

THE KINEMATICS OF THE GRINDING PROCESS

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Abstract

Grinding represents the processing of gears of the greatest productivity, the only disadvantage being the fact that the processing tool is extremely expensive, and is only worthwhile in the case of mass production and in large series. One of the specific aspects of this processing procedure are the kinematics of the grinding process.

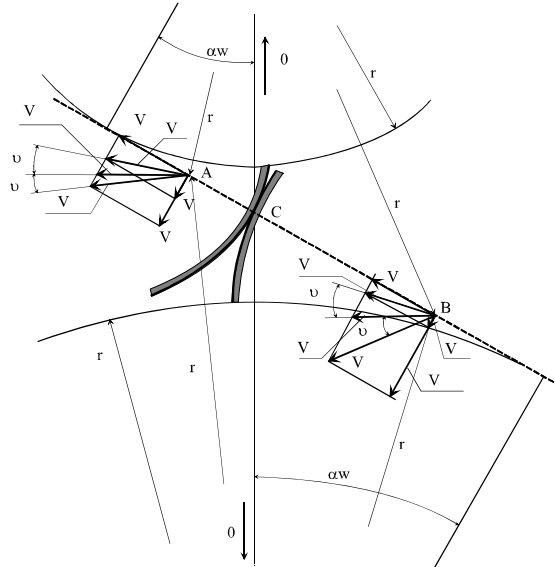


Figure 1. The velocities in the exterior cylindrical gearing:
A – The point of extraction from the gearing;
B – The point of insertion in the gearing.

The splintering speed represents one of the primordial factors of any splintering process. In the case of grinding, concluding the facts presented, it can be affirmed that the importance of the careful analysis of the splintering velocity is extremely relevant, because the choice of the transmission rapport, the revolution of the leading gear and the main elements of the design phases depend on it. As it has been shown, the rigorous establishment of the size and direction of the splintering velocity is analytically difficult, its components depend both on the grinding method, as well as on the parameters of the chosen procedure. The component v_G greatly depends on the profile displacement of the gear and grinder, as well as on the height of the tooth's head for the two gears. Given the fact that the point of annulment of the velocity v_G is dependant on the displacement of the gearing, and the change of orientation of the sliding velocity of the profile does not appear if the point which annuls the sliding is not on the gearing segment, in order to have a balanced and controllable repartition of the relative sliding of the two flanks, it is recommended that the grinder-gear gearing not have a large specific displacement. This is also the reason why in the study the design of the grinder to realize with the grinding wheel a gearing close to the non-displaced gearing has been chosen.

Bibliography

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