

## **Polishing Guidelines**



**Polished vs. Unpolished Tooling**

Coating layers produced by the TD coating process are extremely hard, often exceeding 4000 Vickers in hardness. It is very important that the surface finish of the tooling be smooth and free of any polishing or tooling marks. The key points to consider when polishing are surface roughness and polishing direction. In all cases, the final finish on tooling details subjected to moderate forming pressures should be 5 to 8 RMS micro-inches or better. When forming coated/plated steels, stainless steels, or high strength low alloy (HSLA) steels, the final surface roughness should be between 1 to 5 RMS micro-inches, or a "mirror" finish. The polishing should be performed after final machining in the wear areas or working surfaces, and the detail should be polished progressively using 200 grit to 900 grit polishing stones. The tooling detail can be finished with a 3 to 7 micron diamond compound.



**In-House Polishing Staff**

### **Important Considerations**

In areas of forming, the radius should be true and blended to eliminate sharp transitions. If sharp transitions are present, the tooling will be subjected to extremely high pressures on the sharp transition, and coating failure could occur due to compressive failure of the substrate material.

It is recommended that the polishing direction match the direction of the material flow. This will help minimize galling of the tooling detail during production.

### **Maintenance of TD Coating During Production**

If material pickup or galling appears during the production run, it is important to follow simple guidelines when removing stuck material. The safest approach to removing the galling without damaging the TD coating layer is to use 220 to 320 grit aluminum oxide paper by hand. When this technique is not practical due to production concerns, care should be taken with regard to polishing media selection. Do not mechanically remove the galling with aggressive media that uses silicon carbide, carborundum or diamond material. These media are too aggressive and could damage the coating layer.



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Tooling Details**

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