

REFERENCE

1. T. Islam and H. M. M. A. Rashed, "Classification and application of Plain Carbon Steels," Reference Module in Materials Science and Materials Engineering, 2019. doi:10.1016/b978-0-12-803581-8.10268-1
2. A. Alaswad, K. Y. Benyounis, and A. G. Olabi, "Optimization techniques in material processing," Reference Module in Materials Science and Materials Engineering, 2016. doi:10.1016/b978-0-12-803581-8.04004-2
3. V. I. Stashenko, O. A. Troitskii, and N. N. Novikova, "Electroplastic drawing medium-Carbon Steel," *Journal of Machinery Manufacture and Reliability*, vol. 38, no. 4, pp. 369–372, 2009. doi:10.3103/s1052618809040128
4. M.-J. Kim et al., "Electric current–assisted deformation behavior of Al-mg-si alloy under uniaxial tension," *International Journal of Plasticity*, vol. 94, pp. 148–170, 2017. doi:10.1016/j.ijplas.2016.09.010
5. N. Chakraborti, "The genetic secrets of making, shaping and treating of steel," *Materials and Manufacturing Processes*, vol. 20, no. 3, pp. 333–334, 2005. doi:10.1081/amp-200053415
6. I. Baker, *Fifty materials that make the world*, 2018. doi:10.1007/978-3-319-78766-
7. J. Spoerl, "A brief history of iron and steel production," Academia.edu, https://www.academia.edu/en/31060927/A_Brief_History_of_Iron_and_Steel_Production (accessed Jan. 16, 2024).
8. P. C. Gasson, "Materials Sciences and Engineering – Eighth Edition. W. D. Callister and D. G. Rethwisch John Wiley and Sons, the atrium, Southern Gate, Chichester, West Sussex, PO19 8SQ, UK. 2010. 968PP. illustrated. £47.99. ISBN 978-0-470-50586-1.," *The Aeronautical Journal*, vol. 115, no. 1168, pp. 388–389, 2011. doi:10.1017/s0001924000005947
9. Abbas Sheyaa Alwan, Muna Abbass, and Jalal M. Jalil, "Welding consumables. covered electrodes for manual metal arc welding of Stainless and heat resisting steels. classification," See discussions, stats, and author profiles for this publication at: [https://www.researchgate.net/publication/293333803 Parametric Study of Metallurgical and Heat Transfer Characteristics of Manual Metal Arc Welding Process](https://www.researchgate.net/publication/293333803_Parametric_Study_of_Metallurgical_and_Heat_Transfer_Characteristics_of_Manual_Metal_Arc_Welding_Process), Sep. 2009. doi:10.3403/01242444u
10. The Iron Carbon Phase Diagram, https://www.tf.uni-kiel.de/matwis/amat/iss/kap_6/illustr/s6_1_2.html (accessed Jan. 16, 2022).
11. B. Chandra Kandpal et al., "Effect of heat treatment on properties and microstructure of Steels," *Materials Today: Proceedings*, vol. 44, pp. 199–205, 2021. doi:10.1016/j.matpr.2020.08.556 A case study of heat treatment on AISI 1020 steel - global journals, https://globaljournals.org/GJRE_Volume14/4-A-Case-Study-of-Heat.pdf (accessed Jan. 18, 2024).
12. A case study of heat treatment on AISI 1020 steel - global journals, https://globaljournals.org/GJRE_Volume14/4-A-Case-Study-of-Heat.pdf (accessed Jan. 18, 2024).

13. General Kinematics, "Cold forging vs. hot forging: Pros and cons," General Kinematics, <https://www.generalkinematics.com/blog/cold-forging-vs-hot-forging/> (accessed Jan. 26, 2022).
14. Extrusion process : Working, types, application, advantages and ..., <https://paulmurphyplastics.com/2019/09/25/extrusion-process-working-types-application-advantages-and-disadvantages/> (accessed Jan. 26, 2022).
15. D. Richter, "Advantages, disadvantages of deep drawing and stamping," Charles Richter, <https://www.charlesrichter.com/the-advantages-and-disadvantages-of-deep-drawing/> (accessed Jan. 26, 2022).
16. O.A. Troitskii, V.I. Likhtman, "The anisotropy of the action of electron and γ radiation on the deformation of zinc single crystals in the brittle state," *Sov. Phys. Dok.*, vol. 8, no. 91, 1963.
17. V. Y. KRAVCHENKO, "EFFECT OF DIRECTED ELECTRON BEAM ON MOVING DISLOCATIONS," *SOVIET PHYSICS JETP*, vol. 24, no. 1967, p. 6, 1966.
18. Yu. I. Bolko, Ya. E. Geguzin, and Yu. I. Klinchuk, Drag of dislocations by an electron wind in metals, http://jetp.ras.ru/cgi-bin/dn/e_054_06_1156.pdf (accessed Jan. 29, 2022).
19. X. Zhang *et al.*, "Electron Force-induced dislocations annihilation and regeneration of a superalloy through electrical in-situ transmission electron microscopy observations," *Journal of Materials Science & Technology*, vol. 36, pp. 79–83, Jan. 2020. doi:10.1016/j.jmst.2019.08.008
20. N. K. Dimitrov, Y. Liu, and M. F. Horstemeyer, "Electroplasticity: A review of mechanisms in electro-mechanical coupling of ductile metals," *Mechanics of Advanced Materials and Structures*, vol. 29, no. 5, pp. 705–716, Jul. 2020. doi:10.1080/15376494.2020.1789925
21. H. SONG, Z. WANG, and X. HE, "Improving in plasticity of orthorhombic ti2alnb-based alloys sheet by high density electropulsing," *Transactions of Nonferrous Metals Society of China*, vol. 23, no. 1, pp. 32–37, Jan. 2013. doi:10.1016/s1003-6326(13)62425-5
22. A. F. Sprecher, S. L. Mannan, and H. Conrad, "On the temperature rise associated with the electroplastic effect in Titanium," *Scripta Metallurgica*, vol. 17, no. 6, pp. 769–772, Jun. 1983. doi:10.1016/0036-9748(83)90491-x
23. M. I. Molotskii, "Theoretical basis for electro- and magnetoplasticity," *Materials Science and Engineering: A*, vol. 287, no. 2, pp. 248–258, Aug. 2000. doi:10.1016/s0921-5093(00)00782-6
24. M. Molotskii and V. Fleurov, "Magnetic effects in electroplasticity of metals," *Physical Review B*, vol. 52, no. 22, pp. 15829–15834, Dec. 1995. doi:10.1103/physrevb.52.15829
25. G. Lormand, "Electrical properties of grain boundaries," *Le Journal de Physique Colloques*, vol. 43, no. C6, Dec. 1982. doi:10.1051/jphyscol:1982625

26. M.-J. Kim et al., "Elucidating the origin of electroplasticity in metallic materials," *Applied Materials Today*, vol. 21, p. 100874, Dec. 2020. doi:10.1016/j.apmt.2020.100874
27. T. A. Perkins, T. J. Kronenberger, and J. T. Roth, "Metallic forging using electrical flow as an alternative to warm/hot working," *Journal of Manufacturing Science and Engineering*, vol. 129, no. 1, pp. 84–94, Jun. 2006. doi:10.1115/1.2386164
28. C. M. Dzialo, M. S. Siopis, B. L. Kinsey, and K. J. Weinmann, "Effect of current density and zinc content during electrical-assisted forming of Copper Alloys," *CIRP Annals*, vol. 59, no. 1, pp. 299–302, 2010. doi:10.1016/j.cirp.2010.03.014
29. C. D. Ross, T. J. Kronenberger, and J. T. Roth, "Effect of DC on the formability of ti–6al–4v," *Journal of Engineering Materials and Technology*, vol. 131, no. 3, May 2009. doi:10.1115/1.3078307
30. W. A. Salandro, C. Bunget, and L. Mears, "Modeling and quantification of the electroplastic effect when bending stainless steel sheet metal," *ASME 2010 International Manufacturing Science and Engineering Conference, Volume 1*, Jan. 2010. doi:10.1115/msec2010-34043
31. C. D. Lang et al., "Electrically-assisted manufacturing for reduction in forging forces of bearing steels," *Procedia Manufacturing*, vol. 48, pp. 349–357, 2020. doi:10.1016/j.promfg.2020.05.057
32. H.-D. Nguyen-Tran et al., "A review of electrically-assisted manufacturing," *International Journal of Precision Engineering and Manufacturing-Green Technology*, vol. 2, no. 4, pp. 365–376, Oct. 2015. doi:10.1007/s40684-015-0045-4
33. Z. Xu, G. Tang, S. Tian, F. Ding, and H. Tian, "Research of electroplastic rolling of Az31 MG Alloy Strip," *Journal of Materials Processing Technology*, vol. 182, no. 1–3, pp. 128–133, Feb. 2007. doi:10.1016/j.jmatprotec.2006.07.019
34. Y. Lu et al., "The influence of electroplastic rolling on the mechanical deformation and phase evolution of Bi-2223/Ag Tapes," *Journal of Materials Science*, vol. 45, no. 13, pp. 3514–3519, Mar. 2010. doi:10.1007/s10853-010-4392-9
35. R. Zhu, G. Tang, S. Shi, and M. Fu, "Effect of electroplastic rolling on deformability and oxidation of NITINB shape memory alloy," *Journal of Materials Processing Technology*, vol. 213, no. 1, pp. 30–35, Jan. 2013. doi:10.1016/j.jmatprotec.2012.08.001
36. R. F. Zhu, G. Y. Tang, S. Q. Shi, and M. W. Fu, "Effect of electroplastic rolling on the ductility and superelasticity of Tini shape memory alloy," *Materials & Design*, vol. 44, pp. 606–611, Feb. 2013. doi:10.1016/j.matdes.2012.08.045
37. G. Tang, J. Zhang, Y. Yan, H. Zhou, and W. Fang, "The engineering application of the electroplastic effect in the cold-drawing of stainless steel wire," *Journal of Materials Processing Technology*, vol. 137, no. 1–3, pp. 96–99, Jun. 2003. doi:10.1016/s0924-0136(02)01091-9

38. V. I. Stashenko, O. A. Troitskii, and N. N. Novikova, "Electroplastic drawing medium-Carbon Steel," *Journal of Machinery Manufacture and Reliability*, vol. 38, no. 4, pp. 369–372, Aug. 2009. doi:10.3103/s1052618809040128
39. J. Asghar and R. N. V, Importance of Tool Configuration in Incremental Sheet Metal Forming of Difficult to Form Materials using Electro-Plasticity, https://raiith.iith.ac.in/902/1/WCE2013_pp1734-1738.pdf (accessed Feb. 16, 2022).
40. Z. T. Xu, L. F. Peng, P. Y. Yi, and X. M. Lai, "Study on a novel electrical-assisted pressure welding process of thin metallic foils," *Applied Mechanics and Materials*, vol. 271–272, pp. 147–151, Dec. 2012. doi:10.4028/www.scientific.net/amm.271-272.147
41. S. A. Baranov, V. I. Staschenko, A. V. Sukhov, O. A. Troitskiy, and A. V. Tyapkin, "Electroplastic Metal cutting," *Russian Electrical Engineering*, vol. 82, no. 9, pp. 477–479, Sep. 2011. doi:10.3103/s1068371211090033
42. O. Omoigade, "Electric current as a steel wire manufacturing tool," *Materials Science and Technology*, vol. 34, no. 18, pp. 2202–2213, Dec. 2018. doi:10.1080/02670836.2018.1488435
43. W. A. Salandro *et al.*, "Effect of electrical pulsing on various heat treatments of 5xxx series aluminum alloys," *ASME 2008 International Manufacturing Science and Engineering Conference, Volume 1*, Jan. 2008. doi:10.1115/msec_icmp2008-72512
44. X. Li, X. Li, J. Zhu, X. Ye, and G. Tang, "Microstructure and texture evolution of cold-rolled MG-3al-1ZN alloy by electropulse treatment stimulating recrystallization," *Scripta Materialia*, vol. 112, pp. 23–27, Feb. 2016. doi:10.1016/j.scriptamat.2015.09.001
45. P. Liang and K.-L. Lin, "Non-deformation recrystallization of metal with electric current stressing," *Journal of Alloys and Compounds*, vol. 722, pp. 690–697, Oct. 2017. doi:10.1016/j.jallcom.2017.06.032
46. V. Delobelle, G. Chagnon, D. Favier, and T. Alonso, "Study of electropulse heat treatment of cold worked niti wire: From uniform to localised tensile behaviour," *Journal of Materials Processing Technology*, vol. 227, pp. 244–250, Jan. 2016. doi:10.1016/j.jmatprotec.2015.08.011
47. S. A. Davari and A. S. Wexler, "Quantification of toxic metals using machine learning techniques and spark emission spectroscopy," *Atmospheric Measurement Techniques*, vol. 13, no. 10, pp. 5369–5377, Oct. 2020, doi: <https://doi.org/10.5194/amt-13-5369-2020>.
48. V. Soleymani and B. Eghbali, "Grain Refinement in a Low Carbon Steel Through Multidirectional Forging," *Journal of Iron and Steel Research International*, vol. 19, no. 10, pp. 74–78, Oct. 2012, doi: [https://doi.org/10.1016/s1006-706x\(12\)60155-1](https://doi.org/10.1016/s1006-706x(12)60155-1).
49. J. Duan, D. Farrugia, C. Davis, and Z. Li, "Effect of impurities on the microstructure and mechanical properties of a low carbon steel," *Ironmaking & Steelmaking*, vol.

- 49, no. 2, pp. 140–146, Sep. 2021, doi: <https://doi.org/10.1080/03019233.2021.1972270>.
50. H.-J. Jeong, J. Park, K. J. Jeong, N. M. Hwang, S.-T. Hong, and H. N. Han, “Effect of Pulsed Electric Current on TRIP-Aided Steel,” *International Journal of Precision Engineering and Manufacturing-Green Technology*, vol. 6, no. 2, pp. 315–327, Feb. 2019, doi: <https://doi.org/10.1007/s40684-019-00060-1>
 51. H. Xu et al., “Effect of Pulsed Current on the Tensile Deformation Behavior and Microstructure Evolution of AZ80 Magnesium Alloy,” *Materials*, vol. 13, no. 21, pp. 4840–4840, Oct. 2020, doi: <https://doi.org/10.3390/ma13214840>.
 52. B. Jiang, D. Zhang, H. Xu, Y. Liu, Z. Cao, and X. Yang, “Excellent Ductility in the Extruded AZ61 Magnesium Alloy Tube Induced by Electropulsing Treatment during Tension,” *Metals*, vol. 11, no. 5, pp. 813–813, May 2021, doi: <https://doi.org/10.3390/met11050813>.
 53. Jae Kyung Roh, Jeong Gil Seo, S.-T. Hong, M.-J. Kim, Heung Nam Han, and J. R. Roth, “The mechanical behavior of 5052-H32 aluminum alloys under a pulsed electric current,” *International Journal of Plasticity*, vol. 58, pp. 84–99, Jul. 2014, doi: <https://doi.org/10.1016/j.ijplas.2014.02.002>.
 54. H.-J. Jeong, J. Park, K. J. Jeong, N. M. Hwang, S.-T. Hong, and H. N. Han, “Effect of Pulsed Electric Current on TRIP-Aided Steel,” *International Journal of Precision Engineering and Manufacturing-Green Technology*, vol. 6, no. 2, pp. 315–327, Feb. 2019, doi: <https://doi.org/10.1007/s40684-019-00060-1>.
 55. B. Roodenburg, J. Morren, H. E. (Iekje) Berg, and S. W. H. de Haan, “Metal release in a stainless steel Pulsed Electric Field (PEF) system,” *Innovative Food Science & Emerging Technologies*, vol. 6, no. 3, pp. 327–336, Sep. 2005, doi: <https://doi.org/10.1016/j.ifset.2005.04.006>.
 56. Ichsan Indhiarto, T. Shimizu, and M. Yang, “Effect of Peak Current Density on Tensile Properties of AZ31B Magnesium Alloy,” *Materials*, vol. 14, no. 6, pp. 1457–1457, Mar. 2021, doi: <https://doi.org/10.3390/ma14061457>.
 57. N. T. Thien, Y.-H. Jeong, S.-T. Hong, M.-J. Kim, H. N. Han, and M.-G. Lee, “Electrically assisted tensile behavior of complex phase ultra-high strength steel,” *International Journal of Precision Engineering and Manufacturing-Green Technology*, vol. 3, no. 4, pp. 325–333, Oct. 2016, doi: <https://doi.org/10.1007/s40684-016-0041-3>.
 58. N. Hendeniya, G. A. Abeygunawardena, I. De. Silva, and S. Wickramasinghe, “The tensile electroplasticity of low carbon steel with low amplitude pulse current,” *2020 Moratuwa Engineering Research Conference (MERCon)*, Jul. 2020. doi:10.1109/mercon50084.2020.9185238
 59. *Metals Handbook*. Metals Park, OH, 1998.
 60. H. Zhang and J. Senkara, *Resistance Welding: Fundamentals and Applications*. Boca Raton (FL): CRC Press, 2012.

61. K. Vedantam, "Johnson - cook strength models for mild and DP 590 steels," *AIP Conference Proceedings*, 2006. doi:10.1063/1.2263437
62. L. Dingle and M. H. Tooley, *Aircraft Engineering Principles*. London: Routledge, 2017.
63. I. INDHIARTO, "Investigation of Peak Current Density Effect on Magnesium Alloy AZ31B Foil Tensile Properties under High Density Pulsed Current," National Institute of Informatics, https://tokyo-metro-u.repo.nii.ac.jp/record/2138/files/T00252-001_fulltext.pdf (accessed Mar. 15, 2022).
64. A. Rahnema and R. Qin, "Room temperature texturing of austenite/ferrite steel by electropulsing," *Scientific Reports*, vol. 7, no. 1, Feb. 2017. doi:10.1038/srep42732
65. T. Dhanushka, G. A. Abeygunawardena, and I. De. Silva, "Effect of pulsed current frequency on electroplasticity in Plain Carbon Steel: An experimental study," *2023 Moratuwa Engineering Research Conference (MERCon)*, Nov. 2023. doi:10.1109/mercon60487.2023.10355493
66. A. Lahiri, P. Shanthraj, and F. Roters, "Understanding the mechanisms of electroplasticity from a crystal plasticity perspective," *Model. Simul. Mater. Sci. Eng.*, vol. 27, no. 8, 2019, doi: 10.1088/1361-651X/ab43fc.
67. C. W. Burrows, *Correlation of the Magnetic and Mechanical Properties of Steel*, by Charles W. Burrows .. Washington: Government printing Office, 1926.