



## 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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## Advanced Die Casting Simulation Helps Assure 1st-Shot Success & Repeatability in Production

# MagmaSoft® process simulation technology cuts lead time, improves quality assurance, lowers manufacturing costs

Using the in-house MagmaSoft® system, the most advanced software technology for die casting process simulation, CWM has moved to predictable 1st-shot success, reduced lead time, improved quality assurance and lowered die cast part costs.

Interfacing with customer CAD files, extensive databases, and its 3D modeler, this new software allows rapid analysis of a product's design, proposed tooling, and process variables for optimum first-piece success.

The advanced MagmaSoft high-pressure die casting simulation system enables more rapid optimization of die casting process parameters prior to both die design construction for highest-quality casting results.

### Pre-tooling Performance Predictions

The simulation software for die cast parts, installed in-house at CWM, has been put to the test with challenging tooling design and construction projects, especially for the production of new aluminum die cast parts.

After product requirement discussions and inputting the customer's clean 3D CAD files, simulations can be run prior to the tooling design. The design's expected thermal distribution can be explored at this earliest stage, avoiding later costly consequences through possible modifications.

After development of the initial tooling design for the project, the MagmaSoft process simulation software system is used to enable CWM engineers to create preliminary, highly-predictable metal flow simula-

tions of production outcomes.

### 3D Metal Flow Animations

These computer-generated 3D screen animations can accurately predict expected metal flow patterns across the part's critical surfaces based on initial cavity, runner, gate and overflow configurations of the initial die cavity design.

### Iteration to Optimize Results

After a series of precise tooling design iterations including revisions to the runner and gating layout, followed by repeated 3D simulations, the die design can be released for die cavity construction.

Production tests of the completed tooling, as predicted by the software system's final simulation, have in most cases been consistent: first shot success.

### Optimizing Die Casting Quality

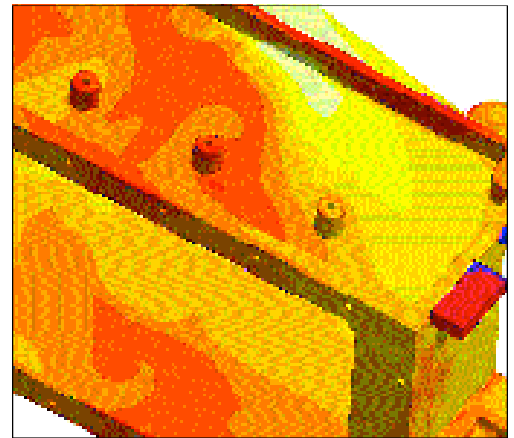
The system's simulations can be used to optimize final die casting part quality in the following ways:

- Optimization of gating layout
- Reduction of air entrapment
- Reduction or elimination of cold shuts
- Reconfigurations to reduce and/or eliminate porosity in critical areas
- Optimization of shot profiles for assured die cavity fill

### Improving Die Casting Productivity

Modifications through software simulations can be used to improve final die casting production in the following ways:

- Reduction in die casting cycle times
- Optimization of thermal balancing of



CWM MagmaSoft metal-flow simulations, such as this 3D screen capture, helps assure 1st shot success.

dies for consistent production

- Optimization of die spray patterns for consistent die cast part ejection

### Lowering Die Casting Costs

Die design guidance through software simulations can lower total costs:

- Fewer required tooling modifications
- Improved productive tooling die life
- Sharp reduction in casting rejects
- Earlier selection of the best die casting machine size for optimized production

Archived MagmaSoft system data can be used in predicting the producibility of a re-designed cast part, prior to initiating the full redesign project itself. These modified simulations for redesigns can help assure the lowest die cast redesign project costs. ■

*For more on how CWM guidance, skills, and design & production technologies can help assure die cast project success, contact [CWM Sales](#).*