



CHICAGO WHITE METAL CASTING, INC.



# Leaner, Faster, Better

## Cost-Effective Die Cast Components and Complete Manufacturing Solutions

ISO 9001:2015 | ISO 14001:2015 REGISTERED

# Chicago White Metal Casting

Founded in 1937, Chicago White Metal specializes in high pressure aluminum, magnesium and zinc die castings for a wide variety of industries and applications. CWM has an award-winning reputation for technical expertise and a proven record for superior quality and service.

Chicago White Metal's success stems from our continued investment in research, advanced technology and exceptional team members, whose primary goal is to provide outstanding levels of service and customer satisfaction. CWM's strong corporate culture, with a unique emphasis on collaboration, cultivates an environment of innovation and forward thinking, providing a robust partnership in product development and engineering expertise. Our focus on serving others, being transparent in our communications, and treating commitments as sacred, enhances operational efficiency and provides for continual improvement throughout the organization.

**Chicago White Metal offers more than just a die casting. We are your complete die casting solution.**

***"Excellence is Expected"***



**Browse CWM's DC<sup>2</sup>**  
(Die Cast Design Center)  
at our website - over 90 design  
aids available for download.

[cwmdiecast.com/design-center](http://cwmdiecast.com/design-center)



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# Full-Service Capabilities

## Total, Flexible Manufacturing Solutions

CWM has the experience and flexibility to provide a wide range of cost-effective manufacturing solutions.

Advanced die casting design, prototyping and production technologies – in aluminum, magnesium, and zinc, from large components to micro-miniature parts, from high-volume to short-run production.

State-of-the-art CNC and custom machining cell capabilities.

Full range of finishing capabilities including vibratory deburring, grit blasting, polishing, buffing, RoHS compliant conversion coatings, wet painting, powder coating, electrostatic deposition (e-coat), electroless nickel, other painting or plating.

Total contract manufacturing services including the management of all components, building and testing of complete assemblies, and shipping to your global locations.

Chicago White Metal Casting's quality management system and environmental management system have been registered to ISO 9001:2015 and ISO 14001:2015, respectively, by North America's leading management systems registrar – SAI GLOBAL.

## Now CWM can do even more for your products

The die casting process has an unparalleled ability to produce complex, high-strength components to near net shapes at low unit cost. And die cast parts can be easily recycled, at the end of their useful life.

Chicago White Metal Casting, with over 87 years of commitment to process innovation, can offer the product engineer greater range of freedom from design and process constraints to help achieve lower total product costs.

Early consultation with CWM can often allow you to design more intricate contours and closer tolerances, thus reducing costs and the need for multiple parts.

Porosity can be minimized with special die design and advanced production technology. Thin wall designs can increase package space, reduce weight, and lower costs.

And, these benefits can be delivered on shorter volume runs, with significantly reduced tooling and production lead times.

# Tap CWM's Special Objectivity

## DIE CASTING SOLUTIONS

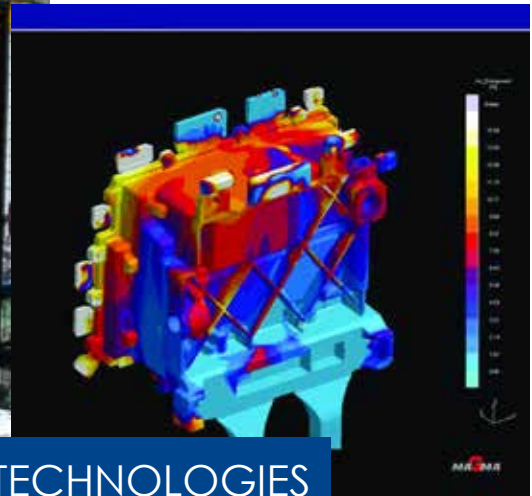
### IN AL, MG, ZN AND MINIATURE ZN

Because we cast in all of the most widely specified alloys, you are always assured of objective material recommendations for your application.

Our fully automated aluminum die casting machines, combined with state of the art vacuum assist technology and process monitoring controls, are capable of making a wide variety of castings at very competitive costs.

For components requiring light weight, with or without a cosmetic finish, CWM's advanced magnesium casting and finishing capability allows for a wide range of options.

CWM was a pioneer in thin wall zinc die casting technology, which allows for reduced part weight (with no loss in strength), space-saving designs and lower material costs.



## LEAN MANUFACTURING AND ADVANCED TECHNOLOGIES

- The latest digital information and production technologies have been harnessed at CWM.
- A comprehensive lean manufacturing program is in place in all manufacturing areas.
- A multi-departmental Value Engineering Team is constantly looking for ways to improve quality and decrease cost.
- State-of-the-art, in-house CAD workstations use the advanced Magmasoft® die casting simulation software system. It enables rapid optimization of process parameters prior to die construction.



# CWM's Advanced Capabilities

CONCURRENT ENGINEERING, QUALITY INTEGRATION, ENVIRONMENTAL RESPONSIBILITY AND CONTINUOUS TRAINING

## CWM CONCURRENT ENGINEERING

CWM's design team is ready to help turn your concepts into effective die casting solutions. Tremendous cost savings and quality improvements can be realized at the critical early stages of a project by focusing on part and tooling design. And, CWM can provide 3D printed models, CNC machined or gravity cast prototypes, and quick turn die-cast pre-production parts to help move the project toward successful volume production.

## COMPANY-WIDE QUALITY INTEGRATION: ISO 9001:2015

Quality assurance is based on a total management commitment and shared responsibility across all departments. Ongoing plant-wide integration of QA programs aimed at defect prevention, error proofing and continuous improvement are the cornerstone to our QA approach.

The company's quality management system was the first in the industry to achieve ISO 9001:2015 registration.



## CWM's Environmental Management System is registered to ISO 14001:2015

CWM was the first North American custom die caster to achieve ISO 14001 registration in 1998. The company has established systematic monitoring, control and continuous improvement in keeping with our culture of environmental responsibility.

With ISO 14001 registration of its environmental management system, CWM is assuring reduction of its consumption of natural resources, reduction of the disposal of waste materials and reduction of pollutants of land, air and water.

## CONTINUOUS PLANT-WIDE TRAINING

CWM management is committed to ongoing, comprehensive and company-wide training to assure that its employees are equipped to excel. Classes are held in-plant, on company time, in every subject; from SPC charting and ISO procedures, to developing a strong understanding of all aspects of defect prevention and problem solving.

# ELECTRICAL/ ELECTRONICS

These high-tech die castings are examples of net-shape and near net-shape housings and components for electrical and electronic devices. Other examples include control panels, servo drives, flow meters, commercial scales, radar detectors, PC board assemblies, and connectors. Part specifications meet superior as-cast surface finish requirements and wall sections are being cast as thin as .015 in. (.381mm) with zero draft in selected areas. Fail-safe EMI/RFI shielding and heat sink properties are built-in features for components in Al, Mg or Zn, together with excellent strength and rigidity.



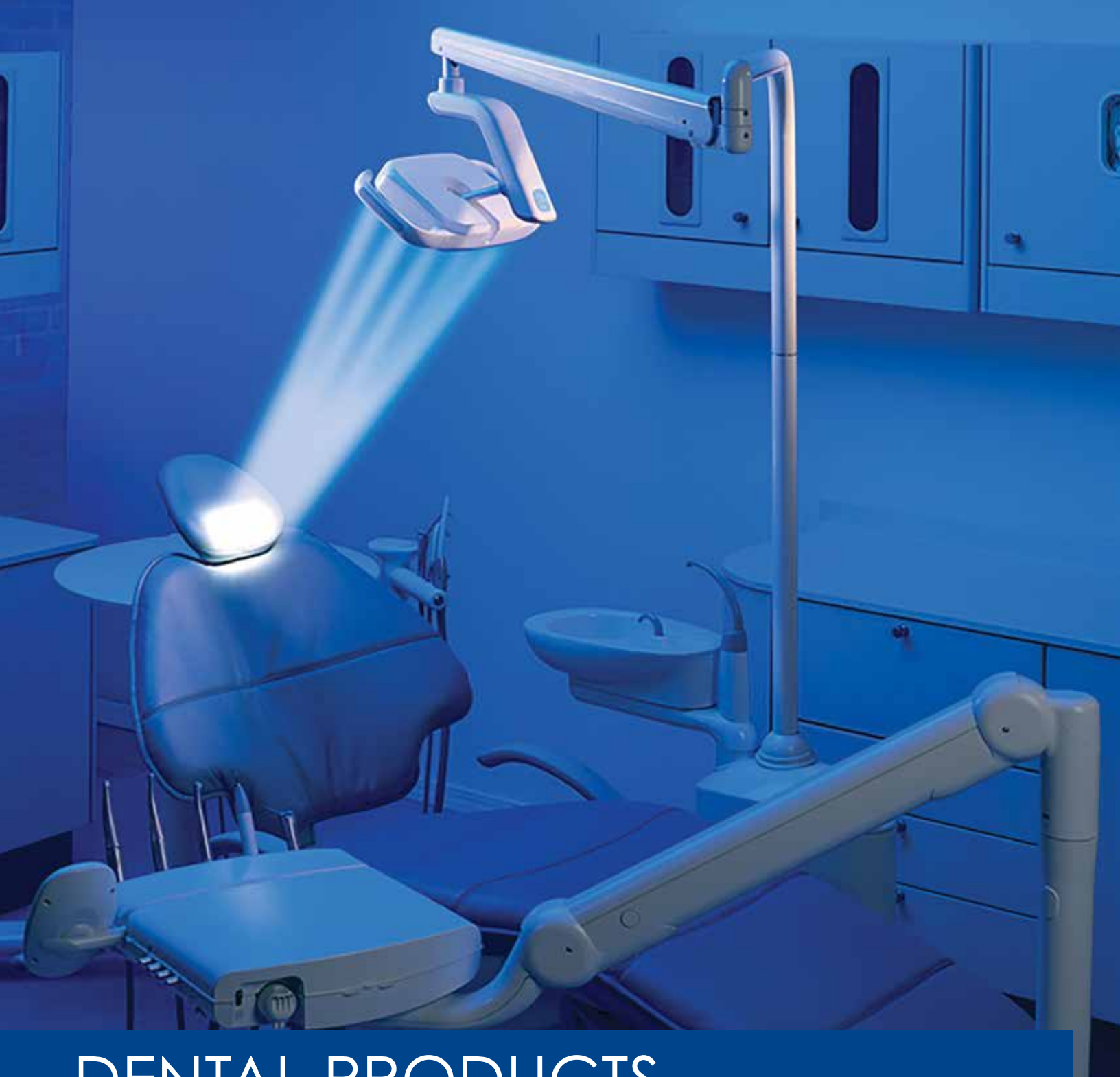
## AUTOMOTIVE

The automotive industry is the largest user of die castings. This market depends on extreme manufacturing efficiency and superior product quality. CWM's technical expertise combined with full-service capabilities offer solutions to meet these challenges.

Today, aluminum is used most frequently in the automotive industry. However, magnesium has gained the interest of modern automotive engineers who wish to explore options which are lightweight yet still structurally sound, improving vehicle handling and fuel efficiency. Significant cost savings can be realized with the fast cycle times of CWM's advanced hot chamber die casting process.

Die castings are used in end applications such as mirrors, electrical housings, powertrain and steering system components, under-hood and in-vehicle brackets, and other parts of the vehicle.





# DENTAL PRODUCTS

Dental products have similar complex configurations as medical devices and are used for many of the same purposes. The equipment must be medical grade and highly cosmetic, given the wide array of patient visits per day. LED light housings, dental X-ray units, patient chair components, and other dental equipment products are some of the parts which utilize Chicago White Metal's aluminum, magnesium and zinc die castings.





# MEDICAL DEVICES

Intricately configured component parts for medical products are being produced as optimized near net-shape CWM die castings. Applications include portable medical monitors, infant care devices, electronically operated hospital beds, EKG and MRI machine components, portable oxygen concentrators, ultrasound equipment, and other medical devices.

The decision to choose the high pressure die casting process for these medical components was based on part strength, rigidity, light weight, and built-in EMI/RFI shielding—along with unit cost savings over alternative manufacturing processes.



# CONSUMER RECREATIONAL

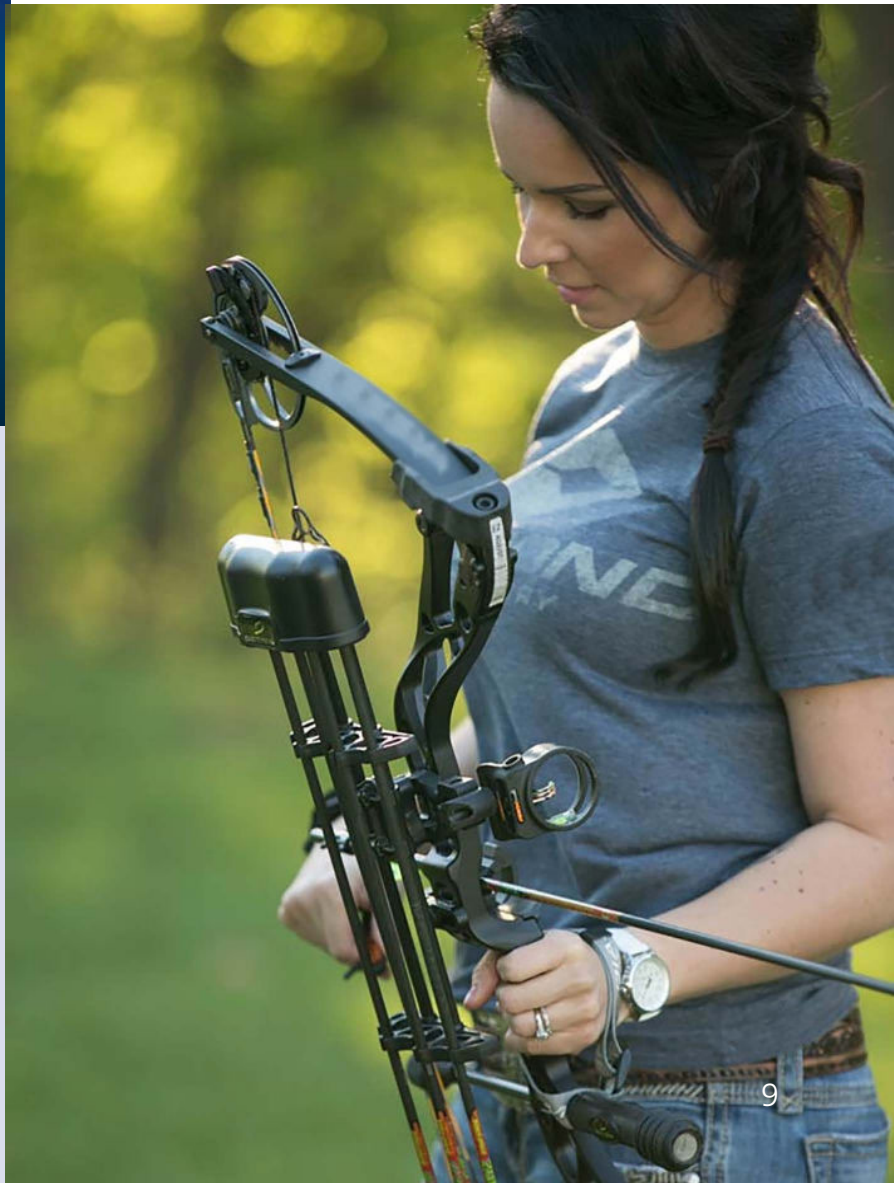
CWM offers both high and low volume die casting for a wide variety of sports and leisure products.

An aluminum archery riser earned the Award of Excellence for a new compound bow developed for young archers. CWM optimized the die casting design to reduce post-machining operations and production costs. Also, working upfront with our painting partner, special racking was developed to avoid paint accumulation in critical areas. CWM's team expedited the design and manufacturing processes, ensuring the customer's die casting product was released in time for the season.



## LIGHTING

The lighting industry requires that the finished product not only have dimensional accuracy due to the intricacy of design in electrical components, but also be able to withstand high temperatures without emitting toxic fumes while the light is powered on. CWM casts lighting related parts for a global market. Pictured are automotive lighting ballasts. CWM ships millions of these to assembly plants in Asia.





# GLOBAL POSITIONING

Die casting provides the combination of high strength and EMI/RFI shielding properties to protect the integrity of the device and prevent electromagnetic and radio frequency interference from tampering with the signal, ensuring the clearest reception possible to provide the accurate geolocation of each receiver.

Chicago White Metal worked with a producer of high end global positioning products to deliver a robust, lightweight component with complex internal features (mounting bosses and ribbing) to stringent dimensional, performance, and cosmetic specifications. The combination of magnesium die casting, CNC machining, and custom finishing, allowed for a cost efficient design.



# LAWN & GARDEN

The lawn and garden industry includes riding mowers, snow blowers, and other such equipment along with portable tools such as blowers, trimmers, pruners, that make lawn & garden maintenance a breeze. CWM die casts components in aluminum, magnesium, and zinc that meet the durability and high strength demands for outdoor, rugged and long-lasting end products.

The part below is a roll cage which goes into the rear differential of commercial mowers (also utilized in utility vehicles and ATV's). This single casting is available at a reduced cost because the features can be cast netshape, eliminating the machining that otherwise would be required.



## NON-AUTO TRANSPORTATION

The non-automotive transportation industry includes off-road vehicles, ATV's, snowmobiles and other transportation methods that require durable components that maximize performance, handling and fuel efficiency and can stand up to the rigorous demands of rough terrain and extreme environments.

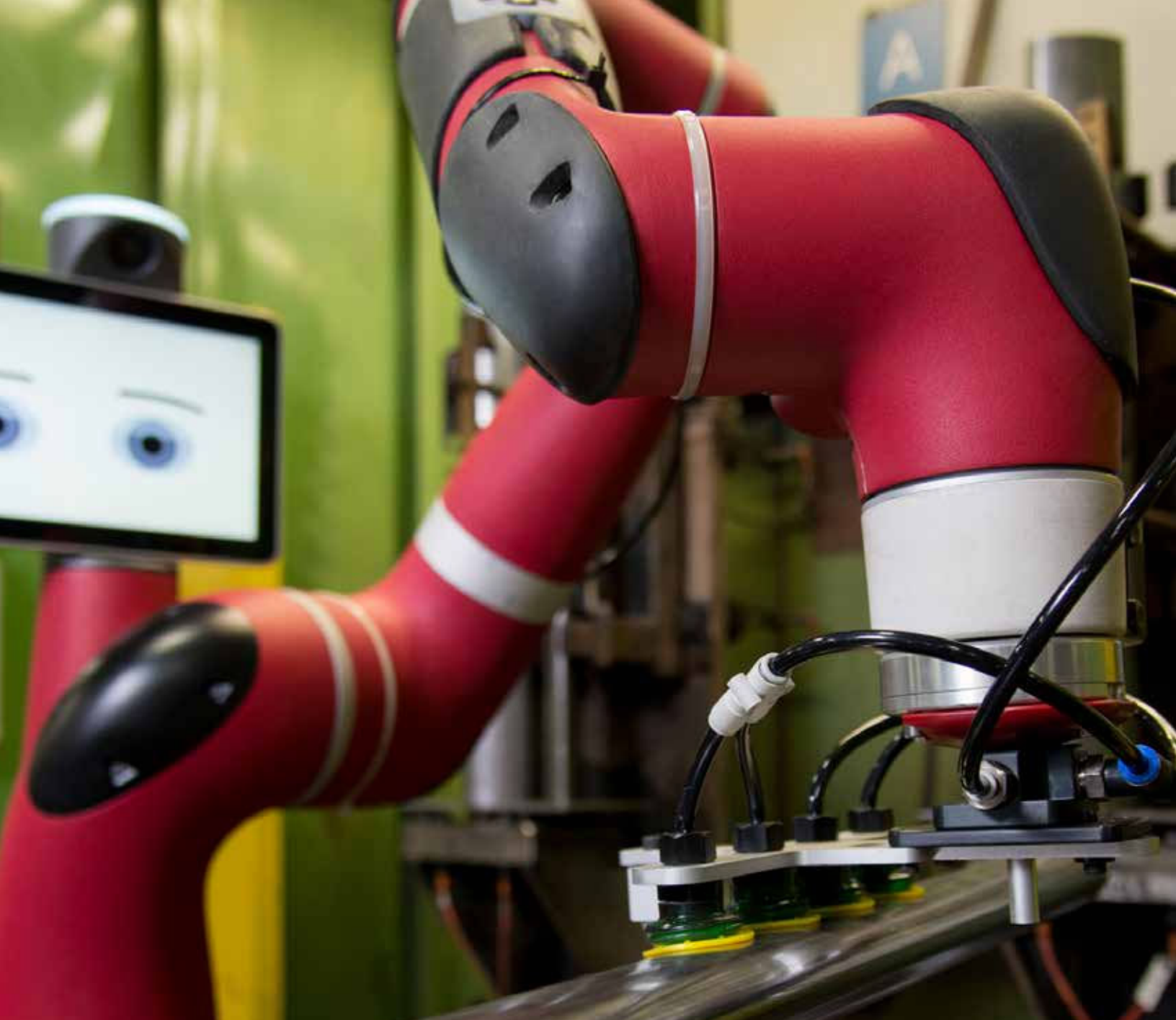
CWM produces a wide variety of components in aluminum, magnesium, and zinc that more than meet these requirements.



*Another example of a lawn and garden product that makes good use of a die casting component is the part pictured below. It is a magnesium fixed line trimmer head that goes into a professional string trimmer.*







# ROBOTICS

Chicago White Metal casts complex metal parts on several industrial robots, keeping with a high standard of quality and cost efficiency.

Innovative manufacturing processes and creative engineering have cultivated an environment of collaboration and forward thinking, resulting in a high level of quality and overall cost savings for the robotics manufacturer, and ultimately the consumer.



# DIGITAL PROJECTION

CWM casts a number of aluminum, magnesium, and zinc parts for high end projectors. They vary in complexity, size, finish, and annual volume, but all were developed via a collaborative design approach, and represent a cost reduction compared to competing processes.

CWM die casts an award-winning Magnesium housing (part shown above on right) in the commercial digital projector above, used in large sporting and media-centric venues such as the Olympics. The casting shown was once an assembly and CWM transformed it into a single casting, providing the customer with a 40% cost savings.

# A Robust Design, Production, and Assembly System



Fine-Tuned to Your Needs

## Early Project Involvement

### ***Early design consultation to establish castability***

Before designs are locked in, minor modifications can make a non-castable part suitable for die castings, at significant savings. If die casting is not cost-effective for your part, we'll tell you.

## Optimizing Designs For Casting

### ***Product design assistance for optimized die casting***

Using your 3D design files in virtually any format, along with part prints, CWM will work with you to optimize the final design for the highest performance and most cost-effective production. Simple refinements can often result in substantial production savings.

## Prototype Engineering

### ***Product prototyping for fail-safe results***

To assure form, fit and function, CWM can rapidly produce complex parts by in-house FDM (ABS plastic) or CNC machining from the appropriate alloy, or by various other outsourced processes depending upon the needs of your testing program.

## Magmasoft Process Simulation

### ***Optimized die designs with Magmasoft® for first-piece success***

Precise computer metal flow simulations of CWM die cavity designs, in advance of die construction, have proven invaluable in predicting optimum production results. Using the most advanced Magmasoft® die casting simulation software, your tooling will be optimized for die casting quality, reduced porosity, lowest cycle times and improved die life.

## Certified & Documented Raw Materials

### ***Raw material certification to precise specifications***

**Tooling:** Superior-grade tool steel is 100% certified. Die microstructure must have uniform carbide distribution, free of internal defects, to insure against premature failure.

**Parts:** Your selected casting alloy's composition is approved by supplier certification, and again with alloy melt inspection at the furnace.



## First-Piece Validation

### ***Die cast part validation to 3-axis accuracy of 40 millionths***

The programmable Sheffield Pioneer CMM machine, including PC-DMIS CAD++ software technology, allows for inspection programming directly from the CAD model. This system is used for both first article inspection and process control checks. Complex parts can be measured quickly and accurately and operator error is virtually eliminated.

## Quick-Die-Change Systems

### ***Quick die change systems for JIT, short-run production***

With “quick die-change” equipment, die set-up time can be dramatically reduced on small parts and show an even greater decrease on large parts, making shorter production runs economic.

## Predictable Process Parameters

### ***Simulation proven process settings***

With use of computerized pre-production process simulations, optimum process settings can be established in advance of production. These predictable parameters have shown consistent high-quality die casting results.

## Die Cast Process Monitoring

### ***Process monitoring to match the optimum die casting process profile***

The system helps to improve quality, reduce scrap and assure that machines perform at optimum levels. The computerized shot monitoring system provides real-time feedback of critical shot parameters, enabling CWM to maintain very precise and accurate process control.

## Plant-Wide SPC

### ***Production Monitoring***

#### ***Plant-wide statistical process control***

During the first and each successive casting run, control charts are used to monitor critical measurements. Using the statistical documentation of SPC, process adjustments can be made before dimensions exceed their predetermined limits.

## X-Ray Evaluation

### ***Digital radiography***

With enhanced automated digital radiography, internal porosity can be accurately determined and corrective action immediately taken. Video images are available for customer review.

## In-House CNC Machining

### ***In-house CNC machining to micro-precision tolerances***

Where net-shape die casting is not feasible, ultraprecision machining to final tolerances is performed, in-house, at state-of-the-art CNC machining centers. Skilled fixture designers, programmers and CNC operators understand the unique requirements of machining die cast parts.

## Certified Die Casting Finishing

### ***Post-casting part finishing to precise specifications***

In addition to machining, CWM provides any secondary operation required: from vibratory deburring or blasting and wheelabrating, to impregnation, for 100% pressure-tightness to withstand the highest operating temperatures and pressures. Finished components can be delivered sanded, polished, buffed, chromated, anodized, painted or plated, certified to your requirements.

## Contract Manufacturing & Assembly

### ***Complete turnkey contract manufacturing and assembly in all production processes***

For mechanical and electromechanical enclosures and components, CWM will provide turnkey responsibility for all production processes. This includes tooling construction, volume production, post-production machining and part surface finishing for both die cast and non-die cast parts – as well as component procurement and complete final assembly.

## Customized Contract

### ***Product Packaging***

#### ***Customized contract product packaging to your exact needs***

Your parts – or sub-assembled products – can be specially packed and shrinkwrapped for shipment.

# CWM Mission Statement

*Create success by enriching the lives of others including our Chicago White Metal associates and their families, our customers, suppliers, and those who live and work in our surrounding communities.*

## CWM'S CULTURAL PILLARS

### **Positive Attitude**

*Adopt it as a way of life*

### **Respect**

*Treat all those around you with equal respect*

### **Commitments**

*We are only as good as the commitments we meet*

### **Not Catering to Rank**

*Everyone deserves the same level of service*

### **Transparency**

*Transparency in all our communications is key to our success*



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Visit CWM's DC2 (Die Cast Design Center) at our website: [cwmdiecast.com/design-center](http://cwmdiecast.com/design-center)

CWM publishes an informative 16-page introductory "Design and Specification Guide" for engineers designing components for die casting. A printed copy is available from your CWM Sales-Engineering Representative, who can be located at [www.cwmdiecast.com](http://www.cwmdiecast.com). Or download it at our DC2 Design Center.