Two-part thixomold digital projector enclosure converted to single CWM die casting for major cost saving

**Mg Unit Redesign as a Single Die Casting Delivers 40% Unit Cost Saving, 8% Less Weight, Superior Performance**

This precision digital projector required a lightweight enclosure with high strength and rigidity. The initial design was produced as two magnesium thixomold parts, assembled into one with seven bolts. CWM reviewed the two-piece design and optimized it into a single housing unit for advanced Mg die casting production. Not only did the one-piece die cast design eliminate separate machining and assembly of two former parts, it resulted in a 40% final part cost reduction, a unit weight saving of 8%, and improved dimensional accuracy.

The product designers of an internal enclosure for a precision digital projector took a close examination of a recommendation to make a major change to the enclosure’s design. CWM’s project engineer presented a redesign opportunity that he felt would have multiple benefits for the digital projector manufacturer. He suggested changing the design, originally two pieces that were bolted together, and adapting it into a single unit die cast housing. Conversion to a die-casting process presented ideal timing to make the change and the projector manufacturer was onboard.

**Simplification Challenges Met**

Internal features requiring undercuts, necessitated by the former two-part design, would be eliminated in the redesign. While all post-casting machining would be performed on a single component, careful planning was necessary for eight different orientations of the part. Gating of the single casting would be limited to a single side of the part, a challenge in ensuring complete metal flow throughout the new design.

**Assuring Optimized Metal Flow**

Chicago White Metal Casting employed extensive Magmasoft® process simulations to optimize critical metal flow in the die casting prior to die construction. These software iterations, along with CWM’s precision tool construction standards, assured optimized sound-ness of the part and production of the unit’s tight tolerances as-cast, which was required for its highly precise final machining steps. The Magmasoft process flow analysis system for die-casting die design is the most advanced software program of its kind currently in use.

**Double Award Winner**

The die-cast enclosure weighs 2.305 lb. (1.044 kg.), an 8% weight reduction compared to the former two-piece unit. With a part cost reduction of 40% and improved dimensional accuracy, the redesign became a winner in both the International Magnesium Association and North American Die Casting Association competitions.

**For more on CWM design & production, see our website’s “Full Service Capabilities” section. Or contact CWM or your CWM Regional Sales Representative.**