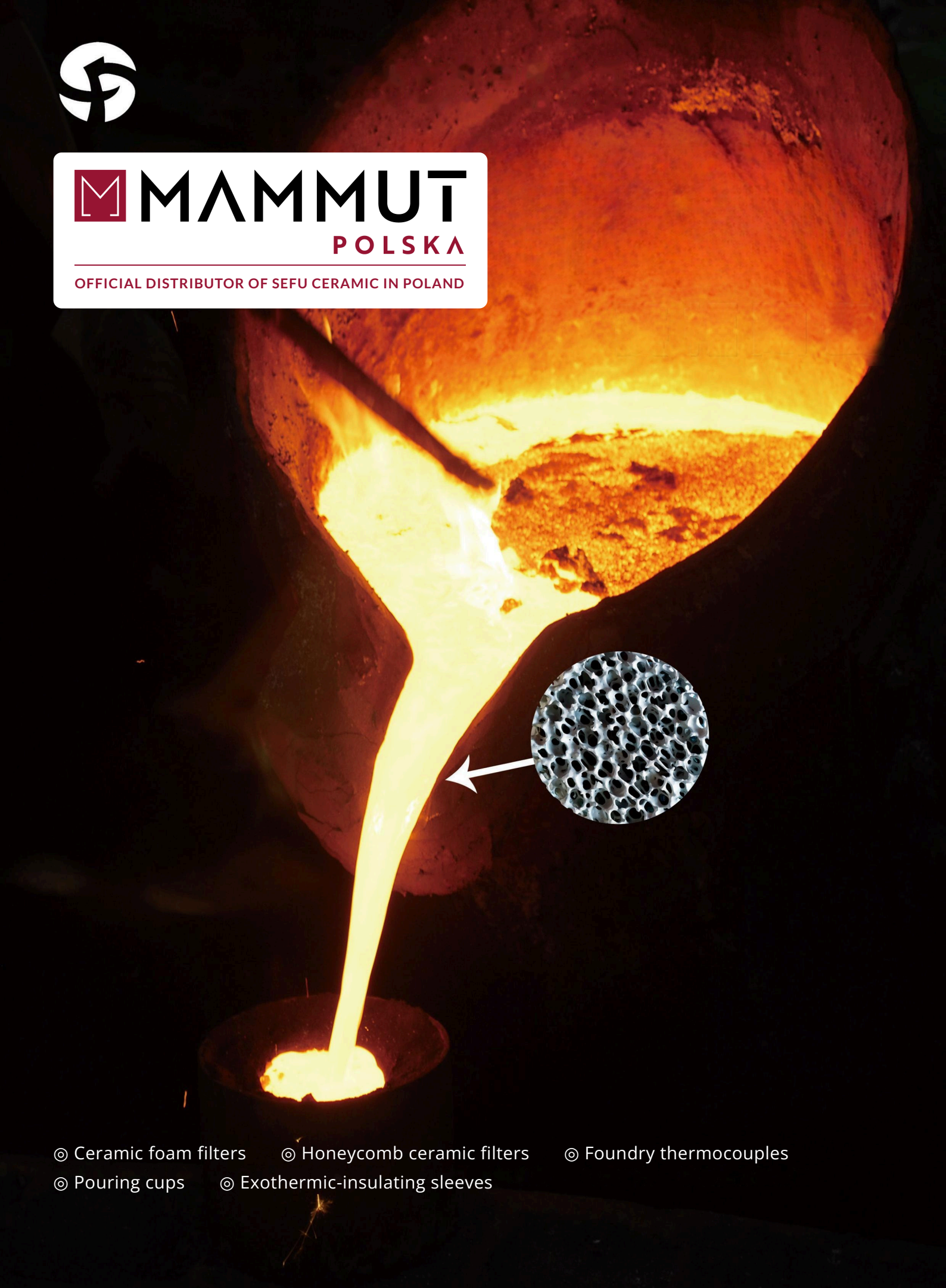
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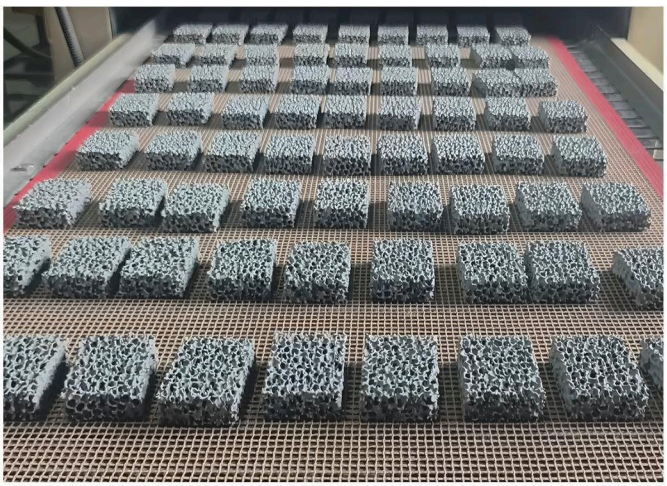
◎ Ceramic foam filters ◎ Honeycomb ceramic filters ◎ Foundry thermocouples
◎ Pouring cups ◎ Exothermic-insulating sleeves

PRODUCTION FACILITY









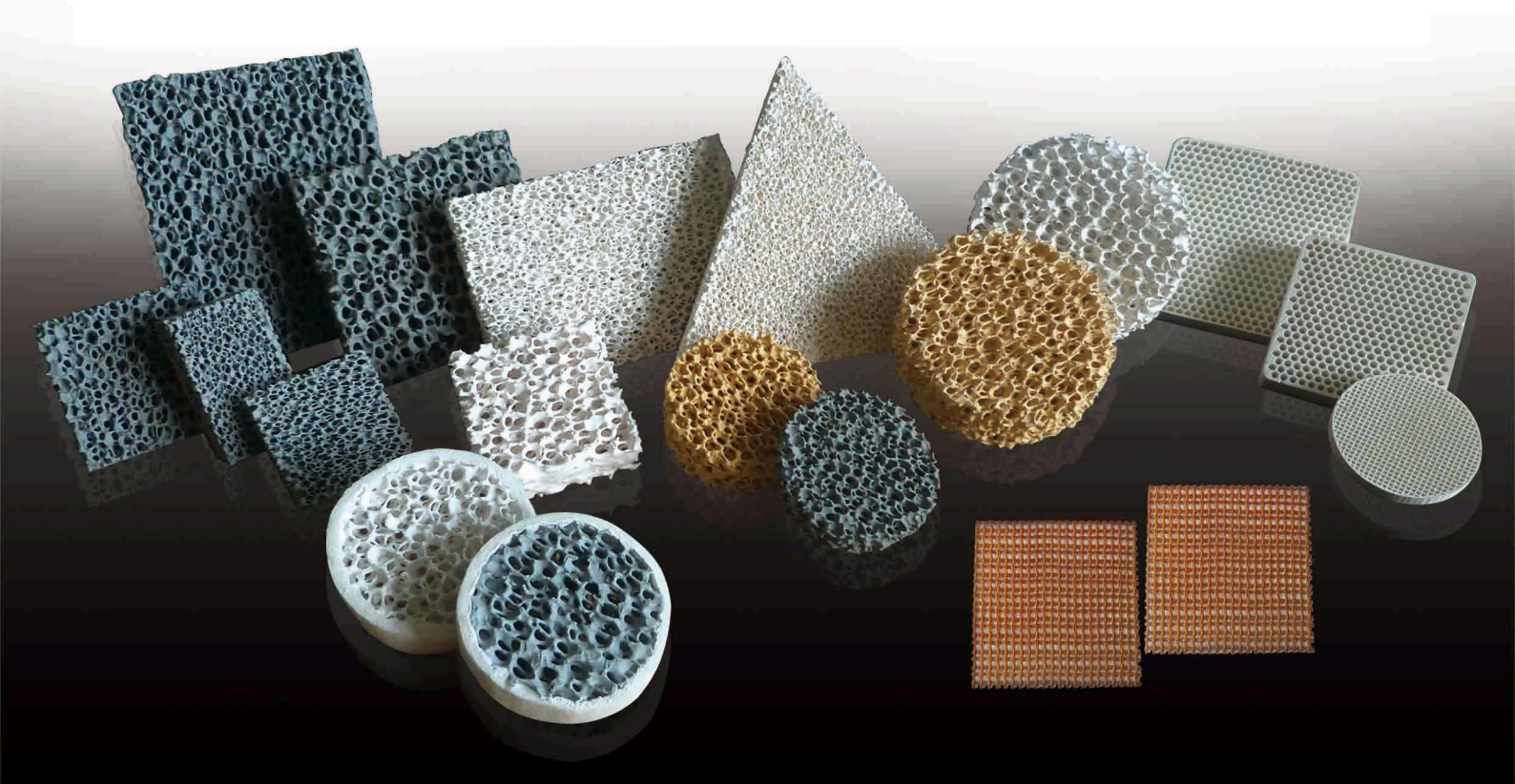


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CERAMIC FOAM FILTERS

Ceramic foam filters are the third generation of filtration media, after fibreglass mesh and honeycomb ceramic filters. Thanks to their three-dimensional structure of interconnected pores, they filter molten metal through four mechanisms: flow rectification, screening, cake filtration and adsorption. Foam ceramics are chemically stable and do not react with the molten alloy, so they effectively remove inclusions and improve the cleanliness of the melt.

Castings get a smooth surface and higher strength, and scrap rates fall. Machining losses and energy consumption go down, productivity rises and costs are reduced. Besides molten metal filtration, foam filters are also used for hot gas treatment, as catalyst carriers, in solid heat exchangers and as special packing in the chemical industry.



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SILICON CARBIDE CERAMIC FOAM FILTERS

Application

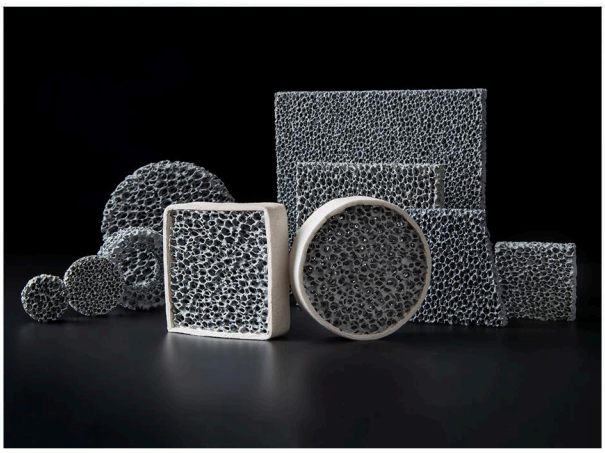
Filtration of molten ductile and grey iron and non-ferrous alloys.

Features

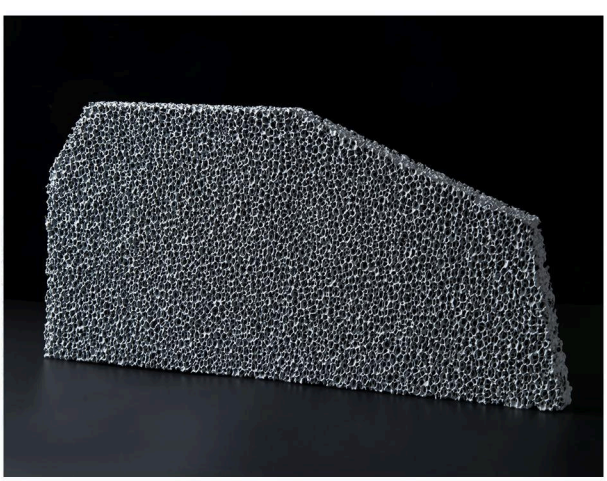
- High filtration efficiency, fewer rejects
- Strong flow-rectifying and adsorption effect – fewer secondary inclusions
- Easier machining and better mechanical properties of castings

Technical data

Pore density (PPI)	10–40
Porosity (%)	80–90
Operating temperature (°C)	≤ 1500
Bending strength at room temperature (MPa)	≥ 0.8
Compressive strength at room temperature (MPa)	≥ 0.9
Thermal shock resistance (cycles / 1100°C)	6





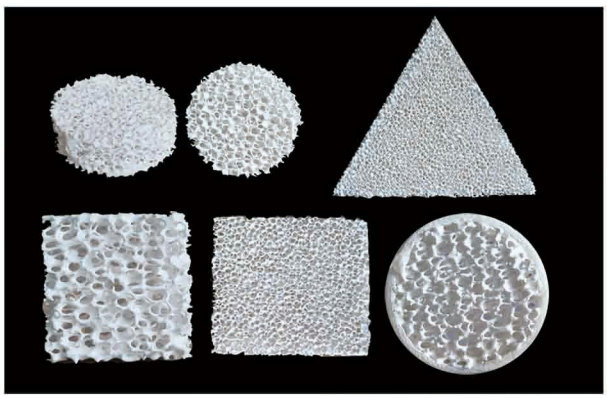


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ALUMINA CERAMIC FOAM FILTERS

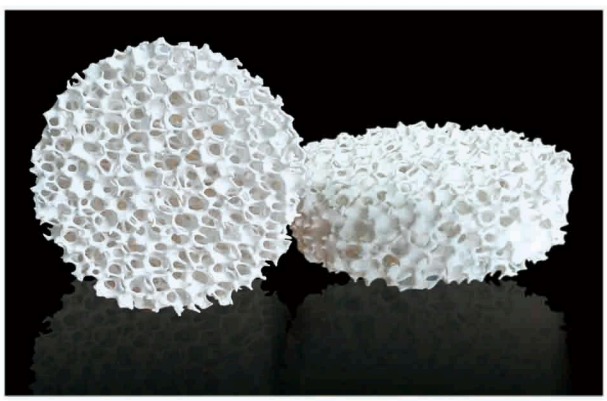
Application

Filtration of molten aluminium and aluminium alloys.



Features

- Effectively remove inclusions from molten aluminium and reduce scrap
- Improve surface quality and product performance
- Improve the microstructure



Technical data

Pore density (PPI)	10–40
Porosity (%)	80–90
Operating temperature (°C)	≤ 1100
Bending strength at room temperature (MPa)	≥ 0.6
Compressive strength at room temperature (MPa)	≥ 0.8
Thermal shock resistance (cycles / 1100°C)	6



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ZIRCONIA CERAMIC FOAM FILTERS

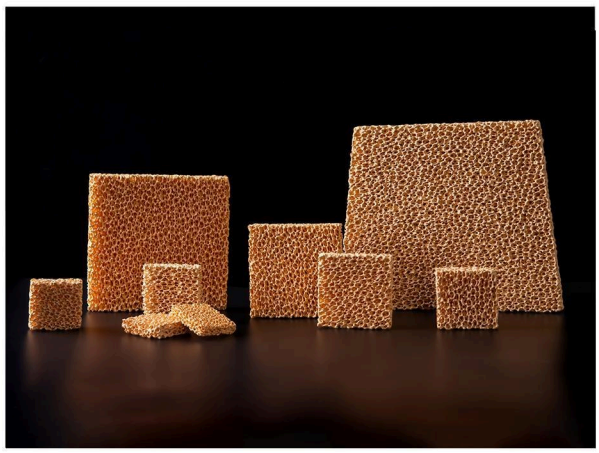
Application

Filtration of molten stainless and carbon steel, and of iron for large castings.

Features

- Rectify the flow and regulate the velocity of the metal stream, reducing secondary inclusions and gas porosity
- Fewer inclusions in castings, less scrap and weld repair
- Better surface quality and mechanical properties of castings







Technical data

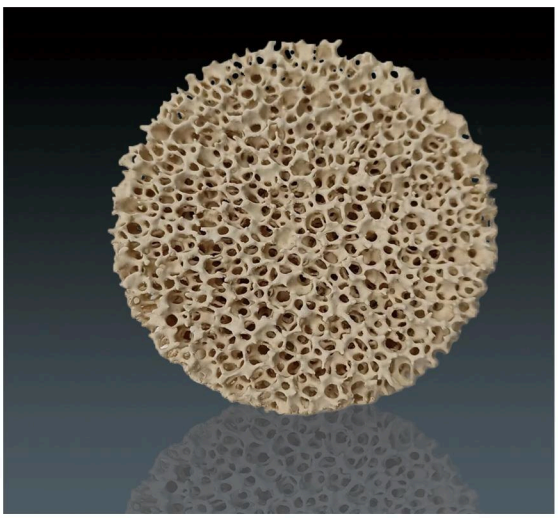
Pore density (PPI)	10–40
Porosity (%)	80–90
Operating temperature (°C)	≤ 1700
Bending strength at room temperature (MPa)	≥ 1.0
Compressive strength at room temperature (MPa)	≥ 1.2
Thermal shock resistance (cycles / 1100°C)	6

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MAGNESIA CERAMIC FOAM FILTERS

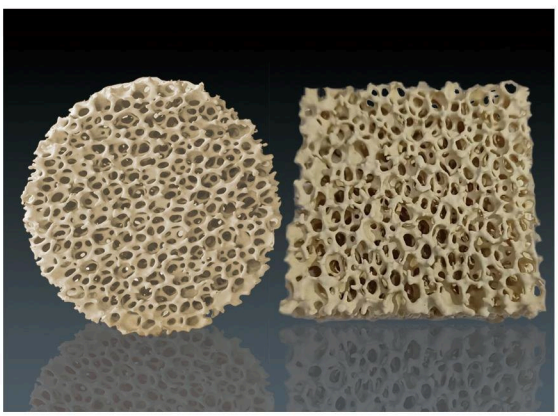
Application

Filtration of molten magnesium and magnesium alloys.



Features

- Effectively remove inclusions from molten magnesium and reduce scrap
- Improve surface quality and product performance
- Improve the microstructure



Technical data

Pore density (PPI)	10–60
Porosity (%)	80–90
Operating temperature (°C)	≤ 1200
Compressive strength at room temperature (MPa)	0.6
Main component	99% magnesium oxide (MgO)

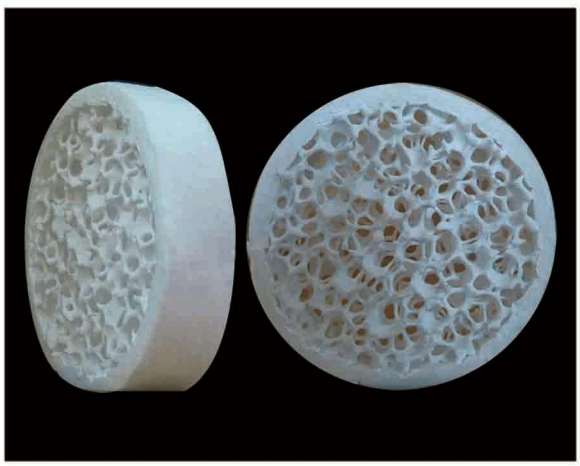


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FILTERS FOR SPECIAL APPLICATIONS

Application

Alumina filters for the aerospace industry and for processes with the most demanding requirements. Available with dual porosity, with edge banding, in various pore sizes and in a wide range of sizes and shapes.

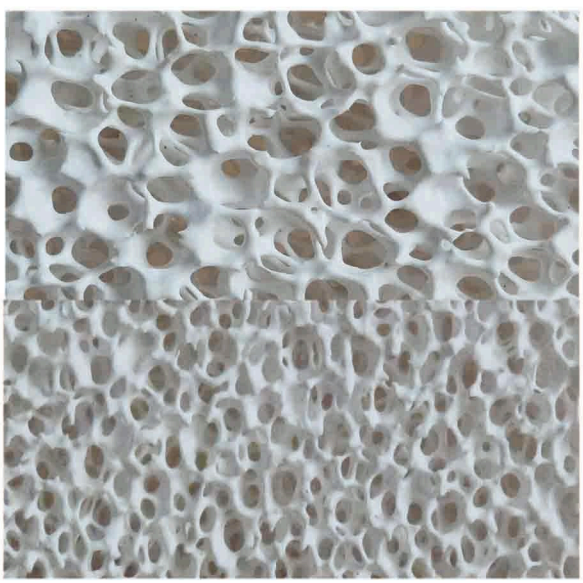


Advantages

- Effectively capture inclusions from aluminium alloys
- Many special designs – made to customer specifications

Dual-porosity filters

A dual-porosity filter combines two layers with different pore sizes in a single piece, so the metal is filtered in two stages in one pass. The coarser layer on the inlet side protects the finer layer on the outlet side. Any combination of pore sizes is possible.

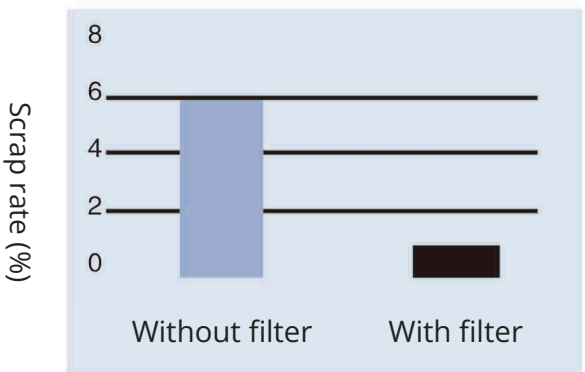


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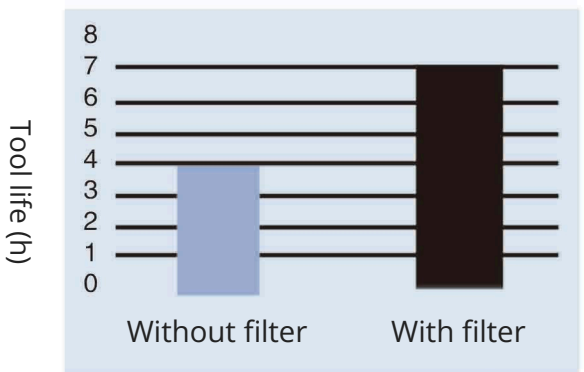
BENEFITS OF CERAMIC FOAM FILTERS

Ceramic foam filters are used mainly in the production of iron, steel and aluminium alloy castings. They effectively remove large inclusions from the molten metal, adsorb fine impurities, reduce the content of gases and harmful elements, and improve the matrix structure and mechanical properties of castings.

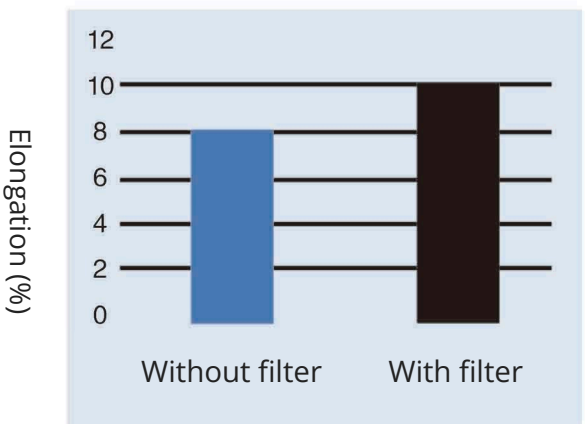
1. Fewer inclusion-related rejects – inclusion defects reduced by more than 50%



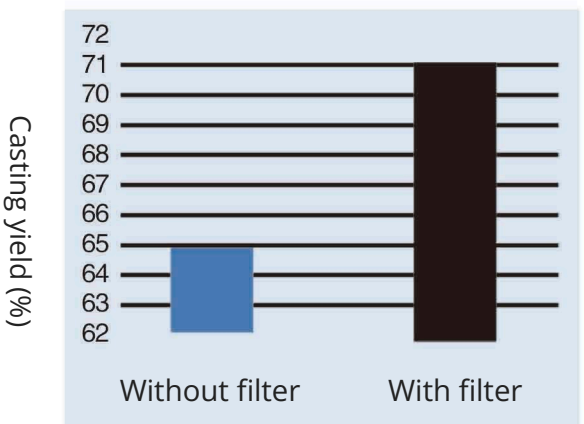
2. Easier machining – cutting tool life increased by more than 30%



3. Better mechanical properties of castings – up by more than 10%



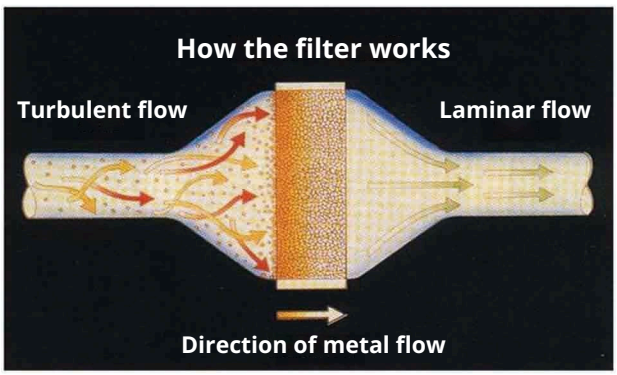
4. Higher casting yield – up by more than 10%

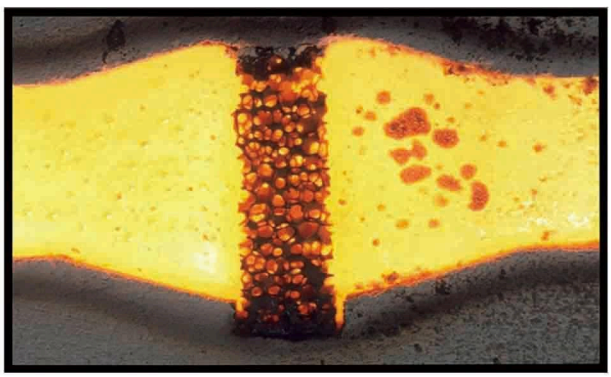


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WORKING PRINCIPLE AND APPLICATIONS

Working principle





Application examples









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HONEYCOMB CERAMIC FILTERS

Application

Filtration of molten metal in the production of iron and non-ferrous alloy castings.

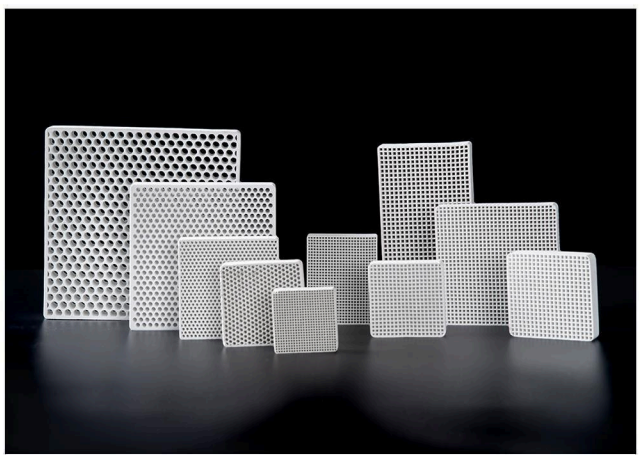
Features

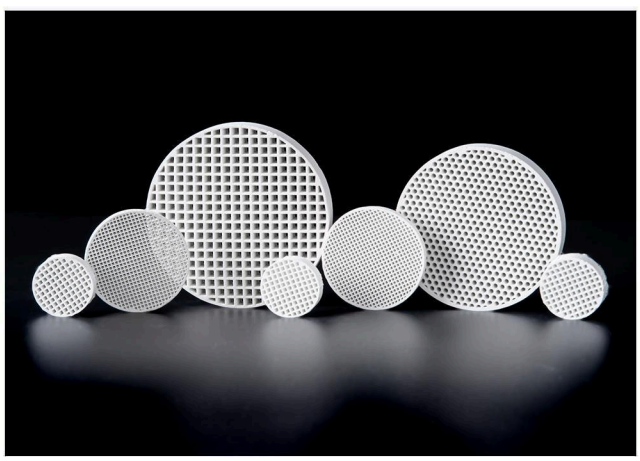
- Made by high-pressure pressing – high filter strength
- Effectively remove solid inclusions, adsorb fine inclusions and gas bubbles; stable flow rate
- High dimensional accuracy ensures a precise fit between filter and mould – especially suited to automated moulding lines

Technical data

Bulk density (g/cm^3)	0.7–1.8
Compressive strength (MPa)	> 15
Coefficient of thermal expansion	< 5 × 10^{-6} K^{-1}
Thermal shock resistance (800°C)	> 5 cycles
Modulus of rupture (MPa)	1.3–1.6
Softening temperature	suitable for various pouring temperatures





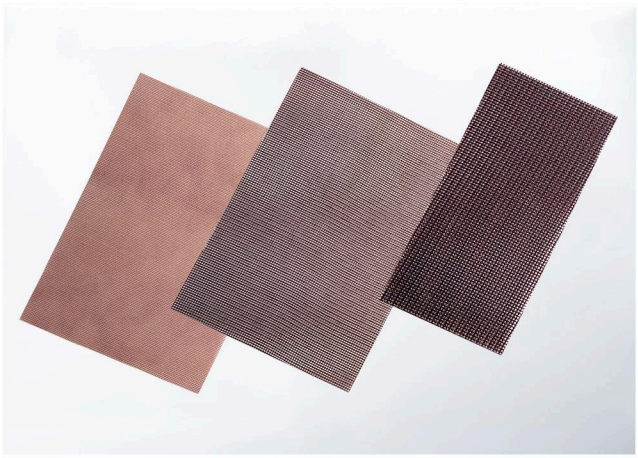


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FIBREGLASS MESH FILTERS

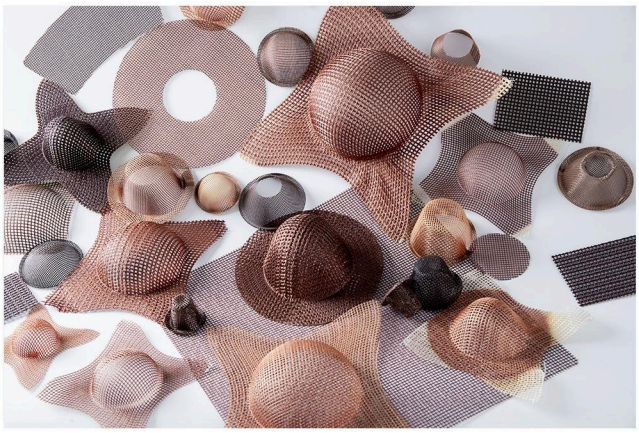
Application

Filtration of metal in the production of iron, aluminium, steel and other alloy castings.



Features

- Made of high-temperature-resistant fibre with special treatment – consistent quality
- Heat-resistant fibre meshes are inexpensive and easy to use
- Effective slag retention, low gas evolution and a significantly higher yield of good castings
- Improve the mechanical properties of castings and machining efficiency



Technical data

Mesh type	Technical data				
	Working temperature (°C)	Melting point (°C)	Continuous working time (min)	Tensile strength (kg / 4 strands)	Gas evolution (cm^3/g)
For steel	1600–1620	1700	5	16	60
For iron	1400–1450	1700	10	8	60
For copper and copper alloys	1200	1700	10	6	60
For aluminium	700–800	900	10	6	30
Cap type (for aluminium)	—	—	—	—	—



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PAPER RUNNER TUBES AND FITTINGS

Paper runner tubes and fittings are designed mainly for lost foam casting, full mould casting, conventional sand moulding and coated sand casting. They help improve casting quality, reduce scrap, improve the quality of reclaimed sand and reduce labour intensity.









Features

- Lightweight and easy to handle
- Good sealing – effectively reduces sand inclusion defects
- High strength, resistant to damage
- Good thermal insulation
- Environmentally friendly, low carbon footprint

Recommendations

- Joined fittings must be tightly embedded in sand and the sand well compacted in the mould
- Follow basic pouring practice: the metal must completely fill the sprue so that no air can enter

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CERAMIC POURING CUPS FOR INVESTMENT CASTING

A ceramic pouring cup is an important component in the production of high-quality investment castings. It is attached to the base of the wax down sprue and becomes part of the ceramic shell. It increases the resistance of the sprue to the impact of the metal stream, stabilises the mould and reduces the risk of inclusions caused by shell cracking. Pouring cups are used mainly for precision castings for the aerospace and automotive industries.









Properties

The cups are made of a highly refractory, high-alumina aluminosilicate material, formed and fired at high temperature. Advantages over similar products:

1. Smooth, clean working surface, resistant to slag corrosion
2. High strength and erosion resistance – stable during pouring
3. Excellent resistance to thermal shock and rapid temperature changes
4. Stable at high temperature – no reaction with molten metal
5. Dimensions made to customer requirements

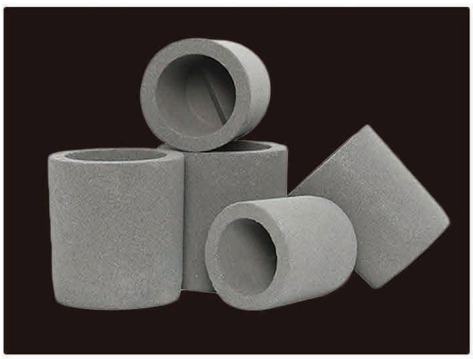
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EXOTHERMIC-INSULATING RISER SLEEVES

Application

For iron and steel castings. The sleeve can be inserted into the sand mould after moulding, or assembled with the core and placed in the mould together.









Features

- High exothermic output and excellent thermal insulation
- High feeding efficiency – higher yield and sounder castings
- Full product range – for various alloys, processes and moulding lines

Main products

- Insulating sleeves
- Exothermic-insulating sleeves
- Highly exothermic sleeves
- Large exothermic-insulating sleeves

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RAPID IMMERSION THERMOCOUPLES

Application

Temperature measurement of molten steel and other high-temperature molten metals.

Features

- Accurate measurement – error below ±1.5°C
- Fast response, short measuring time, safe handling
- Quality materials – more measurements, lower costs
- Connector type: H, O, S, Z
- Protective tube: straight-wound paper, spiral-wound paper, refractory fibre paper, refractory fibre sleeve
- Protective cap: aluminium, steel, plastic, paper
- Protective tube length: 150, 300, 500, 700, 1000, 1200, 1500 mm



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THERMAL ANALYSIS CUPS

Thermal analysis cups are widely used for on-site control of molten iron composition thanks to fast analysis, simple handling, reliable results and low cost. Once iron is poured into the cup, a carbon/silicon analyser determines the carbon equivalent (CEL), carbon (C) and silicon (Si) content and other parameters from the thermal arrests of the cooling curve.



Working principle

As cast iron cools and solidifies, phase transformations release latent heat of crystallisation, which changes the shape of the cooling curve. Thermal analysis uses this effect: from the measured liquidus and eutectic temperatures, a computer determines the carbon equivalent, carbon and silicon content and related properties of the iron.



Models and measuring functions

Model	Measuring function
SF 00/S	Measures CEL and undercooling
SF 01/S	Measures CEL, C, Si
SF 02/S	Measures CEL, C, Si after spheroidisation
SF 01/R	Measures CEL, C, Si





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SAMPLING SPOONS

Ceramic fibre sampling spoons are made by vacuum forming, with ceramic fibre as the main material. They are widely used for taking samples during the transfer and pouring of molten iron and other molten metals.









Application

The spoon is used to take molten metal from the furnace or ladle for testing and analysis.

Features

- Lightweight, good insulation, low heat capacity – temperature loss no more than 5°C
- Easy to maintain and repair
- Withstands extreme cold and heat, does not crack, reusable
- Stable at high temperature – no reaction with molten metal
- Available in many standard versions

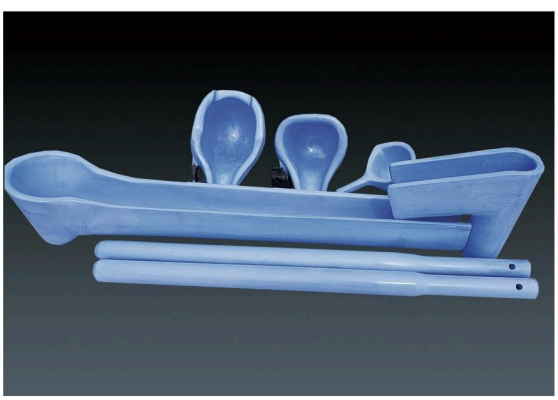
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AUTOMATIC POURING LADLES & LAUNDERS

Automatic pouring ladles are typically used in high-pressure die casting, sand casting and gravity pouring of non-ferrous metals. They are mounted on automatic pouring units, which use them to transfer molten aluminium.







Features

- Special boron nitride (BN) coating – molten aluminium does not stick
- Excellent corrosion resistance, long service life
- Lightweight material – easier handling and installation
- Very good mechanical properties and strength
- Good thermal insulation reduces temperature loss
- A cleaner and safer foundry floor

Technical data

Density	1600 kg/m^3
Max. operating temperature	780°C
Thickness	8–25 mm
Modulus of rupture	21.4 MPa
Coefficient of thermal expansion	0.9 × 10^{-6} mm/(mm·°C)
Thermal conductivity	0.43 W/(m·K) at 750°C

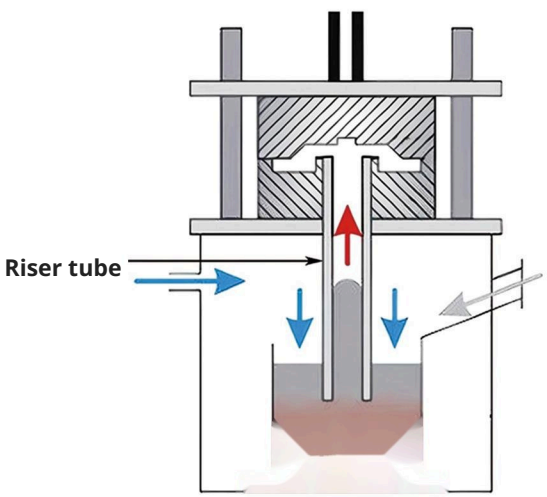
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RISER TUBES

A riser tube (stalk) is the component of a low-pressure casting machine that connects the holding furnace to the die. Driven by gas pressure, it carries molten metal from the furnace into the die cavity and transmits feeding pressure while the casting solidifies. Riser tubes are available in silicon nitride, aluminium titanate and silicon nitride-bonded silicon carbide (NBSiC).

Features

- Excellent thermal shock resistance
- High-temperature resistance, low thermal expansion
- Corrosion resistant – does not react with, or get wetted by, molten aluminium
- No slag build-up, easy to maintain, long service life

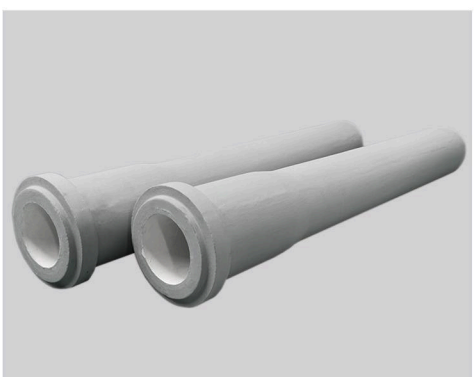




Silicon nitride riser tube



Aluminium titanate riser tube



NBSiC riser tube

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THERMOCOUPLE PROTECTION TUBES

Thermocouples are the most widely used temperature sensors, and their long-term stability and service life depend largely on the protection tube. The tube protects the thermocouple and keeps it working properly in harsh conditions. Silicon nitride is currently one of the most effective materials for temperature measurement and control in non-ferrous foundries – protection tubes made of it allow fast and accurate temperature readings.

Features

- Resistant to high temperature, thermal shock and oxidation
- Resistant to corrosion and erosion; no contamination of the molten metal
- Excellent thermal conductivity and thin wall – fast, accurate measurement of melt temperature
- No slag build-up, easy to maintain, service life over 12 months – excellent value for money



Outer diameter OD (mm)	Inner diameter ID (mm)	Length L (mm)
16	8	100–1000
22	12	100–1100
28	16	100–1500
Custom sizes available on request		

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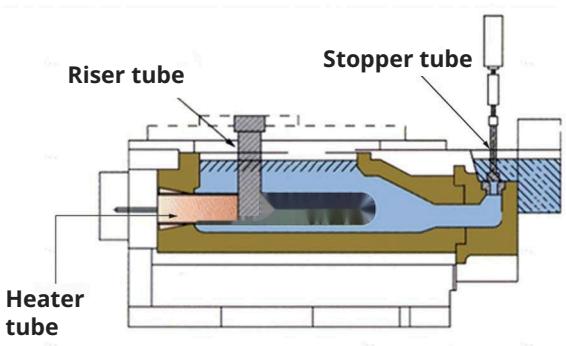
SILICON NITRIDE HEATER PROTECTION TUBES

Silicon nitride heater protection tubes are ceramic protective components designed for extremely high temperatures. They offer very good thermal conductivity and resistance to high temperature and corrosion. They protect the heating element from molten non-ferrous metal, extending its service life and improving reliability, while ensuring uniform heating of the melt.



Features

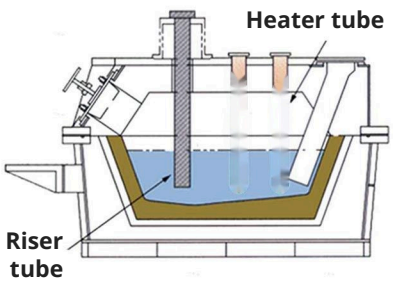
- Excellent high-temperature resistance
- Excellent mechanical properties
- Excellent corrosion resistance – longer service life



Horizontal heater tube installation

Technical data

Size	Max. diameter	Max. length
mm	430	1350
Custom sizes available on request		



Vertical heater tube installation

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GRAPHITE DEGASSING ROTORS

The graphite degassing rotor is a key component of aluminium melt treatment equipment. It consists of a shaft and an impeller and effectively removes hydrogen and oxide inclusions from the aluminium melt, improving metal cleanliness.







Features

- Anti-oxidation coating – corrosion resistance, long service life
- High-purity, high-density, high-strength graphite
- High-temperature resistance, low thermal expansion

Working principle

The rotating impeller stirs the aluminium alloy melt. Argon or nitrogen is blown through the shaft and the impeller nozzle into the molten metal, where centrifugal force breaks it into fine bubbles that the rotor continuously disperses throughout the melt. The gas bubbles adsorb impurities, cleaning the metal.

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TAP-OUT CONES

Application

Cones for the tap holes of aluminium melting, refining and holding furnaces. They insulate the tap hole, making the casting of aluminium and its alloys easier, safer and more reliable.







Features

- Also known as insulating plugs or tap cones. Made from high-grade aluminosilicate fibre
- Uniform material, good flexibility
- Excellent thermal insulation
- Standard sizes plus custom designs to customer needs



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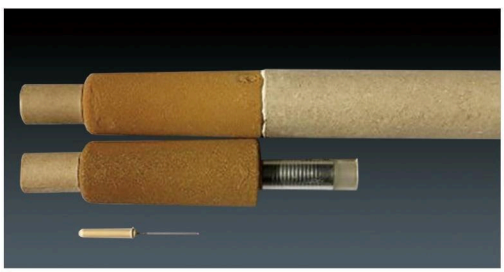
METALLURGICAL SENSORS

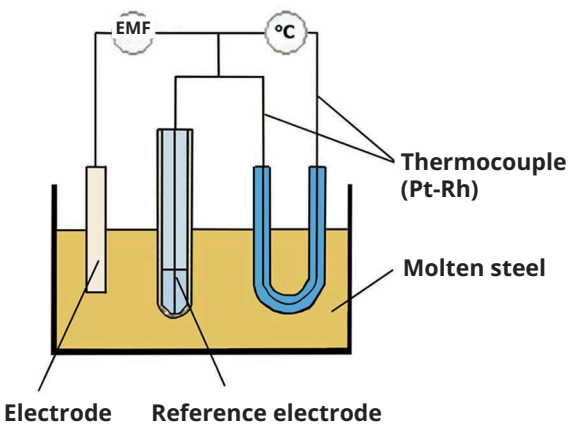
Oxygen probe – temperature and oxygen measurement in molten steel

Oxygen measurement with a solid-electrolyte concentration cell was developed alongside growing steel production and the spread of secondary steel refining. It gives a fast and accurate reading of the oxygen content of molten steel, making it easier to control steelmaking, improve quality and reduce consumption.

Working principle

The solid-electrolyte concentration cell consists of two half-cells: a reference half-cell with a known oxygen partial pressure and the molten steel whose oxygen content is to be measured. The half-cells are connected by a solid electrolyte that conducts oxygen ions, forming an oxygen concentration cell. The oxygen content is determined from the measured electromotive force and temperature.





Technical data

	Reference material	Measuring range	Accuracy	Success rate	Response time
High-oxygen probe	Mo/MoO_2 Cr/Cr_2O_3	100–1200 ppm	10%	oxygen > 90% temperature > 98%	< 8 s
Low-oxygen probe	Cr/Cr_2O_3	1–100 ppm	above 10 ppm: error 10% below 10 ppm: error 1 ppm		

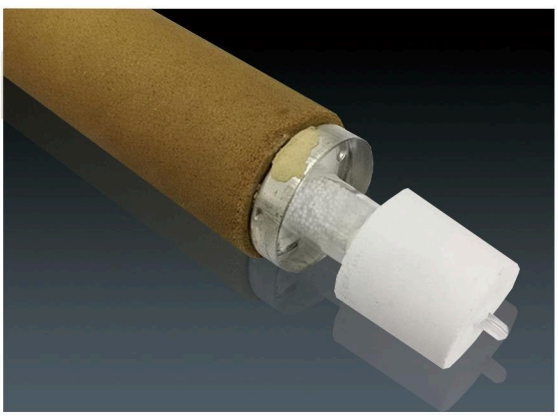
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METALLURGICAL SENSORS

Hydrogen probe – hydrogen measurement in molten steel

The hydrogen probe enables rapid measurement of the hydrogen content of molten steel. It can be used in VOD furnaces, ladle refining furnaces and tundishes to guide the steelmaking process precisely and provide steel plants with reliable data.







Features

- High success rate
- Good repeatability
- High accuracy
- Fast response

Technical data

Measuring range	0.5–14 ppm
Measurement accuracy	±0.15 ppm
Success rate	96%
Test time	30–60 s

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