

Lecture Notes in Networks and Systems 42

Isak Karabegović *Editor*

# New Technologies, Development and Application

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# Increase of Performance of Grinding by Plate Circles

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**Abstract.** A method is proposed for increasing the grinding efficiency of gear wheels by two disk wheels. The possibility of increasing grinding capacity on machines working in two circles by the method of bending without reducing the accuracy of processing has been revealed. The conditions for increasing the processing capacity are determined when placing the disc wheels in one and two adjacent cavities of the treated wheel.

**Keywords:** Disc wheels · Cross travel · Angle of adjustment  
Machining accuracy

## 1 Introduction

Grinding with disk circles is used as a finishing operation in the production of gears of heavy loaded high-speed gears, which are usually made of surface hardened alloy steels.

The machining by two disk circles can be carried out according to the schemes with zero and with  $15^\circ$  profile grinding angles. The process of grinding is accompanied by the release of a large amount of heat in the cutting zone, resulting in phase and structural changes in the surface layer of the teeth of the wheels being treated, leading to a decrease in operational reliability. The zero-degree method of gear grinding is characterized by a greater thermal stress in conjunction with the  $15^\circ$  method. This is explained by the fact that when grinding on the zero scheme, each point of the lateral surface of the tooth is subjected to multiple thermal effects [1–6]. Despite the fact that the  $15^\circ$  grinding method is less heat-stressed, it is rarely used because of low productivity.

It is proposed in [7–10] to increase the productivity of gear grinding by using circles of cubic boron nitride. The disadvantage of using such circles is the need for expensive modernization of the machines to enable the adjustment of the wheels.

This predetermines the need to search for alternative technical solutions aimed at increasing the productivity of the grinding process with disk circles.

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