

References

- [1] Evans, G. M. and Bailey, N., *Metallurgy of Basic Weld Metal* (Abington Publishing, Cambridge, UK, 1997).
- [2] Young, C. H. and Bhadeshia, H. K. D. H., *Strength of mixtures of bainite and martensite*, *Materials Science and Technology* 10, 209 (1994).
- [3] Sugden, A. A. B. and Bhadeshia, H. K. D. H., in *Proceedings of the International conference on trends in welding research, International trends in Welding Science and Technology*, edited by S. A. David and J. M. Vitek (ASM International, Materials Park, Ohio, USA, 1989), pp. 745-748.
- [4] Bhadeshia, H. K. D. H., in *Mathematical Modelling of Weld Phenomena-3*, edited by H. Cerjak and H. K. D. H. Bhadeshia (The Institute of Materials, London, UK, 1997), pp. 229-284.
- [5] Sugden, A. A. B. and Bhadeshia, H. K. D. H., in *Proceedings of the 2nd International conference on trends in welding research, International trends in welding Science and Technology*, edited by S. A. David and J. M. Vitek (ASM International, Materials Park, Ohio, USA, 1989), pp. 745-748.
- [6] MacKay, D. J. C., in *Mathematical Modelling of Weld Phenomena- 3*, edited by H. Cerjak and H. K. D. H. Bhadeshia (The Institute of Materials, London, UK, 1997), pp. 359- 389.
- [7] Robert Honeycombe and Bhadeshia, H. K. D. H., *Steels, Microstructure and properties* (Edward Arnold, London, 1995).
- [8] George E. Dieter, *Mechanical Metallurgy* (McGraw- Hill Book Company, London, UK, 1988).
- [9] Knott, J .F., *Fundamentals of Fracture Mechanics* (Butterworths, London, U.K., 1973).
- [10] Kenneth Easterling. *Introduction to the Physical Metallurgy of Welding*, (Butterworth-Heinemann 1992
- [11] Levine, E. and Hill, D. C., *Toughness in HSLA steel weldments*, *Metal Construction* 346 (1997).
- [12] Garland, J. G. and Kirkwood, P. R., *Towards improved submerged arc weld metal*, *Metal Construction* 275 (1975).

- [13] Bhadeshia, H. K. D. H., *Modeling of steel welds*, Materials Science and Technology 8, 123 (1992).
- [14] Robert Honeycombe and Bhadeshia, H. K. D. H., *Steels, Microstructure and properties* (Edward Arnold, London, 1995).
- [15] Abiko, K, Scientific American (Jap. edition) **23**, 20 (1993).
- [16] Leslie, W. C., *Iron and its dilute substitutionary solid solutions*, Metallurgical transactions 3, 5 (1972).
- [17] Pickering, F. B., *Physical Metallurgy and the Design of Steels* (Applied Science Publishers Ltd., London, 1978).
- [18]** Fetch, N. J., *The cleavage strength of poly crystals*, Journal of Iron and Steel Institute 174, 25 (1953).
- [19] Knot, J. F., *Fundamentals of Fracture Mechanics* (Butterworths, London, UK, 1988).
- [20] Baker, R. G. and Nutting, L., *The tempering of 2 Cr-Mo steel after quenching and normalizing*, Journal of the Iron and Steel Institute **192**, 257 (1959).
- [21] Nutting, J., in *Advanced heat resistant steels for power generation*, edited by R. Viswanathan and J. Nutting (IOM Communications Ltd, London, 1998), pp. 12-30.
- [22] Bhadeshia, H. K. D. H., Svensson, L.- E and Gretoft, B., *The influence of alloying elements of the formation of acicular ferrite in low-alloy steel weld deposits*, Journal of Materials Science Letters 4, 305 (1985).
- [23] Statistica software: Manual on Neural Networks
- [24] D. E. Goldberg. Genetic Algorithms in Search, Optimization and Machine Learning. Addison-Wesley, 1989.
- [25] D. Whitley. A Genetic Algorithm Tutorial. In Statistics and Computing, volume 4, pages 65-85, 1994.
- [26] M. ObitkoarIP .9:1 vik. Visualization of Genetic Algorithms in a Learning Environment. pages 101- 106, Bratislava: Comenius University, 1999. Spring Conference on Computer Graphics, SCCG'99.
- [27] S. H. Lalam, H. K. D. H. Bhadeshia, and D. J. C. MacKay, Estimation of mechanical properties of ferritic steel welds Part 1: Yield and tensile strength, Science and

Technology of Welding and Joining 2000 Vol. 5 No. 3, pp. 135-147

- [28] S. H. Lalam, H. K. D. H. Bhadeshia, and D. J. C. MacKay, Estimation of mechanical properties of ferritic steel welds Part 2: Elongation and Charpy toughness, Science and Technology of Welding and Joining 2000 Vol. 5 No. 3, pp. 149-160
- [29] Bhadeshia, H. K. D. H., Neural Networks in Materials Science, ISIJ International, Vol. 39 (1999), No. 10, pp. 966—979
- [30] Bhadeshia, H. K. D. H., Neural Networks and Information in Materials Science, Published online 16 January 2009 in Wiley InterScience, pp. 296-305
- [31] H. K. D. H. Bhadeshia, E. Keehan, L. Karlsson and H. O. Andren., Coalesced Bainite , Transactions of the Indian Institute of Metals 59 (2006) 689–694
- [32] I. Shah. *Tensile Properties of Austenitic Stainless Steel*. PhD thesis, University of Cambridge, 2002.
- [33] Evans, G. M., Welding Research Supplement 4478 (1992).
- [34] Abson, D. J. and Evans, G. M., in *An international conference on The effect of residual, impurity, and microalloying elements on weldability and weld properties*, edited by R. Dolby and D. McKeown (The Welding Institute, Cambridge, UK, 1984), pp. 44.1-44.16.
- [35] Alekseev, A. A., Shevchenko, G. A., Pokhodnya, I. K. and Yurlov, B. V., *Effect of Copper on Structure and Properties of Multilayer C- Mn- Ni Weld Metal*, Doc H-A-845-91 Kiev, USSR Academy of Sciences, USSR National Welding Committee (1991).
- [36] Blondeau, R., Boulisset, R., Rawson, L., Kaplan, D. and Roesch, L., in *Proceedings of the 5th International Conference on Pressure Vessel Technology* (ASME, San Francisco, USA, 1984), Vol. 2, pp. 1257-1289.
- [37] Batte, A. D. and Murphy, M. C., *Reheat cracking in 2.25Cr-Mo weld metal: influence of residual elements and microstructure*, Metals Technology 62 (1979).
- [38] Chandel, R. S., Orr, R. F., Gianetto, J. A., McGrath, J. T., Patchett, B. M. and Bicknell, A. C., *The microstructure and mechanical properties of narrow gap welds in 2.25Cr1Mo steel*, Physical Metallurgy Research Laboratories, Canmet. Report: ERP/PMRL 8516(OP- J) (1985).
- [39] Cunha, P. C. R., Pope, A. M. and Nobrega, A. F., in Second International Conference on Offshore Welded Structures (TWI, Cambridge, UK, 1982).

- [40] Dittrich, S. and GroBe-Wordemann, J., *2Cr1Mo filler metals with high toughness properties after step cooling*, Thyssen SchweiBtechnik GMBH report (1986).
- [41] De Rissone, N. M. R., DE S. Bott I, Jorge, J. C. F., Corvalan, P. and Surian, E., *ANSI/A WS A 5.1-91 E6013 rutile electrodes: The effect of wollastonite*, Welding Research Supplement **76**, 4898 (1997).
- [42] Dunne, D. J. and Pollard, G., in *Proceedings of the 2nd International conference on trends in welding research, International trends in welding Science and Technology*, edited by S. A. David and J. M. Vitek (ASM International, Materials Park, Ohio, USA, 1989), pp. 269-272.
- [43] Es- Souni, M., Heaven, P. A. and Evans, G. M., *Oerlikon SchweiBmitteilungen* **48**, 15 (1990).
- [44] Es-Souni, M, Heaven, P.A. and Evans, G.M., in *Proceedings of the 2nd international conference on trends in welding research, International trends in welding Science and Technology*, edited by S. A. David and J. M. Vitek (ASM International, Materials Park, Ohio, USA, 1989), pp. 769-773.
- [45] Chauhan. B. J., Personal communication to Welding Industries.
- [46] Evans, G. M., *Effect of boron on modified 9Cr1Mo weld metal*, Report, Oerlikon **52**, 21 (1994).
- [47] Fox, A .G., Rakes, M. W. and Franke, G. L., *The effect of small changes in flux basicity on the acicular ferrite content and mechanical properties of submerged arc weld metal of navy RY- 100 steel*, Welding Research Supplement 3308 (1996).
- [48] Garland, J. G. and Kirkwood, P. R., *Report GS/PROD/643/1/75/C*, British Steel Corp., Rotherham (1975).
- [49] Green, R. S. et al., in *Proceedings of the 3rd International conference on trends in welding research, International trends in welding Science and Technology*, edited by S. A. David and J. M. Vitek (ASM International, Materials Park, Ohio, USA, 1992), pp. 359-364.
- [50] Gonzalez, J.C. de Vedia, L.A., et al., *Effect of carbon content on the characteristics of aswelded and step-cooled AWS E- 801882 type weld metal*, Canadian Metallurgical Quarterly **30**, 187 (1991).

- [51] Ichikawa, K., Horn, Y., Sueda, A. and Kobayashi, J., *Toughness and creep strength of modified 2_{1/4} - 1 Mo steel weld metal*, welding research supplement 74, Welding Research Supplement 74, 2308 (1995).
- [52] Jose Vercesi and Estela Surian, *The effect of welding parameters on high strength SMA W all weld metal. Part 1: A WS E11018- M*, Welding Research Supplement 75, 1918 (1996).
- [53] Dunne, D. J. and Pollard, G., in *Proceedings of the 2nd International conference on trends in welding research, International trends in welding Science and Technology*, edited by S. A. David and J. M. Vitek (ASM International, Materials Park, Ohio, USA, 1989), pp. 793-798.
- [54] Baiter, V. and Gonzalez, J.C., *Influence of molybdenum on the microstructure and properties of weld metal with different manganese contents*, Canadian Metallurgical Quarterly 2, 28, 179 (1989).
- [55] Zhang, Z. and Farrar, R. A., *Influence of Mn and Ni on the microstructure of C-Mn-Ni weld metal*, Welding Research Supplement 183 (1997).
- [56] Haigh, R. H., *Ph. D. thesis*, University of Birmingham, UK (1996).
- [57] Hunt, A. C., Kluken, A. O. and Edwards, G. R., Welding Research Supplement 73, 9s (1994).
- [58] Ichikawa, K., Harli, Y., Sueda, A. and Kobayashi, J., *Report*, Nippon Steel Corp., Tokyo, Japan (1992).
- [59] Inagaki, M., Okane, I. and Nakajima, M., *Influence of heat treatment on creep rupture strength of welded joint of 2 Cr1Mo steel*, Transactions of National Research Institute for Metals 8, 34 (1966).
- [60] Jorge, J. C. F., Rebello, J. M. A. and Evans, G. M., *Microstructure and toughness relationship in C-Mn-Cr all-weld metal deposits*, IIW Document TI-A-880-93, Roissy (1993).
- [61] Kikutake, T., Okamoto, K., Yamanaka, K., Nakao, H., Harli, Y. and Sugioaka, I., in *Proceedings of the 5th International Conference on Pressure Vessel Technology*, (ASME, San Francisco, USA, 1984), Vol. 2, pp. 1188-1209.
- [62] Kluken, A. O., Siewert, T. A. and Smith, R., *Effects of copper, nickel and boron on mechanical properties of low alloy steel weld metals deposited at high heat*

- input, Welding Research Supplement 74, 1938 (1994).
- [63] KoQk, M. , Petrovski, B. I., Richter, E. and Evans, G. M. *influence of titanium and nitrogen on the fracture properties of weld metals*, Offshore Mechanics and Arctic Engineering, Materials Engineering, ASME 3, 277 (1994).
 - [64] Natsume, S., *EOects of chemical compositions on tensile properties of weld metals for modified 2.25Cr- lMo steels.*, Proc. 5th Int. Symp. of the Japan Welding Society, Tokyo 639 (1990).
 - [65] Panton- Kent, R., *Members report No. 429 : Weld metal toughness of MMA electron beam welded modified 9%Cr1%Mo steel*, The Welding Institute, Cambridge 3 (1990).
 - [66] Park, S. and Svensson, L.- E., *Report CML 89023: Estimation of the Microstructure and the Strength of Low-Alloy Cored Wire Weld Deposits, Using a Computer Model*, ESAB (1990).
 - [67] Still, J. R. and Rogerson, J. H., *The cocci of Ti and B additions to multipass submerged arc welds in 50D plate*, Metal Construction 10, 339 (1978).
 - [68] Surian, E., Trotti, J., Herrera, R. and de Vedia, L. A., *Influence of carbon on mechanical properties and microstructure of weld metal from a high strength SMA electrode*, Welding Research Supplement 70, 1338 (1991).
 - [69] Svensson, L-E. and Gretoft, B., *Microstructure and impact toughness of CMn weld metals*, Welding Research Supplement **69**, 4548 (1990).
 - [70] Dolby, R. E., *The effects of V and Nb on weld metal properties*, Metal Science 302 (1983).
 - [71] Bhadeshia, H. K. D. H. and Sevensson, L.- E., in *Mathematical Modelling of Weld Phenomena- 1*, edited by H. Cerjak and K. Easterling (The Institute of Materials, London, UK, 1993), pp. 109-180.
 - [72] Evans, G. M., *The eifect of titanium in SMA C- Mn steel multipass deposits*, Welding Research Supplement **71**, 4478 (1992).
 - [73] Masahiko Ramada, et al., *Microstructure and precipitation behavior in heat aifected zone of C-Mn microalloyed steel containing Nb, V and Ti*, ISIJ International **10**, 35, 1196 (1995).
 - [74] Bhadeshia, H. K. D. H. , MacKay, D. J. C. and Svensson, L.- E., *Impact toughness*

of C-Mn steel arc welds- Bayesian neural network analysis, , Materials Science and Technology **11**, 1046 (1995).

- [75] Evans, G. M., *The Effect of carbon on the macrostructure and properties of C-Mn all-weld metal deposits*, Welding Research Supplement **62**, 3138 (1983).
- [76] Evans, G. M., *The Effect of titanium in manganese- containing SMA weld deposits*, Welding Research Supplement **72**, 1238 (March, 1993).