Steel Making Refractories

TRASTEEL

REFRACTORY SOLUTIONS

TRASTEEL

Trasteel International Group is a Swiss based Company, established in September 2009, active in trading of steel related products such as flat and long products, steel making raw materials such as coking coal, coke and iron ore, steel making consumables, non-ferrous metals and solid fuel such as steam coal and pet-coke.

The Trasteel idea comes from the entrepreneurship of a group of Executives active in the steel market for more than 20 years.

The principal strategy of Trasteel is to invest in industrial assets with a clear sustainability and competitive advantage in the long term in order to support the trading activities of the Group and to develop a multitasking and flexible Company able, in this way, to mitigate the high volatility and uncertainties of the markets. Trasteel, further to its trading activities, offers to its Customers a complete range of services, from shipping and logistic to financing, thereby forming an entire business chain.

Trasteel is positioning itself as a multi-geographical player with major focus on China, Middle East, Europe, CIS countries and South America. The Head Office of the Group is based in Lugano, Switzerland, while representative offices are active in South America, UAE, China, India and Indonesia; furthermore Trasteel is covering other important markets such as North America, Russia, Ukraine, Turkey and Egypt through its network of agents.

During the fiscal year of 2010 the Company generated a consolidated turnover in excess of half a billion US dollars employing almost 50 Professionals.

TRASTEEL REFRACTORY SOLUTIONS

Trasteel has recently formalized the purchase of an important stake in a major Chinese Producer of magnesia-carbon and alumina-magnesia-carbon refractory bricks, establishing a New Venture incorporated under the name of "Liaoning Fenghua Trasteel Industry Co. LTD".

Trasteel will act as the exclusive marketing arm of the Joint Venture on all activities related to overseas marketing, sales, production financing and technology advancement. The Chinese Partner, Liaoning Fenghua Industrial Co. LTD, will confer to the Joint Venture their equipment and facilities. The production facilities are located in Dashiqiao City, Liaoning, a province in China close to the highest quality raw material sources for refractory production and major transportation. The New Joint Venture will integrate production and research facilities and will be able to produce, with a capacity of about 80'000 MT/year, the following range of products:

- Magnesia Carbon bricks for converters, electric arc furnaces and ladles
- Magnesia Alumina Carbon bricks
- Alumina Silicon Carbide Carbon bricks
- Sliding Gate Plates and Nozzles for tundish and ladle flow control
- Various unshaped products for lining installations and maintenance of steel making units.

Our Joint Venture partner owns a magnesite mine with discovered deposits of raw magnesite of 30 million MT with and annual output of 200'000 MT thus assuring the Joint Venture to have a reliable and competitive source of major raw materials available.

The company is also a Scientific & Research enterprise with long term technological collaboration with Beijing Iron & Steel Institute, Wuhan and Beijing Scientific & Technology University and as a result, special materials can be developed and produced and new refractory dedicated solutions can be offered to satisfy and exceed Customer expectations.

In addition Trasteel has established a long term partnership with major dedicated manufacturers of other refractories products:

- Fired Magnesia bricks
- Alumina-Silica Bricks
- Isostatic products for continuous casting machine
- Special shapes like purging plugs, tap hole and well blocks.

Having direct control over the Joint venture facilities and thanks to a team of skilled and long experienced technicians, Trasteel Refractory Solutions can provide its Customers with a full range of services including: refractory engineering, logistics, installation supervision, after sales assistance and global refractory management service with guaranteed performance and with the target to maintain and exceed our Customer's growth objectives.
Furthermore the synergy generated by the recent investment of Trasteel in Revas Technologies, a company specialized in supplying products, systems and processes for steelmaking, offers our Customers the benefit of a turn-key supplier able to provide full refractory solutions integrated with equipments.

HEADQUARTER

- Switzerland

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- Mexico

NETWORK

- Brazil
- Canada
- Egypt
- India
- Indonesia
- Russia
- Taiwan
- Turkey
- USA

PRODUCTION FACILITY

- China

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MgO-C Bricks for CONVERTER

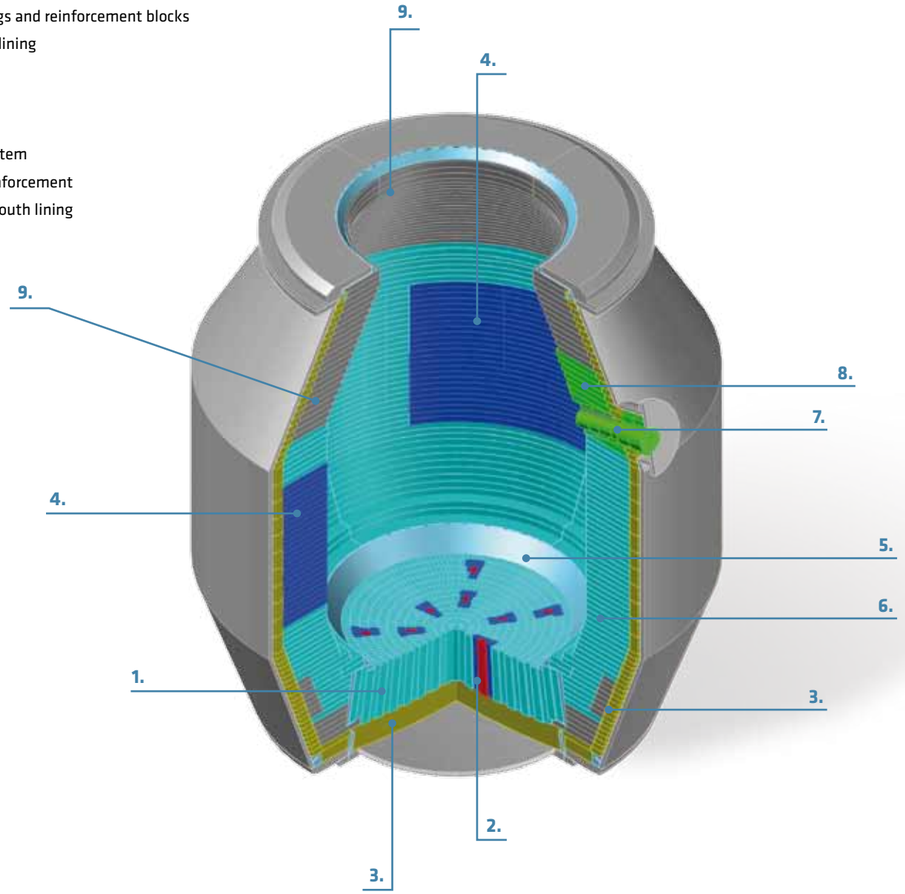
	Chemical content (typical for raw materials)				Chemical content (typical for products)	Physical parameters		
Quality Name	**MgO (%)***	**SiO_2 (%)***	**CaO (%)***	**Fe_2O_3 (%)***	**Carbon (%)**	**BD (g/cm³)**	**AP (%)**	**CCS (Mpa)**
A16C6	98,21	0,38	0,87	0,4	16	2,97	3	40
EA14R6	98,15	0,39	0,90	0,39	14	2,99	3	40
E12C7	98,12	0,4	0,91	0,4	12	3	4	42
E14C6	98,12	0,4	0,91	0,4	14	2,99	3	40
E10C3	98,12	0,4	0,91	0,4	10	3,01	4	45
I14C6	97,23	0,64	1,3	0,65	14	2,99	3	42
I8C3	97,23	0,64	1,3	0,65	12	3,03	4	45
O8C3	96,21	0,85	1,72	0,79	8	3,03	4	43
EP14T6	97,94	0,46	1,01	0,42	14	2,97	3	38
EP10T3	97,94	0,46	1,01	0,42	10	3	4	40
IP10R6	97,22	0,66	1,34	0,61	10	3	4	40
IP14R6	97,22	0,66	1,34	0,61	14	2,97	3	40
IP8L3	97,22	0,67	1,36	0,59	8	3,01	4	43
OP10L3	96,71	0,77	1,57	0,66	10	3	4	40
OP6R3	96,51	0,80	1,63	0,71	6	3,03	5	42
PI8T3	97,21	0,68	1,40	0,55	8	3,01	4	38
PO10R3	96,90	0,74	1,51	0,60	10	3	4	35

Quality Name	Description	Application
A16C6	Top quality material based on high purity large cristal fused magnesite with antioxidant	Barrel and Trunions area
EA14R6	Top quality material based on a blend of high purity and large crystal fused magnesite with antioxidant	Barrel and Trunions area. Scrap impact area
E12C7	Top quality material based on high purity fused magnesite with high grade antioxidant	Purging plugs reinforcement area
E14C6	Top quality material based on high purity fused magnesite with antioxidant	Barrel and Trunions area
E10C3	Top quality material based on high purity fused magnesite	Lower and Upper Cone
I14C6	High quality material based on fused magnesite with antioxidant	Bottom
I8C3	High quality material based on fused magnesite	Bottom
O8C3	High quality material based on fused magnesite	Barrel and Mouth
EP14T6	High quality material based on a blend of Fused and Dead burned magnesite with antioxidant	Barrel and Mouth
EP10T3	High quality material based on a blend of Fused and Dead burned magnesite	Barrel and Mouth
IP10R6	High quality material based on a blend of Fused and Dead burned magnesite with antioxidant	Bottom and Lower Cone
IP14R6	High quality material based on a blend of Fused and Dead burned magnesite with antioxidant	Bottom and Lower Cone
IP8L3	High quality material based on a blend of Fused and Dead burned magnesite	Bottom and Lower Cone
OP10L3	High quality material based on a blend of Fused and Dead burned magnesite	Bottom and Joints area
OP6R3	High quality material based on a blend of Fused and Dead burned magnesite	Bottom and Joints area
PI8T3	High quality material based on a blend of Dead burned and fused magnesite	Safety and Joints area
PO10R3	High quality material based on a blend of Dead burned and fused magnesite	Safety and Joints area

The table does not represent all the available products. More qualities can be produced according to Customer requirements with variations of raw materials ratio, carbon content and antioxidants

MGO-C BRICKS FOR CONVERTER

1. Bottom
2. Purging plugs and reinforcement blocks
3. Permanent lining
4. Trunions
5. Ramming
6. Barrel
7. Taphole System
8. Taphole reinforcement
9. Cone and mouth lining



MgO-C Bricks for EAF

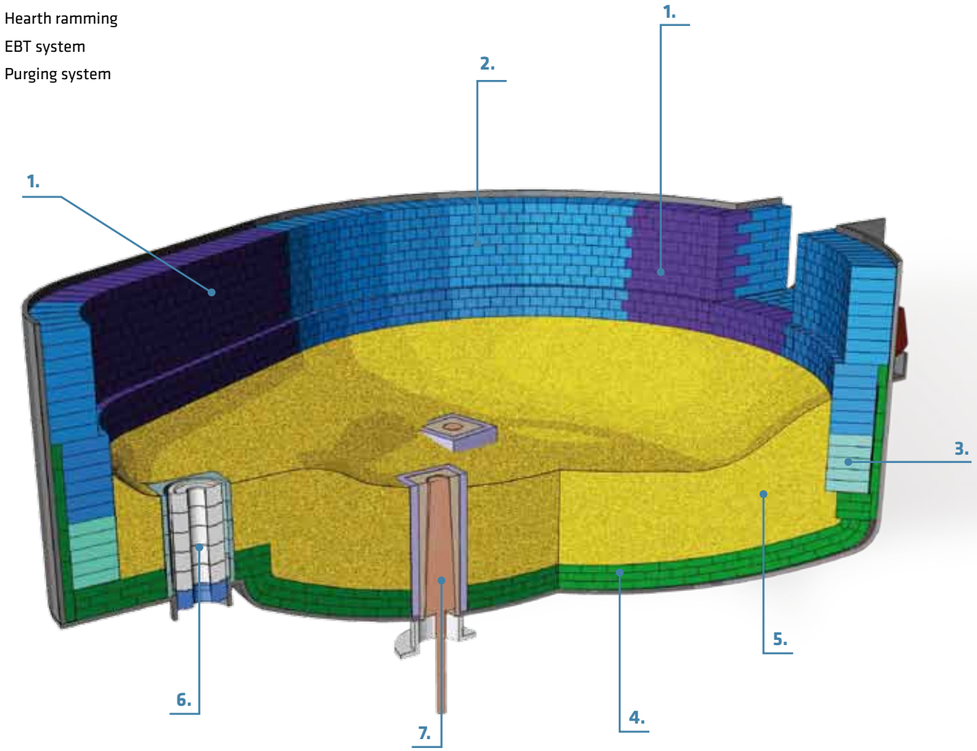
	Chemical content				Chemical content (typical for products)	Physical parameters		
Quality Name	**MgO (%)***	**SiO_2 (%)***	**CaO (%)***	**Fe_2O_3 (%)***	**Carbon (%)**	**BD (g/cm³)**	**AP (%)**	**CCS (Mpa)**
A16C5	98,17	0,41	0,86	0,38	16	2,97	3	40
EA16T5	98,09	0,43	0,92	0,40	16	2,97	3	40
E12C2	98,07	0,44	0,93	0,41	12	3	4	42
E14C5	98,07	0,44	0,93	0,41	14	2,99	3	40
I12C2	97,19	0,65	1,33	0,67	12	3	4	42
I8C5	97,19	0,65	1,33	0,67	8	3,03	3	45
EP10L2	97,62	0,58	1,19	0,48	10	3	4	42
IP12T2	97,19	0,66	1,35	0,64	12	2,99	4	40
IP6R2	97,18	0,67	1,37	0,63	6	3,03	5	45
IP8L2	97,18	0,68	1,39	0,61	8	3,01	5	42
O6C2	96,14	0,86	1,74	0,81	6	3,06	5	43
OP10L2	96,66	0,79	1,60	0,68	10	3	4	38
P8C2	97,17	0,71	1,45	0,54	8	3,01	5	40

Quality Name	Description	Application
A16C5	Top quality material based on high purity large crystal fused magnesite with antioxidant	Slag level and Hot Spot in severe conditions
EA16T5	Top quality material based on a blend of high purity and large crystal fused magnesite with antioxidant	Slag level and Hot Spot in severe conditions
E12C2	Top quality material based on high purity fused magnesite	Slag level and Hot Spot lining
E14C5	Top quality material based on high purity fused magnesite with antioxidant	Slag level and Hot Spot lining
I12C2	High quality material based on fused magnesite	Side wall and Slag level lining
I8C5	High quality material based on fused magnesite with antioxidant	Side wall and Slag level lining
EP10L2	High quality material based on a blend of high purity fused and dead burned magnesite	Side wall and Slag level lining
IP12T2	High quality material based on a blend of fused and dead burned magnesite	Side wall lining
IP6R2	High quality material based on a blend of fused and dead burned magnesite	Side wall lining
IP8L2	High quality material based on a blend of fused and dead burned magnesite	Side wall lining
O6C2	High quality material based on fused magnesite	Side wall lining
OP10L2	High quality material based on a blend of fused magnesite and dead burned magnesite	Safety areas and Underbath lining
P8C2	High quality material based on dead burned magnesite	Safety areas and Underbath lining

The table does not represent all the available products. More qualities can be produced according to Customer requirements with variations of raw materials ratio, carbon content and antioxidants

MGO-C BRICKS FOR EAF

1. Hot spot reinforcement
2. Slag line lining
3. Lower side wall lining
4. Permanent lining
5. Hearth ramming
6. EBT system
7. Purging system



MgO-C Bricks for LADLE

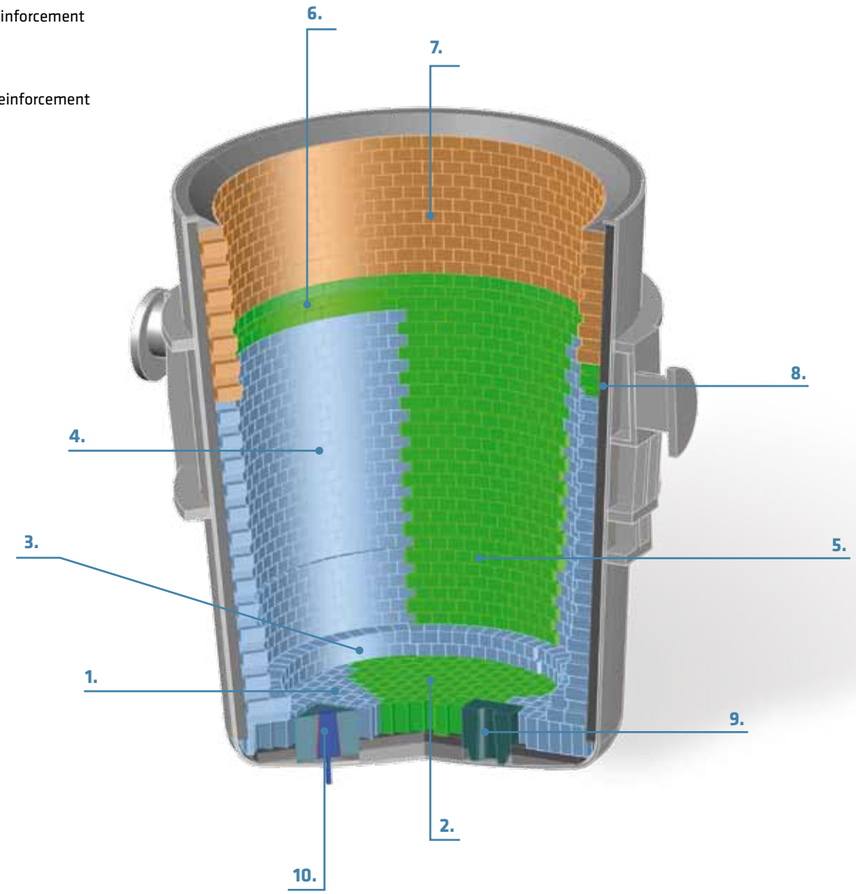
	Chemical content (typical for raw materials)				Chemical content (typical for products)	Physical parameters		
Quality Name	MgO (%)*	SiO_2 (%)*	CaO (%)*	Fe_2O_3 (%)*	Carbon (%)	BD (g/cm³)	AP (%)	CCS (Mpa)
A16C4	98,10	0,42	0,90	0,41	16,00	2,99	3	40
EA16L4	98,08	0,43	0,93	0,42	16,00	2,99	3	40
E12C1	98,05	0,44	0,95	0,43	12,00	3,02	4	42
E14C4	98,05	0,44	0,95	0,43	14,00	3,01	3	40
E16C4	98,05	0,44	0,95	0,43	16,00	2,99	3	39
I6C1	97,11	0,67	1,37	0,70	6,00	3,10	5	45
I8C4	97,11	0,67	1,37	0,70	8,00	3,07	5	45
EP10L1	97,57	0,59	1,22	0,49	10,00	3,02	4	40
IP12T1	97,10	0,68	1,39	0,67	12,00	3,01	4	38
IP6R1	97,10	0,69	1,41	0,66	6,00	3,05	5	43
IP8L1	97,10	0,70	1,43	0,63	8,00	3,03	5	41
O6C1	96,11	0,87	1,75	0,83	6,00	3,10	5	40
OP6R1	96,45	0,82	1,65	0,73	6,00	3,05	5	35
P8C1	97,08	0,73	1,49	0,55	8,00	3,03	5	35

Quality Name	Description	Application
A16C4	Top quality material based on high purity large crystal fused magnesite with antioxidant	Slag level in severe conditions
EA16L4	Top quality material based on a blend of high purity and large crystal fused magnesite with antioxidant	Slag level in severe conditions
E12C1	Top quality material based on fused magnesite	Slag level lining
E14C4	Top quality material based on fused magnesite with antioxidant	Slag level lining
E16C4	Top quality material based on fused magnesite with antioxidant	Slag level lining
I6C1	High quality material based on fused magnesite	Barrel and Bottom lining
I8C4	High quality material based on fused magnesite with antioxidant	Barrel and Slag level lining
EP10L1	High quality material based on a blend of high purity fused and dead burned magnesite	Slag level and Barrel lining
IP12T1	High quality material based on a blend of high purity fused and dead burned magnesite	Slag level and Barrel lining
IP6R1	High quality material based on a blend of high purity fused and dead burned magnesite	Bottom and Barrel lining
IP8L1	High quality material based on a blend of high purity fused and dead burned magnesite	Bottom and Barrel lining
O6C1	High quality material based on fused magnesite	Barrel, Bottom and FreeBoard lining
OP6R1	High quality material based on a blend of high purity fused magnesite and dead burned magnesite	Barrel, Bottom and FreeBoard lining
P8C1	High quality material based on dead burned magnesite	Safety areas and FreeBoard lining

The table does not represent all the available products. More qualities can be produced according to Customer requirements with variations of raw materials ratio, carbon content and antioxidants

MGO-C BRICKS FOR LADLE

1. Bottom
2. Bottom impact reinforcement
3. Safety Rings
4. Barrel lining
5. Sidewall impact reinforcement
6. Transition layers
7. Slag level lining
8. Permanent lining
9. Well block
10. Purging block



MgO-C Special Shape

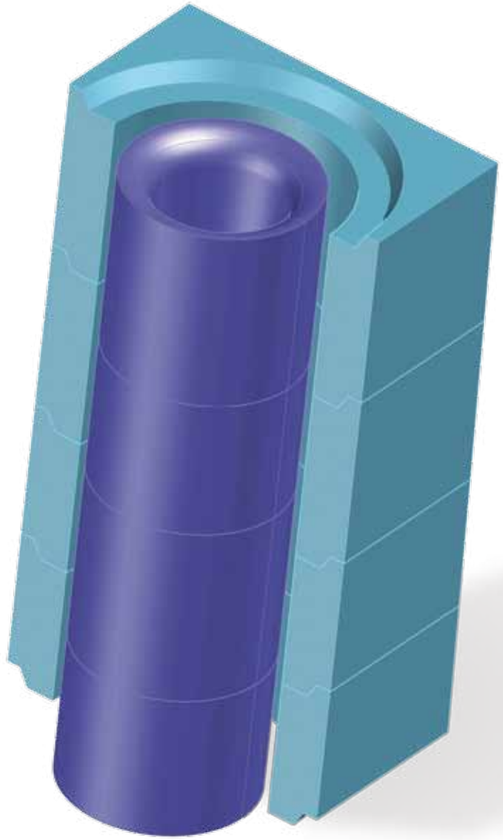
	Chemical content					Physical parameters		
Quality Name	**MgO (%)***	**SiO_2 (%)***	**CaO (%)***	**Fe_2O_3 (%)***	**Carbon (%)**	**BD (g/cm³)**	**AP (%)**	**CCS (Mpa)**
EA14RR	98,20	0,40	0,98	0,42	14	2,99	4	40
EA14RS	98,00	0,49	1,05	0,46	14	2,99	4	40
EA14RE	98,25	0,39	0,96	0,40	14	2,99	4	40
EA14RT	98,10	0,45	1,01	0,44	14	2,99	4	40
EA14RP	98,20	0,40	0,98	0,42	14	2,99	4	40
EA12RR	98,20	0,40	0,98	0,42	12	3	4	45
EA12RS	98,00	0,49	1,05	0,46	12	3	4	45
EA12RE	98,25	0,39	0,96	0,40	12	3	4	45
EA12RT	98,10	0,45	1,01	0,44	12	3	4	45

* Typical for raw materials

Quality Name	Description	Application
EA14RR	Top quality material based on a blend of high purity and large crystal fused magnesite with high grade antioxidant	Converter Tap hole / EAF EBT
EA14RS	Top quality material based on a blend of high purity and large crystal fused magnesite with high grade antioxidant	Converter Tap hole / EAF EBT
EA14RE	Top quality material based on a blend of high purity and large crystal fused magnesite with high grade antioxidant	EAF EBT
EA14RT	Top quality material based on a blend of high purity and large crystal fused magnesite with high grade antioxidant	Converter / EAF Tap hole block
EA14RP	Top quality material based on a blend of high purity and large crystal fused magnesite with high grade antioxidant	Converter / EAF Porous Plug
EA12RR	Top quality material based on a blend of high purity and large crystal fused magnesite with high grade antioxidant	EAF EBT
EA12RS	Top quality material based on a blend of high purity and large crystal fused magnesite with high grade antioxidant	EAF EBT
EA12RE	Top quality material based on a blend of high purity and large crystal fused magnesite with high grade antioxidant	EAF EBT
EA12RT	Top quality material based on a blend of high purity and large crystal fused magnesite with high grade antioxidant	EAF Tap hole block

The table does not represent all the available products. More qualities can be produced according to Customer requirements with variations of raw materials ratio, carbon content and antioxidants

MGO-C SPECIAL SHAPE



AMC Bricks for LADLE

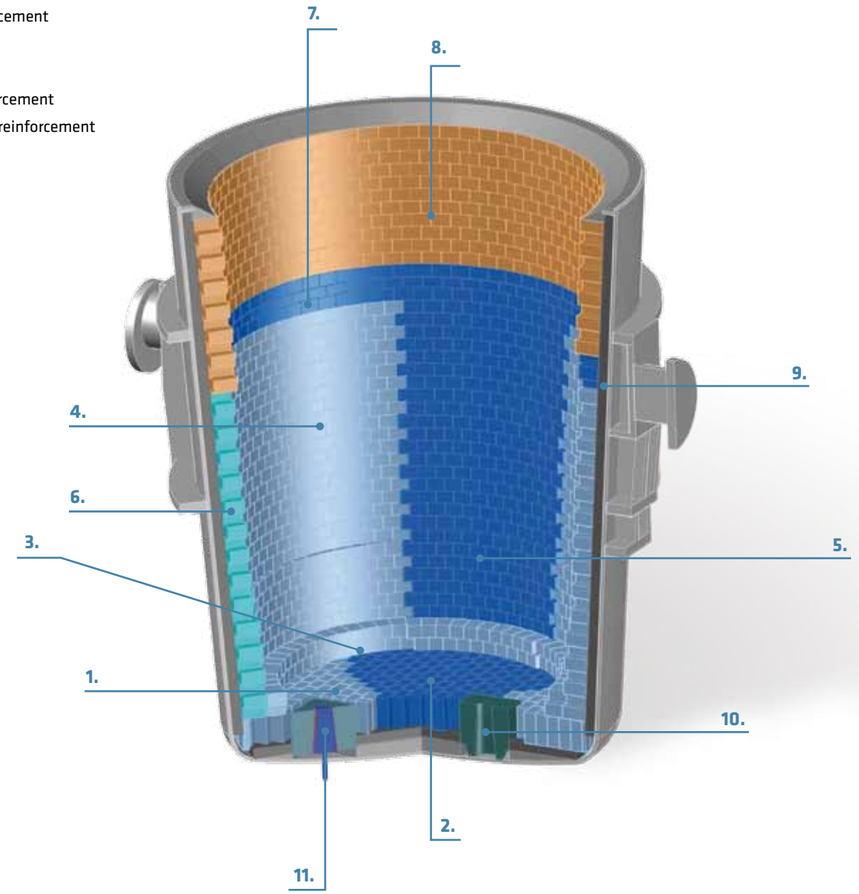
	Chemical content						Physical parameters		
Quality Name	Al_2O_3 (%)	MgO (%)	SiO_2 (%)	CaO (%)	Fe_2O_3 (%)	Carbon (%)	BD (g/cm³)	AP (%)	CCS (Mpa)
810C	78,05	9,92	0,46	0,4	0,7	8	3,20	7	60
810BCS	72,8	10,91	3,22	0,58	1,7	8	3,10	7	60
825B	55,7	25,46	6	0,8	1,8	8	3,06	7	50
655BCS	30,4	55,2	3	1	1,9	6	3,08	7	50
610C	79,07	10,2	0,48	0,43	0,9	6	3,20	7	60
810CS	77,76	9,95	1,15	0,95	0,9	8	3,15	6	55
635T	57,6	32,5	1,22	0,64	0,62	6	3,15	6	65
610BCS	73,1	13,5	2,87	0,46	1,18	6	3,10	7	60
825C	62,2	23,7	1,55	0,9	1,08	8	3,15	7	55
630B	52,05	31,05	4,5	0,55	1,5	6	3,05	8	50

Quality Name	Description	Application
810C	High quality material based on corundum and fused magnesite with antioxidant	Impact areas
810BCS	High quality material based on corundum, bauxite, spinel and fused magnesite with antioxidant	Barrel reinforcement and Bottom
825B	High quality material based on bauxite and fused magnesite with antioxidant	Barrel and Bottom
655BCS	High quality material based on corundum, bauxite, spinel and fused magnesite with antioxidant	Barrel - Slag level transition.
610C	High quality material based on corundum and fused magnesite with antioxidant	Barrel and Impact areas
810CS	High quality material based on corundum, spinel and fused magnesite with antioxidant	Barrel and Impact areas
635T	Top quality material based on tabular alumina with antioxidant	Impact areas
610BCS	High quality material based on corundum, bauxite, spinel and fused magnesite with antioxidant	Barrel reinforcement and Bottom
825C	High quality material based on corundum and fused magnesite with antioxidant	Impact areas
630B	High quality material based on bauxite and fused magnesite with antioxidant	Barrel and Bottom

The table does not represent all the available products. More qualities can be produced according to Customer requirements with variations of raw materials ratio, carbon content and antioxidants

AMC BRICKS FOR LADLE

1. Bottom
2. Bottom impact reinforcement
3. Safety Rings
4. Barrel lining
5. Sidewall impact reinforcement
6. Side wall purging area reinforcement
7. Transition layers
8. Slag level lining
9. Permanent lining
10. Well block
11. Purging block



Fired MgO Bricks

	Chemical content					Physical parameters					
Quality Name	**MgO (%)**	**SiO_2 (%)**	**CaO (%)**	**Fe_2O_3 (%)**	**Carbon (%)**	**BD (g/cm^3)**	**AP (%)**	**CCS (Mpa)**	**PLC (%)**	**RUL (°C)**	**Thermal Expansion (%)**
M91F	91,00	4,50	3,00	1,50	-	2,90	19,00	50,00	0-0.5	1.520	1,7
M93F	92,50	3,90	2,50	1,10	-	2,91	18,00	55,00	0-0.45	1.550	1,7
M93FI	92,50	3,90	2,50	1,10	2,50	2,91	6,00	55,00	0-0.45	1.550	1,7
M95F	95,00	2,00	2,00	1,00	-	2,93	18,00	60,00	0-0.4	1.650	1.6
M95FI	95,00	2,00	2,00	1,00	2,40	2,93	6,00	60,00	0-0.4	1.650	1.6
M97F	96,50	1,20	1,50	0,80	-	2,97	18,00	60,00	0-0.4	1.700	1,4
M97FI	96,50	1,20	1,50	0,80	2,40	2,97	6,00	60,00	0-0.4	1.700	1,4
M95F-F	95,00	1,50	1,60	1,00	-	2,96	17,00	65,00	0-0.35	1.650	1,5
M97F-F	97,00	0,80	1,20	0,80	-	2,98	17,00	65,00	0-0.35	1.700	1.4
M98F-F	98,00	0,50	1,00	0,50	-	3,01	16,00	65,00	0-0.30	1.700	1,3
M98FI-F	98,00	0,50	1,00	0,50	2,20	3,01	5,00	65,00	0-0.30	1.700	1,3

Quality Name	Description	Application
M91F	High quality material based on Dead Burned magnesite	Safety lining of BOF, EAF &LF;CC slag box; Glass furnace
M93F	High quality material based on Dead Burned magnesite	Safety lining of BOF, EAF &LF;CC slag box; Glass furnace
M93FI	High quality pitch impregnated material based on Dead Burned magnesite	Safety lining of BOF, EAF &LF;CC slag box; Glass furnace
M95F	High quality material based on Dead Burned magnesite	Safety lining of BOF, EAF &LF;CC slag box; Glass furnace
M95FI	High quality pitch impregnated material based on Dead Burned magnesite	Safety lining of BOF, EAF &LF;CC slag box; Glass furnace
M97F	High quality material based on Dead Burned magnesite	Safety lining of BOF, EAF &LF;CC slag box; Glass furnace
M97FI	High quality pitch impregnated material based on Dead Burned magnesite	Safety lining of BOF, EAF &LF;CC slag box; Glass furnace
M95F-F	High quality material based on fused magnesite	Safety lining of BOF, EAF; Glass furnace; Non-ferrous metal furnace
M97F-F	High quality material based on fused magnesite	Safety lining of BOF, EAF; Glass furnace; Non-ferrous metal furnace
M98F-F	High quality material based on fused magnesite	Safety lining of BOF, EAF; Glass furnace; Non-ferrous metal furnace
M98FI-F	High quality pitch impregnated material based on fused magnesite	Safety lining of BOF, EAF; Glass furnace; Non-ferrous metal furnace

Al_2O_3 Bricks

Steel Making Application							
	Chemical content		Physical parameters				
Quality Name	Al_2O_3 (%)	Fe_2O_3 (%)	BD (g/cm³)	AP (%)	CCS (Mpa)	RUL (°C)	PLC (%)
HA80BC	80	1,2	2,83	20	75	1550	1550°C×2h 0.2~0.3
HA80B	80	1,8	2,7	20	70	1530	1550°C×2h 1~-0.5
HA75BC	75	1,4	2,8	19	65	1520	1550°C×2h 0.2~0.4
HA75B	75	2	2,6	20	60	1510	1550°C×2h 1~-0.5
HAU80BC	80	1,2	2,83	18	60	1530	/
HAU75BC	75	1,4	2,8	18	55	1520	/
HA65B	65	2	2,5	22	50	1490	1550°C×2h 1~-0.4
HA55B	55	2	2,45	21	50	1470	1550°C×2h 1~-0.4
FC40	40	2,5	2,15	21	45	1430	1550°C×2h ± 0.3
FC42LP	42	1,6	2,2	15	55	1450	1550°C×2h 0~-0.2
FC42	42	1,7	2,15	22	40	1520	1550°C×2h 0~-0.3
FC48	48	1,7	2,35	21	40	1550	1550°C×2h 0~-0.3

Quality Name	Description	Application
HA80BC	High Alumina fired brick, Bauxite and Corundum based	EAF Roof
HA80B	High Alumina fired brick, Bauxite based	Ladle safety and wear lining
HA75BC	High Alumina fired brick, Bauxite and Corundum based	EAF Roof
HA75B	High Alumina fired brick, Bauxite based	Ladle safety lining
HAU80BC	High Alumina unfired brick, Bauxite and Corundum based	EAF Roof
HAU75BC	High Alumina unfired brick, Bauxite and Corundum based	EAF Roof
HA65B	High Alumina fired brick, Bauxite based	Ladle safety lining
HA55B	High Alumina fired brick, Bauxite based	Ladle safety lining
FC40	Fireclay brick	Ladle safety lining
FC42LP	Fireclay brick	Ladle safety lining
FC42	Fireclay brick	Ladle safety lining
FC48	Fireclay brick	Ladle safety lining

Iron Application							
	Chemical content		Physical parameters				
Quality Name	Al_2O_3 (%)	Fe_2O_3 (%)	BD (g/cm³)	AP (%)	CCS (Mpa)	RUL (°C)	PLC (%)
BF-HA88MC	88	1	3	16	120	1700	1500°C×3h 0~+0.1
BF-HA85MC	85	1,2	2,9	18	80	1620	/
C-HA75MCA	75	1	2,7	21	70	1700	1500°C×4h ±0.2
C-HA80MCA	80	1	2,75	21	70	1700	1500°C×4h ±0.2
HA65MCA-S	65	1,2	2,6	20	65	1650	1500°C×4h ±0.2
C-HA65MCA	65	1,8	2,45	22	60	1550	1450°C×3h ±0.2
C-HA72MCA	72	1	2,7	24	50	1550	1500°C×3h ±0.2

Quality Name	Description	Application
BF-HA88MC	High Alumina fired brick, fused Corundum and Mullite based	Blast Furnace
BF-HA85MC	High Alumina fired brick, fused Corundum and Mullite based	Blast Furnace
C-HA75MCA	High Alumina fired brick, Mullite,Corundum and Andalusite based	Hot Blast Stove, Checker brick
C-HA80MCA	High Alumina fired brick, Mullite,Corundum and Andalusite based	Hot Blast Stove, Checker brick
HA65MCA-S	High Alumina fired brick, Mullite,Corundum and Andalusite based	Hot Blast Stove, Checker brick
C-HA65MCA	High Alumina fired brick, Mullite,Corundum and Andalusite based	Hot Blast Stove, Checker brick
C-HA72MCA	High Alumina fired brick, Mullite,Corundum and Andalusite based	Hot Blast Stove, Checker brick

ISOSTATIC PRODUCTS for CONTINUOUS CASTING MACHINE

Monoblock Stopper

	Chemical Content						Phisical Parameters				
Quality Name	MgO (%)	Al_2O_3 (%)	SiO_2 (%)	ZrO_2(%)	C (%)	Si+SiC (%)	BD (g/cm3)	AP (%)	MOR	CCS (Mpa)	Application
MBS-A50B	-	50,00	16,00	-	29,00	3,00	2,40	18,00	4,00	18,00	MBS body
MBS-A60B	-	60,00	11,00	-	24,00	3,00	2,65	17,00	5,00	21,00	MBS body
MBS-MAH	21,00	63,00	-	-	13,00	3,00	2,70	17,00	6,00	18,00	MBS head
MBS-A80H	-	80,00	-	3,00	10,00	5,00	2,75	17,00	6,00	20,00	MBS head
MBS-Z65SL	-			65,00	21,00	3,00	3,20	17,00	5,00	15,00	MBS Slag line
MBS-A60SL	-	60,00	-	-	22,00	4,00	2,40	18,00	5,00	18,00	MBS Slag line
MBS-A90PP	-	90,00	-	-	-	-	2,40	24,00		-	MBS Porous Part

Submerged Entry Nozzle

	Chemical Content						Phisical Parameters				
Quality Name	MgO (%)	Al_2O_3 (%)	SiO_2 (%)	ZrO_2(%)	C (%)	Si+SiC (%)	BD (g/cm3)	AP (%)	MOR	CCS (Mpa)	Application
SEN-A40B	-	40,00	16,00	-	32,00	2,00	2,00	16,00	6,00	20,00	SEN Body / Preheating
SEN-A50B	-	50,00	11,00	-	28,00	3,00	2,20	19,00	6,00	22,00	SEN Body / cold start
SEN-A60B	-	60,00	12,00	-	22,00	4,50	2,40	15,00	9,00	20,00	SEN Body / cold start
SEN-A80I	-	80,00	-	-	-	3,00	2,70	19,00	10,00	20,00	SEN Inner coating
SEN-AMI	20,00	65,00		-	-	8,00	2,65	19,00	7,00	18,00	SEN Inner coating
SEN-Z50I	-	-	-	50,00	20,00	4,50	2,80	18,00	6,00	22,00	SEN Inner coating
SEN-Z80SL	-	-	-	80,00	12,00	3,00	3,80	14,00	5,00	16,00	SEN Slagline
SEN-Z65SL	-	-	-	65,00	18,00	3,00	3,20	17,00	4,00	15,00	SEN Slagline
SEN-A80H	-	80,00	-	-	15,00	4,50	2,30	18,00	5,00	21,00	SEN head
SEN-M70H	70,00	-	-	-	17,00	4,50	2,30	18,00	5,00	21,00	SEN head

Ladle Shroud

	Chemical Content						Phisical Parameters				
Quality Name	MgO (%)	Al_2O_3 (%)	SiO_2 (%)	ZrO_2(%)	C (%)	Si+SiC (%)	BD (g/cm3)	AP (%)	MOR	CCS (Mpa)	Application
SHR-A40B	-	40,00	15,00	-	30,00	2,00	2,00	16,00	6,00	20,00	SEN Body / Preheating
SHR-A50B	-	50,00	11,00	-	26,00	3,00	2,20	19,00	6,00	20,00	SEN Body / cold start
SHR-A60B	-	60,00	10,00	-	20,00	3,00	2,30	15,00	7,00	22,00	SEN Body / cold start
SHR-A65I	-	65,00		-	20,00	3,00	2,40	16,00	-	18,00	SHR Inner coating
SHR-Z75SL	-	-	-	75	12,00	3,00	3,50	16,00	5,00	16,00	SHR Slagline
SHR-Z55SL	-	-	-	55	22,00	4,50	2,80	17,00	4,00	15,00	SHR Slagline
SHR-M60SL	60	-	-	-	20,00	4,00	2,40	18,00	5,00	20,00	SHR Slagline
SHR-A60H	-	58	10,00	-	26,00	4,50	2,30	18,00	5,00	21,00	SHR head

Tundish Nozzle

	Chemical Content						Phisical Parameters				
Quality Name	MgO (%)	Al_2O_3 (%)	SiO_2 (%)	ZrO_2(%)	C (%)	Si+SiC (%)	BD (g/cm3)	AP (%)	MOR	CCS (Mpa)	Application
TN-A55B	-	55,00	11,00	-	27,00	2,00	2,45	15,00	6,00	20,00	Tundish Nozzle Body
TN-A60B	-	61,00	11,00	-	23,00	-	2,50	16,00	7,00	20,00	Tundish Nozzle Body
TN-A65B	-	66,00	11,00	-	20,00	2,00	2,55	16,00	7,00	20,00	Tundish Nozzle Body
TN-MAH	20,00	61,00	8,00	-	11,00	-	2,65	16,00	7,00	22,00	Tundish Nozzle Head

ISOSTATIC PRODUCTS FOR CONTINUOUS CASTING MACHINE

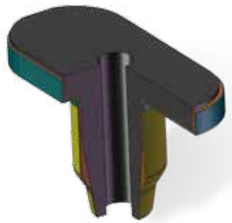
SLIDE GATE PLATES for LADLE and TUNDISH FLOW CONTROL

Sliding Gate Plates								
	Chemical Content				Phisical Parameters			
Quality Name	Al_2O_3 (%)	MgO (%)	ZrO_2 (%)	C (%)	BD (g/cm³)	AP (%)	CCS (Mpa)	Description
SP-A70BU	72,0	-	-	6,0	2,85	8,0	70	Alumina Carbon unfired plate
SP-A80BU	81,0	-	-	4,0	3,05	9,0	90	Alumina Carbon unfired plate
SP-A85BU	86,0	-	-	3,0	3,10	10,0	100	Alumina Carbon unfired plate
SP-A70ZF	70,0	-	5,6	7,5	2,98	8,0	110,00	Alumina Carbon Zirconia fired plate
SP-A75ZF	75,0	-	6,5	7,0	3,05	7,0	115,00	Alumina Carbon Zirconia fired plate
SP-A80ZF	82,5	-	3,5	7,0	3,15	6,0	145,00	Alumina Carbon Zirconia fired plate
SP-A75CF	75,0	-	-	7,0	3,00	10,0	85,00	Alumina Carbon fired plate
SP-A80CF	80,0	-	-	5,0	3,00	9,0	93,00	Alumina Carbon fired plate
SP-A85CF	85,0	-	-	4,0	3,05	8,0	100,00	Alumina Carbon fired plate
SP-M90F	2,5	91,5	-	-	2,95	11,0	80,00	Magnesia fired plate
SP-M80AF	12,0	80,0	-	2,5	2,97	10,0	85,00	Magnesia fired plate
SP-ZR95	-	-	94,0	-	4,80	16,6	140,00	Zirconia Insert

Plates can be provided according to different available mechanical systems

Nozzles								
	Chemical Content				Phisical Parameters			
Quality Name	Al_2O_3 (%)	MgO (%)	ZrO_2 (%)	C (%)	BD (g/cm³)	AP (%)	CCS (Mpa)	Description
IN-A75BC	75,0	-	-	5,0	2,95	12,0	60	Inner Nozzle
IN-A80TC	80,0	-	-	4,0	3,00	13,0	65	Inner Nozzle
IN-A85TC	85,0	-	-	3,0	3,05	14,0	75	Inner Nozzle
IN-M85A	10,0	84,0	-	4,0	2,95	14,0	50	Inner Nozzle
IN-A85TCZ	85,0	-	5,0	5,0	3,10	6,0	80,00	Inner Nozzle
CN-A65BC	65,0	-	-	8,0	2,75	13,0	70,00	Collector Nozzle
CN-A70TCZ	70,0	-	5,0	7,0	2,90	12,0	75,00	Collector Nozzle
CN-A75TC	75,0	-	-	4,0	2,90	12,0	80,00	Collector Nozzle
CN-A80TC	80,0	-	-	3,0	2,95	10,0	85,00	Collector Nozzle
CN-A85TCZ	85,0	-	3,0	3,0	3,06	10,0	90,00	Collector Nozzle
CN-A90CM	92,5	3,6	-	-	3,20	-	90,00	Collector Nozzle

SLIDE GATE PLATES FOR LADLE AND TUNDISH FLOW CONTROL



UNSHAPED REFRACTORY PRODUCTS

Ramming masses

	Chemical Content						Phisical Parameters	
Quality Name	MgO (%)	Al_2O_3 (%)	SiO_2 (%)	CaO (%)	Fe_2O_3 (%)	C (%)	BD (g/cm³)	Size Distribution (mm)
RAM-M83	83,00	0,30	1,50	9,00	5,60	-	2,70	0-6
RAM-M68	68,00	0,50	1,50	26,00	4,00	-	2,70	0-6
RAM-M94V	94,00	-	2,00	-	-	-	2,88	0-3
RAM-M65V	65,00	3,00	21,00	4,00	3,00	-	1,80	0-3
RAM-M80R	80,00	-	2,00	1,50	1,00	8,00	2,20	0-5
RAM-M80D	80,00	-	-	-	-	8,00	2,60	0-5
RAM-A75P	-	75,00	20,00	-	2,50	-	2,40	0-3

Quality Name	Classification	Application
RAM-M83	Magnesia based ramming material. Ceramic bonded.	EAF hearth ramming and repairs to be used without addition of water
RAM-M68	Magnesia based ramming material.	OH/EAF bottom ramming
RAM-M94V	Magnesia based ramming material.	EAF, converter and ladle joints ramming
RAM-M65V	Magnesia and olivine based backfilling material, B2O3 bonded.	EAF, Ladle, converter and degasser backfilling safety material
RAM-M80R	High quality Magnesia based ramming material, carbon bonded.	Converter ramming material for hot reparation
RAM-M80D	High quality Magnesia based ramming material.	Joints ramming material, special quality to be used without addition of water
RAM-A75P	Alumina based plastic ramming material, phosphate bonded	Protective ramming of a flange of steelmaking ladle

Mortars

	Chemical Content				Phisical Parameters		
Old Name	MgO (%)	Al_2O_3 (%)	SiO_2 (%)	Fe_2O_3 (%)	Size Distribution (mm)	Classification	Application
MOR-A51	-	51,00	44,00	1,40	0-0,5	Bauxite and Fireclay based mortar material	Fireclay bricks installation and lining
MOR-A85	-	85,00	7,00	1,10	0-0,5	Alumina based dry mortar mass	Steel-making ladle
MOR-A45	-	45,00	48,00	1,80	0-0,5	Bauxite and Fireclay based mortar material	Fireclay bricks installation and lining
MOR-M80	80,00	-	8,00	1,80	0-0,5	Magnesia based mortar material	Magnesia based bricks installation and lining
MOR-M91	91,00	-	3,00	1,50	0-0,2	Magnesia based mortar material	Magnesia based bricks installation and lining
MOR-M95	95,00	-	1,50	0,90	0-0,5	Magnesia based mortar material	Magnesia based bricks installation and lining

Gunning materials

	Chemical Content					Phisical Parameters	
Quality Name	MgO (%)	Al_2O_3 (%)	SiO_2 (%)	CaO (%)	Fe_2O_3 (%)	BD (g/cm³)	Size Distribution (mm)
GUN-M84C	84,00	0,40	6,00	7,00	1,50	2,30	0-3
GUN-M94V	94,00	0,80	3,00	-	1,00	2,50	0-3
GUN-M65V	65,00	3,00	26,00	3,00	6,00	2,00	0-4

Quality Name	Classification	Application
GUN-M84C	Magnesite based gunning material	Converter trunnions areas, slag line and cone gunning
GUN-M94V	Magnesite based gunning material	Electric Arc Furnace and Converter gunning
GUN-M65V	Magnesite based gunning material	Electric Arc Furnace gunning

Castable materials

	Chemical Content					Phisical Parameters		
Quality Name	MgO (%)	Al_2O_3 (%)	SiO_2 (%)	CaO (%)	Fe_2O_3 (%)	BD (g/cm³)	CCS (Mpa)	Size Distribution (mm)
CAST-A80	-	80,00	11,00	1,35	1,75	2,80	30,00	0-12
CAST-A80S	5,00	80,00	-	-	-	2,85	30,00	0-5
CAST-A90	3,50	90,00	-	-	-	3,05	50,00	0-25
CAST-T94	3,10	93,80	0,10	2,30	0,05	3,08	100,00	0-25
CAST-A40F	-	40,00	55,00	8,00	-	-	15,00	0-5

Quality Name	Classification	Application
CAST-A80	Corundum based self-flow castable material. Steel fiber can be added on request	Long lasting castable safety lining
CAST-A80S	Alumina Magnesia Spinel based castable material	Ladle well block installation
CAST-A90	Corundum based self-flow castable material. Steel fiber can be added on request	Working lining for ladle. Impact areas lining
CAST-T94	Tabular alumina based castable material	Working lining for ladle. Impact areas lining in severe conditions
CAST-A40F	Fireclay castable material. Lightweight	Thermal insulation and safety lining

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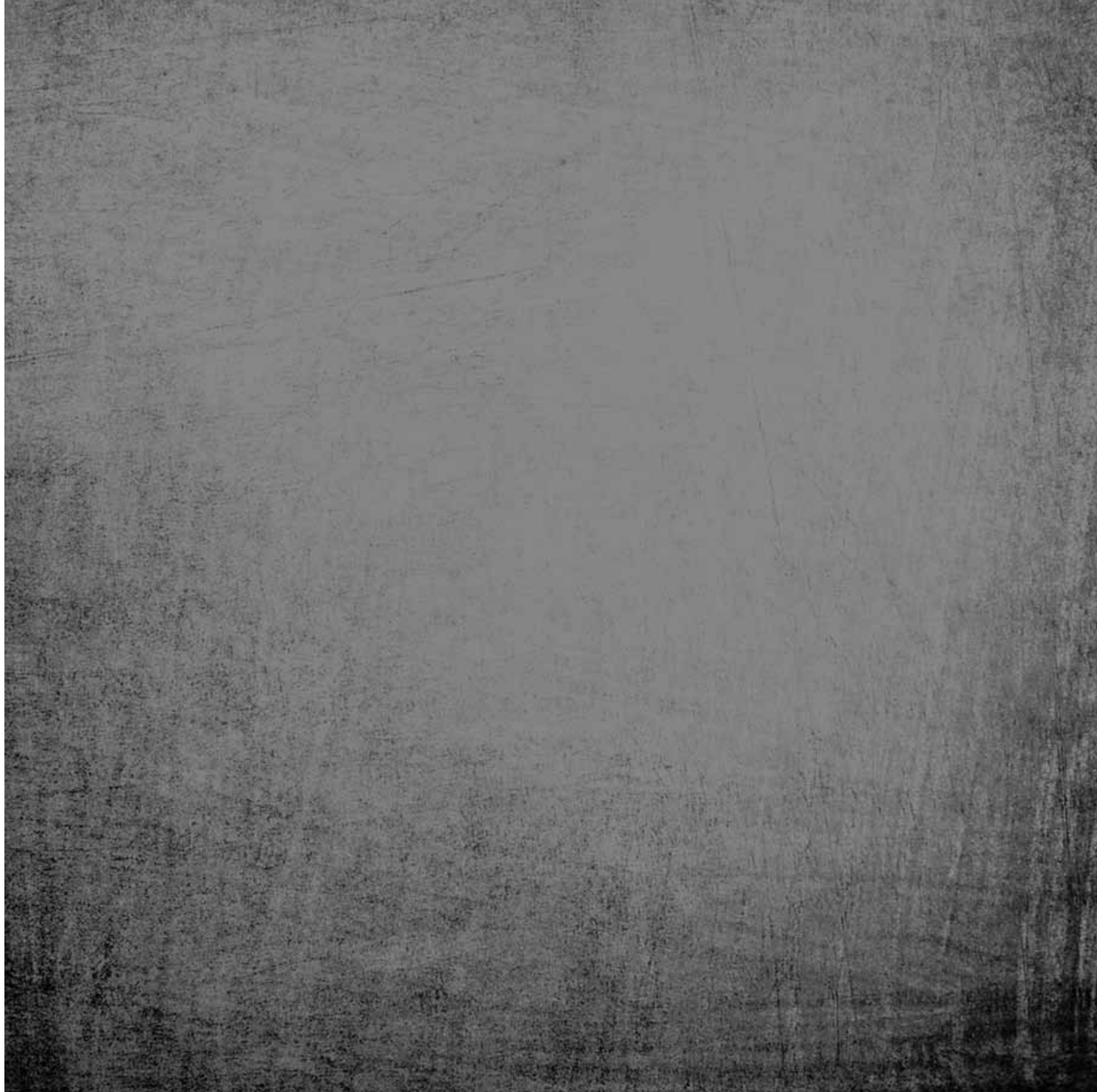

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