GOUDA *refractories*

Cement Plants

Cement Industry

Gouda Refractories delivers complete refractory solutions for all process-stages (Preheating System, Rotary Kiln & Grate Cooler) in the production process of cement.

Since 1901, Gouda Refractories has proven that the company adds extra value when designing and producing refractory linings. Its state of the art production facilities does not just deliver refractory bricks, monolithic and precast shapes, but offers worldwide customer-specific total solutions for the iron & steel, non-ferrous metals, petrochemical, environment & energy and cement industries.

LRQA CERTIFIED ISO 9001

Scope **A-Z**

Years of experience **> 40**

Dedicated product range

Every industry has its own specific challenges and demands. Whether it's a greenfield project or maintenance: Gouda Refractories seamlessly matches the design and the choice of materials to the specific needs of the industry and process. Lifespan, application techniques and reliability are the top priorities. Dialogue and cooperation with the customer mean that products for any specific application can be developed.

The cement industry has specific requirements for refractory materials. Not only the operating conditions but also the most economic installation method determines the most suitable refractory quality.

The differences in the process-stages mean that different types of refractory material are required. With its unique product line, Gouda Refractories has solutions for process specific problems such as alkali growth, high abrasion, thermal shock and mechanical stresses. Gouda Refractories can deliver high quality, tailored products for various critical stages of the cement production process.

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MATERIALS for PREHEATING SYSTEM

Attack mechanisms are abrasion, chemical attack and buildup of slag. Hot Face materials can be supplied in casting and gunning monolithics as well as bricks and prefab shapes. The anchor system is a combination of ceramic and steel (253MA) anchors.

Cyclone Stage 1:

Hot Face Castable:
Curon 130
Curon 140 GM

Hot Face Bricks:
A

Back-up Insulation:
Golite 125

Cyclone Stage 2:

Hot Face Castable:
Vibron 150 H (GM)

Ceramic Anchors:
AK 60 A

Back-up Insulation:
Golite 130 GM

Cyclone Stage 3:

Hot Face Castable:
Curon 130
Curon 140 GM
Vibron 150 H (GM)

Hot Face Bricks:
A

Back-up Insulation:
Golite 125

Cyclone Stage 4 & 5:

Hot Face Castable:
Vibron 150 H (GM)
Vibron 160 H AR GM
Vibron 160 H K10 GM

Ceramic Anchors:
AK 60 A

Back-up Insulation:
Golite 130 GM

Calciner:

Hot Face Castable:
Vibron 150 H (GM)
Vibron 160 H AR GM
Vibron 160 H K10 GM
Curon 180 T Sp GM

Hot Face Bricks:
AK 60 A
LP 60 MP
AK 70 K
AK 86 A
AK 85 MP

Mortar:
Superset XT
Adhesiet 170 P

Ceramic Anchors:
AK 60 A

Back-up Insulation:
Golite 130 GM

Goose Neck:

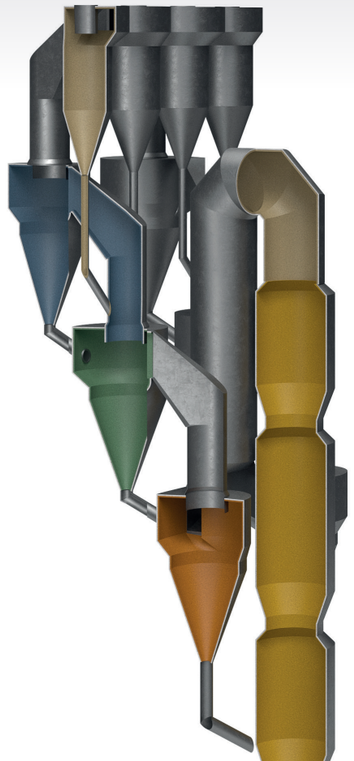
Hot Face Castable:
Curon 150 H GM
Vibron 160 H AR GM
Vibron 160 H K10 GM
Vibron 160 K30
Vibron 160 K60

Hot Face Bricks:
AK 60 A
AK 70 K
AK 86 A

Mortar:
Superset XT
HS 150

Ceramic Anchors:
AK 60 A

Back-up Insulation:
Golite 130 GM



MATERIALS for ROTARY KILN

Most important attack mechanisms (next to abrasion, thermal overload and build-ups) is alkali attack, especially with temperature fluctuations. Since Gouda does not manufacture basic (MgO) refractories, suitable materials for the burning zone can be obtained from third party sources.

Inlet Chamber:

Hot Face Castable:
Vibron 160 H K10
Vibron 160 H (GM)

Hot Face Bricks:
A 35 T
AK 45

Kil Inlet Zone:

Hot Face Bricks:
A 35 T

Calcining Zone:

Hot Face Bricks:
AK 45 / AK 59

Safety Zone:

Hot Face Bricks:
AK 45 / AK 59

Burning Zone:

Third Party

Kiln Outlet Zone:

Hot Face Castable:
Vibron 160 H K10

Hot Face Bricks:
AK 60 A
AK 70 K
AK 86 A

MATERIALS for GRADE COOLER

Low thermal conductivity and abrasion resistance are important for refractories at the kiln hood and burner lead-in. Waste fuels can make chemical resistance necessary too.

Kiln Hood and Hot Zone Back Wall:

Hot Face Castable:
Curon 150 H GM
Vibron 160 H AR GM
Vibron 160 H K10 GM
Vibron 160 K30
Vibron 160 K60

Mortar:
Superset XT
Adhesiet 170 P

Ceramic Anchors:
AK 60 A

Hot Face Bricks:
AK 60 A / AK 59
LP 60 MP
AK 86 A

Back-up Insulation:
Golite 130 GM

Bull Nose:

Hot Face Castable:
Vibron 160 H AR GM
Vibron 160 H K10 GM

Hot Face Bricks:
LP 60 MP

Mortar:
Adhesiet 170 P

Cold Zone:

Hot Face Castable:
Vibron 150 H
Vibron 160 H K30

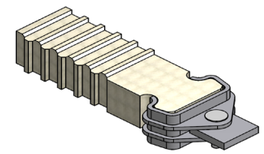
Tertiairy Air Duct:

Hot Face Castable:
Curon 150 H GM
Vibron 160 H AR GM
Vibron 160 K30
Vibron 160 K60

Hot Face Bricks:
A

Mortar:
Superset XT

Back-up Insulation:
Golite 130 GM



Gouda produces a variety of ceramic anchors. In combination with the suitable claw for each section, they provide a reliable anchoring system.

Technical Information

Over the last 100 years, the process of cement-production has changed from basic ring-furnaces to shaft-kilns and from wet rotary kilns to today's dry production lines. As a result of these process changes, the requirements for the installed refractory lining have changed as well.

In general, these process changes result in higher requirements for the quality of the refractory materials. This means that intensified research and development are needed to ensure that the performance is ensured under increasingly harsh environments, while enabling long production campaigns.

Gouda Refractories' R&D department has an advanced, independent ISO-certified laboratory for developing and testing the right product to make sure that the properties of the material match the demands of the customers. Additionally, the R&D department performs so-called postmortem investigations. With the results of such investigation not only the root cause of a problem can be determined, but if required, also the durability of materials can be increased and new product developments can get started.

No two cement plants are the same and must be treated as such. It is therefore essential that, for each customer, specific and tailormade solutions are found. With our focus on perfection and durability we are always able to recommend the optimum solution for each individual plant.

The refractory lining inside a cement plant is complex. Whenever there is an issue, there is no common quick fix. Thorough investigation of each problem for each area of the system's internal lining is the key to achieving the best possible solution. A Gouda Refractories' experienced refractory inspector can perform this task worldwide.

As part of the different processes, a cement plants can have variations and changes in alternative fuels. These variations are also a key factor in the selection of the correct refractory materials. It is therefore imperative to discuss the options and limitations with our experienced team.

Our technical department and our installation team are always prepared to accept the challenge to do the best for the customer.

References

Akcimento, *Turkey*
AlChabba & Building Materials, *Syria*
Alexandria Portland Cement, *Egypt*
Alsen Breitenburg, *Germany*
Arabian Cement & Building Materials, *Syria*
Assiut Portland Cement Co., *Egypt*
Bursa Cimento, *Turkey*
Cimentas Izmir Cimento Fabrikasi, *Turkey*
Cimenteries Belges Réunies, *Belgium*
Ciments d'Oburg, *Belgium*
Ciments Francais, *France*
ENCI, *Netherlands*
Heidelberg Zement, *Germany*
Helwan Portland Cement Company, *Egypt*
Hercules Cement, *Greece*
Intermoselle, *Luxemburg*
Jordan Cement Factories, *Jordan*
Ketton Cements, *UK*
Krupp Polysius, *Germany*
NCMC, *Syria*
Nordzement, *Germany*
Portland Zementwerke Heidelberg, *Germany*
Ready Mix Portland Zementwerke, *Germany*
Ribblesdale Cement, *UK*
Rugby Cement, *UK*
Semen Padang, *Indonesia*
Syrian Company for Cement Industry, *Syria*
Tartous Cement & Building Materials, *Syria*
Titan Cement, *Greece*
Tourah Portland Cement Company, *Egypt*
Yamama Cement, *Saudi Arabia*

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SHINAGAWA REFRA GROUP

SHAPING THE FUTURE OF REFRACTORIES

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Material Properties

Quality	Type	Max. Service Temp.	Cold Crushing Strength	Bulk Density	Apparent Porosity	Thermal Conductivity @ 1100 °C	Al_2O_3	SiO_2	Fe_2O_3	P_2O_5
		°C	MPa	kg/m³	%	W/mK	%	%	%	%
A	Dense Refractory Chamotte Brick	1.400	35	2.150	<20	1,38	40	53	<2	
A 35T	Dense Refractory Chamotte Brick	1.300	35	2.100	19	1,32	35	57	<2	
AK 45	Dense Refractory Chamotte Brick	1.500	55	2.300	16	1,46	45	50	<1	
AK 59	Dense Refractory Mullite Brick	1.550	70	2.450	17	1,74	59	39	<1,2	
AK 60 A	Dense Refractory Andalusite Brick	1.680	90	2.550	13	1,83	60	37	<1	
AK 70 K	Dense Refractory Corundum Brick	1.725	60	2.550	18	1,90	70	28	0,8	
AK 86 A	Dense Refractory Bauxite Brick	1.550	65	2.800	20	2,10	84	11	<1,5	
AK 85 MP	Dense Refractory Bauxite Brick	1.500	130	2.850	14	2,5	83	8	<1	3,5
LP 60 MP	Dense Refractory Andalusite Brick	1.600	120	2.500	12	3,20	60	36	1,1	2

Quality	Type	Max. Service Temp.	Cold Crushing Strength	Bulk Density	Material Consumption	Thermal Conductivity @ 1100 °C	Al_2O_3	SiO_2	Fe_2O_3	SiC
		°C	MPa	kg/m³	kg/m³	W/mK	%	%	%	%
CURON 130	Regular Dense Castable	1.300	35	2.000	1.900	0,56	35	49		
CURON 130 GM	Regular Dense Gunning Mix	1.300	20	1.950	1.900	0,48	33	49		
CURON 140	Regular Dense Castable	1.400	40	2.150	2.050	0,58	47	37	<2	
CURON 140 GM	Regular Dense Gunning Mix	1.400	30	2.050	2.000	0,53	47	40	<2	
CURON 150 H	Regular Dense Castable	1.500	45	2.150	2.050	0,58	48	44	<2	
CURON 150 H GM	Regular Dense Gunning Mix	1.500	25	2.050	1.950	0,56	48	44	<2	
CURON 180 T SP	Regular Dense Castable	1.870	80	2.750	2.700	3,20	94	0,1	0,05	
CURON 180 T SP GM	Regular Dense Gunning Mix	1.870	80	2.600	2.450	3,10	92	0,1	0,2	
GOLITE 125	Insulation Castable	1.250	10	1.500	1.400	0,40	26	48		
GOLITE 125 GM	Insulation Gunning Mix	1.250	8	1.400	1.350	0,42	26	48		
GOLITE 130	Insulation Castable	1.300	18	1.580	1.490	0,38	37	43		
GOLITE 130 GM	Insulation Gunning Mix	1.300	13	1.500	1.400	0,38	37	43		
VIBRON 150 H	Low Cement Castable	1.500	65	2.250	2.150	1,15	50	44	<1,5	
VIBRON 150 H GM	Low Cement Gunning Mix	1.500	40	2.150	2.100	1,14	50	44	<1,5	
VIBRON 160 H AR	Low Cement Castable	1.600	70	2.500	2.450	1,25	63	31	1,5	
VIBRON 160 H AR GM	Low Cement Gunning Mix	1.600	40	2.350	2.300	1,24	62	31	1,5	
VIBRON 160 H K10	Low Cement Castable	1.600	85	2.500	2.450	2,40	54	31	1	10
VIBRON 160 H K10 GM	Low Cement Gunning Mix	1.600	45	2.400	2.350	1,55	54	31	1	10
VIBRON 160 K30	Low Cement Castable	1.600	70	2.450	2.400	3,10	40	25		30
VIBRON 160 K60	Low Cement Castable	1.600	80	2.650	2.600	8,80	30	5	0,2	60

Values are typical. Datasheets are available upon request.

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