Possibilities of prediction of service life of forming tools

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The paper deals with stress of forming dies in complex conditions of concrete processes during their service life. Possibilities of assessment and prediction of tool service life based on comparative analysis of dynamic fatigue and abrasive wear are presented. Classical solution of dynamic fatigue is complemented by analysis of the situation of cyclic contact of rotating instruments. In this case super-position of cyclic pressure effect dominates, as well as abrasion on the surface of the functional surfaces of the rotating forming tool. Specific in this case is the different speed in the contact line and also the dynamics of development of size, shape and localisation of the surface exposed to wear by cyclic compressive stress. The solution is demonstrated on examples of different forms of wear of forging and rolling tools. The results of a comprehensive predictive analysis can be applied at designing of technological chains of forming operations.

Key words: estimation of tool service life, analysis of dynamic fatigue, abrasive wear, contact pressure

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 Paper number: M201334

Manuscript of the paper received in 2013-01-15. The reviewer of this paper: *Josef Chladil*.