

Effective examination for obtaining relation $T=f(v_c)$

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In the development of new cutting materials as well as the application of recent ones it is necessary to know the dependence of their durability on cutting speed. Cutting speed, which determines maximum tool durability, can be derived from it. Recent methodology of finding out this dependence is based mainly on long-term machining examinations and tests, which are demanding on time and material and they can be realised only in laboratory conditions. The paper presents a suggestion of short-term, but equally precise examination, which is based on the observation of tool wear depending on cutting speed.

Keywords: machining, cutting speed, tool durability

References

- [1] ADAMCZAK, S., MAKIELA, W.: Reference measurement and evaluation of cylindricity profiles of machine components. In: *Science Report Computer-Aided Systems for Manufacture and Measurement of Machine Element*. Kielce, 2003, s. 23 – 35.
- [2] BALLHAUSEN, C., VIERREGGE, G.: Spannungen und Risbildung in gelöteten Hardmetallplättchen. *Werkstatt und Betrieb* č. 12, 1952.
- [3] BÉKÉS, J.: *Inžinierska technológia obrábania kovov*. Bratislava: ALFA, 1981, 398 s.
- [4] BOBROV, V.F., et al.: *Razvitije nauki o rezanii metallov*. Moskva: Mašinstrojenije, 1967, 414
- [5] BUDA, J., BÉKÉS, J.: *Teoretické základy obrábania kovov*. Bratislava: ALFA, 1967, 698 s.
- [6] DMOCHOVSKI, J.: *Podstavy obróbki skrawaniem*. Warszawa, 1978, 586 s.
- [7] GAZDA, J.: *Teorie obrábění. Průvodce tvorbou třísky*. Liberec: TU, 2004, 112 s., ISBN 80-7083-789-6
- [8] GENSKÝ, R.: *Metal Cutting Operations*. Leipzig: Edition Leipzig, 1966, 191 s.
- [9] GRANOVSKIJ, G. I., GRANOVSKIJ, V. G.: *Rezanije metallov*. Moskva: vyššaja škola, 1985, 304 s.
- [10] GRZESIK, W.: *Podstawy skawania materialow metalowych*. Warszawa: Wydawnictwa, Naukowo-Techniczne, 2011, 526 s., ISBN 978-83-204-3668-6
- [11] HOLEŠOVSKÝ, F., NAPRSTKOVÁ, N., NOVÁK, M.: GICS for grinding process optimalization. *Manufacturing Technology*, Vol. 12, Nr. 12, pp. 22-26
- [12] JAVAHIR, I. S., LI, P. X., GOSH, R., EXNER, E. L.: Anew Parametric Approach for the Assessment of Comprehensive Tool Wear in Coated Grooved Tools. *Annals of the CIRP*, Vol. 44/1/1995, pp. 49-54
- [13] KALPAKJIAN, S.: *Manufacturing engineering and technology*. New York: Addison Wesley Publishing Company, 1989, pp.1999, ISBN 0-201-12849-7
- [14] KOCMAM, K., PROKOP, J.: *Technologie obrábění*. Brno. Akademické nakladatelství CERM, 2001, 270 s., ISBN 80-214-1996-2
- [15] KOLESOV, I. M.: *Osnovy technologii mašinstrojenija*. Moskva: Vyššaja škola, 1999, 590 s.
- [16] KÖNIG, W.: *Fertigungsverfahren*. Band 1, Düsseldorf, VDT-Verlag 1984, 220 s.
- [17] KOVAČ, P., MILUKIČ, D.: *Rezanje metala*. Novi Sad, Unoversitet, 2008, 237 s., ISBN 86-499-0015-1
- [18] LOLADZE, T.N.: *Základy optimalizácie strojárskej technológie*. Bratislava: ALFA, 1989, 216 s., ISBN 80-05-00083-9
- [19] MACUROVA, A.: Analytic representation of the cut surface. In: *Computer aided Systems for manufacture and measurerent of machine elements*. Kielce: Wydaw, Politechniki Swietokrzyskiej, 2003. pp. 161-168, ISBN 838-890-06-305
- [20] MAJERÍK, J. et al.: The verification of axial forces and torques in drilling by the noncoated cutting tools and drills with PVD TiN coating. In: *Annals & Proceedings of DAAAM International 2012*, Vol. 23, No.1, ISSN 2304-1382

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- [21] NARUTAKI, N., YAMANE, S., TASHIMA, S., KUROKI, H.: A New Advanced Ceramic for Dry Machining. *Annals of the CIRP* Vol. 46/1/1997, pp. 43-50.
- [22] PŘIKRYL, Z., MUSÍLKOVÁ, R.: *Teorie obrábění*. Praha: SNTL, 1982, 235 s.
- [23] SUCHÁNEK, D., DUŠÁK, K.: The impact of the cast-iron semi-finished product hardness on the surface quality process. *Manufacturing technology*, december 2011, Vol. 1, No. 11, pp6 6-70. ISSN 1213-2489, ISBN 978-80-7414-415-8
- [24] TAYLOR, F. W.: On the art of cutting metals. *Transaction of the ASME*, 28, November 1906, s. 31-279, 281-350
- [25] TRENDT, E. M.: *Metal Cutting*. London – Boston: Ed. Oxford, Butterworths – Helnemann, 1991, 273 s., ISBN 0-7506-1068-9
- [26] VASILKO, K., MACUROVÁ, A.: Identifikácia rovnice $T = f(v_c)$ pre spekaný karbid *Technologické inžinierstvo*, III, č.2/2006, s.8-11
- [27] VASILKO, K., MÁDL, J.: *Teorie obrábění 1. díl* Ústí nad Labem, UJEP, 2012, 298 s., ISBN 978-80-7414-459-2.
- [28] WEBER, H., LOLADZE, T.N.: *Grundlagen des Spanens*. Berlin: VEB Verlag Technik, 1986, 255 s.
- [29] WRIGHT, P. K.: Applications of the Experimental Methods Used to Determine Temperature Gradients. In: *Cutting Tools. Austrial Conference Manufacturing Engineering.*, Adelaide, 1977. Barton, 1977, pp. 145-149
- [30] *STN ISO 3685* Skúšanie trvanlivosti sústružníckych nástrojov s jednou reznou hranou. Október 1999
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