Cutting Tool wear condition monitoring (TCM) and Dynamic Assisted Tooling forTurning process

Due to rapid and fast growing in technology, especially in the manufacturing industry, the demand from the customers have urged on the production quality and efficiency. Latest and up-to-date production technology and method are required to ensure the manufacturing industries are competitive it the market place.

Tool wear monitoring is important in machining industries for controlling the quality of machined parts that helps to improve the productivity. To date, many monitoring system methods are developed by utilizing various signals, and cutting force is one of the signals in machining process that has been widely used for tool wear monitoring. The application of the I-kaz^{TM} and I-kaz 2D methods to interpret the cutting force signal for detection the tool wear progression in turning process is presented. The focus is on the assessment of these methods via the relationship between coefficient values of I-kaz^{TM} method and tool wear progression then compared the performance results. The I-kaz coefficient including the I-kaz coefficient of main cutting force (Z_{Fc}^{∞}), feed force (Z_{Ff}^{∞}), and I-kaz 2D coefficient (Z_2^{∞}).

Surface texturing in the form of dimples for mechanical components is very important in enhancing tribological properties which are closely associated to wear and friction. In order to minimize friction and wear, there are 4 methods i.e coating on engine component, surface texturing on engine component, lubricant and rolling resistance of tires. The Dynamic Assisted Tooling was developed to enable the fabrication of dimple structures using the turning process.

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