



**CMA<sup>X</sup>**  
CNBM International Corporation

# Refractories for Cement Industry Products applications

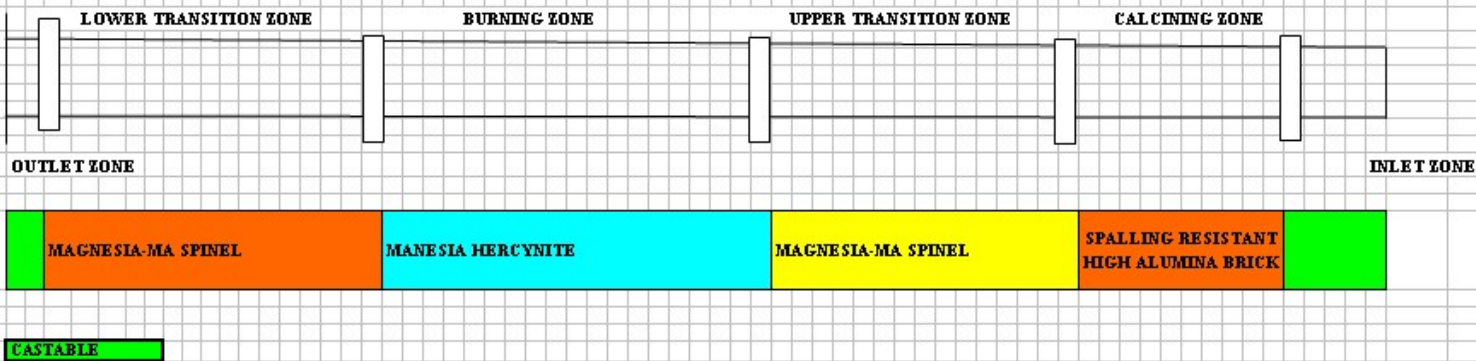


**CNBM**

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## Rotary Kiln



## Refractories for Rotary Kiln

Application \ Scale	Scale			
	2500T/D	5000T/D		
Outlet Zone	High Strength Abrasion Resistant Corundrum-Mullite Castable	C18S		
		C80MC		
Upper & Lower Transition Zone	Magnesia-MA Spinel Brick	MA-85A		
		MA-85B		
		MA-85C		
		MA-93A		
		MA-93B		
	Silica Mullite Brick	SM1650 SM1680		
Burning Zone	Phosphate Bonded High Alumina Brick	P75		
		Directly Bonded Magnesia-Chrome Brick	DMC-8A DMC-8B DMC-9A	
			Magnesia Hercynite Brick	MFe-80 MFe-85 MFe-90
	Magnesia Alumina Zirconia Lanthana Brick			MAZL-90
	Calcining Zone	Spalling Resistant High Alumina Brick		YRS-70 AL-75A AL-75B AL-80A AL-80B
			High Strength Alkali Resistant Brick	RK-H
			Phosphate Bonded High Alumina Brick	P75
Inlet Zone			High Alumina Low Cement Castable	C16



## Physical and Chemical Properties

CODE	PHYSICAL PROPERTIES					CHEMICAL ANALYSIS (WEIGHT %)				
	B.D. (g/cm <sup>3</sup> )	A.P. %	C.C.S. (Mpa)	R.U.L. (T0.6, °C)	T.E (%)	MgO (%)	Fe <sub>2</sub> O <sub>3</sub> (%)	Al <sub>2</sub> O <sub>3</sub> (%)	SiO <sub>2</sub> (%)	Cr <sub>2</sub> O <sub>3</sub> (%)
MA-85A	2.95	18	50	1700	1.2	85		8.0	1.0	
MA-85B	2.90	18	45	1700	1.2	82		8.0	2.0	
MA-85C	2.85	19	40	1650	1.2	80		8.0	3.0	
MA-93A	2.95	18	45	1700	1.5	93		5.0	1.0	
MA-93B	2.90	18	40	1700	1.5	90		5.0	2.0	
MFe-80	2.90	17	45	1550	1.6	80	7.5		2.0	
MFe-85	3.00	17	50	1600	1.6	85	7.5		1.0	
MFe-90	2.85	16	50	1650	1.7	90	4.5		1.5	
DMC-8A	3.00	17	40	1700	1.5	82			1.5	8.0
DMC-8B	2.95	18	45	1650	1.5	76			2.0	8.0
DMC-9A	3.00	19	40	1600	1.6	70			2.8	9.0
YRS-70	2.55	25	60	1470	1.7			70		
AL-75A	2.70	20	70	1500			1.7	75		
AL-75B	2.65	20	55	1500			1.7	75		
AL-80A	2.80	20	80		0.9		1.5	80		
AL-80B	2.70	20	70				1.5	80		
SM1650	2.65	20	95	1650				65	30	
SM1680	2.65	18	90	1680				65	30	
RK-H		20	60	1300	0.70			25-30	60-70	
MAZL90	2.95	18	50	1700	1.5	90		5.0	1.0	
P75	2.65		60	1300			3.2	75		



CODE	PHYSICAL PROPERTIES					CHEMICAL ANALYSIS (WEIGHT %)		
	B.D. (g/cm <sup>3</sup> )	R.L.C. (1100*3h) %	C.C.S (Mpa)	M.W.T. (°C)	W.A (%)	Al <sub>2</sub> O <sub>3</sub> +SiC (%)	Al <sub>2</sub> O <sub>3</sub> (%)	SiC (%)
C13NL	2.10	±0.4	70	1300	6.5-7.5	90	48	50
C14NL	2.20	±0.4	70	1400	6-7	80	48	50
C16T	2.65	±0.3	100	1600	5.5-6.5	70	75	
C16	2.60	±0.4	100	1600	6.0-7.5		70	
C160	2.70	±0.4	100	1600	5.5-6.0		75	
C15B	2.60	±0.4	80	1500	5.5-6.5		70	
C18S	3.00	±0.3	150	1750	4.5-5.0		65	
C80MC	2.90	±0.3	100	1600	4.5-5.5		25-30	
C70MC	2.75	±0.3	100	1600	5.5-6.5	90	5.0	

Note: B.D is short for Bulk Density  
A.P is short for Apparent Porosity  
C.C.S is short for Cold Crushing Strength  
R.U.L is short for Refractoriness Under Load  
T.E. is short for Thermal Expansion  
W.A. is short for Water Addition  
M.S.T. is short for Max. Service Temperature



## Refractories for Preheater/Kiln Hood/Calciner/Tertiary Air Duct/Cooler

Application \ Scale	700~2000T/D	2500~5000T/D	5500~10000T/D
	Materials		Code
Preheater	Alkali Resistant Castable		C13NL
			C14NL
	Alkali Resistant Brick		RK-O
			RK-H
			RK-A
			CB-20
			CB-30
Kiln Hood	High Strength Corndum-Mullite Castable		C18S
			C80MC
			C70MC
	High Alumina Low Cement Castable		C16T
			C16
			C160
			C15B
Calciner	Spalling Resistant High Alumina Brick		YRS-70
			AL-75A
			AL-75B
			AL-80A
			AL-80B
	High Alumina Low Cement Castable		C16T
			C16
			C160
Tertiary Air Duct	Alkali Resistant Castable		C13NL
			C14NL
	Silica-Mullite Brick		SM1650
			SM1680
Cooler	Alkali Resistant Castable		C13NL
			C14NL
	High Alumina Low Cement Castable		C16T
			C16
			C160
			C15B



## Physical and Chemical Properties

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	B.D. (g/cm <sup>3</sup> )	A.P. %	C.C.S. (Mpa)	R.U.L. (T0.6, °C)	T.E (%)	Fe <sub>2</sub> O <sub>3</sub> (%)	Al <sub>2</sub> O <sub>3</sub> (%)	SiO <sub>2</sub> (%)
YRS-70	2.55	25	60	1470	1.7		70	
AL-75A	2.70	20	70	1500		1.7	75	
AL-75B	2.65	20	55	1500		1.7	75	
AL-80A	2.80	20	80		0.9	1.5	80	
AL-80B	2.70	20	70			1.5	80	
SM1650	2.65	20	95	1650			65	30
SM1680	2.65	18	90	1680			65	30
RK-O		25	25	1350	0.70		25-30	60-70
RK-H		20	60	1300	0.70		25-30	60-70
RK-A		25	30	1400	0.65		30-35	60-65
CB-20		30	15	1250	0.60		25-30	60-67
CB-30		30	20	1250	0.60		25-30	60-67



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C16	2.60	±0.4	100	1600	6.0-7.5		70	
C160	2.70	±0.4	100	1600	5.5-6.0		75	
C15B	2.60	±0.4	80	1500	5.5-6.5		70	
C18S	3.00	±0.3	150	1750	4.5-5.0		65	
C80MC	2.90	±0.3	100	1600	4.5-5.5		25-30	
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## **Guide Line for Installation of Refractory Materials in Rotary Kiln**

### 1) Preparation

- Check the conjunct joint and weldable joint.
- Keep the inside surface of rotary kiln neat and dry, exclude the sand blast.
- Keep the stop brick ring in the vertical position with the kiln axe.

### 2) Lining installation

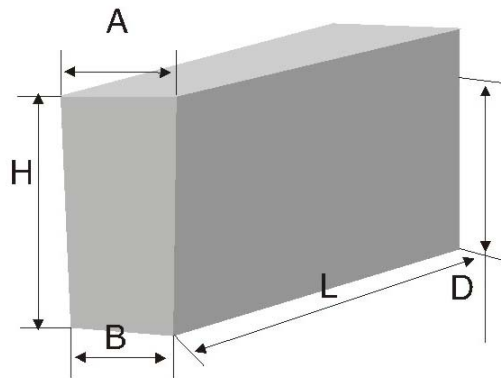
- Whether close any installation measure, make sure the bricks cling to the shell surface tightly. Now, it is universal of ring-installation that is intersecting at the kiln center by radial installation.
- Draw the basic line matching the axes line of brick on the steel plate, then install the bricks strictly.
- The mortar should be coated equably on the bricks, control the joint between bricks within 1-1.5mm.

### 3) Locking-brick

- Locking-brick must be installed in distance. The steel plates can be used to fulfill the joint, which are distributed averagely in locking-bricks ring.

### 4) The transition of the new and old refractory bricks

- Combine the surface of the new and old bricks tightly. The machining bricks (length no less than 80mm) may be used fir transition steadily in the installation.



Brick Tolerance

$H = \pm 1\%$

$A, B, L = \pm 2\text{mm}$

Item	Measurements				Diameter	Volume
	mm					
	A	B	H	L	D	Dm3
<b>VDZ-Shapes</b>						
B216	78	65	160	198	1920	2.27
B316	76	67	160	198	2702	2.27
B416	75	68	160	198	3429	2.27
B516	79	69	160	198	2528	2.34
B616	74	69	160	198	4736	2.27
B716	73	70	160	198	7787	2.27
B218	78	65	180	198	2160	2.55
B318	76.5	66.5	180	198	2754	2.55
B418	75	68	180	198	3857	2.55
B518	74.5	68.5	180	198	4470	2.55
B618	74	69	180	198	5328	2.55
B220	78	65	200	198	2400	2.83
B320	76.5	66.5	200	198	3060	2.83
B420	75	68	200	198	4286	2.83
B520	74.5	68.5	200	198	4967	2.83
B620	74	69	200	198	5920	2.83
B820	73.5	69.5	200	198	7350	2.83
B222	78	65	220	198	2640	3.11
B322	76.5	66.5	220	198	3366	3.11
B422	75	68	220	198	4714	3.11



Item	Measurements				Diameter	Volume
	mm					
	A	B	H	L	D	Dm <sup>3</sup>
<b>VDZ-Shapes</b>						
B522	74.5	68.5	220	198	5463	3.11
B622	74	69	220	198	6512	3.11
B822	73.5	69.5	220	198	8085	3.11
B225	82	61	250	198	1952	3.54
B325	78	65	250	198	3000	3.54
B425	76.5	66.5	250	198	3825	3.54
B525	75	68	250	198	5357	3.54
B625	74.5	68.5	250	198	6208	3.54
B725	74	69	250	198	7400	3.54
B825	73.5	69.5	250	198	9188	3.54
B230	81	62	300	198	2558	4.25
B430	77	66	300	198	4200	4.25
B730	74	68	300	198	7400	4.22



Item	Measurements				Diameter	Volume
	mm					
	A	B	H	L	D	Dm <sup>3</sup>
<b>ISO-Shape</b>						
216	103	86	160	198	1939	2.99
316	103	92	160	198	2996	3.09
218	103	84	180	198	1952	3.33
318	103	90.5	180	198	2966	3.45
418	103	93.5	180	198	3903	3.50
618	103	97	200	198	6180	3.56
220	103	82	200	198	1962	3.66
320	103	89	200	198	2943	3.80
420	103	92.5	200	198	3924	3.87
520	103	94.7	200	198	4964	3.91
620	103	96.2	200	198	6059	3.94
820	103	97.8	200	198	7923	3.98
222	103	80.3	220	198	1996	3.99
322	103	88	220	198	3021	4.16
422	103	91.5	220	198	3941	4.24
622	103	95.5	220	198	6043	4.32
822	103	97.3	220	198	7951	4.36
425	103	90	250	198	3962	4.78
625	103	94.5	250	198	6059	4.89