

7 REFERENCES

- [1] G. Koch, J. Varney, N. Thopson, O. Moghissi, M. Gould, and J. Payer, “International Measures of Prevention, Application, and Economics of Corrosion Technologies Study,” *NACE International*, 2016. <http://impact.nace.org> (accessed May 29, 2017).
- [2] V. S. Moura, L. D. Lima, J. M. Pardal, A. Y. Kina, R. R. A. Corte, and S. S. M. Tavares, “Influence of microstructure on the corrosion resistance of the duplex stainless steel UNS S31803,” *Mater. Charact.*, vol. 59, no. 8, pp. 1127–1132, 2008, doi: 10.1016/j.matchar.2007.09.002.
- [3] S. J. Oh, D. C. Cook, and H. E. Townsend, “Atmospheric corrosion of different steels in marine, rural and industrial environments,” *Corros. Sci.*, vol. 41, no. 9, pp. 1687–1702, Aug. 1999, doi: 10.1016/S0010-938X(99)00005-0.
- [4] J. F. Marco, M. Gracia, J. R. Gancedo, M. A. Martín-Luengo, and G. Joseph, “Characterization of the corrosion products formed on carbon steel after exposure to the open atmosphere in the Antarctic and Easter Island,” *Corros. Sci.*, vol. 42, no. 4, pp. 753–771, Apr. 2000, doi: 10.1016/S0010-938X(99)00090-6.
- [5] S. Feliu, M. Morcillo, and S. Feliu, “The prediction of atmospheric corrosion from meteorological and pollution parameters-II. Long-term forecasts,” *Corros. Sci.*, vol. 34, no. 3, pp. 415–422, 1993, doi: 10.1016/0010-938X(93)90113-U.
- [6] T. T. N. Lan *et al.*, “The effects of air pollution and climatic factors on atmospheric corrosion of marble under field exposure,” *Corros. Sci.*, vol. 47, no. 4, pp. 1023–1038, 2005, doi: 10.1016/j.corsci.2004.06.013.
- [7] A. R. Mendoza and F. Corvo, “Outdoor and indoor atmospheric corrosion of carbon steel,” *Corros. Sci.*, vol. 41, no. 1, pp. 75–86, 1999, doi: 10.1016/S0010-938X(98)00081-X.

- [8] S. Palraj, M. Selvaraj, K. Maruthan, and M. Natesan, "Kinetics of atmospheric corrosion of mild steel in marine and rural environments," *J. Mar. Sci. Appl.*, vol. 14, no. 1, pp. 105–112, 2015, doi: 10.1007/s11804-015-1286-x.
- [9] M. Morcillo, D. De La Fuente, I. Díaz, and H. Cano, "Atmospheric corrosion of mild steel," *Rev. Metal.*, vol. 47, no. 5, pp. 426–444, 2011, doi: 10.3989/revmetalm.1125.
- [10] D. de la Fuente, J. Alcántara, B. Chico, I. Díaz, J. A. Jiménez, and M. Morcillo, "Characterisation of rust surfaces formed on mild steel exposed to marine atmospheres using XRD and SEM/Micro-Raman techniques," *Corros. Sci.*, vol. 110, pp. 253–264, 2016, doi: 10.1016/j.corsci.2016.04.034.
- [11] P. Dillmann, F. Mazaudier, and S. Hœrlé, "Advances in understanding atmospheric corrosion of iron. I. Rust characterisation of ancient ferrous artefacts exposed to indoor atmospheric corrosion," *Corros. Sci.*, vol. 46, no. 6, pp. 1401–1429, 2004, doi: 10.1016/j.corsci.2003.09.027.
- [12] R. N. Parkins, "Pergamon THE INTERGRANULAR CORROSION AND STRESS CORROSION CRACKING OF MILD STEEL IN CLARKE ' S SOLUTION removing corrosion products from steel samples , the exposure period to the stirred," vol. 36, no. 12, pp. 2097–2110, 1994.
- [13] K. K. and S. P. S. Lee, "Kinetics of intergranular corrosion and separation between initiation and propagation of stress corrosion crack in mild steel," *Scr. Metall.*, vol. 22, no. 1, pp. 31–34, 1988, doi: 10.1016/B978-0-444-40976-8.50013-5.
- [14] M. Morcillo, B. Chico, I. Díaz, H. Cano, and D. de la Fuente, "Atmospheric corrosion data of weathering steels. A review," *Corros. Sci.*, vol. 77, pp. 6–24, 2013, doi: 10.1016/j.corsci.2013.08.021.
- [15] Y. Ma, Y. Li, and F. Wang, "Corrosion of low carbon steel in atmospheric



environments of different chloride content," *Corros. Sci.*, vol. 51, no. 5, pp. 997–1006, 2009, doi: 10.1016/j.corsci.2009.02.009.

- [16] Y. M. Panchenko and A. I. Marshakov, "Long-term prediction of metal corrosion losses in atmosphere using a power-linear function," *Corros. Sci.*, vol. 109, pp. 217–229, 2016, doi: 10.1016/j.corsci.2016.04.002.
- [17] Y. M. Panchenko, A. I. Marshakov, T. N. Igonin, V. V. Kovtanyuk, and L. A. Nikolaeva, "Long-term forecast of corrosion mass losses of technically important metals in various world regions using a power function," *Corros. Sci.*, vol. 88, pp. 306–316, 2014, doi: 10.1016/j.corsci.2014.07.049.
- [18] R. Landolfo, L. Cascini, and F. Portioli, "Modeling of metal structure corrosion damage: A state of the art report," *Sustainability*, vol. 2, no. 7, pp. 2163–2175, 2010, doi: 10.3390/su2072163.
- [19] X. Zhong, X. Wu, and E. H. Han, "Characteristics of Oxidation and Oxygen Penetration of Alloy 690 in 600 °C Aerated Supercritical Water," *J. Mater. Sci. Technol.*, vol. 34, no. 3, pp. 561–569, 2018, doi: 10.1016/j.jmst.2016.11.001.
- [20] R. Avci *et al.*, "A practical method for determining pit depths using X-ray attenuation in EDX spectra," *Corros. Sci.*, vol. 93, pp. 9–18, 2015, doi: 10.1016/j.corsci.2014.12.018.
- [21] A. V. Girão, G. Caputo, and M. C. Ferro, "Application of Scanning Electron Microscopy–Energy Dispersive X-Ray Spectroscopy (SEM-EDS)," *Compr. Anal. Chem.*, vol. 75, pp. 153–168, 2017, doi: 10.1016/bs.coac.2016.10.002.
- [22] Y. Zhou and Y. Zuo, "The Intergranular Corrosion of Mild Steel in CO₂ + NaNO₂ Solution," *Electrochim. Acta*, vol. 154, pp. 157–165, 2015, doi: 10.1016/j.electacta.2014.12.053.
- [23] X. X. Ye *et al.*, "The high-temperature corrosion of Hastelloy N alloy (UNS

N10003) in molten fluoride salts analysed by STXM, XAS, XRD, SEM, EPMA, TEM/EDS," *Corros. Sci.*, vol. 106, pp. 249–259, 2016, doi: 10.1016/j.corsci.2016.02.010.

- [24] T. C. and F. Lansing, "Corrosion Mechanism." .
- [25] T. Bellezze, G. Giuliani, A. Viceré, and G. Roventi, "Study of stainless steels corrosion in a strong acid mixture. Part 2: anodic selective dissolution, weight loss and electrochemical impedance spectroscopy tests," *Corros. Sci.*, vol. 130, no. October, pp. 12–21, 2018, doi: 10.1016/j.corsci.2017.10.010.
- [26] A. A. Almusallam, "Effect of degree of corrosion on the properties of reinforcing steel bars," *Constr. Build. Mater.*, vol. 15, no. 8, pp. 361–368, 2001, doi: 10.1016/S0950-0618(01)00009-5.
- [27] H. S. Lee and Y. S. Cho, "Evaluation of the mechanical properties of steel reinforcement embedded in concrete specimen as a function of the degree of reinforcement corrosion," *Int. J. Fract.*, vol. 157, no. 1–2, pp. 81–88, 2009, doi: 10.1007/s10704-009-9334-7.
- [28] C. A. Apostolopoulos and V. G. Papadakis, "Consequences of steel corrosion on the ductility properties of reinforcement bar," *Constr. Build. Mater.*, vol. 22, no. 12, pp. 2316–2324, 2008, doi: 10.1016/j.conbuildmat.2007.10.006.
- [29] W. Zhang, X. Song, X. Gu, and S. Li, "Tensile and fatigue behavior of corroded rebars," *Constr. Build. Mater.*, vol. 34, pp. 409–417, 2012, doi: 10.1016/j.conbuildmat.2012.02.071.
- [30] Ohga, M, Appuhamy, J.M.R.S, Kaita, T, Fujii, K, and Dissanayake, P.B.R, "Evaluation of Tensile Strength Deterioration of Bridge Plates Due To Corrosion," *Int. Conf. Sustain. Built Environ.*, no. December, pp. 521–528, 2010.
- [31] T. Kaita, J. M. R. S. Appuhamy, K. Itogawa, M. Ohga, and K. Fujii,

“Experimental study on remaining strength estimation of corroded wide steel plates under tensile force,” *Procedia Eng.*, vol. 14, pp. 2707–2713, 2011, doi: 10.1016/j.proeng.2011.07.340.

- [32] Y. Wang, J. A. Wharton, and R. A. Shenoi, “Ultimate strength analysis of aged steel-plated structures exposed to marine corrosion damage: A review,” *Corros. Sci.*, vol. 86, pp. 42–60, 2014, doi: 10.1016/j.corsci.2014.04.043.
- [33] Y. Wang, S. Xu, H. Wang, and A. Li, “Predicting the residual strength and deformability of corroded steel plate based on the corrosion morphology,” *Constr. Build. Mater.*, vol. 152, pp. 777–793, 2017, doi: 10.1016/j.conbuildmat.2017.07.035.
- [34] M. Weber, P. D. Eason, H. Özdeş, and M. Tiryakioğlu, “The Effect of Surface Corrosion Damage on the Fatigue Life of Extruded Aluminum Alloy 6061-T6,” University of North Florida, 2017.
- [35] X. Y. Zhang, S. X. Li, R. Liang, and R. Akid, “Effect of corrosion pits on fatigue life and crack initiation,” *13th Int. Conf. Fract. 2013, ICF 2013*, vol. 2, pp. 1667–1675, 2013.
- [36] R. Rahgozar and Y. Sharifi, “Remaining fatigue life of corroded steel structural members,” *Adv. Struct. Eng.*, vol. 14, no. 5, pp. 881–890, 2011, doi: 10.1260/1369-4332.14.5.881.
- [37] S. Al-Shahrani and T. J. Marrow, “Effect of surface finish on fatigue of stainless steels,” *12th Int. Conf. Fract. 2009, ICF-12*, vol. 2, no. 5, pp. 861–870, 2009.
- [38] N. Jothilakshmi, P. P. Nanekar, and V. Kain, “Assessment of intergranular corrosion attack in austenitic stainless steel using ultrasonic measurements,” *Corrosion*, 2013, doi: 10.5006/0714.
- [39] J. Jiao, Z. Fan, F. Zhong, C. He, and B. Wu, “Application of Ultrasonic Methods

for Early Detection of Intergranular Corrosion in Austenitic Stainless Steel," *Res. Nonddestruct. Eval.*, 2016, doi: 10.1080/09349847.2015.1103922.

- [40] K. R. Olsen, "Ultrasonic Detection of Simulated Corrosion in 1 Inch Diameter Steel Tieback Rods," no. August 2009, 2009.
- [41] K. K. Maddumahewa, N. P. A. Madusanka, S. A. K. V. M. Piyathilake, and V. Sivahar, "Ultrasonic Nondestructive Evaluation Of Corrosion Damage In Concrete Reinforcement Bars," pp. 79–82, 2017.
- [42] X. Li, Y. Song, F. Liu, H. Hu, and P. Ni, "Evaluation of mean grain size using the multi-scale ultrasonic attenuation coefficient," *NDT E Int.*, vol. 72, pp. 25–32, 2015, doi: 10.1016/j.ndteint.2015.02.002.
- [43] B. Peirson, "Comparison of the ASTM Comparative Chart Method and the Mean Line Intercept Method in Determining the Effect of Solidification Rate on the Yield Strength of AA5182," Grand Valley State University, 2005.
- [44] H. Ogi, M. Hirao, and T. Honda, "Ultrasonic attenuation and grain-size electromagnetic acoustic resonance," *J. Acoust. Soc. Am.*, vol. 98, no. 1, pp. 458–464, 2014, [Online]. Available: <https://doi.org/10.1121/1.413703>.
- [45] J. Schijve, "Fatigue as a Phenomenon in the Material," in *Fatigue of Structures and Materials*, SpringerLink, 2009.
- [46] P. Behjati, H. Vahid Dastjerdi, R. Mahdavi, and D. Rasouli, "Effect of microstructure on attenuation mechanism of ultrasonic waves in carbon steels," *Mater. Sci. Technol.*, vol. 26, no. 4, pp. 482–486, 2010, doi: 10.1179/026708309X12495548508509.