Surfaces with high precision of roughness after grinding

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The traditional approach to grinding is to operate within the limits of surface quality. The requirements for surface quality in grinding are higher than those in other common machining operations such as turning and milling. The surface quality of machined parts is very important for precise production and assembly. When we focus on roughness parameters after grinding, we can establish the limits of these parameters for typical grain materials: Al_2O_3, SiC, CBN, SG and others. Increasing demands on accuracy and quality of production leads to research concerned with the properties of these materials and the surface quality after grinding. This paper shows new possibilities for the ground surface with focus on surface roughness obtained under varying combinations of cutting conditions. The influence of the grinding wheel, cutting parameters and coolant on higher surface quality is assessed by roughness parameters Ra, Rz, Rt and the Material portion of a surface profile. These high-precision ground surfaces are shown to have a Nanometres (10^{-9}) unit topography demonstrating that the process is able to replace other finishing technologies such as superfinishing or honing.

Keywords: Grinding, High precision, Roughness, Surface

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