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Manufacturing of Twist-Free Surfaces by Magnetism Aided Machining Technologies

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Abstract : As a well-known conventional finishing process, the grinding is commonly used to manufacture seal mating surfaces and bearing surfaces, but is also creates twisted surfaces. The machined surfaces by turning or grinding usually have twist structure on the surfaces, which can convey lubricants such as conveyor screw. To avoid this phenomenon, have to use special techniques or machines, for example start-stop turning, tangential turning, ultrasonic protection or special toll geometries. All of these solutions have high cost and difficult usability. In this paper, we describe a system and summarize the results of the experimental research carried out mainly in the field of Magnetic Abrasive Polishing (MAP) and Magnetic Roller Burnishing (MRB). These technologies are simple and also green while able to produce twist-free surfaces. During the tests, C45 normalized steel was used as workpiece material which was machined by simple and Wiper geometrical turning inserts in a CNC turning lathe. After the turning, the MAP and MRB technologies can be used directly to reduce the twist of surfaces. The evaluation was completed by advanced measuring and IT equipment.

Keywords : magnetism, finishing, polishing, roller burnishing, twist-free
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