FORCES IN THE GRINDING PROCESS, ELASTIC DEFORMATIONS OF THE TEETH AND THE METHOD OF DIMINISHING THEM

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Abstract

As a consequence of the forces being exercised in the grinding process, the teeth of the tool, as well as those of the gear to be processed suffer a series of elastic deformations, which are, in the end, translated into profile errors. A solution for avoiding these inconveniences is the design of wheel-grinders, which are to keep an even number of contact points throughout the whole processing.

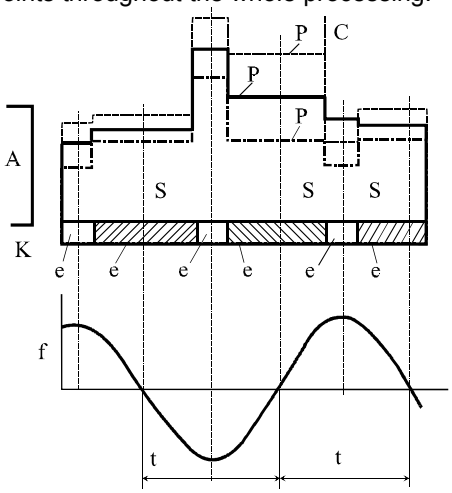

Figure 6. The variation of forces along the gearing line K – the head on the gearing line; C – the rolling point; Ps, Pd – the force on the left (right) flank; Pm – the median force; Ar – the radial force S – symmetry point; ff – the error on the flank; tg – the base pitch; e2, e3, e4 – the contact on two, three and four flanks respectively.

This angle represents the angle of gearing in normal plane for the gear, while it is processed by the disc-grinder, and is further utilized for the determining of the gearing's and grinder's parameters.

The determining of the angle is done for the new grinder and for the used one, and for the half-used one also, taking into account that it gears with the processing gear by an angle that represents the arithmetic mean of the two. The processing precision of these grinders is high, as they must accomplish the gearing in conditions close to the theoretical analysis of the gearing of the gear with the grinder. This implies an extremely careful processing technology for the grinder, which leads to an increase of costs. Therefore, these grinders are used only for the processing of the gears whose profile error must fit into the high-precision class (5÷3). In the processing of gears, this procedure will be chosen as a last resort, in case the processing with increased precision of the preteething becomes too costly.

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