

## DAFTAR PUSTAKA

- [1] Ikuhiro Inagaki, Tsutomu Takechi, Yoshihisa Shirai, and Nozomu Ariyasu, “Application and features of titanium for the aerospace industry,” pp. 22–27, 2014.
- [2] J. Dai, J. Zhu, C. Chen, and F. Weng, “High temperature oxidation behavior and research status of modifications on improving high temperature oxidation resistance of titanium alloys and titanium aluminides: A review,” 2016, Elsevier Ltd. doi: 10.1016/j.jallcom.2016.06.212.
- [3] I. Aniekan, O. Ikechukwu, P. O. Ebunilo, and E. Ikpe, “Material Selection for High Pressure (HP) Compressor Blade of an Aircraft Engine,” *International Journal of Advanced Materials Research*, vol. 2, no. 4, pp. 59–65, 2016, [Online]. Available: <http://www.aiscience.org/journal/ijamrhttp://creativecommons.org/licenses/by/4.0/>
- [4] N. Vaché, Y. Cadoret, B. Dod, and D. Monceau, “Modeling the oxidation kinetics of titanium alloys: Review, method and application to Ti-64 and Ti-6242s alloys,” *Corros Sci*, vol. 178, Jan. 2021, doi: 10.1016/j.corsci.2020.109041.
- [5] D. Rugg, M. Dixon, and J. Burrows, “High-temperature application of titanium alloys in gas turbines. Material life cycle opportunities and threats – an industrial perspective,” *Materials at High Temperatures*, vol. 33, no. 4–5, pp. 536–541, Jun. 2016, doi: 10.1080/09603409.2016.1184423.
- [6] B. Sefer, *Oxidation and alpha-case phenomena in titanium alloys used in aerospace industry : Ti-6Al-2Sn-4Zr-2Mo and Ti-6Al-4V*. Luleå University of Technology, 2014.
- [7] S. Perosanz, M. Viscasillas, N. Martin Piris, M. Hokka, and D. Barba, “On the effect of the microstructure on the dynamic behaviour of Ti-6Al-4V,” *EPJ Web Conf*, vol. 250, p. 02013, 2021, doi: 10.1051/epjconf/202125002013.
- [8] A. Pathania, S. A. Kumar, B. K. Nagesha, S. Barad, and T. N. Suresh, “Reclamation of titanium alloy based aerospace parts using laser based metal deposition methodology,” in *Materials Today: Proceedings*, Elsevier Ltd, 2021, pp. 4886–4892. doi: 10.1016/j.matpr.2021.01.354.

- [9] F. Gemma, R. Joan Josep, S. Birhan, P. Robert, A. Marta-Lena, and M. Antonio, “Oxidation Behavior Of Ti6Al4V Alloy Exposed To Isothermal And Cyclic Thermal Treatments,” pp. 1573–1579, 2017.
- [10] Prof. Caballero, *Encyclopedia of Materials: Metals and Alloys: Metals and Alloys*, 1st ed. Elsevier, 2021. Accessed: Jul. 17, 2024. [Online]. Available: <https://www.sciencedirect.com/referencework/9780128197332/encyclopedia-of-materials-metals-and-alloys>
- [11] G. Rhys Watkins and Mp. Thesis, “Development of a High Temperature Titanium Alloy for Gas Turbine Applications,” MPhil thesis, University of Sheffield, 2015.
- [12] J. Dai, J. Zhu, L. Zhuang, and S. Li, “Effect Of Surface Aluminizing On Long-Term High-Temperature Thermal Stability Of TC4 Titanium Alloy,” *Surface Review and Letters*, vol. 23, no. 2, Apr. 2016, doi: 10.1142/S0218625X15501024.
- [13] Y. Pan *et al.*, “Effect of Sn Addition on Densification and Mechanical Properties of Sintered TiAl Base Alloys,” *Jinshu Xuebao/Acta Metallurgica Sinica*, vol. 54, no. 1, pp. 93–99, Jan. 2018, doi: 10.11900/0412.1961.2017.00143.
- [14] Y. Pan *et al.*, “Effect of Sn addition on the high-temperature oxidation behavior of high Nb-containing TiAl alloys,” *Corros Sci*, vol. 166, Apr. 2020, doi: 10.1016/j.corsci.2020.108449.
- [15] J. Y. Xu, Z. Z. Shi, Z. B. Zhang, H. G. Huang, and X. F. Liu, “Significant enhancement of high temperature oxidation resistance of pure titanium via minor addition of Nb and Si,” *Corros Sci*, vol. 166, Apr. 2020, doi: 10.1016/j.corsci.2020.108430.
- [16] Y. Song *et al.*, “Effect of Nb content on cyclic oxidation behavior of as-cast Ti-1100 alloys,” *Materials*, vol. 13, no. 5, Mar. 2020, doi: 10.3390/ma13051082.
- [17] F. Sharifi *et al.*, “The effect of different heat treatment cycle on hot corrosion and oxidation behavior of Ti-6Al-4V,” *Mater Res Express*, vol. 6, no. 11, Oct. 2019, doi: 10.1088/2053-1591/ab4cb4.
- [18] K. V Sai Srinadh and V. Singh, “Oxidation behaviour of the near  $\alpha$   $\alpha$ -titanium alloy IMI 834,” *Bulletin of Materials Science*, 347-354. 2004.
- [19] S. Amalina Azahra *et al.*, “The Effect of Solution Treatment Temperature on Hardness, Microstructure, and Corrosion Resistance of Ti-6Al-4V ELI,” *Defect and Diffusion Forum*, 2024, [Online]. Available: www.scientific.net.

- [20] P. Pinke Óbudai Egyetem, L. Čaplovič, and T. Anna Kovacs Óbudai Egyetem, “The Influence Of Heat Treatment On The Microstructure Of The Casted Ti6Al4V Titanium Alloy,” 2011, [Online]. Available: <https://www.researchgate.net/publication/266870574>
- [21] Cahya Sutowo, Fendy Rokmanto, Merliana K Waluyo, and Alfirano, “Pengaruh Variasi Temperatur Solution Treatment Terhadap Struktur Mikro Dan Kekuatan Paduan Ti-6Al-6Nb Untuk Aplikasi Biomedis,” *Seminar Sains dan Teknologi 2017*, 2017.
- [22] H. Warlimont, “Titanium and titanium alloys,” in *Springer Handbooks*, Springer, 2018, pp. 195–206. doi: 10.1007/978-3-319-69743-7\_7.
- [23] Adrian. P. Mouritz, “Introduction to aerospace materials,” in *Titanium alloys for aerospace structures and engines*, Elsevier, 2012, pp. 202–223. doi: 10.1533/9780857095152.202.
- [24] H. A. Kishawy and A. Hosseini, “Materials Forming, Machining and Tribology Machining Difficult-to-Cut Materials Basic Principles and Challenges,” 2019. [Online]. Available: <http://www.springer.com/series/11181>
- [25] K. K. Sankaran and R. S. Mishra, “Titanium Alloys,” in *Metallurgy and Design of Alloys with Hierarchical Microstructures*, Elsevier, 2017, pp. 177–288. doi: 10.1016/b978-0-12-812068-2.00005-9.
- [26] C. Leyens and M. Peters, *Titanium and Titanium Alloys: Fundamentals and Applications*. Wiley, 2003. doi: 10.1002/3527602119.
- [27] E. O. Ezugwu and Z. M. Wang, “Materials Processing Technology Titanium alloys and their machinability a review,” 1997.
- [28] X. Yang and C. R. Liu, “Machining titanium and its alloys,” *Machining Science and Technology*, vol. 3, no. 1, pp. 107–139, 1999, doi: 10.1080/10940349908945686.
- [29] ASM International, *Properties and Selection: Nonferrous Alloys and Special-Purpose Materials*, vol. 2. ASM International, 1990. doi: 10.31399/asm.hb.v02.9781627081627.
- [30] M. Motyka, K. Kubiak, J. Sieniawski, and W. Ziaja, “Phase Transformations and Characterization of  $\alpha + \beta$  Titanium Alloys,” in *Comprehensive Materials Processing*, vol. 2, Elsevier Ltd, 2014, pp. 7–36. doi: 10.1016/B978-0-08-096532-1.00202-8.

- [31] P. Singh, H. Pungotra, and N. S. Kalsi, “On the characteristics of titanium alloys for the aircraft applications,” in *Materials Today: Proceedings*, Elsevier Ltd, 2017, pp. 8971–8982. doi: 10.1016/j.matpr.2017.07.249.
- [32] M. Peters, J. Kumpfert, C. H. Ward, and C. Leyens, “Titanium alloys for aerospace applications,” Jun. 01, 2003. doi: 10.1002/adem.200310095.
- [33] Ezekiel Enterprises, “Jet Turbine Engine Fundamentals ,” in *Continuing Education For Professional Engineers*, LLc, 2019.
- [34] E. Van Der Weide, G. Kalitzin, J. Schlüter, and J. J. Alonso, “Unsteady Turbomachinery Computations Using Massively Parallel Platforms,” 2006.
- [35] T. Okura, “Materials for Aircraft Engines,” 2015, Accessed: Nov. 14, 2024. [Online]. Available: <http://animagraffs.com/inside-a-jet-engine/>
- [36] H. Guleryuz and H. Cimenoglu, “Oxidation of Ti-6Al-4V alloy,” *J Alloys Compd*, vol. 472, no. 1–2, pp. 241–246, Mar. 2009, doi: 10.1016/j.jallcom.2008.04.024.
- [37] R. R. Boyer, “A An overview on the use of titanium in the aerospace industry,” *Materials Science and Engineering*, vol. 213, no. 1–2, pp. 103–114, 1996.
- [38] Rajan T.V., C.P Sharma, and Ashok Sharma, *Heat Treatment Principles and Techniques Second Edition. Eastern Economic Edition*. New Delhi, 2011.
- [39] H. Galarraga, R. J. Warren, D. A. Lados, R. R. Dehoff, M. M. Kirka, and P. Nandwana, “Effects of heat treatments on microstructure and properties of Ti-6Al-4V ELI alloy fabricated by electron beam melting (EBM),” 2017. [Online]. Available: <https://www.elsevier.com/open-access/userlicense/1.0/>
- [40] Jr. Matthew J. Donachie, “Titanium: A Technical Guide, 2nd Edition,” 2000. [Online]. Available: [www.iran-mavad.com](http://www.iran-mavad.com)
- [41] B. D. Venkatesh, D. L. Chen, and S. D. Bhole, “Effect of heat treatment on mechanical properties of Ti-6Al-4V ELI alloy,” *Materials Science and Engineering: A*, vol. 506, no. 1–2, pp. 117–124, Apr. 2009, doi: 10.1016/j.msea.2008.11.018.
- [42] Vahid Salimian Rizi, “Ce Pte Us Pt,” *Mater. Res. Express*, pp. 1–12, 2019.
- [43] A. S. Khanna, “High-Temperature Oxidation,” in *Handbook of Environmental Degradation of Materials*, vol. 2, Elsevier, 2018, pp. 117–132. doi: 10.1016/B978-0-323-52472-8.00006-X.

- [44] E. Dong, W. Yu, Q. Cai, L. Cheng, and J. Shi, “High-Temperature Oxidation Kinetics and Behavior of Ti–6Al–4V Alloy,” *Oxidation of Metals*, vol. 88, no. 5–6, pp. 719–732, Dec. 2017, doi: 10.1007/s11085-017-9770-0.
- [45] Sanjaya Okky and A.P Bayuseno, “Analisis Kegagalan Material Pipa Ferrule Nickel Alloy N6025 Pada Waste Heat Boiler Akibat Suhu Tinggi Berdasarkan Pengujian : Mikrografi Dan Kekerasan,” *Jurnal Teknik Mesin*, vol. 2, pp. 33–39, Oct. 2014.
- [46] A. Krisnawan, “Karakterisasi Sampel Paduan Magnesium Jenis AZ9 1D Dengan Berbagai Variasi Waktu Milling Menggunakan X-Ray Fluorescence (XRF) Dan X-Ray Difraction (XRD)”. Jakarta: Universitas Islam Negeri Syarif Hidayatullah, 2009.
- [47] Y. Yuan, N. Zhang, W. Tao, X. Cao, and Y. He, “Fatty acids as phase change materials: A review,” 2014. doi: 10.1016/j.rser.2013.08.107.
- [48] M. Nakai, M. Niinomi, H. Liu, and T. Kitashima, “Suppression of Grain Boundary  $\alpha$  Formation by Addition of Silicon in a Near- $\beta$  Titanium Alloy,” *Mater Trans*, vol. 60, no. 9, pp. 1749–1754, Jul. 2019, doi: 10.2320/matertrans.ME201920.
- [49] J. Mantione, M. Garcia-Avila, M. Arnold, D. Bryan, and J. Foltz, “Properties of Novel High Temperature Titanium Alloys for Aerospace Applications,” *MATEC Web of Conferences*, vol. 321, p. 04006, 2020, doi: 10.1051/matecconf/202032104006.
- [50] N. Eshawish, S. Malinov, and W. Sha, “Effect of Solution Treatment and Cooling Rate on the Microstructure and Hardness of Ti-6Al-4V Alloy Manufactured by Selective Laser Melting Before and After Hot Isostatic Pressing Treatment,” *J Mater Eng Perform*, vol. 31, no. 5, pp. 3550–3558, May 2022, doi: 10.1007/s11665-021-06489-3.
- [51] F. Rokhmanto, H. Arief, Alfirano, and C. Sutowo, “Characteristic of Ti-6Al-6Nb alloys following solution treatment with cryogenic cooling for implant applications,” in *IOP Conference Series: Materials Science and Engineering*, Institute of Physics Publishing, Jul. 2019. doi: 10.1088/1757-899X/541/1/012043.
- [52] T. Grosdidier, Y. Combres, E. Gautier, and M.-J. Philippe, “Effect of Microstructure Variations on the Formation of Deformation-Induced Martensite and Associated Tensile Properties in a Metastable Ti Alloy,” *Metallurgical And Materials* , 2000.

- [53] Ritupurna Sahoo and Abu Syed Kabir, *TMS 2020 149th Annual Meeting & Exhibition Supplemental Proceedings*. in The Minerals, Metals & Materials Series. Cham: Springer International Publishing, 2020. doi: 10.1007/978-3-030-36296-6.
- [54] J. Lin *et al.*, “Effects of solution treatment and aging on the microstructure, mechanical properties, and corrosion resistance of a  $\beta$  type Ti-Ta-Hf-Zr alloy,” *RSC Adv*, vol. 7, no. 20, pp. 12309–12317, 2017, doi: 10.1039/c6ra28464g.
- [55] L. E. Murr *et al.*, “Microstructure and mechanical behavior of Ti-6Al-4V produced by rapid-layer manufacturing, for biomedical applications,” Jan. 2009. doi: 10.1016/j.jmbbm.2008.05.004.
- [56] Tiara Destia Ramadhan, *Analisis Variasi Temperatur Solution Treatment Terhadap Perubahan Struktur Mikro, Kekerasan dan Ketahanan Korosi Paduan Ti-6Al-7Nb Untuk Aplikasi Implan Gigi*. Jakarta: Universitas Islam Negeri Syarif Hidayatullah, 2019.
- [57] R. N. Elshaer, S. El-Hadad, and A. Nofal, “Influence of heat treatment processes on microstructure evolution, tensile and tribological properties of Ti6Al4V alloy,” *Sci Rep*, vol. 13, no. 1, Dec. 2023, doi: 10.1038/s41598-023-38250-2.
- [58] E. P. Utomo, I. Kartika, and A. Anawati, “Effect of Sn on mechanical hardness of as-cast Ti-Nb-Sn alloys,” in *AIP Conference Proceedings*, American Institute of Physics Inc., May 2018. doi: 10.1063/1.5038328.
- [59] A. Sharma, J. N. Waddell, K. C. Li, L. A. Sharma, D. J. Prior, and W. J. Duncan, “Is titanium-zirconium alloy a better alternative to pure titanium for oral implant? Composition, mechanical properties, and microstructure analysis,” *Saudi Dental Journal*, vol. 33, no. 7, pp. 546–553, Nov. 2021, doi: 10.1016/j.sdentj.2020.08.009.
- [60] A. M. Chaze and C. Coddet, “Influence of alloying elements on the dissolution of oxygen in the metallic phase during the oxidation of titanium alloys,” *J Mater Sci*, vol. 22, pp. 1206–1214, 1987.
- [61] M. Yoshihara and K. Miura, “Effects of Nb addition on oxidation behavior of TiAl,” *Intermetallics (Barking)*, vol. 3, pp. 351–363, 1995.
- [62] X. Jin *et al.*, “Oxidation resistance of powder metallurgy Ti—45Al—10Nb alloy at high temperature,” *International Journal of Minerals, Metallurgy and Materials*, vol. 29, no. 12, pp. 2232–2240, Dec. 2015, doi: 10.1007/s12613-021-2320-4.

- [63] Y. Yang *et al.*, “Effects of Ga, Sn Addition and Microstructure on Oxidation Behavior of Near- $\alpha$  Ti Alloy,” *Oxidation of Metals*, vol. 88, no. 5–6, pp. 583–598, Dec. 2017, doi: 10.1007/s11085-017-9741-5.
- [64] S. Matsunaga, A. Serizawa, and Y. Yamabe-Mitarai, “Effect of Zr on microstructure and oxidation behavior of  $\alpha$  and  $\alpha + \alpha_2$  Ti-Al-Nb alloys,” *Mater Trans*, vol. 57, no. 11, pp. 1902–1907, 2016, doi: 10.2320/matertrans.MAW201603.
- [65] K. Aniołek, M. Kupka, M. Łuczuk, and A. Barylski, “Isothermal oxidation of Ti-6Al-7Nb alloy,” *Vacuum*, vol. 114, pp. 114–118, 2015, doi: 10.1016/j.vacuum.2015.01.016.
- [66] Y. Yang *et al.*, “Effect of grain size on oxidation resistance of unalloyed titanium,” in *Materials Science Forum*, Trans Tech Publications Ltd, 2017, pp. 2187–2191. doi: 10.4028/www.scientific.net/MSF.879.2187.
- [67] S. Parizia *et al.*, “Effect of heat treatment on microstructure and oxidation properties of Inconel 625 processed by LPBF,” *J Alloys Compd*, vol. 846, Dec. 2020, doi: 10.1016/j.jallcom.2020.156418.
- [68] K. Zhang, L. Zhang, and J. Li, “The Effect of Refined Coherent Grain Boundaries on High-Temperature Oxidation Behavior of TiAl-Based Alloys through Cyclic Heat Treatment,” *Metals (Basel)*, vol. 14, no. 5, May 2024, doi: 10.3390/met14050521.
- [69] G. Mi, K. Yao, P. Bai, C. Cheng, and X. Min, “High temperature oxidation and wear behaviors of Ti–V–Cr fireproof titanium alloy,” *Metals (Basel)*, vol. 7, no. 6, Jun. 2017, doi: 10.3390/met7060226.
- [70] W. Peng, W. Zeng, Y. Zhang, C. Shi, B. Quan, and J. Wu, “The effect of colored titanium oxides on the color change on the surface of Ti-5Al-5Mo-5V-1Cr-1Fe alloy,” *J Mater Eng Perform*, vol. 22, no. 9, pp. 2588–2593, Sep. 2013, doi: 10.1007/s11665-013-0573-4.
- [71] S. A. Hamdan, I. M. Ibrahim, and I. M. Ali, “Comparison Of Anatase And Rutile TiO<sub>2</sub> Nanostructure For Gas Sensing Application,” 2020.
- [72] S. A. Kim, Sk. K. Hussain, M. A. Abbas, and J. H. Bang, “High-temperature solid-state rutile-to-anatase phase transformation in TiO<sub>2</sub>,” *J Solid State Chem*, vol. 315, p. 123510, Nov. 2022, doi: 10.1016/j.jssc.2022.123510.
- [73] J. Dai, J. Zhu, L. Zhuang, and S. Li, “Effect Of Surface Aluminizing On Long-Term High-Temperature Thermal Stability Of TC4 Titanium Alloy,” *Surface Review and Letters*, vol. 23, no. 2, Apr. 2016, doi: 10.1142/S0218625X15501024.

- [74] W. Chen *et al.*, “Oxidation mechanism of a near  $\beta$ -Ti alloy,” *Mater Des*, vol. 223, Nov. 2022, doi: 10.1016/j.matdes.2022.111144.
- [75] B. F. . Romanowicz and Matthew. Laudon, *Nanotechnology 2008 : materials, fabrication, particles, and characterization : technical proceedings of the 2008 NSTI Nanotechnology Conference and Trade Show : Boston, June 1-5, 2008 : NSTI Nanotech*. Nano Science and Technology Institute ; CRC Press, 2008.
- [76] S. Wang, Y. Liang, H. Sun, X. Feng, and C. Huang, “Oxygen induced phase transformation in tc21 alloy with a lamellar microstructure,” *Metals (Basel)*, vol. 11, no. 1, pp. 1–13, Jan. 2021, doi: 10.3390/met11010163.
- [77] F. S. Ahmed, M. A. El-Zomor, M. S. A. Ghazala, and R. N. Elshaer, “Impact of thermal oxidation parameters on micro-hardness and hot corrosion of Ti-6Al-3Mo-2Nb-2Sn-2Zr-1.5Cr alloy,” *Sci Rep*, vol. 13, no. 1, p. 11249, Jul. 2023, doi: 10.1038/s41598-023-38216-4.
- [78] D. Whitney, “Ceramic Cutting Tools,” in *Comprehensive Hard Materials*, Elsevier, 2014, pp. 491–505. doi: 10.1016/B978-0-08-096527-7.00037-4.
- [79] F. H. Latief, E. S. M. Sherif, A. S. Wismogroho, W. B. Widayatno, and H. S. Abdo, “The cyclic oxidation and hardness characteristics of thermally exposed titanium prepared by inductive sintering-assisted powder metallurgy,” *Crystals (Basel)*, vol. 10, no. 2, Feb. 2020, doi: 10.3390/crust10020104.