

Zamak punches for less

"Find a better way or get out of the business." This was the choice faced by Bonney-Vehslage, a family-owned producer of specialty ticket punches which make distinctive holes in transit and

Sand casting inaccuracies required sorting and extensive fitting to locate matching halves. Thickness variations up to .025 in. were encountered and there weren't consistent reference points



By converting to net-shape die casting, manufacturing operations were cut from 65 to 20 and manufacturing costs reduced 50 percent. The die-cast punch is shown on the left, the machined sand casting on the right.

admission tickets, proof-of-purchase cards, baggage claim tags and other ID devices.

For three generations, B-V had been producing these heavy-duty hand punches from two sand-cast malleable iron halves. The female half is fitted with a precision steel die to produce the distinctive hole and the matching punch or plunger that forces the paper through the die is formed from a protrusion cast into the male half. The punch face is made at an angle to produce a progressive cut and the die is tapered, providing an exit path for the punch and paper slug. Alignment of the pinned halves is critical.

for machining. The cavity for male casting required shaping with a steel wedge and the casting itself needed sizing in a power press. The pivot pin hole and the ticket slot could not be cast and required drilling and sawing. And almost every surface was ground or polished for fit and/or appearance. B-V is located in a high-wage area and the labor cost of the 65 separate machining, fitting, assembly and finishing operations put B-V in a precarious competitive position.

Attempts to reduce costs using malleable sand castings were futile and B-V looked for a non-ferrous alternative. Aluminum was not durable enough to form the punch profile, but a visit to a New Jersey zinc caster put B-V on the right road.

A prototype was produced from ZAMAK 3 bar stock and they "punched things with it 'til their arms fell off," finding that the zinc punch wore as well as its heat-treated iron counterparts. Based on this success, a unit-die-system tool was ordered to produce both halves of the punch.

While the one-time \$25,000 tooling cost was a substantial expense for B-V, the tool should last almost indefinitely, considering the molding temperature of the Zamak 3 and the rate at which the die is being used. Similar tooling has withstood 6-7 million cycles without replacement.

"It's miraculous," says B-V; they're overjoyed. All parts are now exactly the same and halves are randomly mated with no shaping or finishing. The as-cast die pocket accepts the steel die with no sizing required and the ticket slot is formed during casting. The punch profile on the male half is holding up well and the cast pivot-pin holes align exactly.

The die-cast halves are one-third the cost of the malleable sand castings and the 65 operations have been reduced down to 20—a 50 percent reduction in manufacturing cost.

The Zamak 3 punch has the same weight and feel as the iron punch and only a small amount of cosmetic polishing with a mild abrasive belt is needed. Punches are produced as-cast or chrome plated for those still looking for a shiny, bright punch.

Based on the success of their most popular model, tooling is now being developed for a second punch and B-V will consider converting other models to Zamak die casting where the initial cost is justified.

Punch halves are cast, trimmed and vibratory-bowl polished by Haug Die Casting Inc., Kenilworth, New Jersey.