

CAPACIDADES PRODUCTS



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BILLET CASTING



SPOUTS AND FLOATERS

Advantages:

RODABELL's spouts and floaters have been specifically developed to provide the best molten Aluminum distribution in the casting process. Our products are produced by using a certified machining process. Our machining process has been developed jointly with our customers and raw material providers in order to achieve the best quality in the final product.

- Great mechanical resistance
- High thermal shock resistance
- No preheating necessary
- Reduces risks of casting failure due to a sudden metal cooling
- Easy to clean between castings



THIMBLES & T-PLATES

Advantages:

We offer a broad array of precast thimbles and T-plates for hot top systems. PERMATECH Sigma composition offers various advantages for billet casting thimbles. The extremely smooth surface finish of the parts increases their lifetime and may even result in improved billet surfaces. Our T-plates made out of machined graphitized calcium silicate are available in customized sizes and shapes with precise geometry.

- Ready to Use
- Fine Surface Finish
- Long Life
- No Shrinkage
- Minimal Oil Penetration
- Precise Geometry
- Non-Reactive with Molten Aluminum Alloys
- Wagstaff OEM supplier

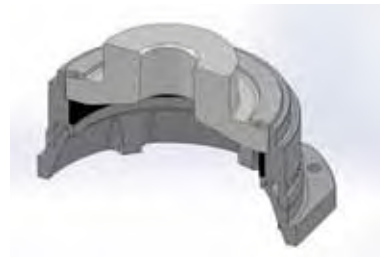


CASTING MOLD LUBRICATION RINGS

Advantages:

RODABELL jointly with major graphite suppliers have developed special graphite grades for aluminum continuous casting operations. Our premium extruded and isostatically pressed graphite material selection were conceived to provide the most demanding cooling and lubricating specifications.

- High accuracy machining
- Long lifetime



MOLDS AND BOTTOM BLOCKS

Advantages:

RODABELL designs and manufactures a range of billet casting molds. Our state of the art machining workshop provides us the ability to manufacture molds for any OEM. We currently offer a great variety of formats and several configurations for refrigeration systems within the mold.

- Reduces maintenance time
- Reduces costs
- Easy to use
- Safe to use

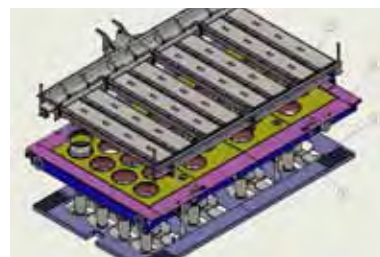


TABLE TOP TROUGH SYSTEMS

Advantages:

The Permtech Engineering Services Team is a leader in engineering the utilization of refractory shapes for aluminum Table Top Troughing Systems. PERMATECH has the necessary design, engineering and manufacturing expertise to produce a complete reline for your Table Top Trough System that will conform to the specific assembly desired.

- Evaluation of troughing Requirements
- Engineering & Design of complete insulation
- Complete construction



BILLET CASTING MACHINE

With over 30 years of experience collected in the aluminum industry, RODABELL is able to design customized casting systems for billet production. Along with our collaboration with the client, we can conduct specific designs made for each casting application. Our systems include casting cylinder, casting table with launder, and all the necessary control Software and hardware.



SLAB CASTING



Control Pins and Spouts for rolling ingot casting operations. The **PERMATECH** Sigma composition offers many advantages over other like products and helps create an extremely smooth surface finish. Special non-wetting properties prevent metal sticking and attack by aluminum and other molten metals.

SPOUTS & CONTROL PINS

Advantages:

- Low Coefficient of Thermal Expansion
- Excellent Thermal Shock Resistance
- Thermal Insulation
- Long Life Wear Resistance
- Long Life Corrosion Resistance
- Precise Geometry
- Complex Shape Capability
- Non Reactive with Molten Aluminum Alloys



COMBO BAG FILTERS

Advantages:

RODABELL combo bag filters are specially designed to prevent inclusions and to improve molten aluminum quality. We offer a great filter shape variety with many mesh sizes and differentiated coatings. Our engineering department is able to provide design assistance for any filter size.

- Prevents inclusions
- Improves molten metal distribution
- No out gassing
- Very stiff shaped bags



SKIM DAMS

Advantages:

Our skim dams are cast from high quality refractory materials and then kiln fired, producing a hard-durable part to fit your desired dimensions. **PERMATECH**'s refractory compositions are designed specifically to be used in molten aluminum applications and because of their extremely non-wetting properties allow for easy clean up

- Longer Lasting
- Float Lower
- Easier to Clean
- No Out Gas

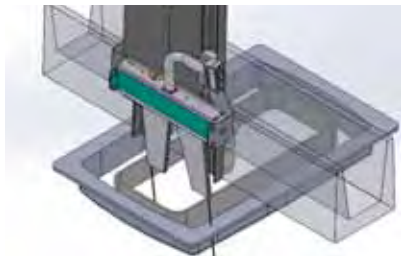


MOLDS AND BOTTOM BLOCKS

Advantages:

RODABELL designs and manufactures slab casting molds and bottom blocks. We currently offer a great variety of formats, and also several options for refrigeration and lubrication techniques. Our workshop is able to provide manufacturing capabilities for any technology in the market.

- High precision machining
- Testing capabilities
- Easy to use
- Safe to handle

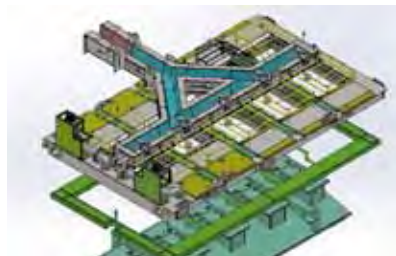


CASTING LAUNDER SYSTEMS

Advantages:

RODABELL casting troughs are specially designed to provide the most accurate metal flow into the molds. Our designs include mechanical regulators (Steady Eddy) for manual control, and laser based systems and actuators for automatic control in collaboration with **PRECIMETER**.

- Customized designs
- Laser sensor technology: Reliable & low maintenance
- Long lasting refractories
- Safe draining operations



SLAB CASTING MACHINE

With over 30 years of experience collected in the aluminum industry, **RODABELL** is able to design customized casting systems for slab production. Along with our collaboration with the client, we can conduct specific designs made for each casting application. Our systems include casting cylinder, casting table with launder, and all the necessary control Software and hardware.

RODABELL's machining and metal fabrication workshops, equipped with the latest machinery, allows us to perform the complete fabrication of our casting pit sets. Our highly skilled welders and milling crew accurately complete and execute the finishing details of the assembly of the whole system.

METAL TRANSFER

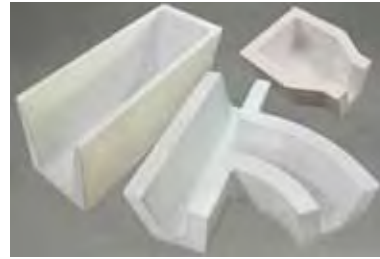


CRUCIBLES & LADLES

RODABELL designs and manufactures metal crucibles upon specification for metal capacity. We include precast and pre-fired refractories shapes in our designs to reduce relining operations and increase life time. Rodabell also commercializes CCM (Crucible Cleaning Machine) in collaboration with STORVIK.

Advantages:

- Great mechanical resistance
- High thermal shock resistance
- Resistance to attack by molten metals
- Reduces risks of casting failure due to a sudden metal cooling



LAUNDER SYSTEMS

RODABELL-PERMATECH designs vary depending on casting house layouts and casting parameters. Our laundry systems include precast refractory sections made out of fused silica. The fused silica materials we use have been developed by **PERMATECH** to provide the best performance and extended lifetime.

Advantages:

- Thermal engineering
- Great mechanical resistance that provides an extended lifetime
- Smooth transition from one profile to another
- Customized steelwork and refractory

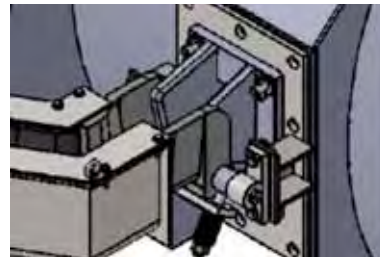


AUTO-DAMS FOR LEVEL CONTROL

Our dams for level control are the excellent solution for regulating metal flow in the casting line. Our designs include pneumatic dams governed by laser sensors or through manual operations.

Advantages:

- Precast refractories for metal contact
- Perfect sealing
- Robust and reliable systems

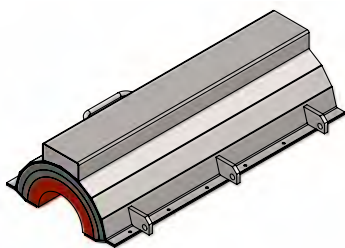


FURNACE SPOUTS

RODABELL designs and supplies furnace spouts in 2 parts configurations for tilting furnaces. The parts are casted in a special steel alloy that improves lifetime. The joint between the two parts is adjusted with a spring system that prevents the metal from leaking.

Advantages:

- Eliminates metal cascade from furnace to launder
- High thermal shock resistance
- Reduces leakage



HEATED LID SYSTEMS

RODABELL provides several heating solutions to prevent loss of Temperature along the launder system. From electrically heated lids to gas powered burners we design the best solution for each specific situation. The same system is also used to preheat the launders after casting operations being stop for a long period of time.

Advantages:

- Reduces metal temperature loss in long launder systems
- Provides homogeneous preheating
- Easy and safe operations



MISCELLANEOUS TOOLS

RODABELL commercializes several tools to safely carry out metal sampling and launder cleaning after casting operations. Contact **RODABELL** for more specific info in any of our products for these applications.

Some of these products are:

- Sampling crucibles
- Test molds for aluminum sampling
- Cleaning rods

METAL TREATMENT



DEGASSING UNITS DESIGN AND REPAIR

Advantages:

Jointly, **RODABELL** & **PERMATECH** account for the necessary resources to design and build high performance degassing systems for any refining specifications. We also provide customized reline kits for your existing system.

- Turn-key solution
- Low maintenance
- Simple designs with few assemblies
- Complete systems drawings
- Complete insulation design
- Different heating solutions



DEGASSING CONSUMABLES

Advantages:

Our state of the art machining center is specialized in graphite parts processing.

We use high quality extruded graphite for gas injection parts and thermocouples. Finishing processes, such as coatings or impregnation are applied in the last stage of manufacturing. These treatments allow raising oxidation resistance in high temperature.

- Different grades and coatings available
- Extended lifetime
- Precise and accurate machining



CERAMIC FOAM FILTER SYSTEM

Advantages:

RODABELL offers turnkey filtration system installations. Bowls, lids, drain pan, preheating, and control systems are included in our broad array of sizes and configurations portfolio. We also design precast relining kits for repairing existing systems.

- High quality Precast refractories
- Several preheating solutions available
- Robust and reliable systems



DEEP BED FILTER LINERS AND GRID BARS MODULES

Advantages:

Our partnership with **PERMATECH** allows us to design customized DBF systems. We are able to provide precast bowls that can hold up to 10Tons of metal in 1 piece. We also provide custom made grid bar modules out of our high performance refractory material for this application, Permotech Beta 2.

- Evaluation of filtration requirements
- Turnkey Projects
- Completely insulated system
- "Grid bars" made for tight tolerances



FIBER GLASS FILTRATION ITEMS

Some of our products include:

RODABELL's Fiber Glass Filters are specially designed to prevent inclusions and to improve molten aluminum quality. Our filters are manufactured from fiber glass textiles providing the best performance in molten aluminum filtering (750°C).

RODABELL offers a great filter shape variety with many mesh sizes and coatings available.

- Fabric rolls
- Launder socks
- Spout socks
- Funnels
- Molded articles



DEGASSING TABLETS

Some of these products are:

Our degassing tablets are produced in compacted tablets available in different sizes to facilitate treatment of various melt sizes. They are plunged into aluminium melts. Some of our degassing tablets also contain grain refining elements functioning as combined degassing and grain refining agents.

- Degassing
- Degassing + grain refining
- Degassing + Mg removal

MISCELANEOUS PRODUCTS



SHAPES FOR ALUMINUM FOUNDRY & DIE CASTING

Some of our products:

- Bull Ladles/Transfer Crucibles
- Tundishes
- Launderers
- Auto-pour Ladles
- Low Pressure Casting (riser) Tubes
- Striko Fill Funnels
- Shot Sleeves
- Pouring Spouts
- Bottom Pouring Nozzles
- Thermocouple Protection Tubes

RODABELL, in collaboration with **PERMATECH** manufactures a comprehensive range of pre-fired, precast shapes for aluminum foundry and die casting applications.



BORON NITRIDE

Advantages:

- Specially formulated
- Reduces application time
- Reduces costs
- Protects refractory systems
- Completely safe product

The Boron Nitride coating, “**Permacoat BN DEEP BLUE**”, is the best solution to facilitate Aluminum removal from refractory systems. The utilization of this product helps extend refractory life along the casting line in subsystems like:

- Molten metal transfer launderers
- Ceramic foam filter bowls
- Ladles or crucibles for molten metal transfer
- Consumables and Tooling



INGOT/SOW CASTING MOLDS

Advantages:

- Able to manufacture molds up to 10Tons in weight
- Design and simulation capabilities
- Long lasting materials

RODABELL under collaboration with Storvik commercializes a great variety of cast iron molds. We also provide engineering services for developing new mold designs. There are several material qualities available depending on the application.



MOLDABLE PRODUCTS

Available in two formulas: Non-Wetting Moldable containing RCF; and Clean Wool Moldable (Non RCF). Available in 400gr tubes; 5Kg buckets and 22Kg buckets.

Advantages:

- High temperature insulating moldable refractory
- Does not react with molten aluminum (non-wetting)
- Higher strength and abrasion resistance than competing products
- 3 Adheres to most any surface

Non-Wetting Moldable provides an easily formed, ready mixed composition for field applications in molten aluminum environments. Designed for use downstream from metal treatment operations, the refractory composition can be applied quickly and simply to make joints, troughs and other shapes, to patch existing refractory materials, and to coat metals as a shield against high temperatures.



COATINGS

Advantages:

- Improves the cast / ingot surface finish
- Increases the life of the tools
- Eliminates contaminations of Iron or other undesired elements
- Avoids blisters on the cast surface
- Easy application method, easy storage

RODABELL commercializes a broad array of coatings for the use in cast-house downstream applications. These coatings are meant to improve the lifetime of refractory and metal systems in contact with molten metal. Our range include Zircon, Graphite and Refractory base coatings. All of them are available on 25Kg buckets.



THERMOCOUPLE PROTECTION TUBES

Applications:

- Melting/Holding furnace
- Degassing system Temp control
- Melt control along casting line
- Anode baking furnace TC

RODABELL commercializes a complete line of thermocouple elements, protective tubes and spare parts for aluminum applications. We suggest the proper TCPT type based on the specifications and scope of work received from the customer. Our product line includes elements for almost every high temperature application. From cast iron (plain or enameled), standard refractory types, graphite, SiC, to SiN more complex tubes.

MELTING, REFINING, ALLOYING



SALTS FOR METAL REFINING, DROSSING

Applications:

- Alkaline agent removal
- Magnesium removal
- De-Drossing
- Furnace cleaning

Oxide and inclusions formation are a common phenomenon that appear in liquid aluminum. Our Fluxes provide the perfect treatment technique to the melt containing impurities and inclusions and facilitates the agglomeration and separation of such undesirable constituents from the melt.



SKIMMING EQUIPMENT

Advantages:

- Able to assemble to lift truck or special vehicles
- Extended lifetime
- Great mechanical properties
- Resilient to metal attack and corrosion

In collaboration with our partner Storvik, we supply cast iron skimming tools. We use materials that have been carefully developed to provide the best thermal shock and mechanical properties allowing extended lifetime compare to competitors products.



STIRRING EQUIPMENT

Some of our products include:

- Able to assemble to lift truck or special vehicles
- Extended lifetime
- Great mechanical properties
- Resilient to metal attack and corrosion

In collaboration with our partner Storvik, we supply cast iron skimming tools. We use materials that have been carefully developed to provide the best thermal shock and mechanical properties allowing extended lifetime compare to competitors products.



DROSS PANS

Advantages:

- Extended lifetime
- Great mechanical properties
- Resilient to metal attack and corrosion

RODABELL supplies a variety of dross and metal draining pans for aluminum recovering. Our casted pans, developed by Storvik, provide the best performance and duration.



FURNACE DOOR ASSEMBLIES

Advantages:

- Prevents heat losses
- Easy to lift/close
- Lifting mechanisms available

RODABELL in cooperation with **PERMATECH** is able to provide complete furnace door installations. We perform all necessary steelwork before installing insulation and refractory kit. We install refractory pre-cast sections instead of poured castable. These frames are the best solution to prevent heat loss and reduce casting operation costs.



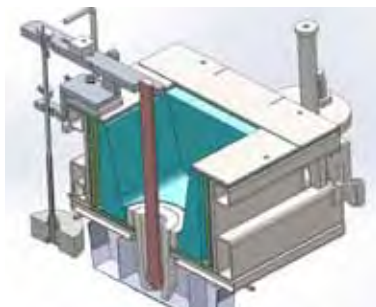
FURNACE BIG BLOCK

Advantages:

- Price competitive
- Reduced installation time
- Fewer joints
- Less dry out costs
- Turnkey project

RODABELL provides installation services for "Big Block" technology relining for Aluminum furnaces. Jointly with manufacturers, we offer the turnkey relining project. Rodabell supplies patented "Big-Block" technology developed by our partner **PERMATECH**.

PRIMARY SMELTING



CAST-HOUSE ENGINEERED SYSTEMS

Some of the systems developed include:

- Billet lifting and handling equipment
- Slab lifting and handling equipment
- Molten metal level control systems
- Preheating equipment (Crucibles, launders, casting troughs, CFF,...)
- Gas panels for degassing units
- Auto-pour Ladles
- Siphon system for crucibles
- Rotary joints



ELECTROLYSIS/POT LINES

Some of the products are:

- Crush brakers
- Bath removal equipment
- Anode lifting and handling equipment
- Anode clamps
- Pot cell repairs
- Superstructures spare parts
- Collector bars
- Graphite sidewalls for pot relining
- Alumina dispenser system
- Fluoride dispenser system
- Tapping pipes and pipe cleaning machines
- Crucible and pipes gaskets



RODABELL has been providing maintenance services to Spanish smelters for over 20 years. This experience in running and repairing Electrolysis equipment has lead us to come up with our own fabrication for spare parts and consumables.

CARBON BAKE



Some of the products are:

RODABELL has been providing maintenance services to Spanish smelters for over 20 years. This experience in running and repairing Carbon Bake equipment has lead us to come up with our own fabrication for spare parts and consumables.

- Big block for anode bake furnace insulation
- TC spare parts and repair
- Carbon bake furnace exhaust lids
- Fiber glass pads for baking furnace
- Special plastics for baking furnace operations
- Anode transport circuits

In collaboration with:

PERMATECH®
SHAPING THE FUTURE OF REFRACTORY TECHNOLOGY

URJA

PRECIMETER
Molten Metal Level Control

STORVIK