

Influence of Manufacturing Parameters on Final Quality of Lapped Parts

Dana Stancekova¹, Mario Drbul¹, Miroslav Janota¹, Natasa Naprstkova², Albert Kulla¹, Jozef Mrazik¹

¹University of Zilina, Faculty of Mechanical Engineering, Univerzitna 1, 010 26, Zilina, Slovak Republic, E-mail: dana.stancekova@fstroj.uniza.sk, mario.drbul@fstroj.uniza.sk, albert.kulla@ucj.uniza.sk, jozef.mrazik@fstroj.uniza.sk,

²J.E.Purkyně University, Faculty of Production Technology and Management, Ústí nad Labem, CZ, E-mail: naprstkova@fvtm.ujep.cz

For a variety of engineering technologies, machining has a specific position because it is a technology that meets the highest requirements on accuracy and quality of products and involves processes that are final, i.e. the last in the production processes of parts machining. Therefore, these processes largely affects the final shape and dimensional requirements of high quality components and hence their performance characteristics, particularly the accuracy and durability. Such production methods designed to achieve high dimensional and shape accuracy is grinding and other finishing methods (superfinishing, polishing, lapping) involved in a high percentage of the production of components whose quality can not be achieved by other technologies, eventually very difficultly. Lapping and about influence of modification of production parameters on quality of lapped surface after lapping. In the experimental part were taken measurement of roughness parameter R_t . From measured values was evaluated which production parameters are useful and economic preferable by demanded reduction of production time and by keeping the roughness parameter at $R_t = 2 \mu\text{m}$.

Keywords: lapping, quality, machining, grinding

Acknowledgement

The article was funded by the grant project VEGA 1/0773/12 - "Implementation of technical ceramic material research to increase the innovation of hybrid products".

References

- [1] MARINESCU, I. D., UHLMAN, E., DOI, T.K. (2006) *Handbook of lapping and polishing*. CRC Press.
- [2] DUPLÁK, J., ZAJAC, J., HATALA, M., MITAL, D., KORMOŠ, M. (2014). Study of surface quality after turning of steel AISI 304 . In. *Manufacturing Technology*, Vol. 14, Issue 4, pp. 527 - 532.
- [3] KRÓLCZYK G., GAJEK M., LEGUTKO S. (2013). Effect of the cutting parameters impact onto tool life in duplex stainless steel turning process, *Tehnički Vjesnik - Technical Gazette*, 20, 4, pp. 587-592.
- [4] KROLCZYK G.M., NIESŁONY P., LEGUTKO S. (2015). Determination of tool life and research wear during duplex stainless steel turning, *Archives of Civil and Mechanical Engineering*, 15, 2, pp. 347 – 354.
- [5] KRÓLCZYK G., LEGUTKO S., RAOS P.: Cutting wedge wear examination during turning of duplex stainless steel, *Tehnički Vjesnik - Technical Gazette*
- [6] KOURIL, K., CEP, R., JANASEK, A., KRIZ, A., STANCEKOVA, D. (2014). Surface integrity at reaming operation by MT3 head. In. *Manufacturing Technology*, Vol. 14, Issue 2, pp. 193 – 199.
- [7] MRAZOVA, M., STANCEKOVA, D., SEMCER, J. (2011) Comparasion of machinability of biocompatible materials used in medicine for dental implants. In. *DAAAM*, pp. 1115-1116.
- [8] RUDAWSKA, A., KUCZMASZEWSKI, J. (2006). Surface free energy of zinc coating after finishing treatment. In. *Materials Science- Poland*, Vol. 24, Issue 4, pp. 975-981.
- [9] LIPA, Z. – JANÁČ, A. (2000). *Dokončovacie spôsoby obrábania*. Bratislava: STU.
- [10] PETRŮ, J., ZLÁMAL, T., ČEP, R., PAGÁČ, M., GREPL, M. (2013). Influence of strengthening effect on machinability of the welded inconel 625 and of the wrought Inconel 625. In. *IMETI 2013 - 6th International Multi-Conference on Engineering and Technological Innovation, Proceedings*, pp.155 – 159.
- [11] BAS, G., STOEVIĆ, L. DURAKBASA, N.M. (2015). Assessment o. The production quality in machining by integrating a system of high precision measurement. In. *Energy Procedia*, Vol. 100, Issue C, pp. 1616-1624.
- [12] http://www.tuzvo.sk/files/FEVT/katedry_fevt/kvtm/dso_obr.pdf
- [13] MÁDL, J. a kol.. (2000) *Technologie obrábění 3.díl*, Praha: ČVUT.
- [14] STÄHLI, A.W. (2001). *Die Läpp-Technik, Firmendruckschrift der A.W. Stähli AG*. Schweiz Peiterlen.

- [15] NÁPRSTKOVÁ, N., CAIS, J., STANCEKOVÁ, D. : Influence of AlSi7Mg0.3 alloy modification by Sb on the tool wear. In. Manufacturing Technology, 1/2014, pp. 75 – 79.
- [16] CUBONOVÁ, N., KURIC, I. (2014). Data structures implementation of the protocol STEP-NC at CNC machines programming. In. Komunikácie, Vol. 16, Issue 3A, pp 176-183.
- [17] STANCEKOVÁ, D., KURNAVA, T., SAJGALIK, M., NÁPRSTKOVÁ, N., STRUHÁRŇANSKY, J., ŠČOTKA, P. (2014). Identification of machinability of ceramic materials by turning. Manufacturing Technology, Volume 14, Issue 1, 2014, pp. 91- 97.
- [18] <http://www.harrisons-engineering.co.uk/wp-content/gallery/lapping-machine/lapping-machine.jpg>
- [19] JANÁČ, A. a kol. (2004). Technológia obrábania, Bratislava: STU.
- [20] CZÁN, A., MARTIKÁŇ, A., HOLUBJÁK, J., STRUHÁRŇANSKY, J. (2014). Identification of stress and structure properties in surface and subsurface layers of nuclea reactor austenitic steel. Manufacturing Technology. Volume 14, Issue 3, 2014, pp. 276 - 281.
- [21] <http://www.polishing-technology.com/en/product/composite-lapping-plates-new-lamr-mm.html>

Paper number: M201652

Copyright © 2016. Published by Manufacturing Technology. All rights reserved.