



Specialist for Pumping Technology

INNOVATION
EFFICIENCY
QUALITY



Ruhrpumpen
Foundry
FUNDEMEX



For more than 60 years the name Ruhrpumpen™ has been synonymous worldwide with innovation and reliability for pumping technology.

Ruhrpumpen is an innovative and efficient centrifugal pump technology company and offers pump system operators a wide range of quality products. The broad product line complies with the most demanding quality standards and industry specifications such as API, ANSI, and Hydraulic Institute Standards.

Ruhrpumpen is vertically integrated with its own foundry, machine shop, service centers, and pump manufacturing plants.

Fundemex dedicated to Ruhrpumpen

Ruhrpumpen's foundry, Fundemex, is headquartered in Monterrey, Mexico and is 100% dedicated to Ruhrpumpen. This ensures availability of the expertise and equipment necessary to produce quality pump castings.

Fundemex first achieved the International Organization for Standardization (ISO) Quality Management System (ISO 9001:2008) certification in 2004 and has maintained compliance with the ISO requirements since that time.

Location:	Monterrey, Mexico
Production Area:	10,000 m ²
Personnel:	About 200
Certification:	ISO 9001 : 2008



Ruhrpumpen Foundry

Materials

Our foundry houses state-of-the-art induction furnaces and can produce nearly all of the materials required to comply with standards such as: ASTM, DIN, EN, and others. The available materials include:

- Austenitic Stainless Steels
- Nickel Base Alloys
- Specialty Irons
 - Heat-resistant Grey Iron
 - Austenitic Grey Iron
 - Austenitic Ductile Iron
- Duplex Stainless Steels
- Cast Tool Steels
- Heat-resistant Stainless Steels
- Carbon Steel Alloys
- Martensitic Stainless Steel Alloys
- Alloy Steels

Other materials are available on special request.



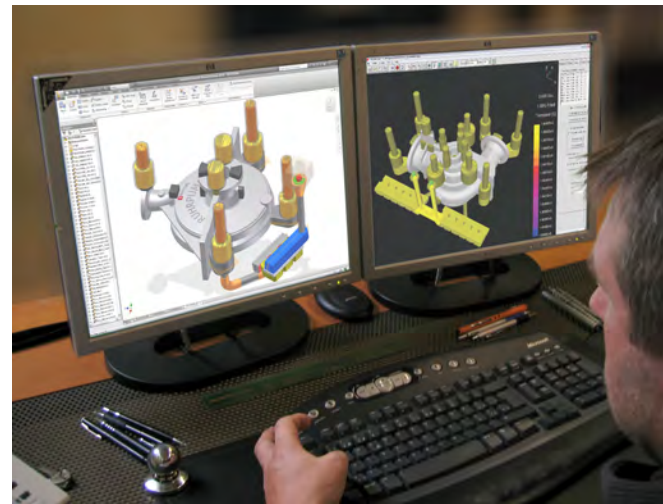
Process

DESIGN

Here is where the whole process starts. Autodesk (R) Inventor 3D is the modern software our designers and engineers use to create drawings for modeling the pieces. A casting simulation for each item ensures the gate and feeder are precise for the piece.

Equipment

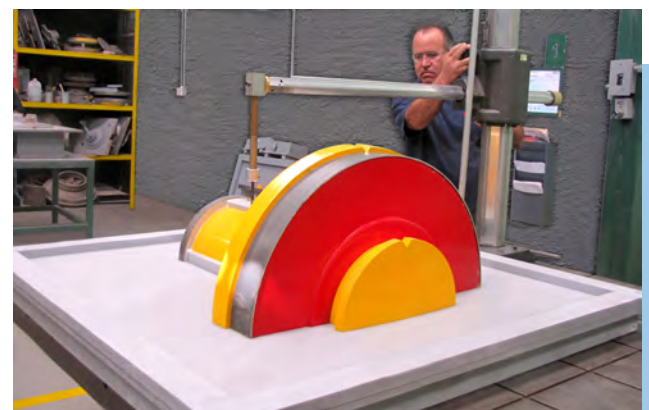
- Autodesk (R) Inventor
- SOLIDCast (R)
- FLOWCast (R)



PATTERN SHOP

The pattern shop handles patterns and core boxes in wood, aluminum, and resin (loose, match plate, and cope & drag) to produce precise patterns used in the molding process.

All patterns for Ruhrpumpen pumps are made with state of the art equipment including the latest technology for rapid prototyping.



Process

MOLD AND CORE SHOP

The Fundemex Core Shop has the most modern equipment for precise cores and molds made of high quality materials. The no-bake process or the ceramic molding process are utilized, depending on the final quality of the casting that is needed.

NO-BAKE PROCESS

The secret of our high quality casting surfaces finishing relies on our process that reduces gas levels and has good mold compaction. The no-bake process also provides superior performance in a variety of ambient weather conditions.

We use sands that are 95% recycled (mechanically and thermically).

The Fundemex Mold and Core Shop sand laboratory conducts a variety of tests for resin bonded sand, such as tensile test, LOI, and grain size (AFS number), to ensure quality.

Our molds and cores can be made at our Floor Molding or by semi-automatic molding machine (IMF). Having both capabilities, increases the quality, flexibility, and efficiency of our process.



CERAMIC MOLDING

For more precise finishing of closed impeller casting surfaces, we recommend cryogenic ceramic molding which begins with a mixture of resin, cryogenic binder and other materials. The mixture is then vacuumed to release all bubbles before being poured over the pattern (with help of a centrifuge if a core is being made).

The molding (or core) is then baked in a gas furnace. A ceramic mold or core guarantees unbeatable precision and surface smoothness that is required for some impellers.



Core Shop Equipment	Molding Shop Equipment	Ceramic Cores and Molding
<ul style="list-style-type: none"> • Two continuous mixers (23 kg/min) • One continuous mixer (45 kg/min) • One continuous mixer (91 kg/min) • One blower machine (45 kg/min) 	<ul style="list-style-type: none"> • No Bake Molding System - Molding Process: Phenolic Urethane three-parts system with silica sand (Wedron) using four continuous mixers with a combined capacity of 1,500 kg/minute. Three molding pits are available for floor molding castings up to seven tons. - Core Process: Phenolic Urethane three-part binder system with zirconium sand and silica sand by using five continuous mixers with a combined capacity of 180 kg/minute and one batch type mixer from Foundry Automation SAS (for cold box process). • No-bake molding line (IMF) Semi-automatic 47x47x19 cope/19 drag, 18 molds per hour 	<ul style="list-style-type: none"> • One continuous mixer • Centrifuge equipment • Vacuum equipment • Gas furnace: 0.67 m³, 1250°C Heat treatment furnaces also available (see Heat Treatment Equipment on page five).

Process

MELTING SHOP

Fundemex is able to satisfy all customer demands and optimize lead time by operating several melting furnaces simultaneously. This provides the following melting capacity:

- 0.5 kg - 6,500 kg net weight
- 5 tons per hour

We manufacture with the most modern melting equipment. Induction furnaces provide an environmentally friendly, energy-efficient, and well controllable melting process.

Induction Furnaces		
Power Supply	Melt Rate (kg/hr)	Furnaces Capacity (kg) each one
750 KW	1,150	1,000 (2)
1,000 KW	1,500	1,500 (2)
1,500 KW	2,200	3,500 (2)

Three units with two induction furnaces each, for a total capacity of 5 tons/hr of molted metal with a holding capacity up to 12 tons.

Our Spectrometer equipment provides highly precise chemical composition analysis and has the option to determine the oxygen content of the molten metal.



Process

FINISHING SHOP

The finishing touch is as important as the rest of the process and therefore we have different methods to meet the customer's specifications. All of our finishing specialists are certified in accordance with ASME Code, Section IX. Our welding capabilities include SMAW, FCAG, TIG, and we employ AWS welding inspectors.

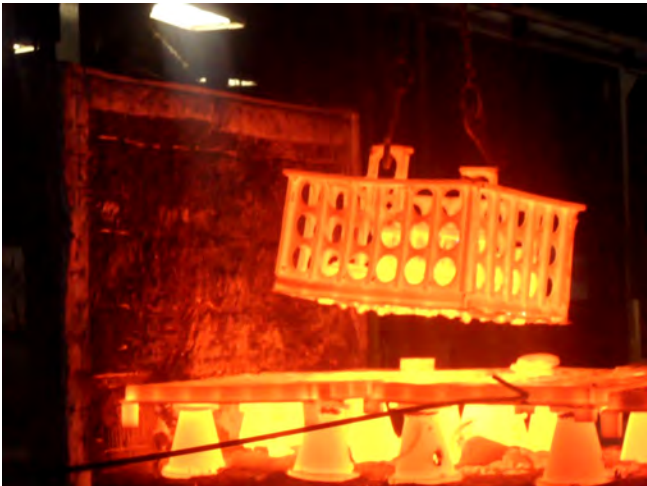
Non-destructive tests are performed before and after heat treatments, depending on material and customer's requirements.

Our foundry offers several heat treatment options, including:

- **Normalizing:** Used to eliminate internal stress and homogenizes (or regenerates) the grain size created by the solidification of the metal.
- **Quenching:** Used to harden and increase the resistance of the steel.
- **Tempering:** Necessary to give ductility to the martensite, property that decreases the hardness and resistance of the tempered or normalized steels; tension created by a previous treatment are also decreased and tenacity is improved.
- **Annealing:** Used to soften the steel, regenerate its structure and eliminate internal tensions for further deformation or scheming.
- **Stress relief:** Used to eliminate stresses generated by solidification, welding or work of the applicable metal to irons or steels.

Heat Treatment Equipment

- Two gas furnaces: 12 m³ and 24 m³
- One double electric furnace: 6 m³ for special heat treatments up to 1,250°C.



To ensure that the castings meet the cleanness necessary just before shipment, we do a final cleaning with either:

- Shot blast machine
- Sandblast
- Chemical passivation / pickling

Quality

INSPECTION & TESTING

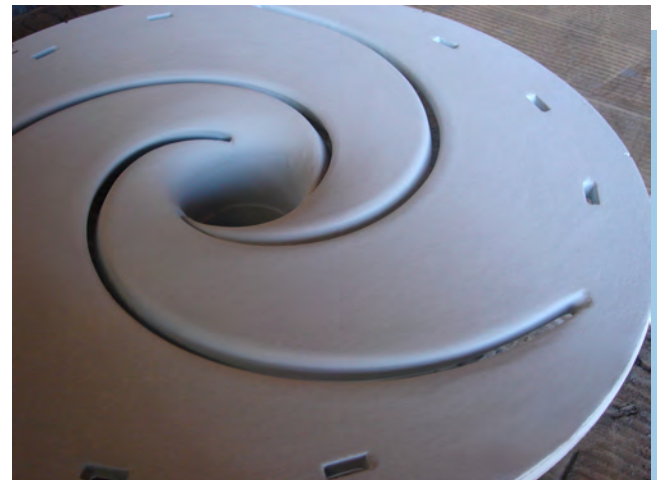
Our foundry first achieved the International Organization for Standardization (ISO) Quality Management System certification in 2004 and has maintained compliance with the ISO requirements since that time.

A quality control program with tests performed at different intervals in the process ensures an excellent quality casting for your pump.

All materials can be produced to comply with quality standards such as: ASTM, DIN, EN, and more.





In-house nondestructive testing conducted by ASNT Level 2 and 3 Certified Inspectors:

- Liquid Penetrant Testing
- Ultrasonic Testing
- Magnetic Particle Inspection (wet method and dry method)
- Hardness Test
- Visual Test
- X-ray inspection (available as an external test)





RUHRPUMPEN PLANTS

-  GERMANY, Witten
-  USA, Tulsa & Orland
-  MEXICO, Monterrey
-  EGYPT, Cairo
-  INDIA, Chennai
-  BRAZIL, Río de Janeiro
-  ARGENTINA, Buenos Aires

More Information:

