

37 - 11 Quantitative Investigation on Loading in

CBN Wheel Life Using Automatic Image Processing

System for Wheel Surface

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The grinding wheel surface condition characterized by the distribution and shape of cutting edges and loadings has strong influence on grinding results such as surface roughness, grinding force and temperature, and so on. There are a great number of cutting edges on a wheel surface, which are more than several thousands and one distributed irregularly. To evaluate quantitatively the surface condition, in our previous researches^{1),2)}, the automatic image processing system attached to a surface grinder is newly developed. In the system, the evaluation is automatically done by means of quick digital handling technique of numerous microscopic images of cutting edges taken precisely from the wheel surface through a video-capture system.

By applying the system to several grinding experiments, the system is ascertained to be useful for pursuing and evaluating quantitatively the behavior of numerous cutting edges. The loading generated by grinding of workpiece, however, can not be evaluated adequately because the loading can not be extracted, in the high accuracy, from the original photo by the developed image processing software program.

In the research, the new software program for the separation of loadings and cutting edges from the original photo is additionally developed. By using the new program, the change of loading and cutting edge on metal bond CBN wheel surface with plunge grinding of a die steel (SKD11) is pursued precisely and quantitatively until wheel life. On the basis of the results, the relation between the CBN wheel life and loading is discussed.

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