
Calculating mounting dimensions and bearing surface parameters for die heads with circular radial chasers

© I.V. Ivanina

Bauman Moscow State Technical University, Moscow, 105005, Russia

The article presents a mathematical model for determining mounting dimensions and bearing surface parameters of die heads equipped with circular radial chasers, with due regard for the specifics of cutting kinematics and position of surface-shaping points on the cutting edge of the tool. The study analytically establishes the connection between structural and geometric parameters of the threaded coupling between the chaser and the workpiece, which means that the cutting edge design and geometry can be analysed further in terms of ensuring that the chaser parts performing cutting and calibrating function properly. The article supplies results of calculations demonstrating the effect of die head mounting dimensions on clearance angle values of elementary cutting profiles and area increment history of chaser bearing surfaces.

Keywords: thread cutting, nibbling cutting pattern, die head, calculation, mounting dimensions, clearance angle, bearing surfaces

REFERENCES

- [1] Dobryanskiy S.S. *Visnik Natsionalnogo tekhnichnogo universitetu Ukraini "Kiivskiy politekhnichniy institut"*, *Seriya Mashinobuduvannya – Journal of Mechanical Engineering, the National Technical University of Ukraine "Kyiv Polytechnic Institute"*, 2012, no. 66, pp. 17–20.
 - [2] Dobryanskiy S.S. *Visnik Natsionalnogo tekhnichnogo universitetu Ukraini "Kiivskiy politekhnichniy institut"*, *Seriya Mashinobuduvannya – Journal of Mechanical Engineering, the National Technical University of Ukraine "Kyiv Polytechnic Institute"*, 2011, no. 64, pp. 21–27.
 - [3] Dobryanskiy S.S. *Visnik Natsionalnogo tekhnichnogo universitetu Ukraini "Kiivskiy politekhnichniy institut"*, *Seriya Mashinobuduvannya – Journal of Mechanical Engineering, the National Technical University of Ukraine "Kyiv Polytechnic Institute"*, 2012, no. 66, pp. 43–46.
 - [4] Dobryanskiy S.S., Babiy D.A. *Pridneprovskiy nauchnyy vestnik – Pridneprovsky Research Journal*, 2010, no. 1 (104), pp. 24–29.
 - [5] Kirsanov S.V. *Material cutting and cutting tools: study aid*. Tomsk, Tomsk Polytechnic University Publ., 2012, 196 p.
 - [6] Kozhevnikov D.V., Grechishnikov V.A., Kirsanov S.V., Kokarev V.I., Skhirtladze A.G. *Rezhushchiy instrument [Cutting tools]*. Moscow, Mashinostroenie Publ., 2007, 528 p.
 - [7] Kharitonov M.K. *Rezbonareznyye golovki s povorotnymi grebenkami i vintovym zatylovaniem*. Dis. ... kand. tekhn. nauk [Die heads with rotary chasers and helical relief. Cand. Eng. Sc. diss.]. Tula, 2003, 141 p.
 - [8] Kharitonov M.K., Spiridonov E.S. *Raschetnye zavisimosti dlya opredeleniya staticheskikh geometricheskikh parametrov rezbonareznykh golovok s povorotnymi grebenkami* [Computational dependences for estimating static geometrical parameters of die heads with rotary chasers]. Moscow, 2003, 14 p., deposited at VINITI (All-Russian Institute for Scientific and Technical Information) 22 January 2003, no. 141-B2003.
-

-
- [9] Kharitonov M.K., Spiridonov E.S. Puti uluchsheniya konstruktzii rezbonareznykh golovok s povorotnymi grebenkami [Methods of refining the design of die heads with rotary chasers]. *Sovremennye problemy i metodologiya proektirovaniya i proizvodstva silovykh zubchatykh peredach: Sb. nauch. tr.* [Proc. of Contemporary problems and strategy of gear transmission design and production]. Tula, Tula State University Publ., 2000, pp. 200–202.
- [10] Dobryanskiy S.S. *Visnik Natsionalnogo tekhnichnogo universitetu Ukraini "Kiivskiy politekhnichniy institute"*, *Seriya Mashinobuduvannya – Journal of Mechanical Engineering, the National Technical University of Ukraine "Kyiv Polytechnic Institute"*, 2010, no. 58, pp. 30–35.
- [11] Dreval A.E., Malkov O.V., Malkova L.D. *Rezboobrazuyushchiy instrument* [Threading tools]. Moscow, Bauman Moscow State Technical University Publ., 2011.
- [12] Semenchenko I.I., Matyushin V.M., Sakharov G.N. *Proektirovanie metallovezhushchikh instrumentov* [Metal-cutting tool design]. Moscow, Gosgortekhnizdat Publ., 1963, 956 p.
- [13] Frumin Yu.L. *Vysokoproizvoditelnyy rezboobrazuyushchiy instrument* [High-performance threading tools]. Moscow, Mashinostroenie Publ., 1977, 180 p.

Ivanina I.V., Cand. Sc. (Eng.), Assoc. Professor, Bauman Moscow State Technical University. Specialises in metrology, interchangeability, performance and precision parameters of thread cutting. e-mail: i-ivanina@yandex.ru
