

高爐堵泥材

Tap-Hole Mud for Blast Furnace

本公司針對高爐需求，開發適合各高爐操作條件之堵泥材，具有下列特性：

1. 能使用於交互與連續出銑
2. 易開孔，能使用於預先開孔條件
3. 高耐蝕性
4. 與舊材結合性佳

For the demand of operating condition of Blast-Furnace, MUD materials with the following features:

- 1.Can be applied to alternative and continuous tapping
- 2.Easily dig
- 3.High corrosion resistance to molten iron and slag
- 4.Easy adhere to old material



Product Specification

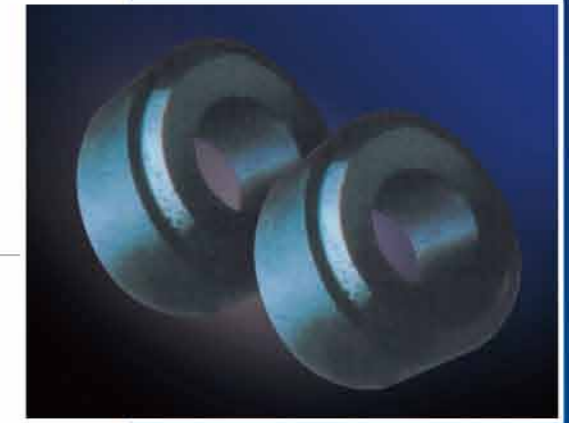
Properties		Brand	STA-01	STA-02	STA-03	STA-04
After heat treatment for 3 hours at 600°C	Bulk Density (g/cm ³)		≥ 1.9	≥ 1.9	≥ 1.9	≥ 1.9
	Cold Crushing Strength (Kg/cm ²)		≥ 60	≥ 65	≥ 60	≥ 60
	Modulus of Rupture (Kg/cm ²)		≥ 25	≥ 27.5	≥ 27	≥ 26.5
Chemical Composition (%)	Al ₂ O ₃		≥ 37	≥ 43	≥ 40	≥ 39
	SiC+Si ₃ N ₄		≥ 13	≥ 13	≥ 15	≥ 15

出鋼口磚

Tapping Hole Bricks

本公司生產的出鋼口磚是一種組合型不燒耐火功能材料，以高純電熔鎂砂加高純石墨為主要原料，添加多種添加劑。產品具有優良的抗侵蝕性和抗沖刷性。適用於煉鋼轉爐和電爐出口部位、出鋼口襯磚和外套磚。可以單件供應，也可以組裝後成套供應。

The Tapping Hole Brick is a sort of combination refractory and manufactured without burning. Its main raw material includes high-pure electric-smelting magnesia and pure graphite, it also contains multitude of reagents. The Tapping Hole Brick has characteristics of good resistance for corrosion and erosion. This products is mainly used for discharge port, converter, ,tapping hole line, wrapping of converter and electric arc. It can be supplied with single piece and a whole set after combination.



Product Specification

Properties	Brand	ZGK-A	ZGK-B
Cold Crushing Strength (Mpa)		≥ 45	≥ 45
Modulus of Rupture at Elevated Temperature, 1400°Cx30min(Mpa)		≥ 12	≥ 12
Bulk Density (g/cm ³)		≥ 2.98	≥ 2.95
Apparent Porosity (%)		≤ 3	≤ 3
Chemical Composition (%)	MgO	≥ 80	≥ 75
	C	≥ 10	≥ 15

滑板/嵌鑲滑板

Plate, Mosaic Plate

流鋼孔用滑板、鑲嵌滑板，可保證管線鋼等，鈣處理鋼的澆注。

Plate and Mosaic Plate are used for steel flowing hole to ensure the casting of calcium processing steel, such as pipeline steel.



Product Specification

Properties	Kind	Al ₂ O ₃ -ZrO ₂ , Al ₂ O ₃ -C						MgO-C	ZrO ₂ -C
		1	2	3	4	5	6		
Bulk Density (g/cm ³)		3.17	3.12	3.14	3.33	3.24	3.13	3.10	4.80
Apparent Porosity (%)		5.5	5.0	4.5	4.0	4.0	5.5	8.5	15.5
Cold Crushing Strength (Mpa)		240	230	280	280	300	150	120	100
Chemical Composition (%)	Al ₂ O ₃	79	70	71	75	74	95	95	10
	ZrO ₂	6	10	13	9	8	---	---	(MgO 89)
	F.C	9	12	10	7	10	4	4	4
Hot modulus of rupture (Mpa) at 1400°C		23	25	28	21	25	35	45	44
Thermal expansion (%) at 1500°C		1.05	0.99	0.96	1.01	1.01	1.30	1.20	1.98

透氣磚

Porous Plug

本公司的透氣磚，採用先進的生產技術，分狹縫式和擴散型兩種類型。產品應用於爐外精煉和頂底復合吹煉等。本系列產品具有優良的抗熱震穩定性、耐侵蝕性和抗氧化性。

Porous Plug, made with advanced technology, the type of Porous Plug have into slit type and diffused type. It is applied in outside furnace smelting and top & bottom blowing smelting and so on. It possesses good high thermal shock resistance, erosion resistance and oxidation resistance.



Product Specification

Properties	Kind	Porous bricks					Outer sleeves	
		Alumina					Alumina	Al ₂ O ₃ -C
Bulk Density(g/cm ³)		2.51	2.49	2.80	3.05	3.22	3.00	2.90
Apparent Porosity (%)		35.0	26.5	27.5	21.2	15.3	17.8	13.3
Cold Crushing Strength (Mpa)		65	65	110	180	150	70	90
Permeability (C.G.S)		1.0	0.8	2.0	1.0	---	---	---
Chemical Composition (%)	Al ₂ O ₃	91	82	91	91	94	95	95
	MgO	---	---	---	---	3	---	---
	F.C	---	---	---	---	---	---	---

分鋼槽水口

Tundish Nozzle

用於分鋼槽底部，讓鋼液能順利流入模具內。高強度與高抗剝落性為其特性。

The Tundish Nozzle of Sunward are used in the bottom of Tundish to make molten steel smoothly pour into mould. The characteristics are high strong and spall resistance.



Product Specification

Properties	Kind	Zircon				
		Zircon	Zircon-Zirconia		Zirconia	
Cold Crushing Strength (Mpa)		120	120	120	140	140
Bulk Density (g/cm ³)		3.7	4.0	4.4	4.8	4.8
Apparent Porosity (%)		20.0	17.5	14.5	15.5	16.0
Chemical Composition (%)						
ZrO ₂		65.0	75.5	82.0	96.0	96.0
SiO ₂		33.0	22.0	16.0	—	—

長水口

Long Nozzle

本公司長水口按功能分主要有預熱/非預熱及吹氬/不吹氬型；按材質分主要有鋁碳質、鋁鎂碳質、鎂碳質等。本產品在使用過程中具有良好的耐鋼水沖刷性能，能有效防止鋼水的氧化和飛濺。

Long nozzles can be classified by:

- 1.Functions: Preheating/ non-preheating, blowing argon/non-argon.
- 2.Materials: Alumina-carbon, alumina-zirconia-carbon, magnesia-carbon, etc.

It possesses good capacity of erosion resistance, anti-oxidation and anti-splashing.



Product Specification

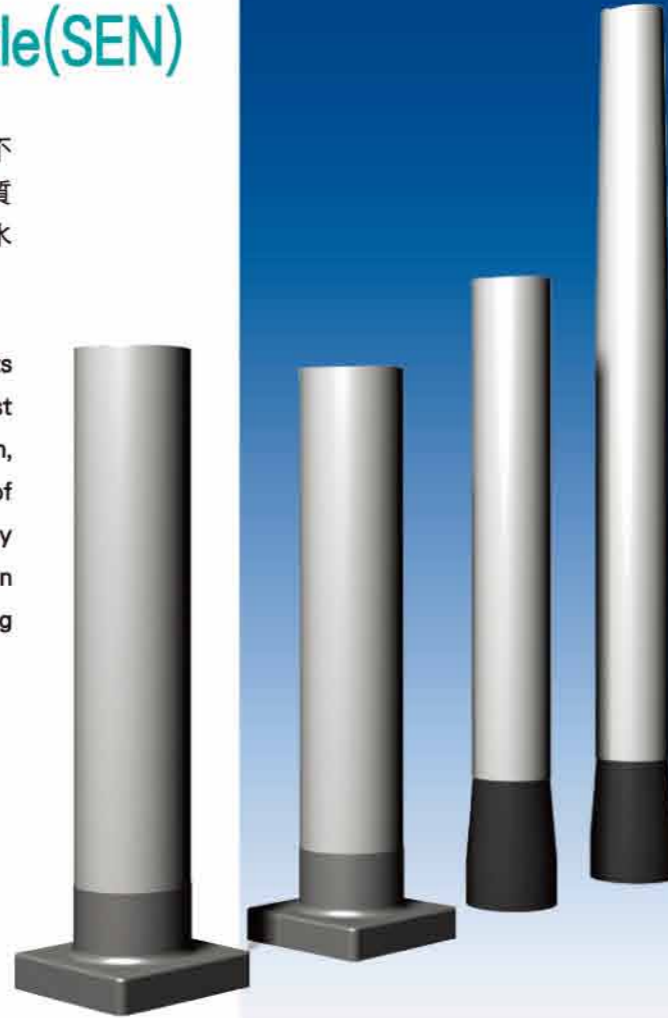
Properties	Kind	Body				Slag Line	
		Alumina-Graphite				Zirconia-Graphite	Alumina-Zirconia-Graphite
Bulk Density (g/cm ³)		2.08	2.31	2.37	2.46	3.20	3.00
Apparent Porosity (%)		16.5	16.3	18.0	17.6	17.0	18.5
Cold Crushing Strength (Mpa)		26	27	24	27	24	24
Modulus of Rupture (Mpa) at R.T		9.2	9.9	8.0	8.5	7.0	8.0
Modulus of Rupture (Mpa) at 1400°C		9.1	8.8	8.7	9.9	---	---
Modulus of elasticity (GPa)		7.9	9.1	6.5	8.3	7.1	10.6
Thermal expansion at 1000°C (%)		+0.28	+0.30	+0.37	+0.40	+0.33	+0.47
Chemical Composition (%)	Al ₂ O ₃	37	56	62	69	---	18
	ZrO ₂	---	---	---	---	68	48
	SiO ₂	24	11	5	---	---	---
	F.C+SiC	35+1	29+0	31+0	29+0	27	27

浸入式水口

Submerged Entry Nozzle (SEN)

本公司浸入式水口按材質和功能分主要有吹氬/不吹氬、快速更換型、鋁碳質、鋁鎂碳質、鎂碳質等類型。本產品在使用過程中具備良好的耐鋼水沖刷性能、抗鋼水氧化和渣侵蝕性能。

Classified by materials and functions, our products can be grouped into blowing argon/ non-argon, fast replacement, alumina-zirconia-carbon, alumina-carbon, magnesia-carbon, etc. It possesses good capacity of erosion resistance to molten steel, anti-oxidation by molten steel and anti-corrosion by slag. We can provide products made of various materials according to the specific conditions of the steel companies.



Product Specification

Properties	Kind	Body				Powder Zone		
		Alumina-Graphite				Zirconia-Graphite		
Cold Crushing Strength (Mpa)		21	27	27	27	20	31	29
Modulus of Rupture (Mpa)		7.0	9.0	9.0	8.5	8.0	10.5	8.5
Bulk Density (g/cm ³)		2.18	2.29	2.34	2.46	3.23	3.46	3.60
Apparent Porosity (%)		16.9	17.5	17.5	17.6	18.0	15.8	16.5
Modulus of elasticity (GPa)		7.5	10.2	10.5	8.3	12.5	13.0	12.9
Thermal expansion at 1000°C (%)		+0.22	+0.29	+0.36	+0.40	+0.35	+0.47	+0.48
Chemical Composition (%)	F.C+SiC	30	33	33	29	24	21	15
	Al ₂ O ₃	41	40	49	69	---	---	---
	SiO ₂	25	18	10	---	---	---	---
	ZrO ₂	3	17	5	---	70	75	80

塞棒

Monoblock Stopper

本公司之塞棒按材質分類主要有鋁碳質、鋁鎂碳質、鋁鎂碳質等。由於本產品具有良好的抗渣侵蝕性能、常溫抗折強度、優良的耐鋼水侵蝕和沖刷性能，進而保證了本產品使用過程中的可靠性。

Classified by materials, our monoblock stoppers can be grouped into Alumina-Carbon, Alumina-Zirconia-Carbon, Alumina-Magnesia-Carbon sistance to the slag、corrosion、rupture and erosion, it ensure reliable during operating procedure.



Product Specification

Properties	Kind	Stopper Heads		Long Stoppers		
		Alumina-Graphite	Burned Alumina	Alumina-Graphite		
Cold Crushing Strength (Mpa)		30	40	32	31	26
Modulus of Rupture (Mpa)		---	---	10.0	10.0	7.0
Bulk Density (g/cm ³)		2.80	2.35	2.47	2.52	2.46
Apparent Porosity (%)		14.5	18.0	16.3	17.3	19.3
Modulus of elasticity (GPa)		---	---	12.0	13.5	10.8
Thermal expansion at 1000°C (%)		---	---	+0.40	+0.55	+0.55
Chemical Composition (%)	F.C+SiC	9(F.C)	---	28	28	28
	Al ₂ O ₃	89	56	52	69	69
	SiO ₂	---	---	9	---	---
	ZrO ₂	---	---	9	---	---