

TechUpdate

Alternative Surface Treatments for Die Steels

Two proprietary processes from Badger Metal Tech, Inc., Menomonee Falls, WI, improve the performance and extend die life of cold-work tool steels such as A2, D2, M2 and PMV, and hot-work tool steels such as H13, Dievar and P20 to extend the life of die-casting dies. Metallformers testify to the performance of the processes in drawing, forming and blanking-tool applications where metal fatigue, wear and galling pickup are encountered.

Badger (www.badgermetal.com) offers its Metallife ambient mechanical process to prevent fatigue of tool-steel edges in blanking and punching operations, where high levels of compression are induced in the surface of the die steel, increasing the yield strength of the material.

The process also creates a micro-texturing on the die's surface without affecting tolerance or configuration. This combination helps the tool-steel surface retain available lubricant, which cre-

ates the necessary barrier to prevent galling and pickup.

Badger's Thermo-life thermo-chemical diffusion process diffuses carbon and nitrogen into the surface of tool steel. The diffusion zone created proves significantly harder than the base material yet is malleable enough to offer a surface ideal for wear-environment applications with or without the presence of die lubricant. The diffusion also creates a shallow compressive layer that helps fight tool-steel fatigue. The structure of the compound layer isolates



Fig. 1



Fig. 2

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work and die materials that have an affinity for galling or pickup.

Matenaer Corp., West Bend, WI, employs Metallife-treated dies for blanking of automotive and water-heater parts in compound and progressive configurations. It finds that the treated punches (Fig. 1) run 30 percent longer between sharpenings compared to untreated tools,

and that resharpenings do not affect the fatigue resistance of the dies.

Boehm Pressed Steel, Valley City, OH, employs Metallife-processed tools for progressive blanking and pierce tooling (Fig. 2). Previously, the company had experienced chipping on its punches and dies, particularly when used on martensitic



Fig. 3

steels. Those problems faded with the switch to Metallife. Also, the firm reports reduced galling on draw rings, and reduced shock fatigue.

Alwin Mfg., Green Bay, WI, reports that using Metallife-treated tools to stamp a high-volume drawn and pinch-trimmed part has increased the part run to 80,000 pieces between tool polishing, up from 10,000. Also, when necessary, it can polish the tools (Fig. 3) three to four times without having to retreat the tooling, using a 600-grit abrasive paper and light oil. For severe applications, such as brushed Type 304 stainless steel, it uses Metallife as a substrate preparation for an additional TiCN coating.

For more information from Badger Metal Tech, write no. 350 on your reader response card.