 8, August 2004, p. 14.

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and Microstructures," Materials Science and Technology 2006 Steel-Related Papers, AIST, 2006, pp. 501-519.

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