

MONARCH  
INDUSTRIES



Custom Casting & Machining Group

Monarch Industries, founded in 1935, has a long-term commitment to the 'Continuous Pursuit of Excellence' in all aspects of it's business.

Monarch Industries is a vertically integrated manufacturer of custom castings, hydraulic cylinders and utility mixers.

The Custom Casting Group's operations encompass pattern making; core making; casting in both grey and ductile iron; machining and further value-added processing including heat treating, painting and sub-assembly.

In every aspect of manufacturing, Monarch's quality goal is to maintain the highest possible levels of Quality and Service to it's customers, exceeding their needs and expectations.

Monarch achieved ISO 9001 certification in 1996, and became certified in ISO 14001 at its foundry location in December 2009. Monarch is committed to re-investing in its processes and to working to create a healthier environment for its employees, the community and their customers.



Head Office and Machining, Winnipeg, Manitoba Canada



Monarch Industries' Foundry, Winkler, Manitoba Canada

# MONARCH INDUSTRIES

## Recognized and Respected

Established in 1993, 'Canada's 50 Best Managed Companies' is the country's leading business awards program, recognizing excellence in Canadian owned and managed companies with revenues over \$10 million.

Monarch Industries is a '50 Best' Platinum member, signifying that they have won the award 15 years in a row.



The program sponsors are Deloitte, CIBC Commercial Banking, National Post, and Queen's School of Business.

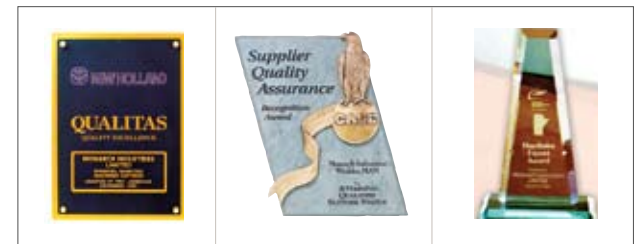
The 'Best Managed' designation reflects Monarch Industries corporate success achieved through: focusing on their core vision, creating stakeholder value and excelling in the global economy.

The program has continued to raise the profile of Monarch Industries by rewarding its efforts to:

- outperform their competitors
- create and sustain hundreds of jobs
- achieve sustainable growth
- excel both at home and abroad

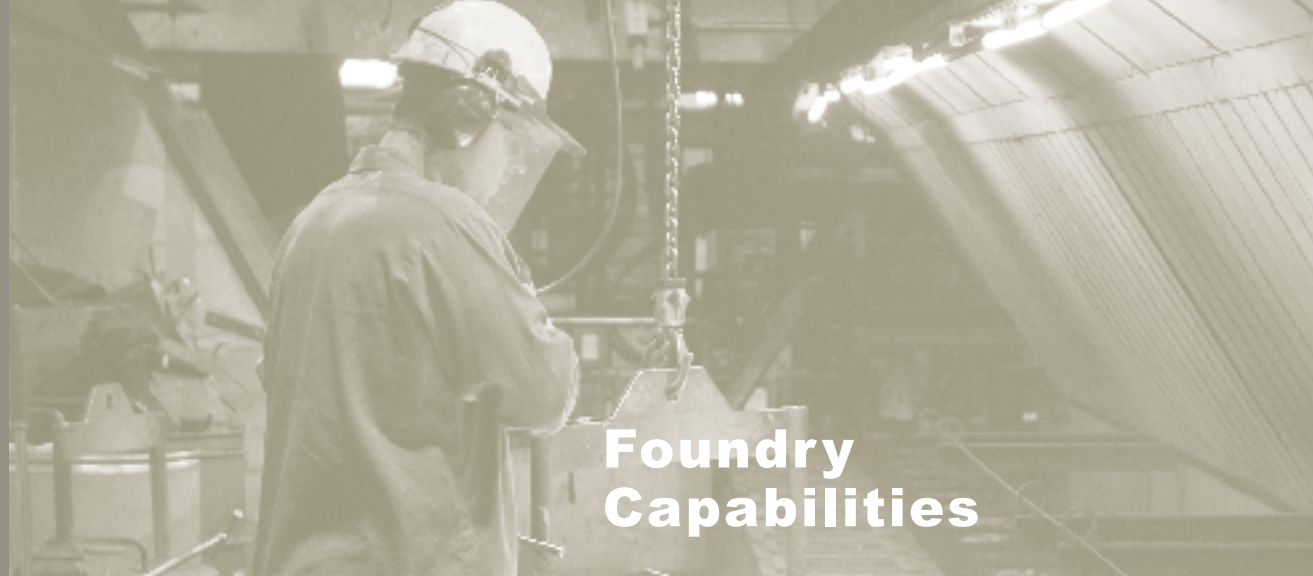
Monarch Industries was the recipient of the "2003 Manitoba Export Award," as selected by Canadian Manufacturers and Exporters (CME). This award recognized Monarch for its development of new products, innovative marketing programs and its significant contribution to the manufacturing sector and the economy of Manitoba.

Monarch has also received numerous awards for its quality products and services from many of its long-standing customers.



# Getting Started

Monarch specializes in the design and fabrication of CNC machined patterns and core boxes from a customer supplied drawing or solid model.



## Foundry Capabilities

Tooling can be made from a variety of materials based on requirements.

- foundry board / plastics either milled or poured to shape
- aluminum milled to shape
- wood milled to shape
- iron produced at our own foundry

In addition to making the tooling, Monarch also offers assistance in preparation of the model to ensure proper parameters are in place for the casting process.

Monarch offers assistance using;

- **CAD** – design and modeling from your original formats using Solidworks® or Pro-E®.
- **CAM** – preparation for the milling of the pattern using Mastercam® or Pro-E®.
- Magmasoft® Solidification Simulation software – simulation to determine proper gating, risers and chill placement to produce the best possible part within their processes.
- Casting and machining ISIRs using co-ordinate measuring equipment.

While in production at Monarch Industries, the customer's tooling is maintained and properly stored when not in use.



Monarch Industries supplies raw or completely finished parts to its client's unique specifications from drawings, digital files or solid models. 'Making it right the first time!' is not only the goal but also a policy at Monarch.

Whether it is tooling, samples or production parts, Monarch is proud to be able to offer its customers a wide selection of material grades and manufacturing processes.



## MATERIAL GRADES

Monarch Industries is able to produce castings in the following grades of material;

### **Grey Iron**

- G2000, G2500, G3000, G3500 and G4000

### **Ductile Iron**

- D4018, D4512, D5506, D7003

### **Austempered Ductile Iron (ADI)**

- Grades 1 thru 5

### **Silicon Moly Ductile Iron**

## PRODUCTION METHODS

Monarch Industries manufactures castings using both Green Sand and No-Bake processes;

### **Green Sand**

- 2 B&P 16X20 Automated Molding Lines
- 1 B&P 26X20 Automated Molding Line

### **No-Bake** - Medium to large flask handling line.

Casting weights can range from less than 1 pound to as large as 1800 pounds.

Cores can be made using any of the following processes, dependent on the size, volume and dimensional requirements;

- Cold Box (Laempe)
- Shell
- Bench Box
- No-Bake Air set

After molding, and after any risers, chills and mold release agents are applied; each mold is drawn and inspected to ensure that both the quality and productivity of the casting and process will be maintained.

## POURING

Once the mold is ready to be poured from one of our two 9 ton induction furnaces, the critical stages of inoculation and metal conversion are carefully managed to ensure the proper material grade is achieved. Proper temperature and pouring times are essential in producing quality castings.

Samples and test bars are taken from each batch of material to ensure the required chemistries and physical properties are maintained. All parts are coded with the pour date to ensure batch traceability and controls are available for future reference.

## Shake-out & Cleaning

Once the casting has cooled in the mold for the prescribed period of time, the casting is removed through the 'shake-out' or 'break-out' process. At this point, any recoverable sand is collected and recycled.

After shake-out, the casting is freed from any risers or gating, shot-blasted and cleaned and packaged for shipping to either the next value added process or directly to the customer. Raw castings can be heat-treated, primed or painted as required.

Monarch Industries recognizes that automation is essential in meeting the customer's expectations for consistent finishing, continuous improvement and cost reductions. Recent investments in both a Robert Sinto 'Barinder' and Maus 'SAM1200' CNC automatic grinding systems demonstrates Monarch's commitment to this growing customer requirement.

### THERMAL TREATMENT

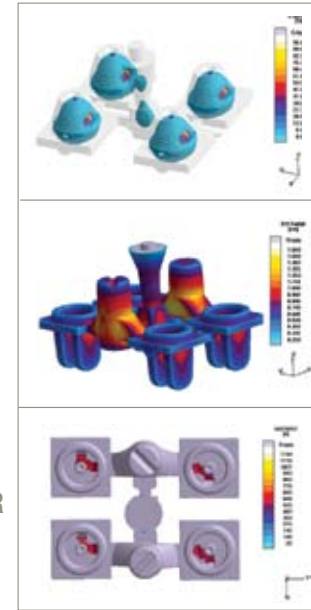
Heat treat furnaces are equipped with a programmable control system and a multi-point recording device which precisely monitors their temperatures according to prescribed requirements.



## Measuring & Testing

Monarch's internal testing and measuring processes have been developed to support both the needs of its customers and its own requirements for sustaining and improving its processes. Customers' ISIR requirements begin at the foundry and

continue through the value-added-stream where machining, plating or painting are also measured for consistency and quality.





Monarch Industries employs a variety of testing processes to ensure quality and consistency are sustained;

- Sand testing and monitoring
- Hardness testing
- Tensile testing
- Metallographic Analysis
- Spectrochemical Analysis
- Ultrasonic testing
- Magnetic Particle Inspection
- Radiography (outsourced)
- Coordinate Measuring Machine (DCC)

Monarch can also provide the necessary documentation to support the customer's quality requirements;

- Metallurgical reports
- Product certificate:
- PPAP
- APQP
- FMEA
- Control plans



## Quality Systems

In 2009, Monarch Industries also implemented and was certified to the ISO: 14001-2004 standard for Environmental Management.

The benefits of ISO 14001, for both Monarch and its Customers are:

- Enhancement of environmental awareness within the organization and the business community.
- Cost savings and reduction in resource usage.
- Ensured compliance with local, national and global legislation and
- Ability of its ISO:14001 Certified Customers to benefit from the improvements Monarch incorporates within its operations.

## Machining Capabilities

Monarch Industries has full machining capabilities either within its own facility or through one of its pre-qualified subcontractors.

- Turning
- Milling
- Drilling
- Horizontal Machining

A complete list of capabilities can be provided on request.

### MANUFACTURING SUPPORT

- Process engineers
- Tooling design
- In-house tool and die shop
- Engineering support with Pro-E® and Solidworks® capabilities



## Value Added Assembly

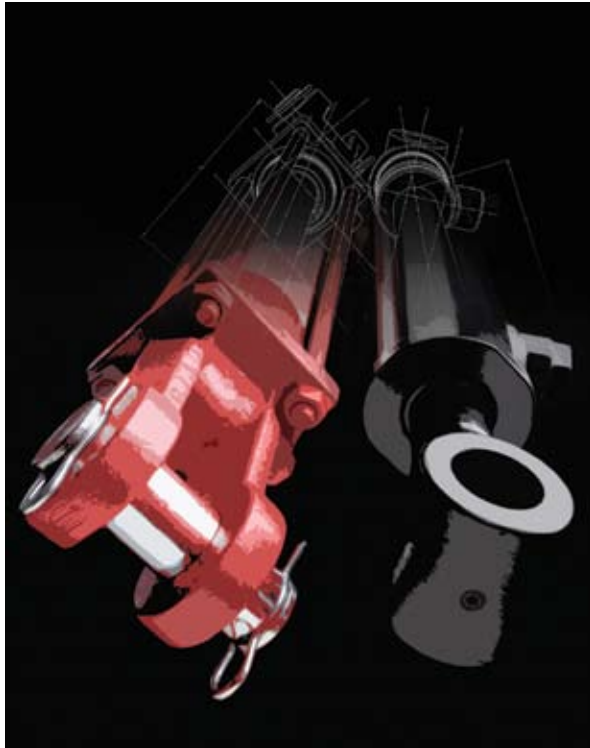
As a manufacturer of both Tie Rod and Welded hydraulic cylinders, Monarch has the capability to cast, machine, manufacture and, finally, complete your sub-assemblies within their facility. Painting, labeling and specialty packaging can also be done so that your parts are ready for point-of-use to either your or your customers' specifications.

Adding value is what Monarch Industries strives to do for its customers everyday and they are always open to finding more ways they can be of service to you.



*Alamo Industrial, Kingpost Frame  
Sub-assembly for Cutter Attachments*

# Value Added



Monarch strives to 'add value' wherever possible and uses the following programs to achieve cost reductions and quality improvements for its customers.

## VALUE ADDED PROGRAMS

- Sub-assembly of casting components
- Returnable containers
- Specialty plating, painting and finishing services are also offered by approved outside 'ISO Approved' sub-contractors.

## VALUE ENGINEERING & VALUE ANALYSIS

- Fabrication to casting or weldment to casting opportunity identification, design and assistance.
- Vendor / customer joint programs to reduce costs, improve quality and improve service.
- Dual sourcing of iron castings from approved 'low cost country' suppliers.
- Steel castings from 'low cost country' suppliers.

## VENDOR MANAGED INVENTORY PROGRAM

Dependent on a 'prequalification' process, J.I.T. inventory requirements can be achieved using V.M.I. where qualified.

## more Value Added

New in 2010, Monarch Industries has installed an Automated Paint Finishing System unique to the industry. Occupying 9,000 sq. feet, it has the dual purpose of applying a durable, high quality finish as well as transporting hydraulic cylinders and custom castings from the staging area to the distribution center for packaging and shipping. The system is comprised of the following 'state of the art' components;

- 5 Stage Wash & Pretreatment system
- 70' of dry-off oven
- 2 cool-down tunnels totaling 130'
- 4 paint booths with 2 integral flash tunnels and an automated paint mixing system
- 74' of convection cure oven and a totally enclosed paint kitchen containing nine Kremlin Flow Max pumps servicing the automated paint system.

Monarch Industries' new paint system also utilizes a fully automated RFID system that reads and interprets the painting and packaging requirements for all parts being painted. This ensures that it is done right and consistently every time.







## MONARCH INDUSTRIES

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