Product Catalogue

Horn & Co. Group

A closed circuit, for the benefit of our environment.

Horn & Co. Group

Mineralmahlwerk Westerwald

Horn GmbH & Co. KG

Processing and recovery of spalled refractory materials

Rhebinol GmbH

Hochfeuerfeste Materialien

Mineralmahlwerk Westerwald

Horn GmbH & Co. KG

Sale of Mixes, grains and metallurgical reagents

HuK

Umweltlabor GmbH

Neutral and accredited test laboratory providing analytical solutions

Eisen- & Stein-Gesellschaft mbH

Horn & Co.

Minerals & Metals Recovering

Mireco AB

Horn & Co. Polska Sp. z o.o.

Horn & Co.

Mireco

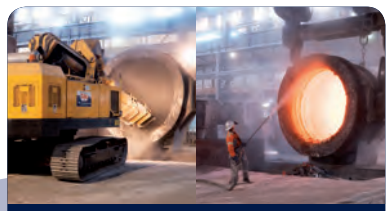
SARL

Horn & Co. Luxembourg

SARL

Recovery and preparation in the steel industry, glass industry, non-ferrous metals industry, lime industry, cement industry and chemical industry

Breakage on-site at the customer's premises by our service companies



Supplier / Customer

Reuse by the customer

Well thought-out solutions and long-standing experience.

The Horn & Co. Group works in the fields of preparation, disposal, control, analysis and sales in the steel industry, glass industry, non-ferrous metals industry, lime industry, cement industry and chemical industry. This functioning network of eight independent companies is committed to realising a closed material circuit for raw material recycling. The Horn & Co. Group works together as precisely as clockwork, closely interlinked, logically structured and coordinated down to the very last detail.

Horn & Co., recycling experts since 1922.

Eisen- & Stein-Gesellschaft mbH
Horn & Co.

Mineralmahlwerk Westerwald
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Reclaimed refractory materials

The history of our reclaimed refractory materials begins with the sorting of broken materials. These materials are manually sorted by highly qualified and experienced personnel at numerous locations using stationary or mobile sorting plants. An innovative sorting process using a laser system is additionally utilised, which increases the yield and enables a more precise classification of the materials in terms of the quality of their grading.

The pre-crushed reclaimed materials can be crushed into the desired grain size.

Materials with a maximum grain size of 1000 mm can be crushed and ground into smaller fragments and standard grain sizes using jaw crushers, impact mills, cone crushers, smooth roll crushers and screening machines.

All mineral pre-products and final products up to around 15 mm can be dried in our drying plant. We usually achieve a residual moisture level of < 0.3 %. The dried products are then packaged in accordance with their relevant properties, their intended use and the customer's requirements. Delivery of the products takes place either in bulk, a silo, big bags, paper sacks or PE bags.

Because our products are reclaimed materials, this may result in some deviations in the analyses. All values given are for orientation purposes and refer to annealed substances.

Further information is available in the inside of the brochure

Basic reclaimed refractory materials

Product	Page	MgO %	CaO %	Fe_2O_3 %	Al_2O_3 %	SiO_2 %	Cr_2O_3 %	ZrO_2 %	C %
Magnesia R 92	10	92.0	2.0	2.0	1.0	2.0	-	0.5	-
Mag-Carbon R 92A2	8	92.0	2.0	1.5	2.0	2.0	-	-	10.0
Mag-Carbon R 90A3	7	90.0	1.6	1.5	3.0	1.0	-	-	4.0
Mag-Carbon R 90A6	8	90.0	1.5	1.0	6.0	1.5	-	-	10.0
Magnesia R 90	9	90.0	2.0	1.5	1.5	3.5	-	-	-
Mag-Carbon R 86A9	7	86.0	2.0	1.5	8.5	2.0	-	-	10.0
Magnesia-Spinell R 85A7	11	85.0	2.0	2.0	7.0	1.5	-	-	-
Magnesia R 82F7	9	82.0	4.0	7.0	2.5	1.8	-	-	-
Magnesia-Zirkon R 75Z9	12	75.0	2.0	1.0	2.0	8.0	-	9.0	-
Magnesia-Forsterit R 68	11	68.0	2.5	9.0	2.0	15.0	2.0	-	-
Magnesia-Chrom R 59Cr18	10	59.0	2.0	12.0	6.0	3.0	18.0	-	-
Forsterit R	6	50.0	1.0	6.0	5.0	35.0	0.5	-	-
Dolomit R	6	35.0	55.0	3.0	3.0	4.0	-	-	-

Non-basic reclaimed refractory materials

Product	Page	Al_2O_3 %	SiO_2 %	CaO %	Fe_2O_3 %	ZrO_2 %	TiO_2 %	MgO %	Na_2O+K_2O %	SiC %	Cr_2O_3 %	C %
Beta-Tonerde R	17	95.0	0.5	-	-	-	-	-	4.0	-	-	-
Korund-Spinell R	19	93.5	0.6	0.3	0.2	-	0.1	5.0	-	-	-	-
Korund R 88	19	88.0	9.0	0.2	0.5	-	0.7	-	0.5	-	-	-
Chromkorundschlacke R	17	86.0	0.2	0.5	0.1	-	-	0.5	2.5	-	10.0	-
Alu-Carbon R 82Z6	13	82.0	7.5	0.6	0.4	6.0	0.2	1.7	0.3	-	-	5.0
Bauxit R 79	16	79.0	14.0	1.0	1.8	-	2.5	0.7	0.4	-	-	-
Alu-Carbon R 77	12	77.0	16.0	0.6	1.0	-	-	2.0	-	-	-	8.5
Bauxit R 76	16	76.0	14.5	0.6	2.8	-	3.3	0.4	0.5	-	-	-
Mullit R	20	75.0	24.0	-	0.3	-	0.2	-	0.5	-	-	-
ASC R 68	14	68.0	6.0	3.0	2.0	-	1.5	1.0	-	10.0	-	-
Andalusit R 61	14	61.0	35.0	0.3	1.3	-	0.6	0.6	0.6	-	-	-
Andalusit R 59	13	59.0	34.0	0.8	2.7	-	0.8	1.0	0.6	-	-	-
AZS R Z30N4	15	50.0	14.0	-	-	30.0	-	0.3	4.0	-	-	-
AZS R Z35	15	48.0	14.0	-	0.3	35.0	-	-	2.3	-	-	-
Schamotte R 44	21	44.0	48.0	-	0.9	-	-	-	4.8	-	-	-
Feuerleichtstein R	18	40.0	51.0	0.8	3.0	-	-	1.0	3.2	-	-	-
Schamotte R 35	20	35.0	54.0	-	2.0	-	2.5	1.5	2.0	-	-	-
SiC R 70	21	4.5	18.5	0.5	0.5	-	0.2	-	1.0	74.0	-	-
Kohlenstoff R	18	-	-	-	-	-	-	-	-	-	-	85.0

All values given are for the purposes of orientation. (Status 05/2012 - current values available at www.horn-co.de)
See pages 41-42 for information on the available grain sizes and the different delivery options.

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Mineralmahlwerk Westerwald
Horn GmbH & Co. KG

Dolomit R

Base raw material

Burnt dolomite bricks

Source

Steel industry

Application examples

Slinging mixes, ramming mixes

MgO %	CaO %	Fe_2O_3 %	Al_2O_3 %	SiO_2 %
35.0	55.0	3.0	3.0	4.0

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See pages 41-42 for information on the available grain sizes and the different delivery options.

Forsterit R

Base raw material

Forsterite bricks

Source

Steel industry

Application examples

Slag pot gunning mixes, new bricks

MgO %	CaO %	Fe_2O_3 %	Al_2O_3 %	SiO_2 %	Cr_2O_3 %
50.0	1.0	6.0	5.0	35.0	0.5

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See pages 41-42 for information on the available grain sizes and the different delivery options.

Mag-Carbon R 86A9

Base raw material

Magnesia carbon bricks with anti-oxidants

Source

Steel industry

Application examples

New bricks, back filling mixes for converters and ladles, gunning and ramming mixes for converters and ladles

MgO %	CaO %	Fe_2O_3 %	Al_2O_3 %	SiO_2 %	C %
86.0	2.0	1.5	8.5	2.0	10.0

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See pages 41-42 for information on the available grain sizes and the different delivery options.

Mag-Carbon R 90A3

Base raw material

Magnesitic slide plates

Source

Steel industry

Application examples

New bricks, back filling mixes for converters and ladles

MgO %	CaO %	Fe_2O_3 %	Al_2O_3 %	SiO_2 %	C %
90.0	1.6	1.5	3.0	1.0	4.0

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See pages 41-42 for information on the available grain sizes and the different delivery options.

Mag-Carbon R 90A6

Base raw material

Magnesia carbon bricks

Source

Steel industry

Application examples

New bricks, back filling mixes, converter repair and maintenance mixes

MgO %	CaO %	Fe_2O_3 %	Al_2O_3 %	SiO_2 %	C %
90.0	1.5	1.0	6.0	1.5	10.0

All values given are for the purposes of orientation. (Status 05/2012 - current values available at www.horn-co.de)

See pages 41-42 for information on the available grain sizes and the different delivery options.

Mag-Carbon R 92A2

Base raw material

Magnesia carbon bricks

Source

Steel industry

Application examples

New bricks

MgO %	CaO %	Fe_2O_3 %	Al_2O_3 %	SiO_2 %	C %
92.0	2.0	1.5	2,0	2.0	10.0

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See pages 41-42 for information on the available grain sizes and the different delivery options.

Magnesia R 82F7

Base raw material

High-iron magnesite bricks

Source

Steel industry

Application examples

New bricks

MgO %	CaO %	Fe_2O_3 %	Al_2O_3 %	SiO_2 %
82.0	4.0	7.0	2.5	1.8

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See pages 41-42 for information on the available grain sizes and the different delivery options.

Magnesia R 90

Base raw material

Magnesite bricks and prefabricated parts

Source

Glass industry, steel industry

Application examples

Back filling mixes, gunning mixes

MgO %	CaO %	Fe_2O_3 %	Al_2O_3 %	SiO_2 %
90.0	2.0	1.5	1.5	3.5

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See pages 41-42 for information on the available grain sizes and the different delivery options.

Magnesia R 92

Base raw material

Carbon-free magnesite bricks

Source

Glass industry

Application examples

Gunning mixes

MgO %	CaO %	Fe_2O_3 %	Al_2O_3 %	SiO_2 %	ZrO_2 %
92.0	2.0	2.0	1.0	2.0	0.5

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See pages 41-42 for information on the available grain sizes and the different delivery options.

Magnesia-Chrom R 59Cr18

Base raw material

Magnesia chrome bricks

Source

Steel, cement and non-ferrous metals industries

Application examples

Repair and maintenance mixes for RH plants, electric arc furnaces, steel ladles, new bricks

MgO %	CaO %	Fe_2O_3 %	Al_2O_3 %	SiO_2 %	Cr_2O_3 %
59.0	2.0	12.0	6.0	3.0	18.0

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See pages 41-42 for information on the available grain sizes and the different delivery options.

Magnesia-Forsterit R 68

Base raw material

Magnesia bricks, forsterite bricks

Source

Heating furnaces

Application examples

Repair and maintenance mixes for RH plants, electric arc furnaces, steel ladles and converters, mortars, gunning and slurry mixes for tundishes, new bricks

MgO %	CaO %	Fe_2O_3 %	Al_2O_3 %	SiO_2 %	Cr_2O_3 %
68.0	2.5	9.0	2.0	15.0	2.0

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See pages 41-42 for information on the available grain sizes and the different delivery options.

Magnesia-Spinell R 85A7

Base raw material

Magnesia spinel bricks

Source

Cement industry

Application examples

Gunning mixes for the cement, lime and non-ferrous metals industries

MgO %	CaO %	Fe_2O_3 %	Al_2O_3 %	SiO_2 %
85.0	2.0	2.0	7.0	1.5

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See pages 41-42 for information on the available grain sizes and the different delivery options.

Magnesia-Zirkon R 75Z9

Base raw material

Magnesia zircon bricks

Source

Glass industry

Application examples

Back filling mixes

MgO %	CaO %	Fe_2O_3 %	Al_2O_3 %	SiO_2 %	ZrO_2 %
75.0	2.0	1.0	2.0	8.0	9.0

All values given are for the purposes of orientation. (Status 05/2012 - current values available at www.horn-co.de)

See pages 41-42 for information on the available grain sizes and the different delivery options.

Alu-Carbon R 77

Base raw material

Carbon-based high alumina products

Source

Steel industry

Application examples

New bricks, tap hole mixes, back filling mixes

Al_2O_3 %	SiO_2 %	CaO %	Fe_2O_3 %	MgO %	C %
77.0	16.0	0.6	1.0	2.0	8.5

All values given are for the purposes of orientation. (Status 05/2012 - current values available at www.horn-co.de)

See pages 41-42 for information on the available grain sizes and the different delivery options.

Alu-Carbon R 82Z6

Base raw material

Slide plates

Source

Steel industry

Application examples

Gunning and casting mixes for blast furnace runners, foundries, ladle rims and core covers

Al_2O_3 %	SiO_2 %	CaO %	Fe_2O_3 %	ZrO_2 %	TiO_2 %	MgO %	Na_2O+K_2O %	C %
82.0	7.5	0.6	0.4	6.0	0.2	1.7	0.3	5.0

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See pages 41-42 for information on the available grain sizes and the different delivery options.

Andalusit R 59

Base raw material

Andalusite bricks

Source

Steel industry

Application examples

Refractory concrete, ramming mixes, mortars

Al_2O_3 %	SiO_2 %	CaO %	Fe_2O_3 %	TiO_2 %	MgO %	Na_2O+K_2O %
59.0	34.0	0.8	2.7	0.8	1.0	0.6

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See pages 41-42 for information on the available grain sizes and the different delivery options.

Andalusit R 61

Base raw material

Andalusite bricks

Source

Steel industry

Application examples

New bricks, refractory concrete, ramming mixes, mortars

Al_2O_3 %	SiO_2 %	CaO %	Fe_2O_3 %	TiO_2 %	MgO %	Na_2O+K_2O %
61.0	35.0	0.3	1.3	0.6	0.6	0.6

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See pages 41-42 for information on the available grain sizes and the different delivery options.

ASC R 68

Base raw material

High alumina bricks containing SiC

Source

Steel industry

Application examples

Gunning, casting and ramming mixes for blast furnace runners

Al_2O_3 %	SiO_2 %	CaO %	Fe_2O_3 %	TiO_2 %	MgO %	SiC %
68.0	6.0	3.0	2.0	1.5	1.0	10.0

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See pages 41-42 for information on the available grain sizes and the different delivery options.

AZS R Z30N4

Base raw material

Alumina-Zirconia-Silica bricks

Source

Glass industry

Application examples

Gunning mixes for the cement industry

Al_2O_3 %	SiO_2 %	ZrO_2 %	MgO %	Na_2O %
50.0	14.0	30.0	0.3	4.0

All values given are for the purposes of orientation. (Status 05/2012 - current values available at www.horn-co.de)

See pages 41-42 for information on the available grain sizes and the different delivery options.

AZS R Z35

Base raw material

ZAC fragments

Source

Glass industry

Application examples

Gunning mixes, castables (abrasion resistant)

Al_2O_3 %	SiO_2 %	Fe_2O_3 %	ZrO_2 %	Na_2O+K_2O %
48.0	14.0	0.3	35.0	2.3

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See pages 41-42 for information on the available grain sizes and the different delivery options.

Bauxit R 76

Base raw material

Bauxite bricks

Source

Steel industry (pig iron)

Application examples

Concrete or ramming mixes for different applications, back filling mixes

Al_2O_3 %	SiO_2 %	CaO %	Fe_2O_3 %	TiO_2 %	MgO %	Na_2O+K_2O %
76.0	14.5	0.6	2.8	3.3	0.4	0.5

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See pages 41-42 for information on the available grain sizes and the different delivery options.

Bauxit R 79

Base raw material

Bauxite bricks

Source

Steel industry

Application examples

New bricks, back filling mixes for steel ladles, patching mixes for tundish permanent lining, gunning, repair and maintenance mixes for the steel, cement and lime industries

Al_2O_3 %	SiO_2 %	CaO %	Fe_2O_3 %	TiO_2 %	MgO %	Na_2O+K_2O %
79.0	14.0	1.0	1.8	2.5	0.7	0.4

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See pages 41-42 for information on the available grain sizes and the different delivery options.

Beta-Tonerde R

Base raw material

Fused cast alumina

Source

Glass industry

Application examples

Refractory concretes

Al_2O_3 %	SiO_2 %	Na_2O+K_2O %
95.0	0.5	4.0

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See pages 41-42 for information on the available grain sizes and the different delivery options.

Chromkorundschlacke R

Base raw material

Chrome corundum slag

Source

Manufacture of metallic chrome

Application examples

Casting mixes for blast furnace runners

Al_2O_3 %	Cr_2O_3 %	SiO_2 %	CaO %	Fe_2O_3 %	MgO %	Na_2O+K_2O %
86.0	10.0	0.2	0.5	0.1	0.5	2.5

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See pages 41-42 for information on the available grain sizes and the different delivery options.

Feuerleichtstein R

Base raw material

Insulating refractory bricks

Source

Glass industry, steel industry

Application examples

New bricks, light weigth insulating refractory mixes

Al_2O_3 %	SiO_2 %	CaO %	Fe_2O_3 %	MgO %	Na_2O+K_2O %
40.0	51.0	0.8	3.0	1.0	3.2

All values given are for the purposes of orientation. (Status 05/2012 - current values available at www.horn-co.de)

See pages 41-42 for information on the available grain sizes and the different delivery options.

Kohlenstoff R

Base raw material

Carbon bricks

Source

Steel industry

Application examples

Tap hole mixes, carburizing agents

Carbon content

85.0 %

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See pages 41-42 for information on the available grain sizes and the different delivery options.

Korund R 88

Base raw material

Ceramic bonded grinding wheels

Source

Metalworking industry

Application examples

New bricks

Al_2O_3 %	SiO_2 %	CaO %	Fe_2O_3 %	TiO_2 %	Na_2O+K_2O %
88.0	9.0	0.2	0.5	0.7	0.5

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See pages 41-42 for information on the available grain sizes and the different delivery options.

Korund-Spinell R

Base raw material

Corundum spinel bricks

Source

Steel industry

Application examples

Refractory concretes

Al_2O_3 %	SiO_2 %	CaO %	Fe_2O_3 %	TiO_2 %	MgO %
93.5	0.6	0.3	0.2	0.1	5.0

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See pages 41-42 for information on the available grain sizes and the different delivery options.

Mullit R

Base raw material

Mullite bricks

Source

Glass industry

Application examples

New bricks

Al_2O_3 %	SiO_2 %	Fe_2O_3 %	TiO_2 %	Na_2O+K_2O %
75.0	24.0	0.3	0.2	0.5

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See pages 41-42 for information on the available grain sizes and the different delivery options.

Schamotte R 35

Base raw material

Fireclay bricks

Source

Steel, cement, glass and non-ferrous metals industries

Application examples

New bricks, refractory concretes

Al_2O_3 %	SiO_2 %	Fe_2O_3 %	TiO_2 %	MgO %	K_2O %
35.0	54.0	2.0	2.5	1.5	2.0

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See pages 41-42 for information on the available grain sizes and the different delivery options.

Schamotte R 44

Base raw material

Insulating porcelain

Source

Insulators

Application examples

Refractory concretes (also CO-resistant)

Al_2O_3 %	SiO_2 %	Fe_2O_3 %	K_2O %
44.0	48.0	0.9	4.8

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See pages 41-42 for information on the available grain sizes and the different delivery options.

SiC R 70

Base raw material

SiC bricks/components

Source

Ferrous and non-ferrous metals industries, metalworking industry and ceramics industry

Application examples

Casting and gunning mixes for blast furnace runners, foundries, tap hole mixes

SiC %	Al_2O_3 %	SiO_2 %	CaO %	Fe_2O_3 %	Na_2O+K_2O %	TiO_2 %
74.0	4.5	18.5	0.5	0.5	1.0	0.2

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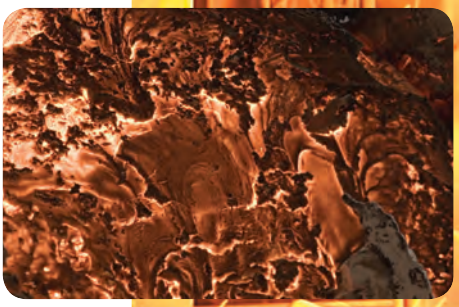
See pages 41-42 for information on the available grain sizes and the different delivery options.

Metallurgical reagents

Carefully prepared and reclaimed refractory materials, combined with standard commercial primary raw materials, form the basis for a broad spectrum of metallurgical reagents.

They influence the formation of slag, the liquefaction of slag and the composition of slag in all areas of pig iron and steel manufacturing.

In consultation with consumers, these products are designed to provide a sufficient level of availability and a high-quality composition. This involves taking into account the diverse range of requirements set by the customer in terms of their economic and cost-effective utilisation but also encompasses aspects dealing with the recovery and environmental compatibility of the slag. We are continuously opening up new sources of raw materials and areas of application for the benefit of our customers.



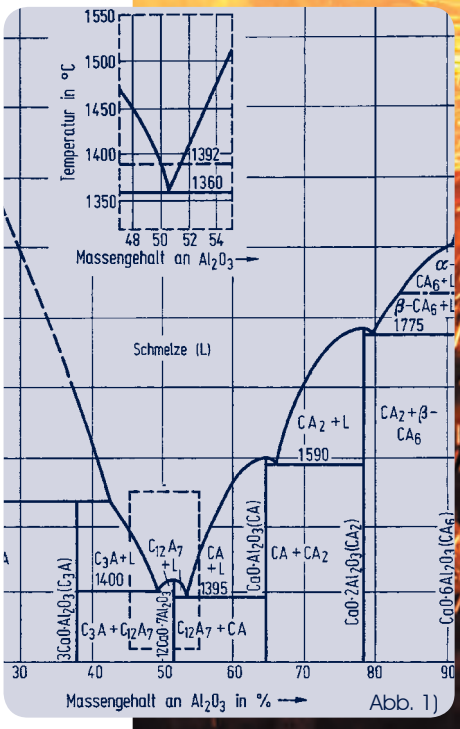


Fig. 1) Source: "Metallurgy in Steel Manufacturing" from Franz Oeters, Springer Publishing House, Berlin (1989)

Mineralmahlwerk Westerwald
Horn GmbH & Co. KG

MgO 55

Base raw material

Magnesia and dolomite bricks

Application examples

Slag conditioning

MgO %	CaO %	Fe_2O_3 %	Al_2O_3 %	SiO_2 %
55.0	20.0	5.0	10.0	5.0

(Status 05/2012 - current values available at www.horn-co.de) See page 42 for information on the different delivery options available.

MgO 75

Base raw material

Reclaimed magnesite

Application examples

Slag conditioning

MgO %	CaO %	Fe_2O_3 %	Al_2O_3 %	SiO_2 %	C %
75.0	6.0	4.0	5.0	6.0	7.0

(Status 05/2012 - current values available at www.horn-co.de) See page 42 for information on the different delivery options available.

MgO 80

Base raw material

Magnesite products

Application examples

Grainy refractory raw mixes, slag conditioning

MgO %	CaO %	Fe_2O_3 %	Al_2O_3 %	SiO_2 %	C %
80.0	4.0	3.0	3.5	6.0	8.0

(Status 05/2012 - current values available at www.horn-co.de) See page 42 for information on the different delivery options available.

Rhecal 10

Base raw material

Mixed lime dolomite fluorspar

Application examples

Formation of slag

MgO %	CaO %	Fe_2O_3 %	Al_2O_3 %	SiO_2 %	CaF_2 %
5.0	15.0	1.5	55.0	10.0	10.0

(Status 05/2012 - current values available at www.horn-co.de) See page 42 for information on the different delivery options available.

TE 80

Base raw material

Reclaimed alumina

Application examples

Slag fluxing agent

Al_2O_3 %	CaO %	Fe_2O_3 %	MgO %	SiO_2 %	TiO_2 %
78.0	2.0	2.5	3.0	11.0	2.0

(Status 05/2012 - current values available at www.horn-co.de) See page 42 for information on the different delivery options available.

TE 85

Base raw material

Reclaimed alumina

Application examples

Formation of slag, secondary metallurgy

Al_2O_3 %	Fe_2O_3 %	MgO %	SiO_2 %	TiO_2 %	C %
85.0	0.7	1.4	8.8	2.0	4.0

(Status 05/2012 - current values available at www.horn-co.de) See page 42 for information on the different delivery options available.

TE 90

Base raw material

Reclaimed alumina

Application examples

Secondary metallurgy, formation of slag

Al_2O_3 %	CaO %	Fe_2O_3 %	MgO %	SiO_2 %	C %
90.0	2.3	0.8	4.0	1.8	< 0.2

(Status 05/2012 - current values available at www.horn-co.de) See page 42 for information on the different delivery options available.

Rhecal 60

Base raw material

Mix of lime an reclaimed alumina

Application examples

Synthetic slag

Al_2O_3 %	CaO %	Fe_2O_3 %	MgO %	SiO_2 %	Cr_2O_3 %
61.0	34.0	0.2	0.5	0.5	3.5

(Status 05/2012 - current values available at www.horn-co.de) See page 42 for information on the different delivery options available.

Rhecal A75

Base raw material

Pre-melted slag

Application examples

Synthetic slag

Al_2O_3 %	CaO %	Fe_2O_3 %	MgO %	SiO_2 %	Cr_2O_3 %
75.0	18.0	0.1	0.4	0.4	4.0

(Status 05/2012 - current values available at www.horn-co.de) See page 42 for information on the different delivery options available.

Rhecal A58M29S6

Base raw material

Reclaimed alumina and magnesia

Application examples

Slag fluxing agent, slag conditioning

MgO %	CaO %	Fe_2O_3 %	Al_2O_3 %	SiO_2 %
29.0	1.5	1.5	58.0	6.0

(Status 05/2012 - current values available at www.horn-co.de) See page 42 for information on the different delivery options available.

Rhecal 40

Base raw material

Pre-melted slag

Application examples

Synthetic slag

Al_2O_3 %	CaO %	CaF_2 %	Fe_2O_3 %	MgO %	SiO_2 %
20.0	30.0	40.0	0.5	3.0	5.0

(Status 05/2012 - current values available at www.horn-co.de) See page 42 for information on the different delivery options available.

Mixes

Depending on the base raw materials used, the production of our Mixes is carried out in two plants on separate production lines.

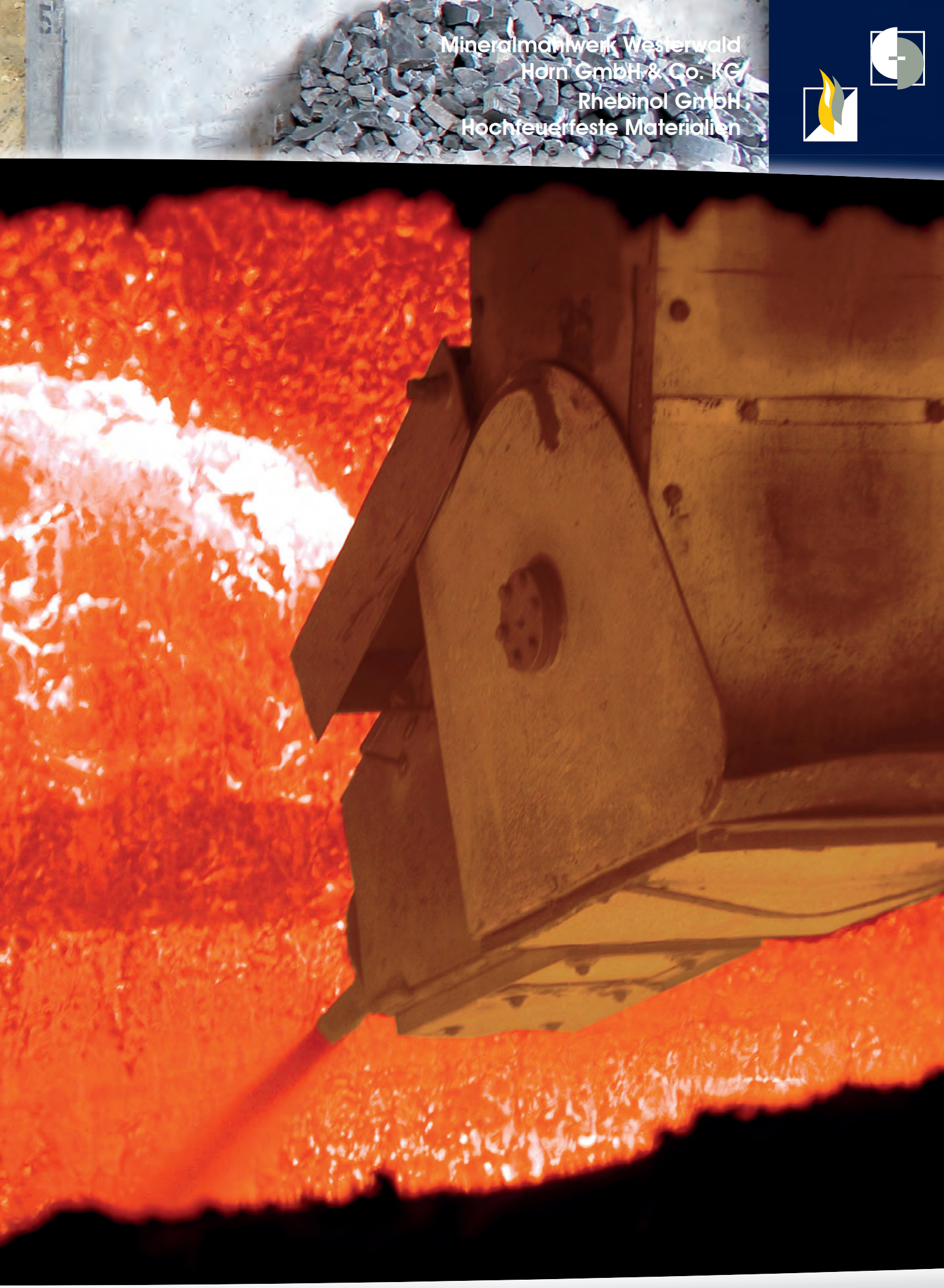
We process standard commercial virgin magnesite and alumina, as well as specially prepared grains of basic and alumina-based reclaimed refractories. The design of our products, such as those factors dealing with the grain structure and bonding system, is carried out in close cooperation with the relevant user.

The use and the proportion of alumina-based and basic reclaimed refractories added to our products are primarily based on the relevant requirement profile and are coordinated with our customers in each individual case. Therefore, our range of products includes high-quality compounds based on alumina, bauxite and sintered magnesite, as well as variants that are partially or totally produced using alternative raw materials.

This guarantees the flexibility and optimised nature of the product to a large degree for the benefit of the customer.

The products listed on the following pages only represent a selection of our total product range.

Mineralmahlwerk Westerwald
Horn GmbH & Co. KG
Rhebinol GmbH
Hochfeuerfeste Materialien



Gunning and slinging mixes

Rhemagun MA-IV CS

Magnesite-based

Application

Electric arc furnaces, steel casting ladles, tundish, slag pots, non-ferrous metals industry

Application temperature

> 1600 °C

	Bonding	MgO %	SiO_2 %	CaO %	Cr_2O_3 %	Fe_2O_3 %	Al_2O_3 %	Application examples
Rhemagun MA-IV CS	chemical	92.0	3.5	2.0	1.5	1.0	0.5	Electric arc furnaces, non-ferrous metals industry
Rhemagun VN-S 90/95	chemical	89.0	4.0	1.8	-	1.3	1.0	Electric arc furnaces
Rhemagun MA-IV 90/95	chemical	86.0	7.0	2.0	-	1.0	2.0	Electric arc furnaces
Schleudermasse M	ceramic	85.0	4.0	2.0	-	4.5	2.0	Electric arc furnaces
Schleudermasse MCR	ceramic	68.0	7.0	1.0	9.0	12.0	3.0	Electric arc furnaces
Rhemagun TSWK	chemical	67.0	20.0	3.0	-	5.0	4.0	Tundish, slag pots
Rhemagun C4	inorganic chemical	63.0	5.5	2.5	13.0	9.0	5.0	Steel ladles

(Status 05/2012 - current values available at www.horn-co.de) See page 42 for information on the different delivery options available.

Rhenit SP-CH

Alumina-based

Application

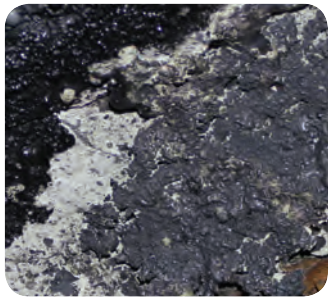
Ladle covers, drying chambers, slag chambers, ladle plates, casting pits, splash guards, heat guards

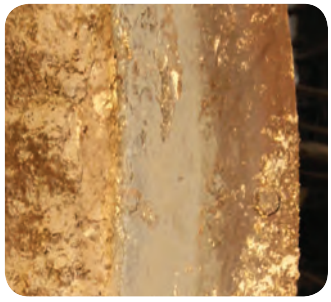
Application temperature

1000 °C - 1650 °C

	Bonding	Al_2O_3 %	SiO_2 %	CaO %	Fe_2O_3 %	TiO_2 %	Application examples
Rhenit SP 87 L	hydraulic ceramic	87.0	4.0	7.0	0.4	0.8	Covers e.g. VOD plants
Rhenit ISO 78	hydraulic chemical	78.0	9.0	6.0	2.0	3.5	Drying chambers, general applications
Rhenit SP-KM	hydraulic	77.0	8.0	9.0	1.5	3.0	Slag chambers
Rhenit SP-CH	hydraulic	72.0	15.0	6.5	1.7	2.5	Ladle plates, ladle covers
Rhenit SP 47 ISO	hydraulic	47.0	40.0	9.0	3.0	-	Casting pits, slag chambers
Rhenit SP L10	hydraulic	37.0	48.0	8.5	3.0	-	Splash guards, heat guards

(Status 05/2012 - current values available at www.horn-co.de) See page 42 for information on the different delivery options available.





Refractory concretes

Rhenit TK4

Vibration mixes

Application

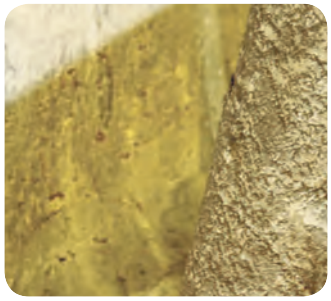
Pocket bricks, rinsers, tilting runners, tundish permanent lining, casting ladles, slag chamber walls, prefabricated parts, ladle covers

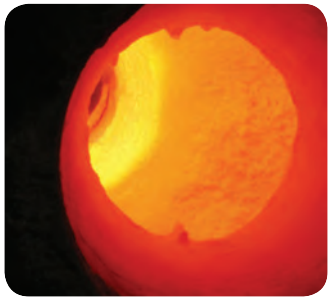
Application temperature

1650 °C - 1750 °C

	Bonding	Al_2O_3 %	SiO_2 %	CaO %	Fe_2O_3 %	TiO_2 %	Application examples
Rhenit 95 M	hydraulic	96.8	0.1	2.5	-	-	Pocket bricks, rinsers
Rhenit A0/G	hydraulic	84.0	7.0	3.5	1.3	3.1	Non-ferrous metals industry, tilting runners
Rhenit TK4	hydraulic	83.0	10.0	1.8	1.3	2.9	Tundish permanent lining
Rhenit 80 G	hydraulic	80.0	13.7	1.5	1.1	2.5	Casting ladles (spout or rim)
Rhenit KBS	hydraulic	80.0	9.5	5.0	1.3	2.8	Slag chamber walls, prefabricated parts
Rhenit 76 N	hydraulic	76.0	18.0	1.5	1.5	2.5	VOD covers, ladle covers

(Status 05/2012 - current values available at www.horn-co.de) See page 42 for information on the different delivery options available.





Rhenit 70 CN

Casting mixes

Application

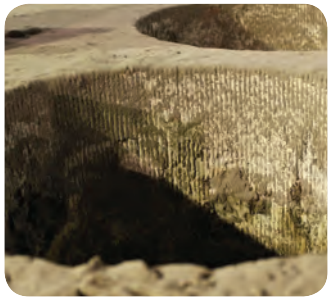
Electric arc furnaces, core covers, VOD covers, slag chambers, floor work surfaces, crucible lids, tub covers

Application temperature

1400 C° - 1700 °C

	Bonding	Al_2O_3 %	SiO_2 %	CaO %	Fe_2O_3 %	TiO_2 %	Application examples
Rhenit 70 CN	hydraulic	84.0	6.0	5.0	1.5	3.0	Electric arc furnaces, core covers, VOD covers
Rhenit CK 14	hydraulic	76.0	9.0	5.5	1.0	0.8	Slag chambers, floor work surfaces
Rhenit 43 RW	hydraulic	44.0	44.0	5.5	1.5	-	Crucible and tub covers

(Status 05/2012 - current values available at www.horn-co.de) See page 42 for information on the different delivery options available.



Repair mixes

Rhemag CPS

Application

Electric arc furnaces, ladle lips, tapping spouts, tundish permanent lining

Application temperature

> 1550 °C

	Bonding	MgO %	Al_2O_3 %	SiO_2 %	CaO %	Fe_2O_3 %	Application examples
Rhema GS4	inorganic chemical	92.5	1.6	3.0	1.5	1.0	Electric arc furnace linings, non-ferrous metals industry
Rhemag CPS*	inorganic chemical	90.0	0.9	2.4	1.6	1.0	Electric arc furnace linings, ladle lips, tapping spouts
Rhenit 166	hydraulic	-	70.0	20.0	2.3	2.5	Tundish permanent lining

* Cr_2O_3 = 1.8 %

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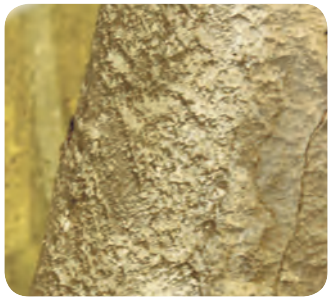
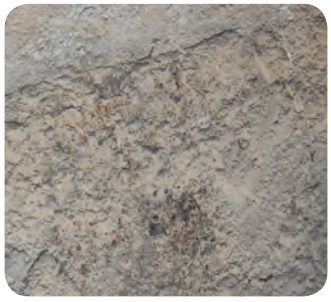
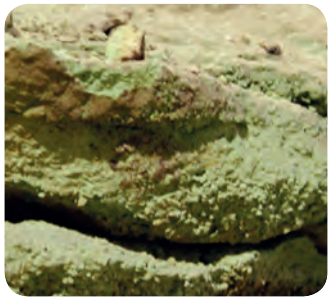






Refractory mortar

Rhemabond 82

Application

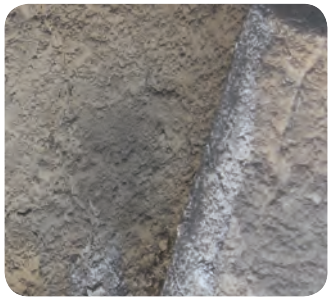
Tundish, slide cassettes, ladle permanent lining

Application temperature

> 1600 °C

	Bonding	MgO %	Al_2O_3 %	SiO_2 %	CaO %	Fe_2O_3 %	Application examples
Rhenit TM 97	chemical	-	93.7	5.3	0.1	0.2	Tundish repairs
Rhemabond 82	chemical	88.0	2.0	5.0	2.0	1.5	Slide cassettes
Rhebond 74 H	hydraulic	-	77.0	13.0	3.5	1.1	Ladle permanent lining
Rhebond 80 R	ceramic	-	73.0	19.8	0.9	1.9	Ladle permanent lining

(Status 05/2012 - current values available at www.horn-co.de) See page 42 for information on the different delivery options available.



Back filling mixes

Rhenit B 8

Application

Ladles, steel casting ladles, tundish, converters, electric arc furnaces

Application temperature

> 1600 °C

	Bonding	MgO %	Al_2O_3 %	SiO_2 %	CaO %	Fe_2O_3 %	Application examples
Rhemasit M 90/3	organic chemical	90.0	1.5	3.5	2.0	1.5	Ladles, tundish
Rhemasit M 90 B	chemical	90.0	1.0	3.6	1.8	1.2	Ladles
Rhemadur TN4	inorganic chemical	87.0	1.0	4.5	2.0	2.0	Converters
Rhemasit GX	organic chemical	85.0	1.0	5.0	2.0	1.5	Ladles
Rhemadur GT	organic	84.0	2.5	5.0	5.0	3.5	Converters, ladles, electric arc furnaces
Rhemasit M 90/3 CSZ	inorganic chemical	80.0	3.0	4.5	3.0	2.0	Ladles
Rhenit B 8	chemical ceramic	-	85.0	7.5	1.0	1.5	Ladles

(Status 05/2012 - current values available at www.horn-co.de) See page 42 for information on the different delivery options available.

Ramming mixes

Rhemadur GT

Application

Converters, ladles, tundish, pre-heater electric arc furnaces, pig iron ladles, ladle rims

Application temperature

> 1600 °C

	Bonding	MgO %	Al_2O_3 %	SiO_2 %	CaO %	Fe_2O_3 %	Application examples
Rhemag 95 XH	organic chemical	94.5	0.5	1.4	1.8	1.6	Ladles
Rhedo 803	ceramic	44.0	3.5	5.0	44.0	3.0	Converters, ladles
Vorwärmermasse	without	> 35.0	4.0	5.0	< 55.0	3.0	Pre-heater electric arc furnaces
Rhenit 85 ST	ceramic	-	86.0	9.0	0.3	1.5	Perforated bricks
Rhenit TSR-PT 85	chemical	-	83.0	7.0	-	1.5	Tundish, ladles
Rhenit 76 ST	ceramic	-	76.0	17.5	0.6	1.7	Pig iron ladles
Rhenit 65 plast	ceramic	-	65.0	30.0	0.4	1.5	Ladle rims

(Status 05/2012 - current values available at www.horn-co.de) See page 42 for information on the different delivery options available.

Grain sizes

Standard grain sizes

0 - 1 mm grain

1 - 3 mm grain

3 - 6 mm grain

6 - 10 mm grain

Special grain sizes

Grain sizes according to customer's requirements

Delivery options

Loose (bulk material)

Silo vehicle

Big bags

Deliverable with sealed seams, with/without outlet

Sacks on palette

Deliverable in paper sacks or PE sacks

Special packaging according to customer's requirements

Deliverable e.g. in crates, cardboard packaging or containers

Index

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Umweltlabor GmbH

Horn & Co. Polska Sp. z o.o.
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