

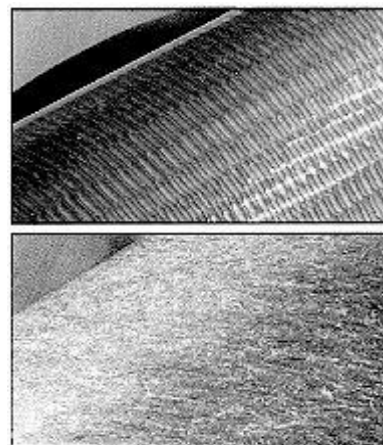
Focus Technology Inc. Notes on Technology advancements:

Drag Finishing of Turbine Blades

Drag Finishing is an emerging edge and surface finish technology for processing gas turbine rotating hardware. This method is used primarily for deburring and edge contour development on Turbine Blades. The process is capable of producing consistent and uniform edge and surface effects on these critical areas.

Currently, much of this work is performed manually or with single point-of-contact methodologies with relatively high reject/rework rates and or with Abrasive Belt Technology. These methods are more invasive and labor intensive. It has been found that Drag finishing produces a more homogenous surface pattern that has an additional functional advantage in that load bearing and wear resistance qualities of surfaces are improved as a direct result and all edge features are processed identically and simultaneously. Overall the part is more uniform no matter what contour the part has.

Drag Finishing is a "cool" process that is more non-selective than traditional processing, there is little temperature phase shift involved as edges and surfaces are altered. Two basic mechanisms are involved in this machining process: Envelopment of rotational parts within a fluidized bed of relatively small abrasive granular media, fixtured parts are rotated at sufficient speed to develop effective intensity interaction between part surfaces and edges, and the abrasive particles suspended within the bed area. . Protection of the critical roots and shrouds is accomplished as a part of the part-holding fixtures, which also eliminate any potential for part-on-part impingement. It is a batch process with very simple fixturing and can be automated



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