

The test Result Analysis of the Basic Bricks

--RHI, MH-90, MH-90-1/2/3

30/6/2016/



We have developed 3 kind of Magnesia-hercynite bricks (MH-90-1, MH-90-2 and MH-90-3) based upon our available brick MH-90 for burning zone of cement rotary kiln. We take a sample brick from RHI in China for comparison evaluation. The test results and relevant analysis are as follows:

1. Test Results:

Brick Name	RHI	MH-90	MH-90-1	MH-90-2	MH-90-3
Bulk Density (g/cm ³)	2.96	2.97	3.00	2.96	2.99
Apparent Porosity (%)	15.8	15.4	15.1	15.7	14.9
Cold Crushing Strength (MPa)	65	105	72	58	56
Refractories Under Load (°C)	1646	1700	1675	1660	1623
Chemical Composition					
MgO (%)	89.41	91.46	89.29	87.95	89.01
Al ₂ O ₃ (%)	4.87	3.45	5.38	6.11	4.03
Fe ₂ O ₃ (%)	3.35	3.14	3.48	4.04	4.20
SiO ₂ (%)	0.74	0.69	0.87	0.77	1.40
CaO (%)	1.53	1.23	0.96	1.01	1.33

Note: All of the data are average values of 3 pcs samples.

2. The Evaluation

- 1) Bulk Density & Apparant Porosity
MH-90 series bricks are superior.
- 2) Strength
MH-90 & MH-90-1 are stronger than RHI, another 2 are weaker
- 3) Refractories Under Load
MH-90 & MH-90-1 & MH-90-2 is higher than RHI

3. Thermal Shock Resistance

Heating for 30 minutes(1100°C), then air cooling for 5 minutes with wind pressure 0.075 MPa, then natural cooling for 5 minutes.

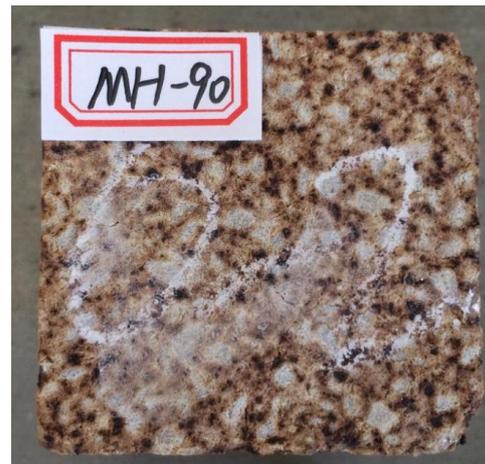
For thermal shock resistance, we check strength reduction and cracks after heating & air cooling process.The Results is below:

A. Cracks

First Time Process



RHI after first time process



MH-90 after first-time process



MH-90-1 after first-time process



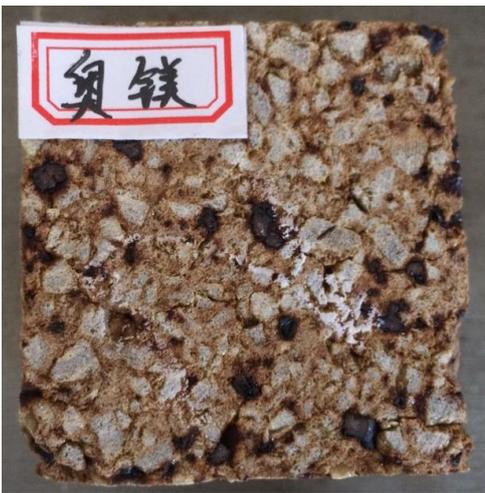
MH-90-2 after first-time process



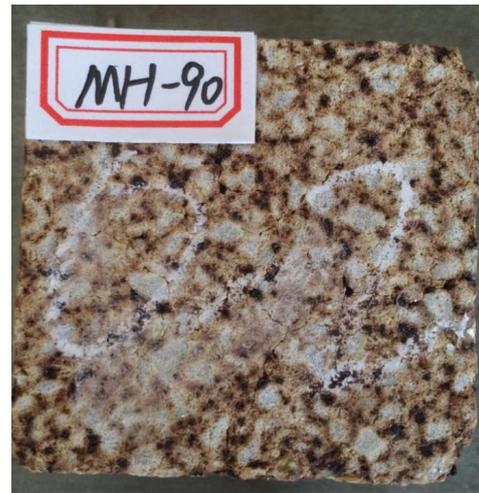
MH-90 after first-time process

Note: Slight Crack is found on MH-90, MH-90-1 & MH-90-3 while no crack on MH-90-2 and RHI.

3-Time Process



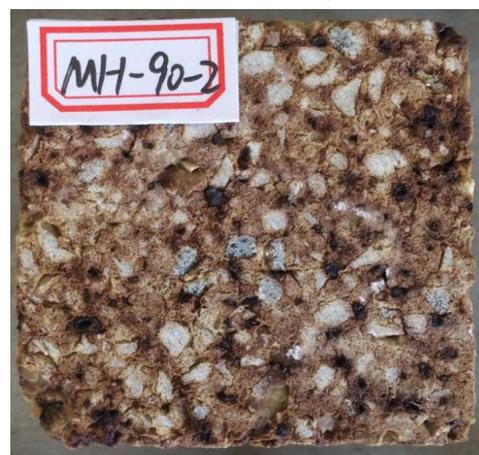
RHI after 3-time process



MH-90 after 3-time process



MH-90-1 after 3-time process



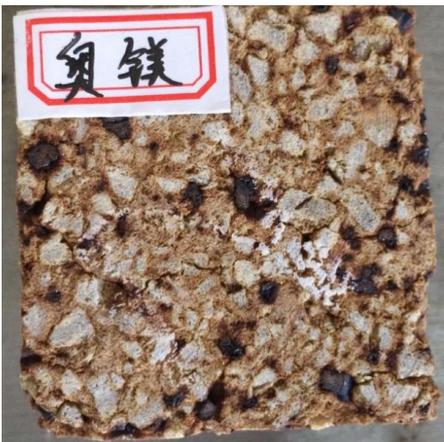
MH-90-2 after 3-time process



MH-90-3 after 3-time process

Note: After 3 time process, there is visible crack on RHI and MH-90-2, and the cracks of another 3 become more obvious. Also some spalling is found on MH-90-1 and MH-90-3.

5-Time Process



RHI after 5-time process



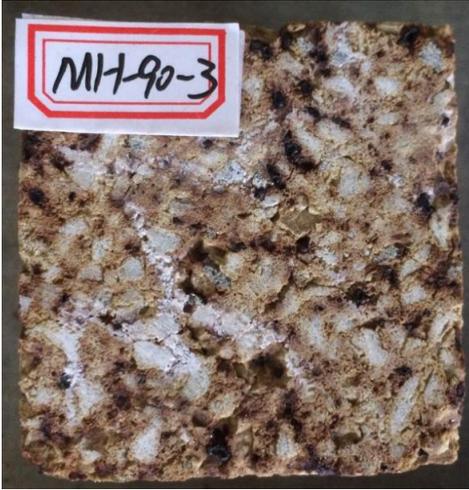
MH-90 after 5-time process



MH-90-1 after 5-time process



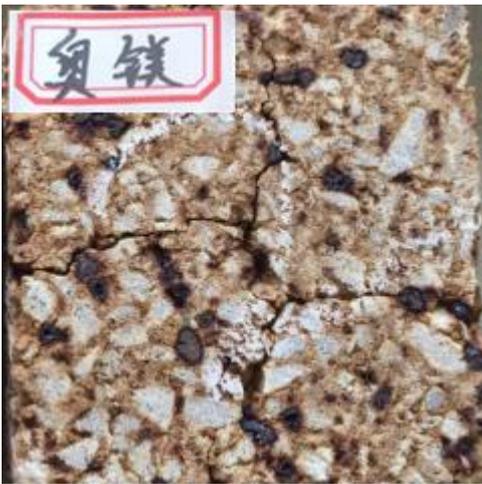
MH-90-2 after 5-time process



MH-90-3 after 5-time process

Note: The crack of all sample modules become more obvious than before.

20-Time Process



RHI after 20-time process



MH-90 after 20-time process



MH-90-1 after 20-time process



MH-90-2 after 20-time process



MH-90-3 after 20-time process

Note:The obvious crack is found on all sample modules after 20-time process.

B.Reduction Rate of Strength

Brick Name	RHI	MH-90	MH-90-1	MH-90-2	MH-90-3
Cold Crushing Strength (MPa)	64.87	104.70	71.97	58.40	56.47
Cold Crushing Strength (1100°C,Air Cooling, 5 Times) (MPa)	56.22	93.48	65.41	48.88	52.00
Cold Crushing Strength (1100°C,Air Cooling, 20 Times) (MPa)	48.92	76.07	45.28	38.12	41.95
Reduction Rate of Strength after Process 5 times (%)	13.00	11.00	9.00	16.00	8.00
Reduction Rate of Strength after Process 20 times (%)	25.00	27.00	37.00	35.00	26.00



Note:

1. ■ Reduction Rate of Strength after Process 5 times (%)
2. ■ Reduction Rate of Strength after Process 20 times (%)

The Results show:

A. Strength

after 5-time process: RHI,MH-90 & MH-90-1 are stronger.

after 20 time process:RHI,MH-90 & MH-90-1 are stronger.

B.Strength Reduction

after 5 time process:MH-90,MH-90-1 & MH-90-3 are superior.

after 20 time process:MH-90,RHI & MH-90-3 are superior.

In General,**RHI,MH-90 and MH-90-1** show better performance than others in thermal shock resistance.

4.Conclusion

Our Magnesia Hercynite Brick MH-90 is close to RHI counter sample in properties.

By the way, the performance of MH-90 has been proved by China Resource in 8,000 tons/day cement production line.

5.Our Achievement

	<p>FLSmidth is a leading supplier of equipment and services to the global cement and minerals industries since its foundation in 1882</p>
	<p>CONCH Cement is the largest cement factory in Asia, with 5 super 10,000,000 tons of clinker base and 3 lines of 12,000 t/d</p>
	<p>TCC Cement is the largest cement factory in Taiwan,the production capacity in 2014 is about 60 million tons.</p>
	<p>Sinoma Int. is a major service provider for international cement technology & equipment and engineering market, With 140 cement production lines constructed or under construction in over 70 countries and regions</p>
	<p>China Resources Cement is one important cement factory in China with about 70 production lines.</p>

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