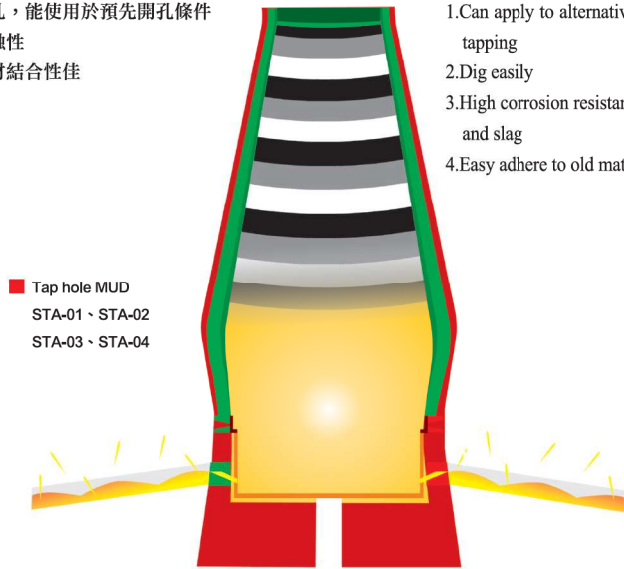


高爐堵泥材 Tap-Hole Mud for Blast Furnace

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銹
- 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 apply to alternative and continuous tapping
- 2.Dig easily
- 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-05	
After heat treatment for 3 hours at 600°C	Bulk Density (g/cm ³)	≥2.0	≥2.0	≥2.0	≥2.0
	Cold Crushing Strength (Kg/cm ²)	≥80	≥100	≥100	≥100
	Modulus of Rupture (Kg/cm ²)	≥40.0	≥42.5	≥45.0	≥45.0
Chemical Composition (%)	Al ₂ O ₃	≥35.0	≥27.5	≥22.5	≥20.0
	SiC+Si ₃ N ₄	≥35.0	≥40.0	≥42.5	≥45.0

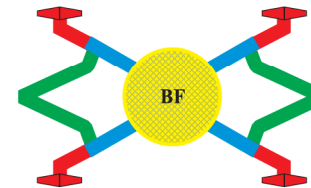
高爐流道及電弧爐預鑄型出鋼槽澆注材 Refractories for Trough of Blast Furnace & Pre-Cast Spout

本公司開發製造之高爐流道具有下列特性：
本公司並以澆注材料預鑄電弧爐用出鋼槽供客戶選擇使用。

- 1.高耐蝕性
- 2.高機械強度
- 3.低氣孔率
- 4.高耐氧化鋅
- 5.耐熱震、剝落性
- 6.易與原料結合，可多次修補，適用於條件嚴苛之高爐流道

Sunward Castable Materials for Trough of Blast Furnace & Pre-Cast Spout of EAF are featured with

- 1.High corrosion resistance
- 2.High mechanical strength
- 3.Low porosity
- 4.High oxidation resistance
- 5.High thermal shock resistance
- 6.Numerous repairs



- Main Trough
Slag Zone : BFR-MTH、SNC-B82、SNC-B81
- Iron Zone : BFR-MTA、SNC-B20、SNC-B81
Iron & Tilting Runner : SNC-B17、BFR-MTA
- Slag Runner : BFR-MTA
Repairing : SGM-B02、SPNG-TSI、SPNG-TMZ

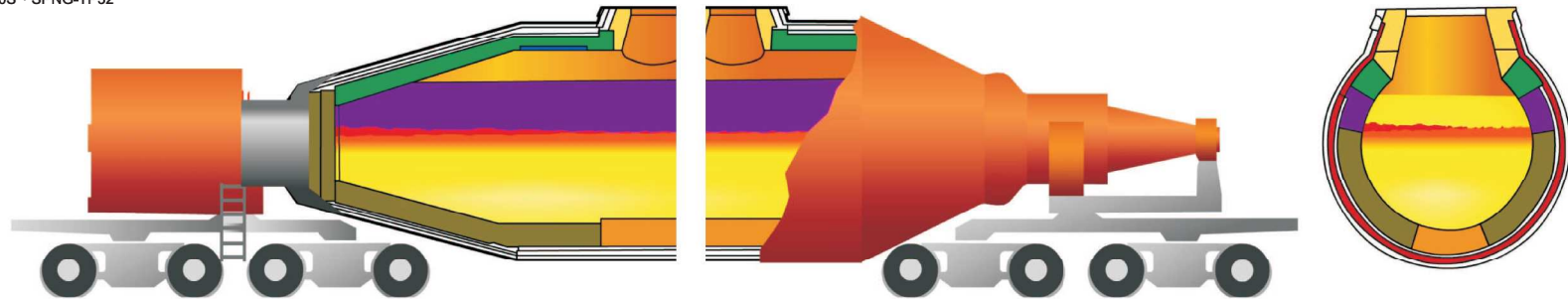
Product Specification:

Properties	Brand									
	SNC-B81	SNC-B82	SNC-B20	SNC-B17	BFR-MTA	BFR-MTH	SGM-B02	SPNG-TSI	SPNG-TMZ	
After heat treatment for 3 hours at 1450°C	Modulus of Rupture (Kg/cm ²)	≥80	≥70	≥80	≥100	≥50	≥50	≥10	≥50	≥50
	Bulk Density (g/cm ³)	≥2.90	≥2.80	≥2.85	≥2.95	≥2.60	≥2.55	≥2.20	≥2.80	≥2.85
Chemical Composition (%)	Al ₂ O ₃	≥65	≥55	≥65	≥73	≥60	≥62	≥65	≥52	≥65
	F.C.+SiC	≥17.5	≥35	≥15	≥13	≥17.5	≥25	≥22	≥30	≥10
	MgO	-	-	≥6	-	-	-	-	-	≥5
Characteristics	Casting Slag & Iron	Casting Slag	Casting Iron Zone	Casting Iron Runner	Ramming Iron Zone	Ramming Slag Zone	Gunning Repairing	Wet-Gunning	Wet-Gunning	
	Application	Main-Trough	Main-Trough	Main-Trough	Main-Trough	Main-Trough	Main-Trough	Main-Trough	Main-Trough	

魚雷車耐火材料 Refractories for Torpedo Car



- Repairing : SGM-A03、SPNG-TP70S、SPNG-TP32
- Slag Line : SAS-TS1
- Iron Line : SAS-TC1
- Roof : SAS-TR1
- Impact Zone : SAS-TP1
- Mouth : SNC-W60
- Safety Lining : F1
Mortar : SMO-AS1



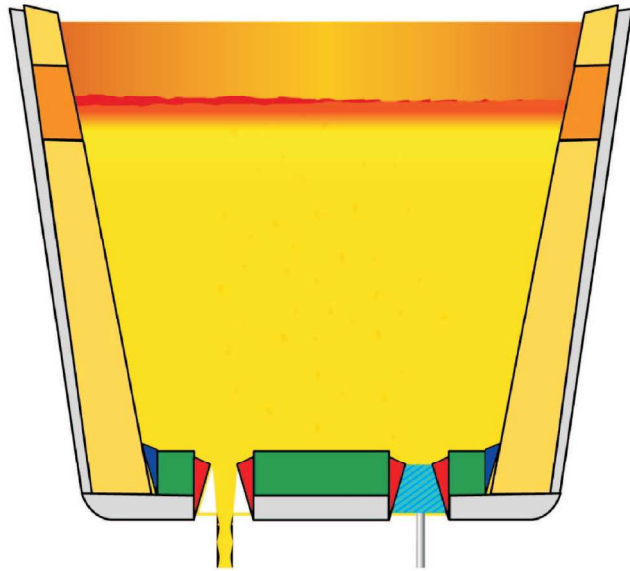
Product Specification:

Properties	Brand	SAS-TP1	SAS-TR1	SAS-TS1	SAS-TC1	F1
Refractoriness (SK)		—	—	—	—	33
Apparent Porosity (%)		≦11	≦7	≦7	≦7	≦21
Cold Crushing Strength(kg/cm ²)		≧300	≧300	≧300	≧300	≧300
Modulus of Rupture(kg/cm ²)		—	—	—	—	—
Bulk Density (g/cm ³)		≧2.85	≧2.90	≧2.90	≧2.90	≧2.10
Chemical Composition (%)	Al ₂ O ₃	≧60.0	≧67.5	≧65.0	≧62.5	≧40.0
	SiC+C	≧13.5	≧12.5	≧15.0	≧15.0	—
	CaO	—	—	—	—	—
	Fe ₂ O ₃	—	—	—	—	≦2.0
Characteristics	Brick	Brick	Brick	Brick	Brick	Brick
Application	Impact	Roof	Slag Line	Iron Line	Slag Line	Slag Line

Product Specification:

Properties	Brand	SMO-AS1	SNC-W60	SGM-A03	SPNG-TP70S	SPNG-TP32
Refractoriness (SK)		—	—	—	—	—
Apparent Porosity (%)		—	≦23 1500°Cx3hrs	≦25 1500°Cx3hrs	≦23 1450°Cx3hrs	≦23 1450°Cx3hrs
Cold Crushing Strength(kg/cm ²)		—	≧400 1500°Cx3hrs	≧200 1500°Cx3hrs	≧500 1450°Cx3hrs	≧300 1450°Cx3hrs
Modulus of Rupture(kg/cm ²)		≧3 1400°Cx2hrs in Coke	≧60 1500°Cx3hrs	≧50 1500°Cx3hrs	≧100 1450°Cx3hrs	≧50 1450°Cx3hrs
Bulk Density (g/cm ³)		—	≧2.40	≧2.10	≧2.75 1450°Cx3hrs	≧2.85 1450°Cx3hrs
Chemical Composition (%)	Al ₂ O ₃	≧70.0	≧60.0	≧60.0	≧64.0	≧72.0
	SiC+C	≧5.0	—	—	≧12.5	≧15.0
	CaO	—	≦2.0	—	—	—
	Fe ₂ O ₃	—	—	—	—	—
Characteristics	Mortar	Casting	Gunning	Wet-Gunning	Wet-Gunning	Wet-Gunning
Application		Mouth	Repair	Repair	Repair	Repair

盛鋼桶及精煉爐用耐火材料 Refractories for Ladle (Furnace) and Refining Furnace



- Slag Zone : SMGC-026 · 029
- Wall Zone : SHA-L08 · SSP-001 · SAM-001 · RK-28 · SAMG-002 · SAMG-007 · SAMG-008
- Corner : CA-185
- Bottom : SSP-001 · SAM-001
Impact Zone : SSP-001 · SAM-001
- Well Block : SNC-90C
- Repairing : SGM-A02 · SPNG-LDI

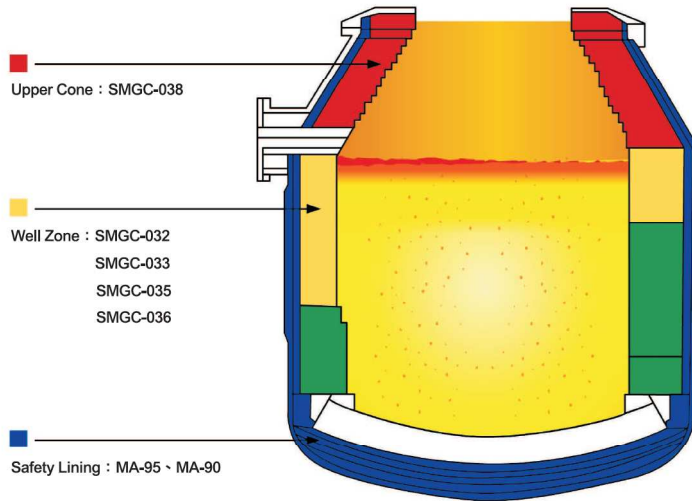
Product Specification:

Properties	Brand	SSP-001	SAM-001	CA-185	CA-17	SGM-A02	SPNG-LDI
Cold Crushing Strength (kg/cm ²) at °Cx3hrs		≧350	≧400	≧300	≧200	≧200	≧500
		1500°C	1500°C	1500°C	1400°C	1500°C	1450°C
Modulus of Rupture(kg/cm ²) at °Cx3hrs		≧125	≧150	≧100	≧70	—	≧150
		1500°C	1500°C	1500°C	1400°C	—	1450°C
Bulk Density (g/cm ³) at °Cx3hrs		≧2.75	≧2.70	≧2.80	≧2.25	≧2.15	≧2.70
		1500°C	1500°C	1500°C	1400°C	1500°C	1450°C
Chemical Composition (%)	Al ₂ O ₃	≧90.0	≧90.0	≧94.0	≧60.0	≧74.0	≧80
	MgO	≧2.0	≧5.0	—	—	—	≧5
	SiO ₂	—	—	—	—	—	—
	F.C.	—	—	—	—	—	—
Characteristics		Casting	Casting	Castable	Castable	Gunning	Wet-Gunning
Application		Wall & Bottom	Wall & Bottom	Corner of Wall & Bottom	—	Repair	Repair

Product Specification:

Properties	Brand	HMO	RK-28	SHA-L08	SMGC-026	SMGC-029	SAMG-002	SAMG-007	SAMG-008
Cold Crushing Strength (kg/cm ²) at °Cx3hrs		—	≧250	—	—	—	—	—	—
		—	1500°C	≧600	≧350	≧300	≧500	≧400	≧500
Modulus of Rupture(kg/cm ²) at °Cx3hrs		≧50	—	—	—	—	—	—	—
		1500°C	—	—	—	—	—	—	—
Bulk Density (g/cm ³) at °Cx3hrs		—	≧2.18	≧2.80	≧2.90	≧2.80	≧3.05	≧2.95	≧3.00
		—	1500°C	≧2.80	≧2.90	≧2.80	≧3.05	≧2.95	≧3.00
Chemical Composition (%)	Al ₂ O ₃	≧85.0	—	≧80.0	—	—	—	—	—
	MgO	—	—	—	≧75.0	≧75.0	≧90.0	≧65	≧60.0
	SiO ₂	—	≧70.0	—	—	—	≧5.0	≧15.0	≧22.5
	F.C.	—	—	—	≧12.5	≧15.0	≧2.0	≧5.0	≧7.5
Characteristics		Mortar	Brick	Shape-Brick	Shape-Brick	Shape-Brick	Shape-Brick	Shape-Brick	Shape-Brick
Application		—	Wall-Zone	Wall-Zone	Slag-Zone	Slag-Zone	Wall-Zone	Wall-Zone	Wall-Zone

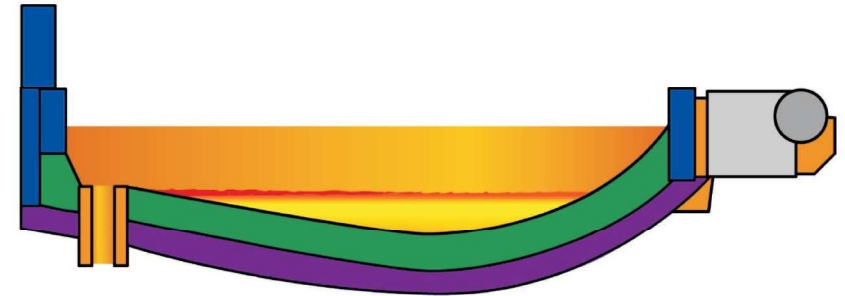
轉爐用耐火材料
Refractories for Convert (BOF)



Product Specification:

Properties	Brand	SMGC-032	SMGC-033	SMGC-035	SMGC-036	SMGC-038	MA-90	MA-95
Refractories		—	—	—	—	—	40	40
Apparent Porosity (%)		≦5	≦5	≦5	≦5	≦4.5	≦19	≦22
Bulk Density (g/cm ³)		≧2.80	≧2.80	≧2.80	≧2.85	≧2.84	≧2.80	≧2.75
Cold Crushing Strength (Kg/cm ²)		≧300	≧300	≧300	≧350	≧300	≧600	≧700
Chemical Composition (%)								
F.C		≧17.0	≧17.5	≧16.5	≧12.0	≧15.0	≧90	≧94
MgO		≧76.0	≧76.0	≧76.0	≧81.0	≧75.0		

電弧爐用耐火材料
Refractories for Electric Arc Furnace

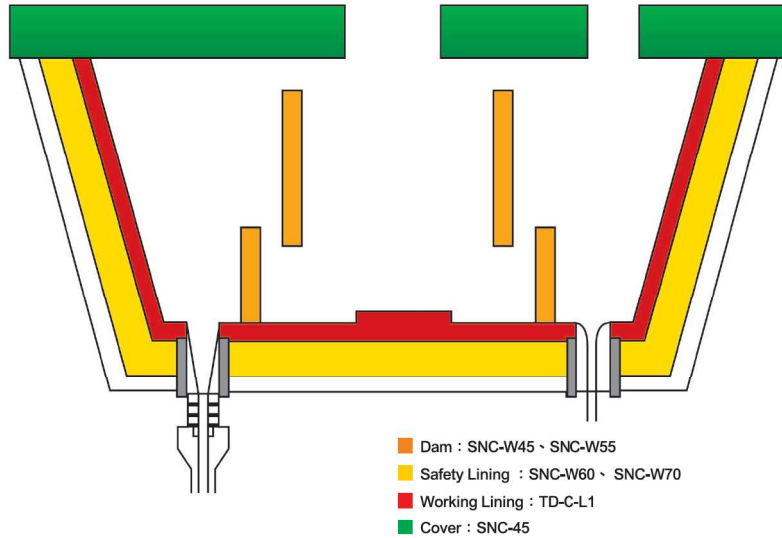


- Safety Lining : MA-95、MA-90
- Working Lining : SMGC-025、SMGC-38
- Repairing : SGM-M12、SGM-M15

Product Specification:

Properties	Brand	SMGC-025	SMGC-038	MA-90	MA-95	SGM-M12	SGM-M15
Refractories (SK)		—	—	40	40	—	—
Apparent Porosity (%)		≦5	≦4.5	≦19	≦22	—	—
Bulk Density (g/cm ³)		≧2.90	≧2.84	≧2.80	≧2.75	≧2.45 at 1500°Cx3hrs	≧2.20 at 1500°Cx3hrs
Cold Crushing Strength (kg/cm ²) at 1500°Cx3hrs		≧350	≧300	≧600	≧700	≧60 at 1500°Cx3hrs	≧80 at 1500°Cx3hrs
Chemical Composition (%)	F.C	≧10.0	≧15.0	—	—	—	—
	MgO	≧80.0	≧75.0	≧90	≧94	≧87	≧83

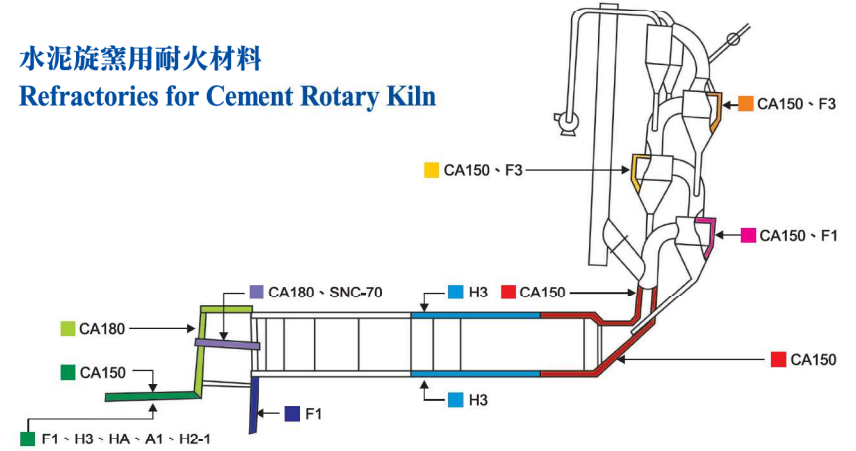
分鋼槽耐火材料 Refractories for Tundish



Product Specification:

Properties	Brand	SNC-W45	SNC-W55	SNC-W60	SNC-W70	TD-C-L1	SPNG-TD1
Cold Crushing Strength (kg/cm ²) at 1500°Cx3hrs		≧600	≧600	≧550	≧500	≧50	≧50
Modulus of Rupture(kg/cm ²) at 1500°Cx3hrs		≧100	≧100	≧80	≧80	≧20	≧10
Bulk Density (g/cm ³) at 1500°Cx3hrs		≧2.10	≧2.30	≧2.40	≧2.65	≧1.87	≧2.00
Chemical Composition (%)	Al ₂ O ₃	≧45	≧55	≧60	≧70	-	-
	MgO	-	-	-	-	≧82	≧82.5
	CaO	≧2.0	≧2.0	≧2.0	≧2.0	-	-
Water Require (%)		7.8~8.5	6.5~7.5	6.5~7.5	6.0~7.0	20~25	20~25
Characteristics		Coating				Coating	Spraying

水泥旋窯用耐火材料 Refractories for Cement Rotary Kiln

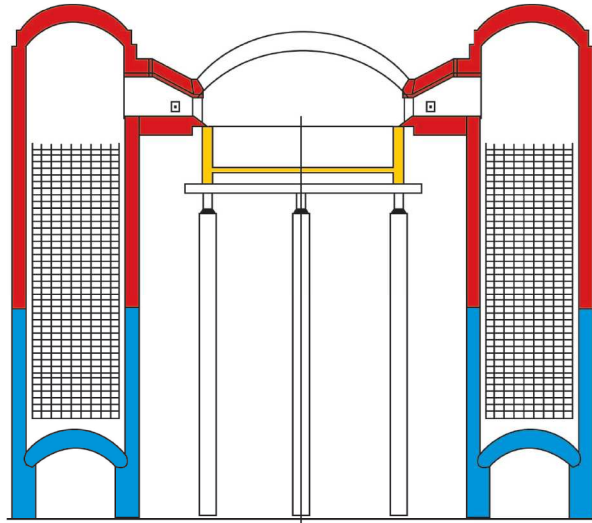


Product Specification:

Properties	Brand	CA-150	CA-180	SNC-70	PL-150
Cold Crushing Strength (kg/cm ²) at °Cx3hrs		≧300	≧250	≧500	≧80
		1400°C	1500°C	1500°C	1500°C
Modulus of Rapture (kg/cm ²) at °Cx3hrs		≧60	≧60	≧80	≧60
		1400°C	1500°C	1500°C	1500°C
Bulk Density (g/cm ³) at °Cx3hrs		≧2.05	≧2.40	≧2.65	≧2.00
		1400°C	1500°C	1500°C	1500°C
Chemical Composition (%)	Al ₂ O ₃	≧45	≧70	≧70	≧40
	CaO	-	-	≦2.0	-
Water Require (%)		12~14	11~13	6.0~7.0	-
Characteristics		Castable	Castable	Casting	Plastic

Properties	Brand	F1	F3	HA	A1	H2-1	H3
Refractories(SK)		34	32	39	38	37	36
Apparent Porosity(%)		≦24	≦24	≦26	≦26	≦20	≦26
Cold Crushing Strength(kg/cm2)		≧200	≧200	≧500	≧300	≧400	≧300
		≧2.00	≧2.00	≧2.50	≧2.40	≧2.55	≧2.15
Bulk Density(g/cm3)		≧2.00	≧2.00	≧2.50	≧2.40	≧2.55	≧2.15
Chemical Composition (%)	Al ₂ O ₃	≧40.0	≧40.0	≧80.0	≧70.0	≧60.0	≧50.0
	Fe ₂ O ₃	≦3.0	≦3.0	≦2.0	≦2.0	≦2.5	≦2.5
Characteristics		Brick	Brick	Brick	Brick	Brick	Brick

玻璃窯用耐火材料 Refractories for Glass Melting Furnace

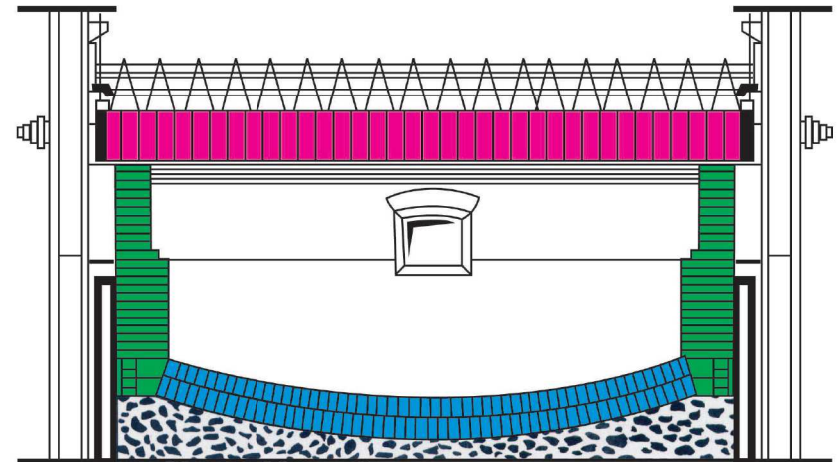


■ H1-2、MA-65、A1、H3、H2-1
■ F2、CM-37、F3
■ F2、F3

Product Specification:

Properties	Brand	F3	F2	H3	H2-1	A1	H1-2	MA-65	CM-37
Refractories (SK)		32	33	36	37	38	38	40	40
Apparent Porosity (%)		≦24	≦24	≦26	≦20	≦26	≦21	≦20	≦20
Cold Crushing Strength(kg/cm ²)		≧200	≧200	≧300	≧400	≧300	≧600	≧300	≧300
Bulk Density (g/cm ³)		≧2.00	≧1.90	≧2.15	≧2.55	≧2.40	≧2.70	≧2.90	≧2.95
Chemical Composition (%)	Al ₂ O ₃	≧40.0	≧32.0	≧50.0	≧60.0	≧70.0	≧80.0		
	Fe ₂ O ₃	≧3.0	≧3.0	≧2.5	≧2.5	≧2.0	≧2.0		
	Cr ₂ O ₃							≧9.0	≧20.0
	MgO							≧65.0	≧37

非鐵金屬提煉用耐火材料 Refractories for Nonferrous Metals Melting Furnace

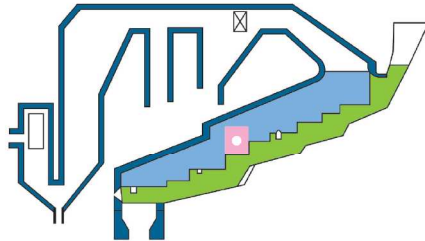


■ MA-65、MA-75
■ H2、H3

Product Specification:

Properties	Brand	H2	H3	MA65	MA75
Refractories(SK)		37	36	40	40
Apparent Porosity(%)		≦26	≦26	≦22	≦20
Cold Crushing Strength(kg/cm ²)		≧300	≧300	≧300	≧350
Bulk Density(g/cm ³)		≧2.25	≧2.15	≧2.75	≧2.90
Chemical Composition (%)	Al ₂ O ₃	≧60.0	≧50.0	-	-
	Fe ₂ O ₃	≧2.50	≧2.50	-	-
	MgO	-	-	≧65.0	≧75.0
	Cr ₂ O ₃	-	-	≧9.0	≧6.0

焚化爐用耐火材料 Refractories for Incinerator



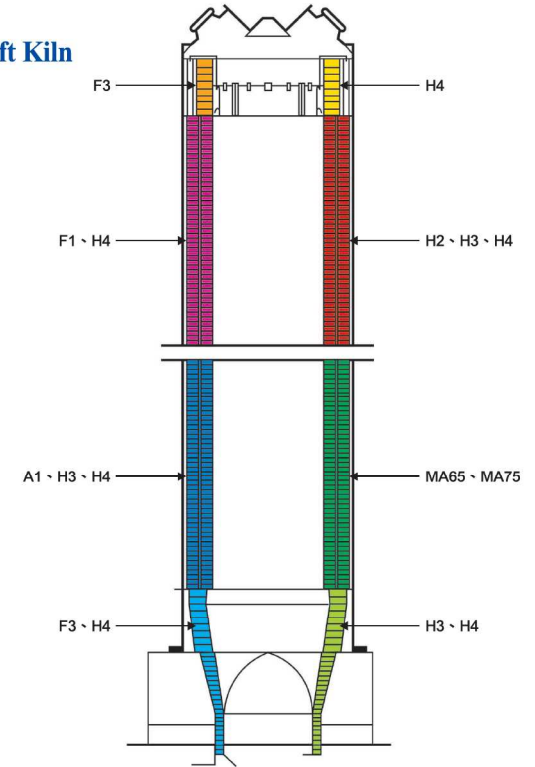
- CA-130、CA-150、CA-160
- F1、H2、H3
- SSA-50、SSC-80、SSC-85、SSC-90
- SSF-70、SiC60、SiC85
- PL-170

Product Specification:

Properties	Brand	CAT-130	CA-150	CA-160	PL-170	F1	H3	H2
Refractories(SK)		—	—	—	—	34	36	37
Apparent Porosity(%)		—	—	—	—	≦24	≦26	≦26
Cold Crushing Strength (kg/cm ²) at °Cx3hrs		≧50	≧300	≧300	≧80	—	—	—
		1200°C	1400°C	1500°C	1500°C	≧200	≧300	≧300
Modulus of Rapture (kg/cm ²) at °Cx3hrs		≧20	≧60	≧65	≧25	—	—	—
		1200°C	1400°C	1500°C	1500°C	—	—	—
Bulk Density (g/cm ³) at °Cx3hrs		≦1.30	≧2.05	≧2.10	≧2.05	≧2.00	≧2.15	≧2.25
		1200°C	1400°C	1500°C	1500°C	—	—	—
Chemical Composition (%)	Al ₂ O ₃	≧40	≧45	≧55	≧60	≧40.0	≧50.0	≧60.0
	Fe ₂ O ₃	—	—	—	—	≦3.0	≦2.5	≦2.5
Water Require (%)		30~37	12~14	11~13	—	—	—	—
Characteristics		Castable	Castable	Castable	Plastic	Brick	Brick	Brick

Properties	Brand	SSA-50	SSC-80	SSC-85	SSC-90	SSF-70	SiC60	SiC85
Apparent Porosity(%)		≧18	≧18	≧15	≧15	≧15	≧15	≧15
Cold Crushing Strength (kg/cm ²)		≧600	≧600	≧1000	≧900	≧1000	≧350	≧500
Bulk Density(g/cm ³)		≧2.65	≧2.45	≧2.60	≧2.60	≧2.60	≧2.40	≧2.50
Chemical Composition (%)	Al ₂ O ₃	35.0	—	—	—	—	—	—
	SiC	47.0	80.0	85.0	88.0	70.0	60.0	85
	Si ₃ N ₄	—	—	—	—	20.0	—	—
Water Require (%)		—	—	—	—	7.0~8.0	7.5~8.5	—
Characteristics		Brick	Brick	Brick	Brick	Brick	Castable	Castable

石灰豎窯用耐火材料 Refractories for Lime Shaft Kiln



- F3
- H4
- F1、H4
- H2、H3、H4
- A1、H3、H4
- MA65、MA75
- F3、H4
- H3、H4

Product Specification:

Properties	Brand	A1	H2	H3	H4	F1	F3	MA65	MA75
Refractories(SK)		38	37	36	35	34	32	40	40
Apparent Porosity(%)		≦26	≦26	≦26	≦27	≦24	≦26	≦22	≦20
Cold Crushing Strength(kg/cm ²)		≧300	≧300	≧300	≧250	≧200	≧200	≧300	≧350
Bulk Density(g/cm ³)		≧2.40	≧2.25	≧2.15	≧2.10	≧2.00	≧1.90	≧2.75	≧2.90
Chemical Composition (%)	Al ₂ O ₃	≧70.0	≧60.0	≧50.0	≧45.0	≧40.0	≧32.0	—	—
	Fe ₂ O ₃	≧2.00	≧2.50	≧2.50	≧2.50	≧3.00	≧3.00	—	—
	MgO	—	—	—	—	—	—	≧65.0	≧75.0
	Cr ₂ O ₃	—	—	—	—	—	—	≧9.0	≧6.0