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REFRACTORIES FOR NON-FERROUS METALS INDUSTRY



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Refractories for Non-ferrous Metals Industry

Refractory for Non-ferrous Metals Industry



Refractories Experts for high-temperature industry

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Si₃N₄ Bonded SiC Block

PN-SCN series of silicon nitride bonded silicon carbide blocks are fired at high temperature in nitriding furnaces, with high-purity SiC as raw material, and silicon powder as additives based on situ theory.

Its micro structures show SiC grains are evenly surrounded by phases which are composed of granular SiC and fiber-based Si₃N₄ which are made by situ reaction, Si₃N₄ fibers interlace three-dimensional network to embrace smaller SiC grains and form strong mechanical bonding with big SiC grains.

These products are used in the electrolyte baths to decrease the working lining thickness and increase the baths' volume. They feature high thermal conductivity, oxidization resistance and cryolite resistance, and are especially suitable for high-power baths.

PN-SCN blocks have been supplied to many big aluminum electrolyte baths in China and oversea, such as Jiaozuo Wanfang Aluminum, Guiyang Aluminum, Zhongfu Aluminum, Baotou Aluminum, and BSL, RUSAL etc.



Main Specification

ITEM		Electrolysis Cell	
		PN-SCN	PN-SCN-A
Chemical Composition	SiC(%); ≥	72	74
	Si ₃ N ₄ (%); ≥	18	18
	Fe ₂ O ₃ (%); ≤	0.7	0.5
Cold Crushing Strength(MPa); ≥		150	150
Modulus of Rupture(MPa); ≥	Room Temp	42	42
	1400 °C	45	45
Apparent Porosity(%); ≤		16	16
Bulk Density (g/cm ³); ≥		2.65	2.65
Thermal Conductivity (1000 °C)(W/m · K); ≥		15.5	15.5

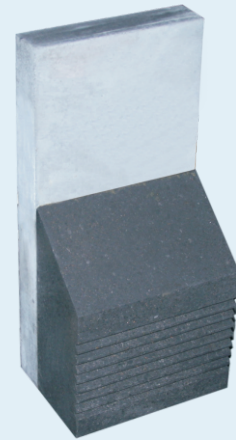
Packing: Wooden pallets.

Storage and transportation: It should be stored and transported under dry condition.

Shelf life: 2 years.

Semi-graphitized Sidewall Carbon Block

The semi-graphitized carbon blocks are produced through shaping, baking, and machine, and of high-quality electrically-calcined-anthracite, petroleum coke, pitch, man-made graphite. They are usually applied along with silicon nitride bonded silicon carbide blocks and the properties of sidewalls' erosion resistance and penetration resistance can be significantly improved, and the carbon-based ramming mixes enable to lower the pollution and the labor costs while installed. The composite blocks and the silicon nitride bonded silicon carbide blocks have been applied in large-sized electrolysis baths in many Aluminum plants such as Pingguo Aluminum, Guiyang Aluminum, Zhongfu Aluminum, and exported to RUSAL.



Main Specification

ITEM	Aluminum Electrolysis Cell
	PN-BSM30
Graphite Content (%); ≥	30
True Density(g/cm ³); ≥	1.94
Bulk Density(g/cm ³); ≥	1.56
Apparent Porosity(%); ≤	17
Ash Content(%); ≤	3
Cold Crushing Strength(MPa); ≥	30
Modulus of Rupture(MPa); ≥	10

Packing: Wooden pallets.

Storage and transportation: It should be stored and transported under dry condition.

Shelf life: 2 years.



Dry-Barrier Mass for Aluminum Electrolysis Cell

PN series of dry barrier mass features easy installation, re-usage, good penetration/erosion resistance, and good volume stability. It can greatly reduce the consumption of fluoride, and increase the service life of Al electrolysis baths.

Main Specification

ITEM		PN-GF1	PN-GF2	PN-GF3
Chemical Analysis(%); \geq	$Al_2O_3 + SiO_2$	88	90	92
Loose Bulk Density(g/cm^3); \geq		1.40	1.45	1.50
Compact Bulk Density(g/cm^3); \geq		1.90	1.95	2.00
Refractoriness($^{\circ}C$); \geq		1500	1500	1500
Thermal Conductivity($650^{\circ}C$)($W/m \cdot K$); \leq		0.45	0.45	0.45
Area of Application		Beneath Cathode carbon block		

Packing: 25kg/bag.

Storage and transportation: It should be stored and transported under dry condition.

Shelf life: 6 months.

Diatomite Insulation Brick

The diatomite insulation bricks are made from porous diatomite, or cut into shapes with natural diatomite. However diatomite bricks are generally made from diatomite and clay additives by pressing and firing. its safety service temperature is usually 900°C.

Main Specification

Brand	PN-GG0.7a	PN-GG0.7b	PN-GG0.6	PN-GG0.5a	PN-GG0.5b	PN-GG0.4
Bulk Density(g/cm ³)	0.7	0.7	0.6	0.5	0.5	0.4
Cold Crushing Strength(MPa); ≥	2.5	1.2	0.8	0.8	0.6	0.8
Application Area	Bottom of Electrolysis bath					

Packing: Paper box or wooden box.

Storage and transportation: It should be stored and transported under dry condition.

Shelf life: 6 months.



Aluminum Silicate Fiber

Aluminum silicate fiber is a kind of new superior-light refractories. It appears like cotton flowers and shapes like white fibers. They feature light weight, high-temperature resistance, good thermal stability, low thermal transmissibility, low thermal capacitance, good mechanical vibration resistance, low heated expansion, and good insulation etc.

Main Specification

ITEM		Specification
Chemical Composition	$Al_2O_3 + SiO_2(\%) \geq$	96
	$Al_2O_3(\%) \geq$	45
	$Fe_2O_3(\%) \leq$	1.2
	$K_2O + Na_2O(\%) \leq$	0.5
Bulk Density(kg/m^3)		100-300
Slag Ball Above 0.25mm($\%$); \leq		5
Linear Shrinkage After Heating($\%$)(1150 $^{\circ}C \cdot 6h$); \leq		4
Water($\%$); \leq		0.5
Application Area		Bottom of bath

SiC-Based Mortar for Aluminum Electrolysis Cell

PN series of SiC-based mortar and high strength SiC-based mortar both are specially developed for electrolysis cell. PRCO has three types of silicon carbide mortars, phosphate bonded wet mortar, basic binder bonded mortar and dry mortar as well. These mortars are successfully applied to the electrolysis baths in Jiaozuo Aluminum, Guizhou Aluminum, Baotou Aluminum and Zhongfu Aluminum etc.

Main Properties

ITEM		PN-SM1	PN-SM2	PN-SM3
Chemical Composition(%); \geq	SiC	60	70	70
Binding Modulus of Rupture(MPa); \geq	160°C × 16h	4	3	4
	1000°C × 3h	4	3	4
Grain Size Distribution(%)	<1mm	100	100	100
	>0.4mm	<2	<2	<2
	<0.074m	>60	>60	>60
Application Area		Joints between bricks or blocks		

Remarks:

PN-SM1 is phosphate bonded wet mortar, it is packed in 25kg or 40kg barrel.

The dry material and binder of PN-SM2 are separately packed, dry materials are packed 25kg or 40 kg bag, and binder are packed in 25kg or 50kg barrel.

PN-SM3 is dry mortar and it is packed in 50kg bag.

Shelf life: 3 months.



High Strength Barrier Mass

High strength barrier mass developed by PRCO features easy installation, strong anti penetration, high strength, long service life, good anti-erosion resistance. They can be applied to smelting furnaces, launders, refining furnaces and vacuum pots etc.

Main Properties

ITEM		PN-FA40	PN-FA80
Chemical Composition(%); \geq	Al_2O_3	45	80
Bulk Density(g/cm^3); \geq	$110^\circ C \times 24h$	2.20	2.80
Modulus of Rupture(MPa); \geq	$110^\circ C \times 24h$	6	12
	$1100^\circ C \times 3h$	6	12
Cold Crushing Strength(MPa); \geq	$110^\circ C \times 24h$	35	70
	$1100^\circ C \times 3h$	40	75
Linear Change(%)	$110^\circ C \times 24h$	-0.4~-0.1	-0.3~-0.1
	$1100^\circ C \times 3h$	-0.7~-0.1	-0.5~-0.5
Max Service Temperature($^\circ C$)		1200 (unsoaked)	1200 (unsoaked)

Packing: 25kg/bag.

Storage: It should be always stored under dry conditions.

Shelf life: 6 months.

High Strength Low Cement Castables

Ultra-low-cement castables developed by PRCO features good flowability, high strength, good thermal shock resistance and easy installation. They could be applied to the periphery of doors and burners.

Main Properties

ITEM		PN-GQ1	PN-GQ2
Chemical Composition(%); \geq	Al_2O_3	80	85
Refractoriness($^{\circ}C$)		1700	1700
Bulk Density(g/cm^3); \geq	110 $^{\circ}C$ \times 24h	2.90	3.00
	1000 $^{\circ}C$ \times 3h	2.80	2.90
Modulus of Rupture(MPa); \geq	110 $^{\circ}C$ \times 24h	10	15
	1000 $^{\circ}C$ \times 3h	10	15
Cold Crushing Strength(MPa); \geq	110 $^{\circ}C$ \times 24h	60	60
	1000 $^{\circ}C$ \times 3h	80	85
Linear Change(%); \leq	110 $^{\circ}C$ \times 24h	0.2	0.2
	1000 $^{\circ}C$ \times 3h	0.3	0.3

Packing: 25kg/bag.

Storage: It should be always stored under dry condition.

Shelf life: 6 months.



Self-flow Castables

According to the solid rheological theory and the actual working condition, PRCO has developed the high-tech self-flow castables (SFC) in China. Without vibration, SFC will be degassed and leveled by gravity and thereby become compact.

The products show the features of good flow ability, suitable setting time, labor-saving, high-strength, long service life, good insulation, high temperature resistance, superior resistance to thermal shock and erosion-corrosion resistance.

The products have been renowned as the fourth generation of castables, which can be applied on these areas where low-cement, ultra-low cement or cement-free castables is applied.

Self-flow castables was approved by Henan Science & Technology Committee on Nov.4, 1996 and was awarded as the second prize by Henan Metallurgy & Construction Dept. They could be applied on burners and periphery of the furnace doors.



Main Properties

ITEM		PN-SF1	PN-SF1A	PN-SF2	PN-SF2A	PN-SF6	PN-SF6A
Chemical Composition(%); ≥	Al ₂ O ₃	50	55	60	65	60	65
Bulk Density(g/cm ³); ≥	110°C × 16h	2.20	2.25	2.30	2.35	2.30	2.35
	1350°C × 3h	2.15	2.20	2.25	2.30	2.25	2.30
Cold Crushing Strength(MPa); ≥	110°C × 16h	30	38	35	40	40	45
	1350°C × 3h	50	55	55	65	60	60
Modulus of Rupture(MPa); ≥	110°C × 16h	5	6	6	6	6	6
	1350°C × 3h	7	9	8	8	8	8
Linear Change(%)	110°C × 16h	0~-0.2	0~-0.2	0~-0.2	0~-0.2	0~-0.2	0~-0.2
	1300°C × 3h	0~-0.5	0~-0.5	0~-0.5	0~-0.5	0~-0.5	0~-0.5
Water Addition(%)		7~9	7~9	7~9	7~9	7~9	7~9
Long term Service Temperature(°C)		1350	1350	1350	1350	1350	1350
Max Service Temperature(°C)		1500	1500	1500	1500	1500	1500

Packing: 25kg/bag.

Storage: It should be always stored under dry condition.

Shelf life: 6 months.

Light-Weight Insulation Castables

Light-weight insulation castables developed by PRCO are made of light-weight porous materials or hollow insulating ones, refractory powders and binding agents as well. The kind of castables features good volume stability, high strength.



Main Properties

ITEM		PN-LW0.6	PN-LW0.8	PN-LW1.0
Bulk Density(g/cm ³)		0.6 ± 0.1	0.8 ± 0.1	1.0 ± 0.1
Cold Crushing Strength(MPa); ≥	110°C × 24h	/	1	2
	1000°C × 3h	/	1(900°C × 3h)	2
Linear Change (%)	1000°C × 3h	/	0~-0.8(900°C × 3h)	0~-0.8
Thermal Conductivity(700°C)(W/m · K); ≤		0.25	0.28	0.35
Long Term Service Temperature °C		800	900	1000

Packing: woven bag.

Storage: It should be always stored under dry condition.

Shelf life: 6 months.



Silicon Carbide Castables

Silicon carbide castables developed by PRCO are made of silicon carbides, refractory powders and binding agents as well. The kind of castables features good resistance to erosion, abrasiveness resistance, and high strength. They are mainly applied to tap-hole area.

Main Properties

ITEM		PN-JT75
Chemical Composition(%); \geq	SiC	75
	Al ₂ O ₃	5
	SiO ₂	5
Bulk Density(g/cm ³); \geq		2.55
Modulus of Rupture(MPa); \geq	110°C × 24h	15
	1000°C × 3h	20

Packing: 25kg/bag.

Storage: It should be always kept dry.

Shelf life: 6 months.

Refractory for Aluminum Refining Furnace

Purging plugs developed for aluminum refining have superior chemical stability; they don't react with molten aluminum or aluminum alloy. The pore position of purging plugs is homogeneous and designed to generate stable tiny bubbles. They have been successfully applied in Luoyang Wanji Aluminum Industry and Liaoning Yinyuan Aluminum Alloy Company.



Main Properties

Item	Brand	PN-TC6
Chemical Composition(%); ≥	Al ₂ O ₃	85
Bulk Density(g/cm ³); ≥		2.65
Apparent Porosity(%); ≥		22
Cold Crushing Strength(MPa); ≥		25
Gas Flow(0.4 MPa)Nm ³ /h		10~50

Packing: wooden pallet or paper box.

Storage: The products should be always kept dry.

Shelf life: 12 months.



High Strength Abrasion Resistance Castables

PN series of abrasive castables for gas suspension furnace are made from dense high strength aggregate, composite micro-powder and special additives. They feature high bonding strength, abrasive resistance, stable volume, easy installation, relatively short setting time at room temperature.

Main Properties

ITEM		PN-NMJ60	PN-NMJ65	PN-NMJ70
Chemical Composition(%); \geq	Al_2O_3	60	65	70
Modulus of Rupture(MPa); \geq	110°C × 24h	10	11	11
	1000°C × 3h	11	11	12
Cold Crushing Strength(MPa); \geq	110°C × 24h	65	70	80
	1000°C × 3h	80	85	100
Linear Change(%)	1000°C × 3h	0 ~ -0.3	0 ~ -0.3	0 ~ -0.3
Thermal Shock Resistance(times); \geq	900°C -water	25	25	25
Abrasion Loss(cm^3); \leq	900°C × 3h	7	6	6
Bulk Density(g/cm^3); \geq		2.40	2.50	2.60

Packing: 25kg/bag.

Storage: The products should be always kept dry.

Shelf life: 6 months.

Abrasive Anchor Bricks

The abrasive anchor bricks have the features of high strength, abrasive resistance, and superior thermal shock resistance. They are suitable to work as wear lining of gas suspension furnace.



Main Properties

ITEM		PN-NMZ65	PN-NMZ70
Chemical Composition(%); ≥	Al ₂ O ₃	65	70
Modulus of Rupture(MPa); ≥		11	11
Cold Crushing Strength(MPa); ≥		70	80
Thermal Shock Resistance(Times); ≥		25	25
Bulk Density(g/cm ³); ≥		2.50	2.60
Abrasive Loss(cm ³); ≤		6	6

Packing: Wooden Pallets.

Storage: The products should be always kept dry.

Shelf life: 12 months.



High-Strength Light-Weight Castables

PN series of high-strength light-weight castables are made of shale or mullite as aggregate. They have the features of small bulk density, low thermal conductivity and high strength. They are ideal products for working lining of anode furnaces.

Main Properties

ITEM		PN-LW1.3	PN-LW1.5	PN-LW1.65	PN-LW1.8	PN-LW2.0
Chemical Composition(%); \geq	Al_2O_3	35	38	48	45	45
Cold Crushing Strength (MPa); \geq	110°C × 24h	5	6	8	12	18
	1300°C × 3h	5 (1200°C × 3h)	10 (1250°C × 3h)	12	15	22
Linear Change(%)	110°C × 24h	0~-0.2	0~-0.2	0~-0.2	0~-0.2	0~-0.2
	1300°C × 3h	0~-0.8 (1200°C × 3h)	0~-0.8 (1250°C × 3h)	0~-0.8	0~-0.8	0~-0.8
Thermal Conductivity(700°C)(W/m · K); \leq		0.4	0.48	0.60	0.70	0.75
Long Term Service Temperature(°C)		1200	1250	1300	1300	1300
Bulk Density(g/cm ³)		1.3 ± 0.1	1.5 ± 0.1	1.65 ± 0.1	1.8 ± 0.1	2.0 ± 0.1
Application Area		Furnace lining	Furnace lining	Furnace top and regenerator		

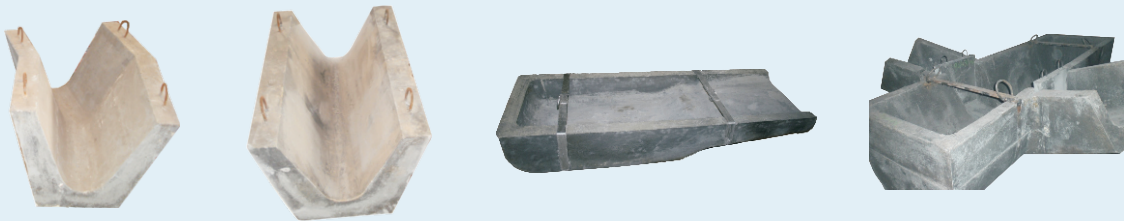
Packing: Woven bags.

Storage: It should be always kept in dry condition.

Shelf life: 6 months.

**Precast Block for Tundish and Casting Ladle in Copper Metallurgy; Alumina SiC
Precast Block for Copper, Ferronickel, Lead, Zinc Metallurgy and Matte Chute in
High Grade Nickel Metallurgy**

PN-SK65 series of alumina-SiC-based precast blocks for tundish, casting ladles show the features of high strength ,good wear resistance, strong erosion resistance performance. They have been widely applied in Yunnan Copper Industry Group, Xiangguang Copper Industry and other Copper companies. The service life has increased from 1 heat to 10 heats, it helps to make the production more continuous and to reduce labor intensity and the consumption of refractories as well.



ITEM		PN-SK65	PN-SK65-X
Chemical Composition(%); ≥	Al ₂ O ₃	55	55
	SiC	6	6
Bulk Density(g/cm ³); ≥	110 °C × 16h	2.40	2.40
	1350 °C × 3h	2.30	2.30
Cold Crushing Strength(MPa); ≥	110 °C × 16h	50	50
	1350 °C × 3h	60	60
Modulus of Rupture(MPa); ≥	110 °C × 16h	6	6
	1350 °C × 3h	8	8
Linear Change(%)	1350 °C × 3h	±0.5	±0.5



High-strength Explosion-proof Abrasion Resistance Castables Reinforced with Steel Fiber, High-strength Abrasion Resistance Castables Reinforced with Steel Fiber, Low Cement Abrasion Resistance Castables Reinforced with Steel Fiber, Low Cement Abrasion Resistance Castables

As the conventional refractory linings of rotary kilns in nonferrous metal industry are brick-relined, some bricks would be displaced after 3 months, and it is very difficult to patch the joints between new bricks and old ones. In order to solve this kind of problem, PRCO introduced monolithic casting technology to the rotary kiln in nonferrous metal industry (High-strength Explosion-proof Abrasion Resistance Castables reinforced with steel fiber for high temperature zone, High-strength Abrasion Resistance Castables stainless steel fiber reinforced for medium temperature zone, Low Cement Abrasion Resistance Castables fiber reinforced for low temperature zone), and it successfully improved the thermal shock resistance, abrasion resistance, anti-hot-spalling performance. At present, this technology has been widely applied in Jinchuan Group, Fujian Dingxin industries, GuangxinShengte Metal Company, Linyi Jinhui Nickel industry, Jiangsu Delong Nickel industry, Fujian Desheng Nickel industry, Qinghai Jinguang Nickel-chrome material company, Myanmar TagaungTaung Nickel Resource Project.

Low Cement Abrasion Resistance Castables

ITEM		PN-AH10、PN-AH10-X
Chemical Composition(%); \geq	Al_2O_3	60
Bulk Density(g/cm^3); \geq	$110^\circ C \times 16h$	2.35
Cold Crushing Strength(MPa); \geq	$110^\circ C \times 16h$	55
	$1350^\circ C \times 3h$	70
Modulus of Rupture(MPa); \geq	$110^\circ C \times 16h$	7
	$1350^\circ C \times 3h$	8
Linear Change(%)	$110^\circ C \times 16h$	0~-0.2
	$1300^\circ C \times 3h$	0~-0.5
Service Temperature($^\circ C$)		1350 $^\circ C$
Application Area		Suitable for all the sections

Low Cement Abrasion Resistance Castables Reinforced with Steel Fiber

ITEM		PN-AH10-A 、PN-AH10-A-X
Chemical Composition(%); \geq	Al ₂ O ₃	60
Bulk Density(g/cm ³); \geq	110°C × 16h	2.35
Cold Crushing Strength(MPa); \geq	110°C × 16h	50
	1350°C × 3h	70
Modulus of Rupture(MPa); \geq	110°C × 16h	7
	1350°C × 3h	8
Linear Change(%)	110°C × 16h	0~-0.2
	1300°C × 3h	0~-0.5
Service Temperature(°C)		1250

High-Strength Abrasion Resistance Castables steel fiber Reinforced with Steel Fiber

ITEM		PN-AH60-A-X
Chemical Composition(%); \geq	Al ₂ O ₃	62
Bulk Density(g/cm ³); \geq	110°C × 16h	2.45
Cold Crushing Strength(MPa); \geq	110°C × 16h	60
	1350°C × 3h	70
Modulus of Rupture(MPa); \geq	110°C × 16h	8
	1350°C × 3h	9
Linear Change(%)	110°C × 16h	0~-0.2
	1300°C × 3h	0~-0.5
Service Temperature(°C)		1300



High-strength Explosion-proof Abrasion Resistance Stainless Steel Fiber Reinforced Castables

ITEM		PN-AH68-A-X
Chemical Composition(%)	Al ₂ O ₃ ; ≥	68
	SiO ₂ ; ≤	26.5
	Fe ₂ O ₃ ; ≤	2.0
	CaO; ≤	2.0
Bulk Density(g/cm ³); ≥	110°C × 16h	2.5
Cold Crushing Strength(MPa); ≥	110°C × 16h	60
	1350°C × 3h	75
Modulus of Rupture(MPa); ≥	110°C × 16h	8
	1350°C × 3h	8
Linear Change(%)	110°C × 16h	0~-0.2
	1300°C × 3h	0~-0.5
Service Temperature(°C)		1350

High Strength Light-weight Castable

ITEM		PN-LW1.2
Chemical Composition(%) ≥	Al ₂ O ₃	32
Bulk Density(g/cm ³)	110°C × 16h	1.2 ± 0.1
Cold Crushing Strength(MPa); ≥	110°C × 16h	3
	1200°C × 3h	3
Linear Change(%)	110°C × 16h	0~-0.2
	1200°C × 3h	0~-0.8
Thermal Conductivity(700°C)(W/m · K); ≤		0.38
Service Temperature(°C)		1200
Application		Furnace lining

Chrome Corundum Bricks, Purging Plugs for Copper Anode Furnace

Purging plugs for Copper Anode Furnace developed by PRCO generates good current condition for heat transfer inside the furnace through solutions like soakage and permeability and improves the heat utilization efficiency, metal collection and slag removal. The application of purging plugs has great significance on reducing tap-to-tap time and increasing production output.

At present, PRCO series of chrome corundum refractories have been used in lots of copper companies in China. The chrome-corundum-based purging plugs are widely used for 350t Anode furnace in Yunnan Copper Industry, 160t Anode furnace in KunPeng Copper industry, Guangxi Wuzhou Copper industry, PanyuYuanhang Copper industry, etc. Chrome corundum blocks are widely applied in shaft furnaces as well as tapping spouts in many copper companies.

Main Properties

ITEM		Copper Smelting Furnace
		PN-LG26
Chemical Composition(%); ≥	Al ₂ O ₃	80
	Cr ₂ O ₃	3
Cold Crushing Strength(MPa); ≥		100
Modulus of Rupture(MPa); ≥		30
Apparent Porosity(%); ≤		16
Bulk Density (g/cm ³); ≥		3.2

Made from high-purity, high-density, high-strength corundum based materials and matrix-adjusted system (MAS), the PN-TZ8 series of purging plugs, with the unique radiated through-slots structure, show the features of stable structure, high and adjustable gas-flow, high purging rate, good corrosion/erosion resistance and long service life etc.

ITEM		PN-TZ8
Chemical Composition(%); ≥	Al ₂ O ₃ + Cr ₂ O ₃	96
Bulk Density(g/cm ³); ≥	1500℃ × 3h	3.15
Modulus of Rupture(MPa); ≥	1500℃ × 3h	15
Cold Crushing Strength(MPa); ≥	1500℃ × 3h	80

Packaging: wooden pallets

Storage and transportation: Anti-moisture measures must be done and they should be kept in dry condition.

Shelf life: 6 months.

Non-water Taphole Clay for High Nickel Chrome Alloy

Tap-hole clay is a necessary consumption material in iron & steel industry, at present it becomes a functional refractory product. With the increasing capacity of nonferrous industry and mechanization operation, there is higher requirement on tap-hole plugging materials at Nickel industry. The application of non-water tap-hole clay for both blast furnaces and EAF, not only meet the needs of mechanization operation, but also protect the tapping area and improve the life of refractory lining and equipments. PRCO innovated non-water tap-hole clay for High Nickel alloy and Nickel-Chrome production to meet the requirements of different nonferrous metallurgy equipments.



The tap-hole clay are made of bauxite, fused corundum, SiC, mullite, coke, micro-powder, manufactured under constant temperature mixing technology to guarantee the quality of every lot is good and stable. We can also develop suitable products to fulfill the requirements of specific customers.

The tap-hole clay features easily open, easily closed, non-smoking, non-splashing, good resistance to erosion. It has been tested and applied in 750m³ blast furnaces in Baosteel Stainless Steel, Fujian Dingxin33000KVA, 35000KVA EAF, Myanmar TagaungTaung Nickel Resource Project, etc.

Specifications of water free tap-hole clay

ITEM		PN-RF2-S4	PN-RF3-YGD
Chemical Composition(%); ≥	Al ₂ O ₃	30.0	30.0
	SiO ₂	26.0	30.0
	Si ₃ N ₄ +SiC	20.0	10.0
	C+ Binder	10.0	15.0
Bulk Density(g/cm ³); ≥	1400°C × 3h	1.85	1.75
Cold Crushing Strength(MPa); ≥	1400°C × 3h	14.5	8.0
Linear Change(%)	1400°C × 3h	± 0.5	± 1.0
Application		BF process	EAF process

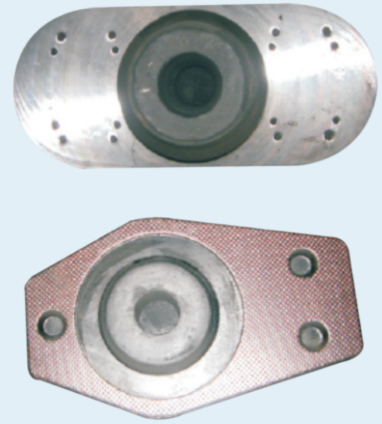
Packaging: Woven bag, Paper box, 1000kg/bag or pallet.

Storage and transportation: Rain/snow proof, no exposure to sunlight, avoiding high temperature baking. 3 months shelf life in summer and 6 months shelf life in winter.

High Performance Slide Plates

In order to meet the needs of nonferrous metallurgy, PRCO developed high-performance chrome-corundum-based sliding gate plates, they feature high strength, strong erosion resistance, good thermal shock resistance, etc. They are especially suitable for tapping gate of copper anode furnaces.

The application advantages of sliding gate plate in non-ferrous metallurgy is as below: it would provide more safety to operators; casting system could be controlled precisely and casting speed would be stable; it would reduce splashing during casting; it would reduce casting time by continuous casting and oxidation could also be reduced; it could stop casting in case of emergency.



Specification of high performance slide gate plates

ITEM		LG11
Chemical Composition(%); ≥	Al ₂ O ₃	80
	Cr ₂ O ₃	3
Bulk Density(g/cm ³); ≥		3.2
Apparent Porosity(%); ≤		12
Cold Crushing Strength(MPa); ≥		120

Packaging: Paper box , wooden box or pallets.

Storage and transportation: Moisture proof, shock proof, collision proof. The storage time is 6 months, best performance within 6 months, and will be effected a little within another 6 months.



315 Mechanism of Slide Gate Plate

PRCO developed PN315 sliding gate mechanism in order to the market needs. PN315 sliding gate mechanism consists of a base, framework, fixed slide mechanism and elasticity elements. The fixed slide mechanism reciprocates within the framework. Under the help of spring elements, fixed and symmetrical sliding pressure occurs between the two slide plates. This product is patent protected and PRCO will strictly pursue infringements cases.

1. Fixed slide mechanism features easy installation and disassembly, and exact orientation.

2. When the door of fixed sliding mechanism is closed, springs don't work without pressure. When get to the sliding courses, spring will tightly pressure upper and lower slide plates automatically. So, man-made factors are at lowest. At the same time, invariable and symmetrical side pressure is kept and mechanism can run safely.

3. Special air cooling measures may be employed; not only the spring elements, but also the framework and fixed slide mechanism can also be cooled.

4. Compound insulation barriers provide a simple structure with a low conductance of heat radiated from molten metal.

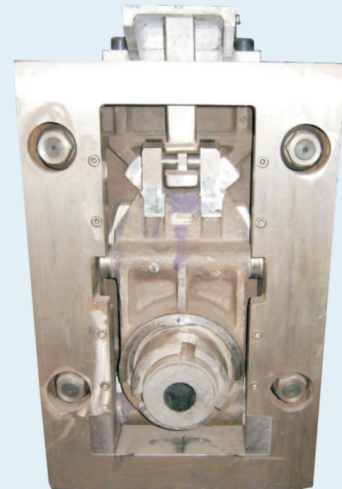
5. The base, framework and fixed slide mechanism are all made of high temperature abrasive material, resistant to deformation with a long service life.

6. Spring elements are fine butterfly-shaped springs which are minimally affected under high temperature. Since the long-lasting spring groups require checking every 200 heats, labor time is reduced.

7. Use special pre-sets; pressure is evened across the slide plates. This in turn equalizes thermal shock resulting in fewer chances to crack.

8. The unique spiral structure of slide car and lower nozzle protector allow for easy installation and application of the lower nozzle.

9. Sliding plates employ the design of plane contact and maximize the area between nozzle and sliding plates. So the surface pressure is stabilized and safety coefficient is increased and also benefit to installation and disassembly of sliding plates. Sliding plates for our



mechanism disregard traditional male-female structure and instead employ a face-contact design to maximize the area between nozzle and sliding plates. Face pressure is stabilized increasing safety and ease of application and disassembly.

10. Handling, installation and disassembly are easily managed.

11. Many parts, such as the framework, setting equipments for slide plates, fixed slide mechanism, collector nozzles protector and motion controlling lock are of our patented technologies.

They have been widely applied in many plants, such as CUU in Vietnam, Shanxi Yigang Steel Company, Zhuhai Yueyufeng Steel Company, Jiangsu Lianfeng Steel Company.

PN315 sliding gate mechanism is patent-protected.