



**THE QUALITY OF MAGNESIA-CHROME & MAGNESIA-SPINEL BRICKS FOR CEMENT KILN**

**Typical Properties**

Brand		Magnesia-Chrome Brick	
		ND-8	ND-10
Properties			
Apparent Porosity(%)		13.5	15.8
Bulk Density(g /cm <sup>3</sup> )		3.05	3.10
Cold Crushing Strength (kg f /cm <sup>2</sup> )		450	550
Hot Modulus of Rupture at 1400°C (kgf/cm <sup>2</sup> )		15	20
Refractoriness under load (T <sub>2</sub> °C)Load:2kgf/cm <sup>2</sup>		> 1650	> 1650
Permanent Linear Change (%) 1500°C -2hrs		0.25	0.21
Thermal Expansion(%) at 1000°C		< 1.25	< 1.25
Thermal Shock Test (Cycles) 1200°C *12Min. Air*2Min.		> 60	> 60
Chemical Composition(%)	MgO	77.0	74.0
	Al <sub>2</sub> O <sub>3</sub>	4.5	6.8
	Cr <sub>2</sub> O <sub>3</sub>	9.8	13.0
	ZrO <sub>2</sub>	—	—
Characteristics		Direct bond	Direct bond
Main Application		Rotary kiln etc.	Rotary kiln etc.



# KUAN-HO REFRACTORIES INDUSTRY CORPORATION

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## Typical Properties

Brand		Magnesia-Chrome Brick		
		MC-10	MC-21	MC-25
Properties				
Apparent Porosity(%)		16.8	18.0	17.2
Bulk Density(g /cm <sup>3</sup> )		3.04	3.04	3.06
Cold Crushing Strength (kg f /cm <sup>2</sup> )		436	450	398
Hot Modulus of Rupture at 1400°C (kgf/cm <sup>2</sup> )		25	25	30
Refractoriness under load (T <sub>2</sub> °C)Load:2kgf/cm <sup>2</sup>		> 1500	> 1500	> 1500
Permanent Linear Change (%) 1500°C -2hrs		0.25	0.20	0.25
Thermal Expansion(%) at 1000°C		1.20	1.20	1.20
Thermal Shock Test (Cycles) 1200°C*12Min. Air*2Min.		> 100	> 100 (At 950°C/Air)	> 100
Chemical Composition(%)	MgO	80.0	74.0	71.0
	Al <sub>2</sub> O <sub>3</sub>			
	Cr <sub>2</sub> O <sub>3</sub>	4.0	8.0	11.0
	Fe <sub>2</sub> O <sub>3</sub>	8.0	9.0	10.0
Characteristics		High Flexibility	High Flexibility	High Flexibility
Main Application		Rotary Kiln Transfer Zone	Rotary Kiln Transfer Zone	Rotary Kiln Transfer Zone



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## Typical Properties

Brand		Magnesia-Spinel Brick					
		SP-11	SP-16F	SP-18	SP-22	SP-23	SP-25
Properties							
Apparent Porosity(%)		15.0	17.5	16.5	15.2	14.8	14.5
Bulk Density(g/cm <sup>3</sup> )		2.96	2.90	2.95	2.97	2.99	3.02
Cold Crushing Strength (kg f/cm <sup>2</sup> )		450	450	550	380	750	765
Hot Modulus of Rupture at 1400°C (kgf/cm <sup>2</sup> )		28	25	40	45	50	55
Refractoriness under load (T <sub>2</sub> °C)Load:2kgf/cm <sup>2</sup>		> 1650	> 1650	> 1650	> 1700	> 1700	> 1700
Permanent Linear Change (%) 1500°C -2hrs		0.20	0.10	0.10	0.15	0.1	0.10
Thermal Expansion(%) at 1000°C		1.25	1.25	1.35	1.30	1.3	1.30
Thermal Shock Test (Cycles) 1200°C*12Min. Air*2Min.		> 100	> 100	> 100	> 100	> 100	> 100
Chemical Composition(%)	MgO	83.2	77.0	78.0	91.0	91.6	91.0
	Al <sub>2</sub> O <sub>3</sub>	12.5	16.0	18.0	7.0	5.0	2.5
	Cr <sub>2</sub> O <sub>3</sub>	—	—	—	—	—	—
	ZrO <sub>2</sub>	—	1.5	—	—	1.5	1.5
Characteristics		High Burned	High Burned	High Burned	High Burned	High Burned	High Burned
Main Application		Lime Kiln	Cement Rotary kiln Sinter Zone & Transfer Zone.	Cement Rotary kiln Transfer Zone.	Cement Rotary kiln	Lime Kiln	Lime Kiln