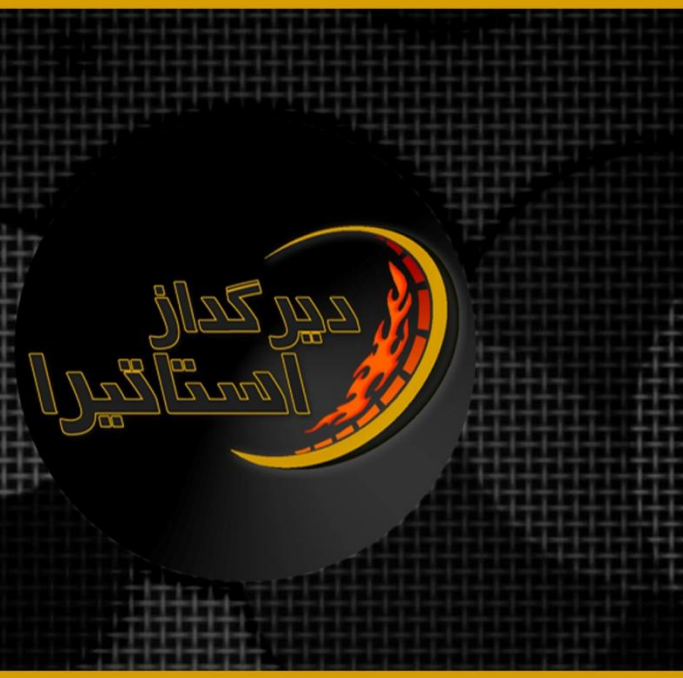
STATIRA REFRACTORY

NON METAL MINERAL PRODUCTION COMPANY

NMMPCO

NON METAL MINERAL PRODUCTIONS Co.

شرکت فرآورده های کانی غیر فلزی خراسان



THE CATALOGUE OF PRODUCTIONS 2023

THIS TEXT FILE IS A CATALOGUE TO INTRODUCE ALL INSULATION FIRE BRICKS AND REFRACTORY CASTABLES AND MORTAR.

Wrote and Design by: IT team of "Statira Group"

The Catalogue of Productions

Subject: To Introduce Refractory Products of STATIRA Refractory

Wrote and Design by: IT team of "Statira Group"

Introduction:

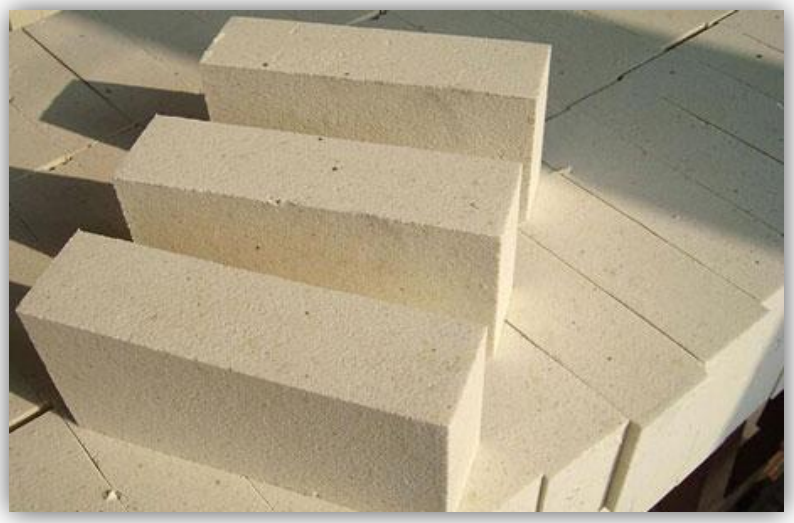
This is to confirm that I, Hossein Vejdani (CEO in **NON METAL MINERAL PRODUCTIONS CO.** or STATIRA Refractory), has more than eight years of experience in production of refractory bricks and also in construction and installation of such factories in Mashhad, Iran. In the past two decades, we were in charge of supplying various industries in Iran and also exporting these bricks to several companies in the region, namely Baku steep factory, SOLCAY Petroleum Company of Azerbaijan, and also with the help of a proxy company to Turkey, for which we have received certificates of excellence in quality. What is more, I have received a certificate of excellence in quality from DANIELI Company which was the contractor of steep projects in Iran. Now according to my 8 years-old experience in this industry, I built a similar factory in Georgia that the name is "Diamond Fire Proof".

This text file is a Catalogue to introduce all insulation fire bricks & refractory castables and mortar.

Silica Insulation Fire Bricks

Silica Insulation Bricks, a kind of quality and excellent insulating refractory products, are based on silicon ore as the main raw material. Silica Insulation Bricks are manufactured for exporting to the international market at an advantage price. Its excellent performance of durability, high quality and light weight has been widely appreciated by the customers.

"**Statira Refractory**" Factories also can provide the customized range of Silica Insulation Bricks according to customers' special requirement for furnace or kiln's application.



Silica Insulation Bricks

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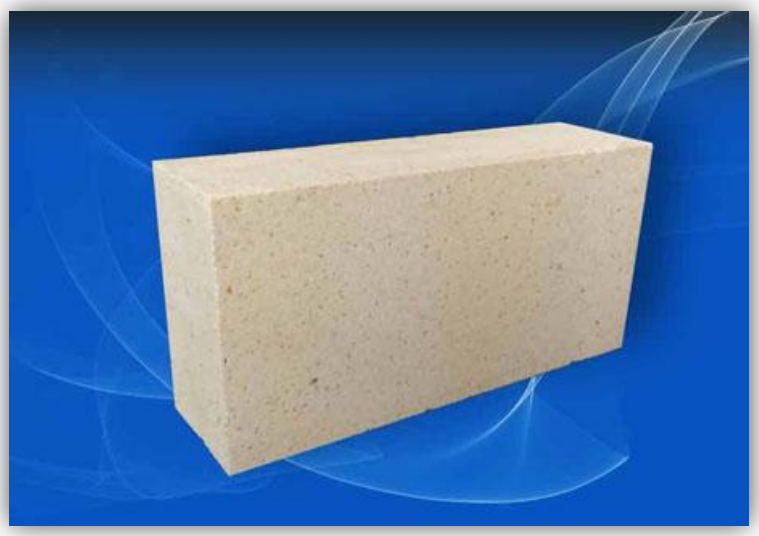
Description for Silica Insulation Bricks

- Silica insulation bricks adopt crystal silica as raw material by adding into compound flammable substance, which have special features of low weight, high solidity and low heat conductivity and mainly used in blast furnace and rotary kiln. Silica insulation bricks can resist high temperature and save heat energy.

- Silica Insulation Brick, a kind of light weight refractory materials, is also called siliceous insulating brick with over 91% silicon dioxide content and below 1.2 $\frac{gr}{cm^3}$ bulk density. Silica insulating brick has rare difference on refractoriness and refractoriness under load with the common silica bricks that have the same ingredient. There is much porosity for Silica insulation brick. So its compression strength, slag resistance and corrosion resistance are inferior to the common silica bricks. But its thermal shock resistance is higher.

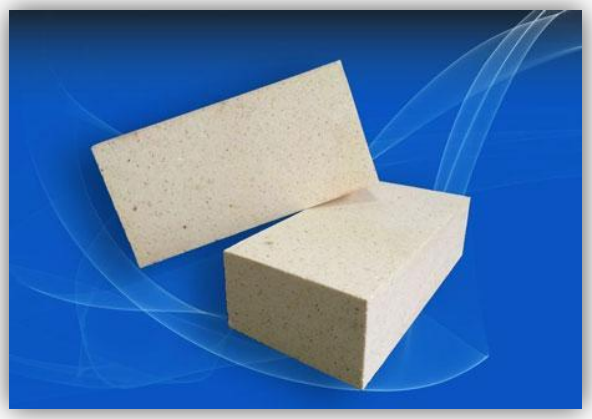
- The critical particle size of silica rock is 1 ^{mm} at most and 90% particles are more than 0.5 ^{mm} . Silica Insulation Brick is manufactured by adding flammable substance or adopting gas bubble method to generate porosity through firing. And also can be made to be unburned products. The highest service temperature of Silica Insulation Bricks about 1200~1500℃ according to the different materials texture.



Silica Insulating Brick

Properties of Silica Insulation Bricks

- Low bulk density
- Low thermal conductivity
- High apparent porosity
- Good thermal shock resistance.
- Great high temperature mechanical strength
- High temperature stable volume change
- Strong acid slag erosion resistance



Silica Insulation Refractory Bricks

Application of Silica Insulation Bricks

- Silica Insulation Bricks are widely used for thermal insulation layer of various high temperature kiln equipments.
- Silica Insulation Bricks can be used in Glass Plant furnaces and other furnaces & boilers for providing perfect insulation from heat.
- Silica Insulation Bricks also can be used in Coke ovens, hot blast stove, Glass furnace, Carbon forging furnace and any other industrial furnaces.

Statira Refractory bricks and materials manufacturer can export quality and cheap Silica Insulation Bricks to India and any other countries around the world. We will satisfy customers' special requirements for service properties of Silica Insulation Bricks in a very economical way.

The specifications of this kind of bricks is shown in table 6:

Refractory Type Light Silica		Insulation fire Brick Acc .to ASTM		
Brand Name		SC2	SC3	SC4
Maximum Service Temperature	˚C	1300	1350	1400
Bulk Density	$\frac{kg}{m^3}$	0.9	1	1.1
Cold Crushing Strength	$\frac{N}{m^2}$	20	25	35
Chemical Analysis Al_2O_3	%	3~2	3~2	3~2
Chemical Analysis SiO_2	%	93	93	93
Chemical Analysis Fe_2O_3	%	0.57	0.57	0.57
Chemical Analysis CaO	%	3.85	3.85	3.85
Apparent Porosity	%	65	60	56
Thermal Conductivity 400 ˚C	$W/m \cdot c$	0.47	0.49	0.54
Thermal Conductivity 600 ˚C	$W/m \cdot c$	0.58	0.59	0.65
Thermal Conductivity 800 ˚C	$W/m \cdot c$	0.67	0.69	0.76
Thermal Conductivity 1000 ˚C	$W/m \cdot c$	0.76	0.80	0.87

Table 6: The specifications of lightweight Silica insulation fire bricks

High Alumina Lightweight Insulation Fire Bricks

High Alumina Lightweight Insulation Fire Bricks, a kind of alumina-silicate refractory products with more than 48% content of Al_2O_3 inside, are made of bauxite and other raw material with higher alumina content after molding and Calcining. High Alumina Brick has various properties of high temperature strength, high thermal stability and good chemical slag erosion resistance, and is mainly used to build linings of Blast Furnace, Hot Air Furnace, Air Furnace, Reverberatory Furnace and Rotary kiln and etc.

Description for High Alumina Bricks

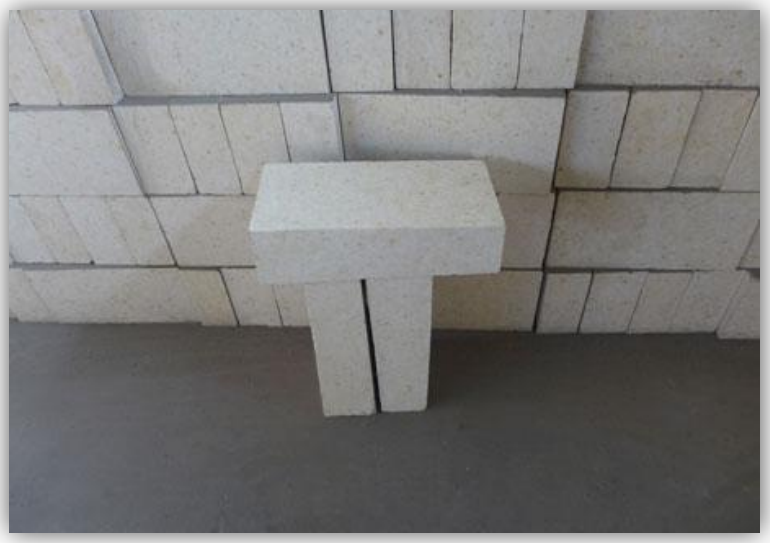
High Alumina Bricks are neutral refractory that can be divided into 3 Grades:

1. Gr26 (AW2) means that including 45% contents of Al_2O_3
2. Gr260 (AW3) means that including 55% contents of Al_2O_3
3. Gr28 (AW4) means that including 65% contents of Al_2O_3

The specifications of this kind of insulation bricks is shown in table 7 and 8:

Refractory Type High Alumina Lightweight Insulation Fire Bricks		Insulation fire Brick Acc .to ASTM		
		Gr26	Gr260	Gr28
Brand Name		AW2	AW3	AW4
Maximum Service Temperature	˚C	1430	1480	1530
Bulk Density	$\frac{kg}{m^3}$	0.9	1	1.1
Cold Crushing Strength	$\frac{N}{m^2}$	25	31	37
Chemical Analysis Al_2O_3	%	45±2	55±2	65±2
Chemical Analysis SiO_2	%	50~54	38~41	28~31
Chemical Analysis Fe_2O_3	%	0.67	0.56	0.51
Apparent Porosity	%	65	60	56
Thermal Conductivity 400 ˚C	$W/m \cdot c$	0.33	0.38	0.39
Thermal Conductivity 600 ˚C	$W/m \cdot c$	0.37	0.41	0.42
Thermal Conductivity 800 ˚C	$W/m \cdot c$	0.42	0.44	0.45
Thermal Conductivity 1000 ˚C	$W/m \cdot c$	0.47	0.49	0.49
Thermal Conductivity 1200 ˚C	$W/m \cdot c$	0.51	0.53	0.54

Table 7: The specifications of high alumina lightweight insulation fire bricks



High Alumina Fire Bricks

High Alumina Bricks Properties

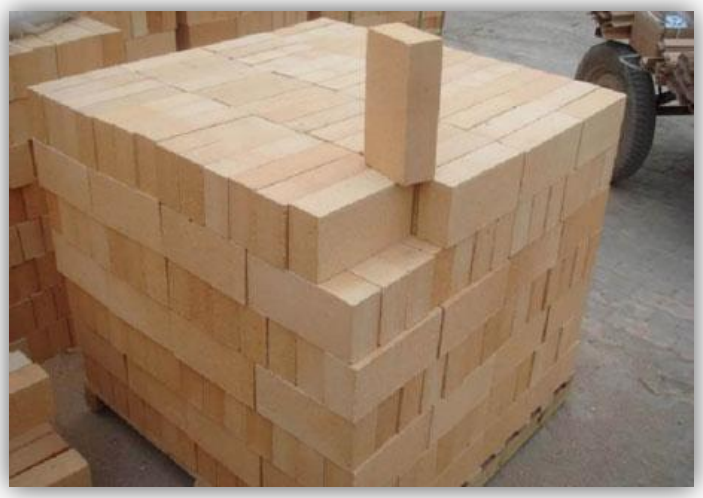
- High refractoriness.
- High temperature strength.
- High thermal stability.
- Neutral refractory.
- Good resistance to acid and basic slag corrosion.
- High refractoriness under load.
- High temperature creep resistance.
- Low apparent porosity.

Application of High Alumina Bricks

- High Alumina Bricks are used to construct and protect linings of Blast Furnace, Hot Air Furnace, Air Furnace, Reverberatory Furnace and Rotary kiln and etc.
- High Alumina Bricks are widely used in the fields of iron and steel, glass, cement, ceramics, oil, gas, petrochemical industry and etc.

Chamotte Insulation Fire Brick

 heap Light Weight Fire Clay Insulation Brick (Chamotte Insulation Fire Bricks) for sale in Diamond Fire Proof Factory is a kind of quality refractory insulation materials for all kinds of industrial kiln application with various excellent properties of high strength, even low bulk density, low thermal conductivity and low impurity, which is produced with top grade fireclay raw materials under the high temperature according to our advance manufacturing technology.



Light Weight Fire Clay (Chamotte) Insulation Brick

Description for Light Weight Fire Clay Insulation Brick

Light Weight Fire Clay Insulation Brick is made of fire-clay grog as the raw material and plastic clay as the binding agent then adding suitable combustible or foaming agent through firing. Light Weight Fire Clay Bricks are mainly used as insulation materials in industrial kiln to reduce heat loss of kiln, save energy and lighten the quality of thermal equipment.

Fire clay bricks is argillaceous product with about 30~35% Al2O3 content. Fire clay brick is made of 50% soft clay and 50% hard Chamotte according to certain granularity need to blend and fired at 1300~1400 ℃ high temperature after moulding and drying.

Its main mineral composition includes kaolinite (Al_2O_3, $2SiO_2$ and $2H_2O$) and 6~7% impurities (K, Na, Ca, Ti, Fe oxide). The firing process of fire clay bricks

kaolinite produce mullite crystal through constant dehydration and decomposition.

SiO_2 and Al_2O_3, together with impurities that contained in the fire clay brick form low-melting-point silicate in the process of firing.

Fire clay bricks belong to faintly acid refractory product and can resist acid slag and acid gas erosion. But it has a weak resistance to alkali material. Fire clay bricks have good thermal performance and thermal shock resistance. Its refractoriness is high up to 1690~1730 ℃.

Application of Light Weight Fire Clay Insulation Brick

Light Weight Fire Clay Brick is mainly used as refractory material for hot surface or supporting insulation layer. Fire Clay Insulation Brick can be used in melting furnace, refine equipments, heating equipment, regenerative apparatus, gas furnace, soaking pit, annealing furnace, reaction chamber and other industrial hot working equipment.

The specifications of this kind of insulation bricks is are shown in table 9:

Refractory Type Light Chamotte		Insulation fire Brick Acc .to ASTM (Gr23)		
Brand Name		SW2	SW3	SW4
Maximum Service Temperature	˚C	1300	1350	1350
Bulk Density	$\frac{kg}{m^3}$	0.9	1	1.1
Cold Crushing Strength	$\frac{N}{m^2}$	22	28	35
Chemical Analysis Al_2O_3	%	30±2	30±2	30±2
Chemical Analysis SiO_2	%	59~63	59~63	59~63
Chemical Analysis Fe_2O_3	%	1	1	1
Apparent Porosity	%	65	60	56
Thermal Conductivity 400 ˚C	$W/m \cdot c$	0.30	0.41	0.45
Thermal Conductivity 600 ˚C	$W/m \cdot c$	0.41	0.44	0.48
Thermal Conductivity 800 ˚C	$W/m \cdot c$	0.45	0.48	0.55
Thermal Conductivity 1000 ˚C	$W/m \cdot c$	0.49	0.53	0.61
Thermal Conductivity 1200 ˚C	$W/m \cdot c$	0.54	0.58	0.67

Table 9: The specifications of lightweight fire clay (Chamotte) insulation fire bricks

High Alumina Fire Brick (Medium & Heavy Weight)

High Alumina fire brick is a shape made from refractory ceramics. It is used in lining furnace kilns, fireboxes and fireplaces. Its primary purpose is to withstand high temperature and also to retain the heat for greater energy efficiency. We offer wide range of low, medium & high alumina refractory firebricks. Apart from standard shapes, we can also make special shapes as per custom requirements. Our bricks are made by wet pressing method and are fired in electronically controlled tunnel kiln.

Thermal Insulation Refractory Fire Bricks High Alumina Brick For Glass Furnace:

Features:

1. Medium bulk density, low thermal conductivity, good thermal insulation performance.
2. Refractory category allow direct contact of fire, suitable of various atmosphere
3. Good integrity with furnace lining, long service life, easy operation, could be shaped freely
4. Product specification: standard form, normal standard, shaped and special shaped bricks.
5. Can be used in various kilns because of its cheapness and general tray package. Among all of the refractory materials, it is the most widely used.

Applications:

1. Furnaces of metallurgy industry, heat treatment furnace
2. Furnaces of chemical industry and construction industry.
3. Furnace of incineration of garbage, recirculating fluidized bed furnace

Standard sizing: 230 x 114 x 65 mm (NF1) others up to the client

Competitive Advantage:

1. Abundant Experience. Prevent cracks and twist in bricks.
2. Different Moulds. Save mould fees for you.
3. Strict Quality Control. Meet clients' quality requirement.
4. Large stocks. Guarantee prompt delivery.
5. Professional Packing. Avoid damage and secure the goods in transportation

Physical and chemical indexes:

The specifications of this kind of fire bricks is are shown in table 10:

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Refractory Type High Alumina Fire Bricks		Insulation fire Brick Based on scale of Alumina					
Brand Name		MAB50	MAB55	MAB60	MAB70	MAB75	MAB80
Al_2O_3	%	50	55	60	70	75	80
SiO_2	%	42~45	37	32	23	18	13
Fe_2O_3	%	2.4	2.4	2.3	2	1.9	1.9
Refractoriness	sk	34/35	35/36	36	37/38	38/39	39
Bulk Density	g/cm^3	2.2~2.3	2.2~2.3	2.3~2.4	2.5~2.6	2.6~2.65	2.65~2.75
Apparent Porosity	Vol-%	17~20	18~21	19~21	18~20	19~21	18~20
Cold Crushing Strength	$\frac{kg}{cm^2}$	350~450	350~450	450~550	450~600	500~600	600~800
Thermal Shock Resistance (TSR – H_2O)	-	21˜23	20˜25	27	>25	30	30
Refractoriness Under Load (Differential)	$T_{0.5}$ ºC	1360	1380	1420	1430	1440	1480
	t_a ºC	1470	1500	1550	1560	1570	1580
Thermal Expansion at 1000 ºC (linear)	%	0.55	0.6	0.65	0.65	0.85	0.85
Thermal Expansion at 1400 ºC (linear)	%	0.80	0.80	0.80	0.80	1.00	1.00
Thermal Conductivity at 400 ºC	W/m.ºK	1.30	1.40	1.35	1.70	1.93	1.90
Thermal Conductivity at 700 ºC	W/m.ºK	1.40	1.50	1.45	1.65	1.85	1.85
Thermal Conductivity at 1000 ºC	W/m.ºK	1.50	1.65	1.55	1.90	1.90	1.90

Table 10: The specifications of High Alumina Fire Bricks

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Refractory Castables & Mortar

Refractory castables can be used to create the monolithic linings within all types of furnaces and kilns. They can be further classified into the following sub-categories, conventional, low iron, low cement, and insulating for installation either by gunning or manually. There is a wide variety of raw materials that refractory castables are derived from, including chamotte, andalusite, bauxite, mullite, corundum, tabular alumina, silicon carbide, and both perlite and vermiculite can be used for insulation purposes.

Refractory mortar is a specially engineered mixture of sand, calcium aluminate, cement, and fireclay. It is used to lay firebrick in places that are exposed to extremely high temperature. The refractory mortar is utilized only to build fire places and shall not be applied on hot faces.

Physical and chemical indexes:

The specifications of Refractory Castables are shown in table 11-1 & 11-2 and The specifications of Refractory Low Cement Castables are shown in table 12 and The specifications of Refractory Mortar are shown in table 13:

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Refractory Type Refractory Castable			Refractory Castable Based on scale of Alumina					
Brand Name			MAC20	MAC21	MAC45	MAC50	MAC60	MAC70
Al_2O_3		%	17~19	21~23	45	48~55	60	69~71
SiO_2		%	52~54	52	36	33	32	17
Fe_2O_3		%	2~4	5~6	7	5.5	1.4	1.9
CaO		%	12~14	10~11	11	8	5	4~5
Grain Size		mm	0~5	0~5	0~5	0~5	0~5	0~5
Bulk Density		g/cm^3	0.55~0.7	1.1	2.22	2.3	2.44	2.5
Water Required		Weight Percent	14	14	12	9.5	9	9
Cold Crushing Strength	After drying at 110 ℃	$\frac{kg}{cm^2}$	15~20	30~33	300~450	270	350~400	300~350
	After drying at 600 ℃		-	20~25	-	240	300~400	150~180
	After drying at 850 ℃		7~10	20~25	-	235	200~400	155~190
	After drying at 1500 ℃		-	18~20	200~300	250	>350	500~700
Storage Limit		Month	12	12	12	12	12	8
Max. Service Temp		℃	1000	1200	1300	1350	1500	1600

Table 11-1: The specifications of Refractory Castables

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Refractory Type Refractory Castable			Refractory Castable Based on scale of Alumina			
Brand Name			MAC80	MAC85	MAC90	MAC94
Al_2O_3		%	80	85	91~92	93~95
SiO_2		%	3.5	3.5	2.5	0.5
Fe_2O_3		%	1.9	1.9	0.4	0.5
CaO		%	4~6	4~6	4~5	3.5~4.5
Grain Size		mm	0~5	0~5	0~5	0~5
Bulk Density		g/cm^3	2.64	2.73	2.75	2.8
Water Required		Weight Percent	8.5	8.5	8.5	8
Cold Crushing Strength	After drying at 110 ℃	$\frac{kg}{cm^2}$	600~700	300~500	700~800	-
	After drying at 600 ℃		650~750	300~400	-	-
	After drying at 850 ℃		650~750	250~400	-	-
	After drying at 1500 ℃		700~800	500~700	>800	-
Storage Limit		Month	12	12	8	8
Max. Service Temp		℃	1650	1680	1740	1800

Table 11-2: The specifications of Refractory Castables

Refractory Type Refractory Low Cement Castable			Refractory Castable Based on scale of Alumina		
Brand Name			MACLW80	MACLW90	MACLW94
Al_2O_3		%	57~60	90	96
SiO_2		%	29~33	2~4	2~3
Fe_2O_3		%	<2.2	<0.2	<0.2
CaO		%	<3	2~2.5	<1
Grain Size		mm	0~5	0~5	0~5
Bulk Density		g/cm^3	2.4	2.7	2.9~3.1
Water Required		Weight Percent	8~10	5.5~7	5~6
Cold Crushing Strength	After drying at 110 ℃	$\frac{kg}{cm^2}$	350~550	350~550	300~500
	After drying at 600 ℃		-	-	-
	After drying at 850 ℃		-	-	-
	After drying at 1500 ℃		600~800	600~800	600~800
Storage Limit		Month	8	8	8
Max. Service Temp		℃	1550	1730~1780	1800~1840

Table 12: The specifications of Refractory Low Cement Castables

Refractory Type Refractory Mortar			Refractory Mortar Based on scale of Alumina			
Brand Name			MAM45	MAM60	MAM70	MAM80
Al_2O_3		%	42~44	60~62	70~72	75~80
TiO_2		%	3	3	3.5	3
Fe_2O_3		%	1.9	1.9	0.4	0.5
Water Required		%	4~6	4~6	4~5	3.5~4.5
Required Mortar for 1000 standard bricks	For Dry Bricks	kg	110~130	110~130	110~130	110~130
	For Dipped Bricks		160~250	160~250	160~250	160~250
Max. Service Temp		℃	1600	>1730	1750	1760

Table 13: The specifications of Fireclay and Alumina Mortar

Burned Magnesite Bricks

The Magnesite brick is one of the most widely used basic refractory bricks. Different grade magnesites used as raw materials produce Magnesia bricks of various qualities.

Burned Magnesite Bricks

Burned Magnesite Bricks Properties:

- Material and Technique: magnesia as raw material.
- Property: good high-temperature performance, strong slag resistance.

- Application:

  MAG90:

  1- Electric Arc Furnace (permanent lining & sub-wall)
  2- Treatment Ladle for secondary metallurgical process (permanent lining & reaction zone)
  3- Soaking Pit (walls F & Bottom F)
  4- Slag-cleaning furnace for Cu (Superstructure & Safety Lining)
  5- Convertor for FeNi (safety lining)
  6- Electric reduction for FeCr with Low C. Content (safety lining)
  7- Regenerator of glass meting tanks (Checker work 3)
  8- Open-Hearth furnace (Brick work & tap, tap runner)
  9- Top Blown converter (BOF)/Gas purging system & permanent lining

  MAG95:

  1- Peg iron collector vessel (mixer)/wear lining (inlet & outlet) permanent lining back
  2- Gas purging sets for steel casting lades (pocket block)
  3- Soaking Pit (walls F & bottom F)
  4- Electric reduction for FeCr with Low C. Content (bath-slag zone)
  5- Regenerator of glass melting tanks (port lining & chamber crown & chamber wall 1, 2 & chamber works 1, 2)
  6- Annular shaft kiln (firing zone & Firing chamber)

7- Top blown convertor (BOF)/Gas purging system & permanent lining

The specifications of this kind of insulation bricks is are shown in table 14:

Refractory Type Burned Magnesite & Mg-Chrome Brick		Refractory Bricks Based on scale of Magnesite		
Brand Name		MAG-CH80	MAG90	MAG95
Modulus of Rupture	$\frac{kg}{cm^2}$	40~70	55~85	100~150
Bulk Density	$\frac{gr}{cm^3}$	2.7~2.8	2.6~2.7	2.85~3
Cold Crushing Strength	$\frac{kg}{cm^2}$	300~400	450~550	470~670
Chemical Analysis MgO	%	80~85	87±2	95±2
Chemical Analysis CaO	%	1~2	≤ 5	1~2
Chemical Analysis Al_2O_3	%	2~4	0.55	0.45
Chemical Analysis SiO_2	%	2~3	≤ 4.9	≤ 2.8
Chemical Analysis Fe_2O_3	%	6~8	3.1	≤ 1.81
Chemical Analysis Cr_2O_3	%	3~5	0	0
Apparent Porosity	%	16~19	17~20	16~18
Refractoriness under load (ta)	˚C	≥ 1700	≥ 1750	≥ 1760
Thermal Conductivity (t0.5)	˚C	≥ 1680	≥ 1700	≥ 1710

Table 14: The specifications of Burned Magnasite and Mg-Chrome Bricks