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Study on the Surface Roughness Expression

(Particularly of the ground surface)

Akihide KATO (加 藤 明 英)

Maximum height (Hmax) and root mean square height (Hrms) are commonly used to express the surface roughness. Statistically, Hmax is a quantity to indicate the range, and Hrms indicates the standard deviation in the surface roughness. We have taken the ground surface as the one of the machined surface. The relationships of the grinding conditions and the both of Hmax and Hrms have been researched and Hmax/Hrms ($=K$) have been derived. With this, the significance of K as one of the characteristic factors to express these surface roughness curves has been studied. The micro geometrical shapes of the surface roughness curves in the grinding direction and the direction perpendicular to the grinding direction have been compared with K.

The findings are as follows:

(1) The value of K of the ground surface in the range of 0.9～10.1 μ (Hmax) is

$$K=5.47\ (3.20\sim9.54)\ (\sigma=1.10)$$

(2) K increases as the table speed, the grain size, the dressing speed and the dressing depth of cut increase.

(3) The ratios of the roughness in the perpendicular direction and the grinding direction are 1.3～4.0 (Hmax) and 1.7～4.5 (Hrms). These ratios increase as the cumulative metal removed increase.

(4) The shape of the roughness curves of the grinding direction is more irregular than that of the perpendicular direction.

The Experimental Research on Plastic Forming by the Vibration Method

Kotaro KANEKO (金 子 洪 太 郎)

Recently, there has been a tendency that the vibration, especially, ultrasonic is applied to plastic forming. And many useful effects have been discovered with respect to wire-drawing, rolling, press, punching and so on.

Up to date, however, the fundamental investigations which make it enable to explain the mechanism of the foregoing effects, are very few.