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Diamond Machining Technology for Taming the Tough by Nishaidhijames

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Diamond machining technology (DMT) has made the task of cutting tougher materials easy. Lathes use this technology for machining precision elements. Tips of tool bits used in turn mills; rotary transfers, etc are made of natural or synthetic diamonds. The major use of this technology is in the field of optics. Optical accessories like that of telescopes. Video projectors, sophisticated missile guidance systems, microscopes, spectacles that we wear to correct our vision, etc. depend on this technology. Diamonds are critical in other applications like milling, honing and grinding.

Process

Different stages are involved in the process of diamond machining technology (DMT). CNC lathes of increasing quality are used during the infant stages of machining process. In order to achieve sub micrometer form accuracies and surface finishes of sub-Nano meter level, diamond tipped lathe tools are widely used during final stages of manufacturing process. Distance left between the grooves by the lathe is measured to assess the surface finish quality. Measuring of form accuracy is done by measuring the mean deviation from the accurate target form. These two are monitored throughout the process of manufacture by using such equipment like electron microscope.

Application

DMT is necessary for industries like aerospace, automotive, communications, optical, semiconductors and also for domestic applications like sharpening of our kitchen knife. Natural diamonds are the best for the single-point cutting elements especially during the final stages of the manufacturing process in order to achieve maximum perfection. For making intricate shapes out of hard materials, you have to depend on this technology for achieving the best outcome. We need this for such difficult jobs like accurate curvature in piezo-ceramic lenses, for internal diameter slicing (ID slicing) for making very thin components out of hard materials.

Dicing is another important area of its application. For creating those uniform grooves on ceramics or for minimizing those unwanted burrs on plated electronic accessories, you need this technology. We cannot think of an area or industry where this technology is not applied.

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