Parts for Molten Aluminium - Material & Spec Sheet

Degassing rotors, riser tubes and thermocouple sheaths in silicon nitride

Aluminium and magnesium melts are corrosive, thermally punishing and unforgiving of anything that flakes, wets or dissolves. Every part below lives submerged or partly submerged in liquid metal at 700-760 C and gets dipped, lifted and re-dipped. This is why they are made from silicon nitride.

Steel, graphite or Si3N4 in molten-metal service

Property in molten Al / Mg service	Steel / Cast iron	Graphite	Si3N4 (NitriCeram)
Continuous service temperature	Moderate	Good	Excellent
Thermal-shock resistance	Poor	Good	Excellent
Corrosion by molten Al/Mg	High	Moderate	Very low
Wetting by molten metal	Yes (erosion)	Yes	No (non-wetting)
Typical degassing-rotor life	Days-weeks	Weeks	Months

What we make, and what it does

Part	Duty	Result
Degassing rotors	Fully submerged spinner at 700-760 C, thousands of rpm; breaks argon or nitrogen into fine bubbles to strip dissolved hydrogen from the melt. Custom vane geometry per duty cycle.	Months of service instead of days-weeks
Riser / stalk tubes	Lift melt from the furnace into the die in low-pressure die casting; hot at the bottom, cold at the top, melt creeping up the bore.	No cracking, clean bore, consistent flow, fewer inclusions
Thermocouple protection sheaths	Hold the thermocouple in the melt over a full campaign.	Inert and dimensionally stable, true reading, no bath contamination
Nozzles, ladle and transfer parts	Pouring and transfer hardware in aluminium, magnesium and zinc service.	Non-wetting, no build-up, no metal debris in the melt

What to specify

Item	Recommendation
Material grade	High-purity, fully densified GPS / HIP Si3N4 - density is what keeps the melt out.
Surface	Glazed or fine-ground, so the melt cannot wet or key into the ceramic.
Rotor geometry	Vane design and surface finish set bubble size and gas consumption; geometry proposed from your duty cycle.
Tell us	Alloy, service temperature and cycle time; for rotors, your current rotor or drawing.

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Why NitriCeram

Sintered in-house, not bought in and resold. NitriCeram is a brand of Shandong Dolphin Technology Co., Ltd., with an integrated line covering powder synthesis, forming, gas-pressure sintering, HIP, precision machining and in-house testing - 15 gas-pressure sintering furnaces, 9 HIP and 3 hot press units. Diamond grinding and lapping for tubes, bores and rotor vanes, with glazed finishes on request. ISO 9001 quality system; material certificate naming grade, route and measured density (> 99% of theoretical) with every shipment. Magnesium service is more aggressive than aluminium - we confirm the exact alloy and temperature before recommending a grade.

Tell us your alloy, temperature and cycle - or send a drawing or worn part - and we reply within 24-48 hours with a recommended grade, finish and price. NDA signed on request before drawings change hands. Email: dolphintec@aliyun.com