

## Zinc anchors sent to the salt mines

When the AKZO Salt Company had problems getting roof-bolt wedge anchors from its malleable-iron foundry supplier, it was literally left "between a rock and a hard place." These split anchors are wedged into holes drilled into the roof to support the hooks that keep electrical cables up off the floor.

Mine management set out to find an alternate source for these vital parts, but were unable to find another ferrous foundry to fill the void. So they turned to a local pattern shop specializing in non-ferrous work for help.

An iron sample was sent to a non-ferrous foundry and

consultation with an alloy producer confirmed that most zinc alloys are low-sparking and approved materials for mining operations; several are structurally capable of replacing malleable iron.

Sand-cast ZA-12 zinc alloy was recommended as the ideal solution. ZA-12 mechanical properties were more than adequate and included attractive bonuses of a 17 percent weight saving, improved corrosion resistance and non-sparking properties.

But the real bonus was the prompt availability of the anchors for uninterrupted mining.

Test prototypes were quickly made, using the malleable iron sections as patterns. When they were approved by the mine, economical aluminum match plate production tooling was produced for less than \$4,000.

The foundry was able to deliver 5,000 sets of anchors with little difficulty since the standard zinc sand casting tolerance of  $\pm .030$  in. was ample for the application and finishing operations are limited to sawing off the gating, grinding the parting flash and giving the parts a steel shot blasting.

Although many of the performance capabilities of ZA-12, like precise dimensional control, intricate detail reproduction, thin-section capability and a smooth as-cast surface, are not called for in this application, the ease with which this versatile material can be sand cast and the flexibility of the non-ferrous foundry provided plenty of value for AKZO.

The cost of ZA-12 alloy is more than the malleable iron it replaced, but when total cost was considered, and availability and service were factored in, these zinc-alloy roof-bolt wedge anchors proved to be more than competitive.

Gravity cast zinc alloys deserve consideration as a suitable replacement for medium-quantity runs of hard-to-get malleable iron and other ferrous materials.

*The pattern and development work was done by K&H Precision Products, Honeoye Falls, New York and the castings were produced by Rochester Bronze and Aluminum Foundry Company in Rochester, New York.*

*Gravity-cast ZA-12 alloy became an ideal replacement for malleable iron in the production of roof-bolt wedge anchors with better lead times, 17 percent weight savings and improved corrosion resistance. Anchor halves measures 1-1/4 in. x 4-1/16 in.*

