

CAD Directed Precision Inspection System for Sculptured Surface in Mold Manufacturing

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Abstract

A CAD directed precision inspection system has been developed for sculptured surface in mold manufacturing. In this paper, a computer assisted inspection planning system has been implemented, where optimum methods are proposed for measurement points sampling on the sculptured surfaces. A new method is also proposed for the calculation of surface profile considering the probe radius on the sculptured surface based on the ISO specification, where the profile tolerance as well as the offset error can be successfully evaluated. The developed system has been applied to the real molds having sculptured surfaces, demonstrating that the inspection system can be applied to the practical mold inspection jobs with commercial CMMs of CNC capability. High degree of computer integration has been also demonstrated in the procedures of inspection planning, measurement operation, and the error evaluation.