

OS-11

# O'SIALON CERAMICS SERIES

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- Master of advanced ceramic materials
- In the global aluminum processing industry



**SGJL**<sup>®</sup>

# OS-11 O'SIALON CERAMICS - MATERIALS REVOLUTION OF ADVANCED CERAMIC

## OS-11 O'SIALON ( $\text{Si}_2\text{N}_2\text{O}$ )

The advent of OS-11 O'Sialon ceramics is of epoch-making significance for breaking the non-ferrous metal processing industry's long-standing dependence on graphite materials.

- The non wettability of the molten metal is similar to that of boron nitride ceramics, which is the highest level
- The thermal shock resistance performance is close to that of aluminum titanate ceramics, which is the highest level
- Superior insulation and dielectric properties compared to silicon nitride ceramics
- The maximum working temperature reaches 1450 °C

### Performance Parameter

### O'Sialon

Density (g/cm <sup>3</sup> )	2.7-2.8
Hardness	8.5
Fracture Toughness (Mpa•m <sup>1/2</sup> )	3-4
Bending Strength (Mpa)	400-500
Thermal Conductivity (W/m•K)	1-2
Thermal Expansion Coefficient (10 <sup>-6</sup> K <sup>-1</sup> )	<1.5
Max Operation Temperature (°C)	1450
Thermal Shock Resistance	Excellent
Non-Stick Performance	Excellent

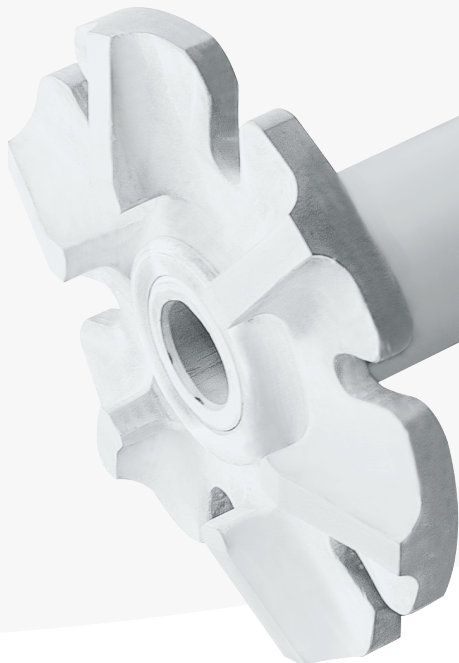
# DEGASSING ROTOR

High rotation speed, high corrosion resistance, high thermal shock resistance

In contrast to silicon nitride ceramics, OS-11 O'sialon ceramics can be repeatedly inserted and removed from molten metal without preheating.

**With non-wetting properties close to those of boron nitride, O'Sialon ceramics do not stick to aluminium and do not wear out, making them the ultimate choice of rotor material.**

- O'sialon ceramic materials are non-wetting, no abrasion and no pollution to molten aluminium, the degassing effect is still good in long-term use; the corrosion resistance to molten metal is very strong, and it will not be oxidized and corroded.
- The degassing rotor breaks up air bubbles to the millimetre or even micron level, slowing down the rate of bubble uplift and increasing the number of bubbles and their dispersion in the molten aluminium.
- The high density and strength of O'sialon ceramics ensure reliable and stable operation of the degassing rotor during high-speed rotation.



Excellent thermal shock resistance

**No need for preheating**

Maximum speed

**≥ 500 rpm**

\*Higher than traditional graphite rotors < 300 rpm

# STALK / RISER TUBE

Low thermal conductivity, Non-wettability, High thermal shock resistance

Among the existing available materials, OS-11 O'sialon ceramic has become an ideal riser tubematerial due to its superior performance.

\*The insulation performance of the riser tube in differential pressure and low-pressure casting is directly related to the defect rate of the casting.

## Low Thermal Conductivity

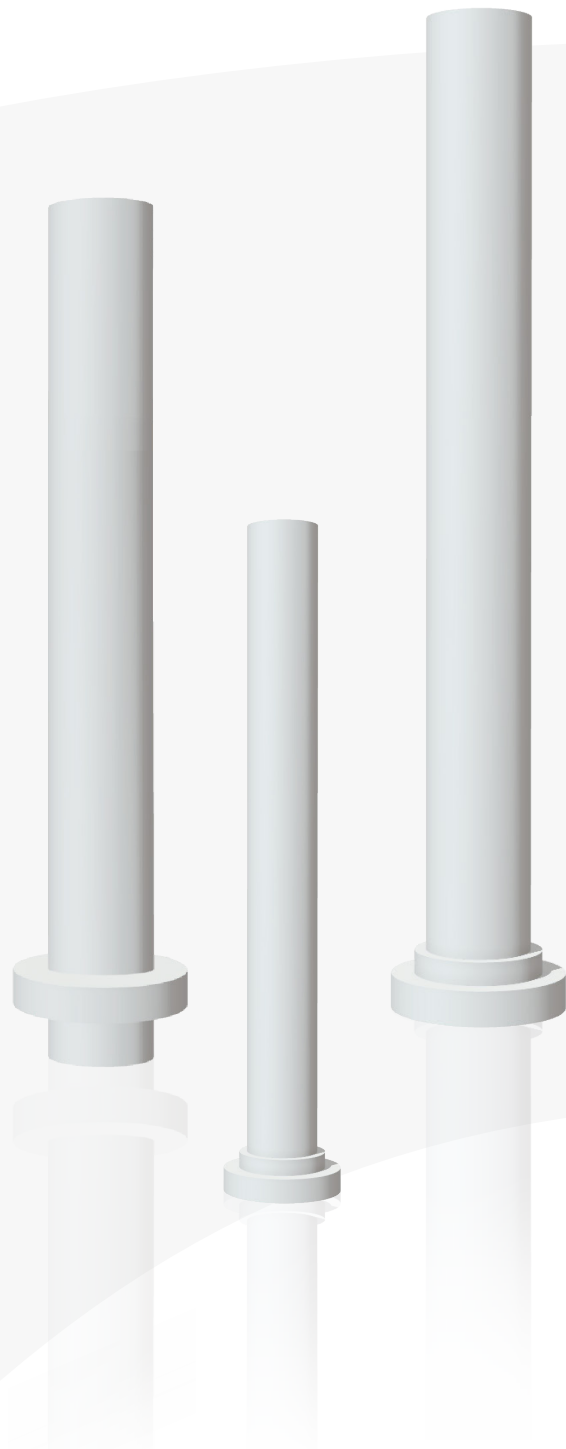
The low thermal conductivity and non wetting performance of O'sialon effectively reduce slagging on the upper part of the riser tube, ensure the filling degree of the mould cavity, and improve the quality stability of the casting;

## High Thermal Shock Resistance

Compared with cast iron, carbon nitrogen, aluminum titanate, and silicon nitride, O'sialon has the best thermal shock resistance, which can avoid preheating treatment before installation and reduce the labor intensity.

## Non-wettability Property

Among several commonly used materials in molten aluminum , O'sialon has the best non- wetting properties, eliminating the need for coating agents and has no pollution to molten aluminum.



# FLUXING ROTOR

High temperature resistance, corrosion resistance, Non-wettability

OS-11 O'sialon ceramic has excellent thermal shock resistance, corrosion resistance, high-temperature oxidation resistance, and non-wetting properties with molten aluminum, making it an ideal structural material for large-sized fluxing rotor.

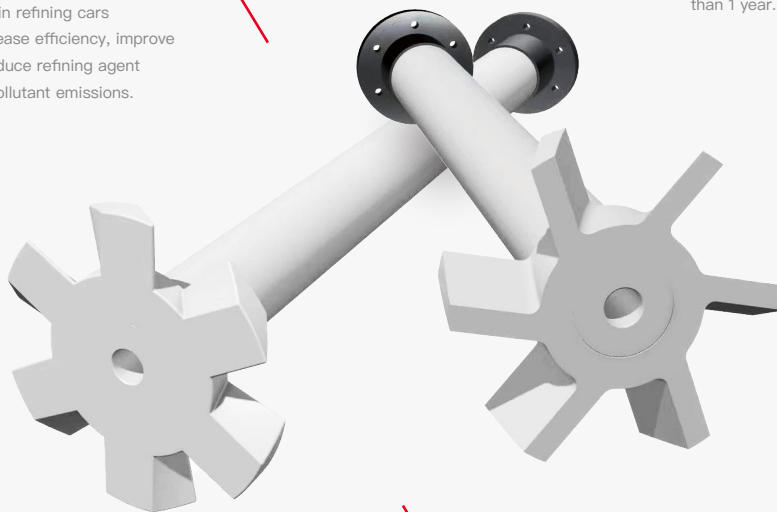
\*The strong metallic and corrosive nature of molten aluminum makes the selection of fluxing rotor materials difficult. This leads to a long-term reliance on easy oxidation, short life, low strength graphite materials, which becomes a long-term pain point in the industry.

## High efficiency Good quality

- Compared to graphite rotors, O'sialon fluxing rotors used in refining cars simultaneously increase efficiency, improve melt quality, and reduce refining agent consumption and pollutant emissions.

## Thermal shock resistance High temperature resistance

- They are resistant to thermal shocks (rapid cooling and heating), high temperature, and do not react with molten aluminum, non-wetting and non-abrasive, also the degassing effect remains good for a long period of time, with a service life of more than 1 year.



## High speed High stability

- Higher machining accuracy and strength than graphite, with speeds up to 500 rpm. The concentricity of the rotor is controlled within 0.2mm, which ensures the stability of rotor rotation at high speed.

The product is compatible with automatic degassing, refining, and stirring in all aluminum processing furnaces.

# FLUXING PIPE & PLUG

Low thermal conductivity, Non-wettability, High thermal shock resistance



## Fluxing Pipe

- O'sialon ceramics have strong high temperature and corrosion resistance to aluminum solutions.
- At the same time, O'sialon ceramics have high mechanical strength and excellent thermal shock resistance, non-wettability and no wear out in molten aluminum.

## Plug

- O'sialon material has excellent non-stick to aluminium and thermal shock resistance. Plugs made of this material are suitable for the insulation and sealing of aluminium outlet of various melting furnaces and the flow control and interception of molten aluminium in the degassing and filtration tanks.
- O'sialon plugs have high hardness, good flexibility, better abrasion resistance and better plugging and sealing effect.



# ALUMETIZING HOOK & PUMP PARTS

High temperature resistance, corrosion resistance, and wear resistance

## Alumetizing Hook

- Special structural components with high requirements for thermal shock resistance, such as alumetizing hooks, are areas where O'sialon materials can be vigorously developed in the future.
- It will become a trend to replace some hard alloys, alumina, zirconia, and silicon carbide materials in applications with high temperature, strong corrosion, and wear resistance requirements.



## Pump Parts

The closed pipeline transportation of molten aluminum has never been achieved. The OS-11 O'sialon Ceramic Aluminium Pump is the world's first mechanical pump of all ceramic structure that can be used for the transportation or lifting of molten aluminum.

- O'sialon is suitable for use in pumps immersed in molten aluminium, such as shafts, impellers, main columns, liner rings, casing bushings, etc., for transferring, pumping or circulating.
- Compared to conventional graphite products, O'sialon pumps do not show any oxidative corrosion in high temperature operation.

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