



Chicago White Metal Casting

High-Tech Al, Mg, & Zn Die Casting and Miniature 4-Slide Zn & ZA-8 Die Cast Parts

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A value analysis of alternate production efficiencies led to a major cost reduction:

CWM Miniature Zinc Die Casting Replaced Low Volume Brass Component at a 500% Unit Cost Savings

For small component production, Miniature 4-Slide Zinc and ZA-8 die casting can offer very significant unit cost savings for a range of machined parts, even with low production volumes. Sourcing this close-toleranced part for a medical device from CNC machined brass to miniature die cast zinc—produced to net shape—is a prime example.

Originally machined from brass billet, project management called for a review of alternate production processing for this 0.2 oz. (6.2 g) precision component measuring 1.06 x 2.34 x .094 in. (27 x 59.44 x 2.39 mm). Despite low yearly production volumes, automated flash-free 4-slide miniature die casting in zinc alloy clearly offered significant unit cost savings.

Physical Properties Comparison

A review of the physical properties of die cast Zinc No. 3 (ZAMAK) alloy was made, in relation to the current brass alloy being

used. While the properties of die cast Zn were considered more than adequate for the application, with the superior stiffness of zinc a distinct plus, prototypes would have to be prepared and tested.

Prototype Testing

CNC prototypes were machined by Chicago White Metal from a Concast zinc alloy block closely approximating the properties of die cast Zn No. 3. Surface finishing to final part specifications was performed on each prototype.

The prototypes passed all functional criteria on the first round of testing.

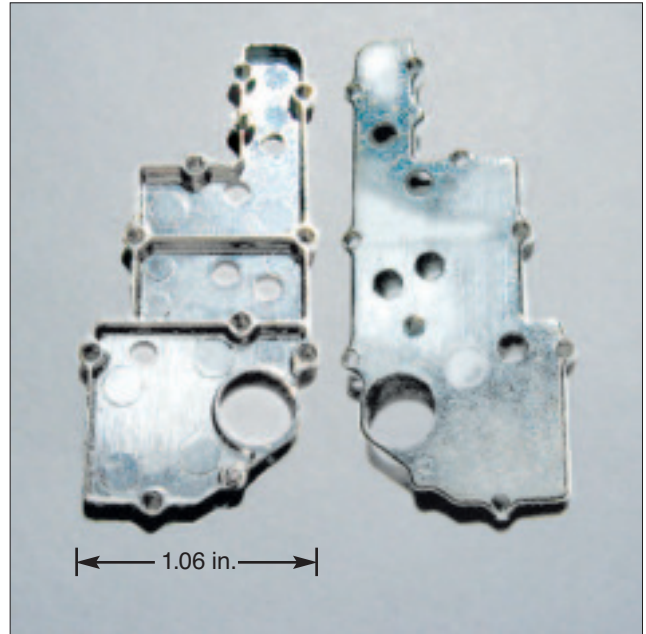
Tooling and Volume Production

Following the successful prototype tests, tooling design and construction of the required dies for 4-slide miniature die casting proceeded to completion. The miniature die casting dies are guaranteed by CWM for the life of the project.

500% Part Cost Saving

Net-shape multi-slide miniature die casting production, which eliminates any need for a flash-trimming step, required only the post-casting tapping of several holes. Two critical center rib heights were held to +/- .001 in. (+/- .025 mm), as cast.

The delivered component was provided



This net-shape miniature die cast part (shown front & back), measures 1.06 x 2.34 x .094 in. (27 x 59.44 x 2.39 mm). The height of two critical center ribs is held to +/- .001 in. (+/- .025 mm).

by CWM with copper-nickel-tin plating to assure non-conductive shielding.

Final cost savings were as projected: a reduction of 500% per unit compared to the previous machined brass production. Die investment was recovered in six months.

Call or email CWM to discuss whether CWM Miniature 4-Slide Die Casting can provide a cost-saving alternative for your small component production.

Chicago White Metal specializes in delivering miniature parts ready for assembly with any required post-casting finishing, including machining when net-shapes are not possible. (See phone/email address, at top)

Brass vs Zinc Properties Comparison		
Property	Free Machining Brass	Die Cast Zinc #3
Tensile Strength	55ksi	48 ksi
Hardness	65 BHN	82 BHN
Elongation	15% in 2 ft.	10% in 2 ft.
Shear Strength	34 ksi	38 ksi