



Specialist for Pumping Technology



RP METALS

Ruhrpumpen Metals... where everything begins

As a global leader in the development of pumping solutions, Ruhrpumpen knows the importance of having its own supply of quality castings to create the most robust and reliable pump systems in the marketplace. RP Metals is Ruhrpumpen's own foundry. It is part of our vertical integration that also includes machine shops, service centers and pump manufacturing plants around the globe.

Headquartered in Monterrey, Mexico, since 1989, RP Metals designs and manufactures integral and high performance components in a wide range of materials. It houses its own no-bake molding process and state-of-the-art induction furnaces to provide better dimensional control, smoother surface finish and higher quality castings.



Dedicated to Ruhrpumpen

RP Metals supplies castings to Ruhrpumpen's own factories and to external special customers. This ensures availability of the expertise and equipment necessary to produce quality pump castings, and provides complete flexibility to adjust time-scales and schedules to meet our customers' needs.

RP Metals is certified to ISO 9001 quality systems, since year 2000, to ensure our castings are produced to the topmost quality standards required by the industry.

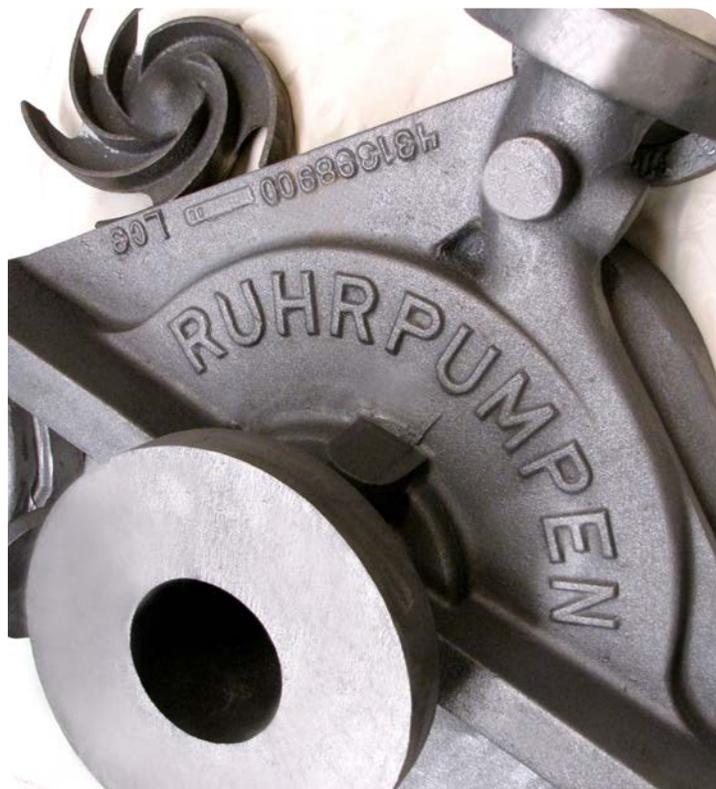
Materials

Our foundry shop has state-of-the-art induction furnaces and can produce the majority of metallurgies commonly required by our customers, in compliance 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

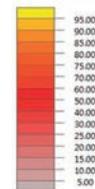
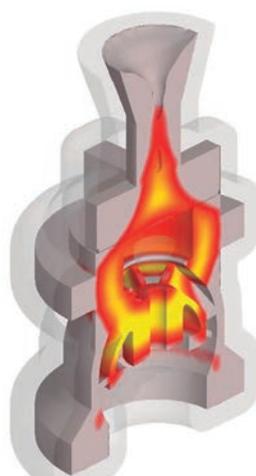
Other materials are available on special request.



Process

1. Design

This is where the whole process starts. Our designers and engineers use the latest 3D modelling software to create drawings and models. Moreover, simulation software is used to test the performance of the metal in the mold and ensure the gate and feeder are precise for the piece.



410 SS	1620.0
410 SS	1620.0
Shell Sand	980.0
Air_Outside	20.0
Air_in_mold	20.0
Time (h,m,s)	000:17:51.516
Filled volume, %	98.20
Liquid phase, %	22.20
Shrinkage, %	1.80
XZ plane, mm 147.00 [49]	
NovaFlow&Solid4.5r1	
Descriptor : Lost Wax with gating - Shell v3.0r	
Date : 2012-01-03	
NovaCast Systems AB	
Copyright 1996 - 2011	

NovaFlow & Solid
Control Volume

2. 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.



3. Molding

RP Metals Core Shop has the most modern equipment for precise cores and molds made of high quality materials. Depending on the final quality required for the casting, our Core Shop can work with the next processes:

No-Bake Process

The secret of our high-quality casting surface 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 thermally). RP Metals 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 by Floor Molding or by semi-automatic molding machine (IMF). Having both capabilities increases the quality, flexibility, and efficiency of our process.



Core Shop equipment:

- 2 continuous mixers with a capacity of 23 kg
- 1 continuous mixer with a capacity of 45 kg
- 1 continuous mixer with a capacity of 91 kg
- 1 blower machine with a capacity of 45 kg

No-bake process equipment:

- No Bake Molding System
- **Molding Process:** Phenolic Urethane 3 Parts System with silica sand from Wedron using 4 continuous mixers with a combined capacity of 1,500 Kg/minute. 3 molding pits are available.
- **Core Process:** Phenolic Urethane 3 Parts System with Silica Oklahoma, Zirconium, Synthetic and Silica Wedrom sand from using 5 continuous mixers with a combined capacity of 180 Kg/minute and 1 batch type mixer from Foundry Automation SAS (For cold box process)
- IMF Semi-automatic 47x47x19 cope/ 19 drag, 12 molds per hour
- Floor Molding

4. Melting Shop

RP Metals is able to satisfy all customer demands and optimize lead time by operating several melting furnaces simultaneously and the following melting capacity:

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

RP Metals has the the most modern melting equipment. Induction furnaces provide an environmentally friendly, energy-efficient, and easily controllable melting process.

Induction Furnaces

Power Supply	Melt Rate (kg/hr)	Furnaces Capacity (kg) each one
350 KW	400	350 (2)
750 KW	1150	1000 (2)
1000 KW	1500	1500 (2)
1500 KW	2200	3500 (2)

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.



The spectrometer, with a capacity to detect 16 elements, and Leco, for Carbon analysis, are used to assure the chemical analysis. Additionally, we have the ELTRA equipment, an instrument for gas analysis, which is able to determinate the levels of oxygen, nitrogen and hydrogen.



5. Finishing Shop

The finishing touch is as important as the rest of the process and therefore we have different methods to meet our customers' specifications. All of our finishing specialists are certified in accordance with ASME Code, Section IX. Our welding capabilities include: SMAW, FCAW, and GTAW process.

Our foundry offers several heat treatment options, including:

- **Normalizing:** Used to eliminate internal stress and homogenize (or regenerate) the grain size created during the solidification of the metal.
- **Quenching:** Used to harden and increase the resistance of steel.
- **Tempering:** A technique applied to ferrous alloys to achieve greater toughness by adjusting the hardness of the alloy. The reduction in hardness is usually accompanied by an increase in ductility. It is usually performed after hardening to reduce some of the excess hardness.
- **Annealing:** Used to soften the steel, regenerate its structure and eliminate internal stresses.
- **Stress relief:** Used to eliminate stresses generated by solidification, welding or other work.
- **Ferritized:** Used to increase the Ferrite in Ductil Iron.



Heat treatment equipment:

- Two gas furnaces: for 2 ton (12 m³) and 6 ton (24 m³) capacity and 1250 °C
- One electric furnace: 1 Ton (6 m³) for special heat treatments up to 800 °C

To ensure that the castings meet the cleanliness necessary, we do a final clear up by way of:

- Shot blast machine
- Sandblast



Quality

Inspection and Testing

RP Metals is certified to ISO 9001 quality systems.

Our quality control program, with tests performed at different stages throughout the process, ensures an excellent quality casting for your pump.

All materials can be manufactured in compliance with quality standards such as: ASTM, DIN, EN, NACE and more.

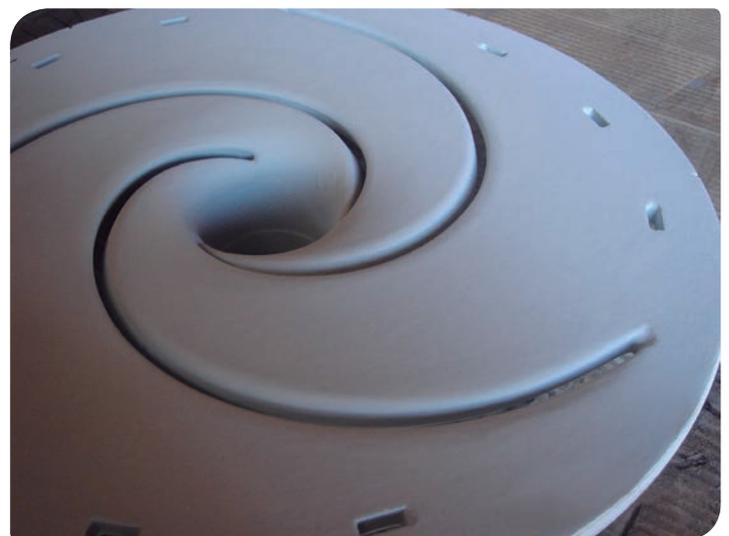
Available testing includes:

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



Additionally, tests can be carried out either by internal inspectors qualified to ASNT Level 2 or external inspectors Level 3, depending on type of test and customer requirements.

RP Metals has full in-house capabilities for carrying out chemical and mechanical testing for certifying Material Test Reports according to EN 10204.



+65 years creating the pumping technology that moves our world

Ruhrpumpen is an innovative and efficient pump technology company that offers highly-engineered and standard pumping solutions for the oil & gas, power generation, industrial, water and chemical markets. We offer a broad range of centrifugal and reciprocating pumps that meet and exceed the requirements of the most demanding quality specifications and industry standards such as API, ANSI, UL, FM, ISO and Hydraulic Institute.

