

# Horn & Co. Products GmbH

*A part of Horn & Co. Group*



Refractory products

# Horn & Co.

Group

## Horn & Co.

Industrial Services

### CAPACITY MANAGEMENT

- Consulting and workflow management
- Slag management and clean pit
- Scrap management
- Refractory breakout
- In-house logistics and repair and maintenance service
- Industrial cleaning
- Refractory lining
- Digitalization of business processes
- Disposal of commercial waste and recyclable materials

## Horn & Co.

Analytics

### ANALYTICAL SERVICES

- Service and consulting according to the 4R concept
- Hygiene analysis
- Environmental analysis
- Material analysis

## Horn & Co.

Minerals Recovery

### RECYCLING AND RECOVERY

- CERO WASTE concept
- Collection point management
- Material sorting
- Recycling
- Disposal
- Raw materials for the refractory and ceramic industry
- Raw materials for the iron and steel industry
- Contract manufacturing

## Horn & Co.

Products

### INDIVIDUAL PRODUCT SOLUTIONS

- High-performance refractory products
- Service & Technical customer service
- Commercial business



# Refractory products

Horn & Co.

Products

Made in Europe! This is our commitment. Our refractory products are manufactured exclusively in three plants in Germany and one in Sweden. The product portfolio comprises unshaped basic and non-basic products. We cover a large part of the demand for refractory products in the iron and steel industry as well as the non-ferrous metal and cement industry.

Our products are designed in close cooperation with the customer to achieve the best possible performance for the relevant application conditions. When developing products, our unique know-how is characterized by the use of raw materials that are recovered from the processing of refractory waste.

The use of secondary raw materials allows us to create a sustainable and cost-optimized refractory product supply concept for our customers. This enables us to react particularly flexibly and quickly to the changing requirements of the market.

Together with our customers, we make an important contribution to the conservation of natural resources and environmental protection with these concepts. Only the use of products that contain secondary raw materials can keep the recycling cycle alive and make it future-proof.



# Unshaped refractory products

We use primary and secondary raw materials based on alumina and magnesia in our unshaped products. You can find the right product for every type of application and process, e.g., backfilling, ramming, gunning and plastic mixes as well as castable concretes.

The products are selected in close coordination between the customer and our technically trained sales department that accompanies you from product selection to the successful qualification of the product.



# Outstanding Individuality

What distinguishes us is that we have mastered modern raw material procurement management and the technological diversity of refractory products to a degree that enables our customers to continuously optimize their cost-benefit ratio and redefine technological limits.

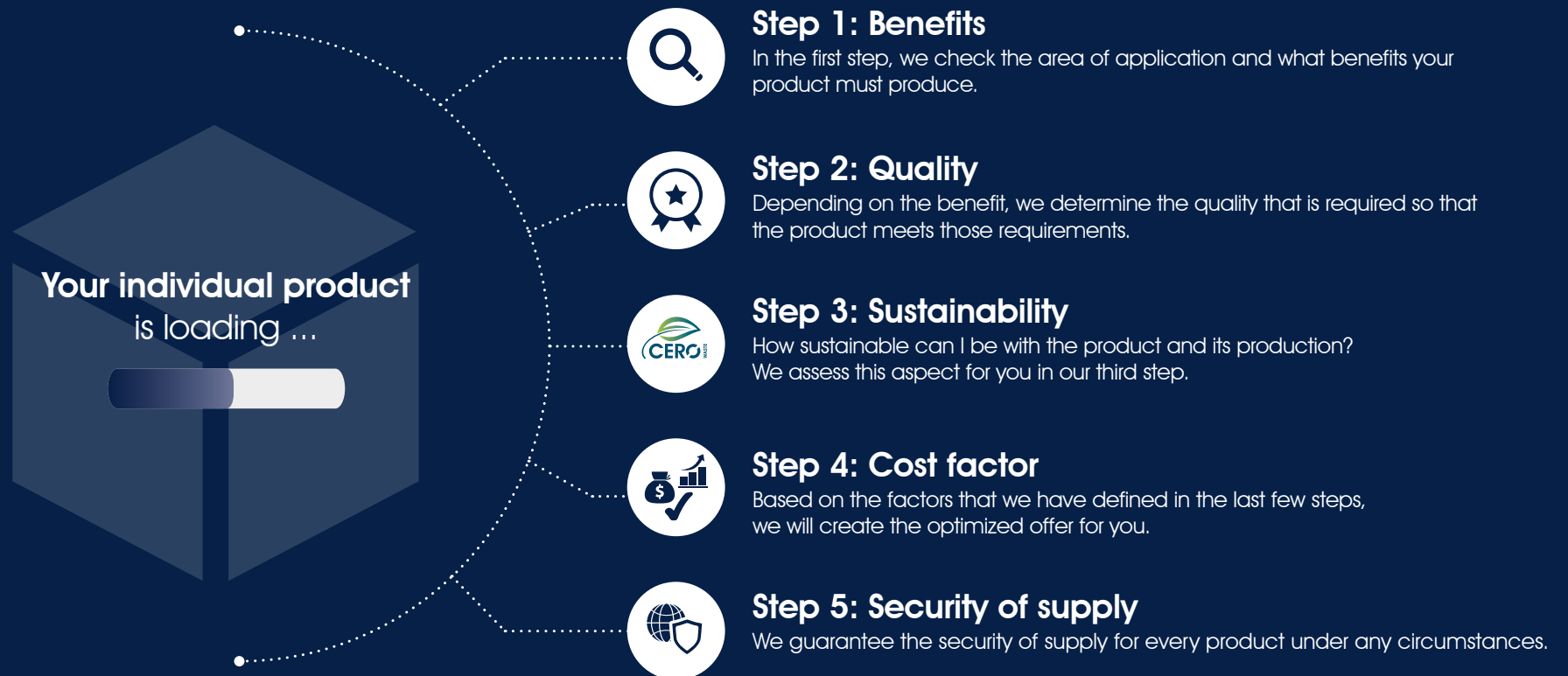
Our products deliver the best performance characteristics for the relevant application conditions.

Our products and raw materials are handled within comparably short routes - coming mainly from Germany – which allows us to create an optimised CO2-footprint – regardless of any interruptions on global supply chains.

Our tight material cycle a) enables a high degree of flexibility in terms of production conditions and product modifications and b) makes an important contribution to resource conservation and environmental protection.

We have decades of market expertise that guarantees continuity and stability in delivery performance.

And above all, we have a pronounced closeness to our customers, which is characterized by production analytics and shapes the ground for all of our refractory products and services.



# Converters

Application example	Bonding	MgO	Al <sub>2</sub> O <sub>3</sub>	SiO <sub>2</sub>	CaO	Fe <sub>2</sub> O <sub>3</sub>	Product
Backfill mix	Organic-chemical	90.0 %	1.0 %	3.5 %	2.0 %	2.5 %	Rhemasit M 90
Backfill mix	Inorganic-chemical	85.0 %	1.5 %	6.0 %	2.5 %	3.5 %	Rhemadur TN4
Ramming mix	Organic	87.0 %	3.5 %	5.0 %	2.5 %	1.5 %	Rhemadur GT
Ramming mix	Organic	90.0 %	1.5 %	3.5 %	2.0 %	2.5 %	Rhema 108
Ramming mix	Organic	91.0 %	2.5 %	2.0 %	2.5 %	1.5 %	Rhemadur

# Pig iron applications

Application example	Bonding	MgO	Al <sub>2</sub> O <sub>3</sub>	SiO <sub>2</sub>	CaO	Fe <sub>2</sub> O <sub>3</sub>	Cr <sub>2</sub> O <sub>3</sub>	TiO <sub>2</sub>	ZrO <sub>2</sub>	Na <sub>2</sub> O + K <sub>2</sub> O	SiC	Product
Pig iron ladle gunning mix	Hydraulic	1.5 %	81.0 %	9.0 %	6.0 %	0.7 %	-	-	-	-	-	Rhenit SP/RP
Ramming mix	Ceramic	-	70.0 %	17.5 %	0.6 %	1.7 %	-	3.4 %	-	0.8 %	-	Rhenit 76 ST
Tap hole mix	Organic	-	62.0 %	30.0 %	-	1.5 %	-	1.0 %	-	-	4.5 %	RecoBlast K
Tap hole mix* 	Organic	-	62.0 %	30.0 %	-	1.5 %	-	1.0 %	-	-	4.5 %	RecoBlast E*

\* The environmentally friendly tap hole mixes developed by Horn & Co. are characterized by their zero-pollutant binding system. By avoiding binders such as tar and phenolic resin that are commonly used in tap hole mixes, no harmful polycyclic hydrocarbons are introduced into the mix. Compared to other commercially available tap hole mixes, our mixes do not require labelling and unpleasant odours are significantly reduced. The use of high-quality secondary raw materials from our own production preserves natural raw material sources and avoids the sometimes complex and energy-intensive processes involved in raw material processing, which also underlines the "green character" of the mixes.

# Electric arc furnaces

## Mixes

Application example	Bonding	MgO	Al <sub>2</sub> O <sub>3</sub>	SiO <sub>2</sub>	CaO	Fe <sub>2</sub> O <sub>3</sub>	Na <sub>2</sub> O	Cr <sub>2</sub> O <sub>3</sub>	TiO <sub>2</sub>	P <sub>2</sub> O <sub>5</sub>	ZrO <sub>2</sub>	Product
Concrete launder	Hydraulic	6.0 %	80.5 %	1.5 %	2.2 %	0.1 %	-	8.0 %	-	-	-	Rhenit 82 CK
Concrete launder / EAF roof	Hydraulic	-	83.0 %	5.0 %	1.6 %	-	-	8.4 %	-	-	-	Rhenit 85 CK
Backfill mix	Organic-chemical	90.0 %	1.0 %	3.5 %	2.0 %	2.5 %	-	-	-	-	-	Rhemasit M 90
Backfill / ramming mix / castable concrete	Inorganic-chemical	89.0 %	-	3.0 %	1.5 %	1.0 %	-	2.0 %	-	2.0 %	-	Rhemag CPS
Medium-cement castable	Hydraulic	-	92.0 %	0.2 %	2.5 %	-	-	3.0 %	-	-	-	Rhenit 92 CR
Medium-cement castable / EAF roof	Hydraulic	-	82.0 %	7.0 %	5.0 %	2.0 %	-	-	3.5 %	-	-	Rhenit 70 CN
Slinging mix	Ceramic	68.0 %	4.0 %	6.5 %	2.0 %	10.0 %	-	13.0 %	-	-	-	Rhema SL MFCR
Patching mix	Inorganic-chemical	85.0 %	2.0 %	5.5 %	2.0 %	2.0 %	-	-	-	-	-	Rhemapatch CSR
Tap maintenance gunning mix	Inorganic-chemical	92.0 %	0.5 %	3.0 %	2.0 %	1.0 %	-	1.5 %	-	-	-	Rhemagun MA IV CS
Wall maintenance gunning mix	Inorganic-chemical	89.0 %	1.0 %	4.0 %	1.8 %	1.3 %	-	-	-	-	-	Rhemagun VN-S 90/95
Gunning mix for maintenance of wall and tap	Inorganic-chemical	87.5 %	1.5 %	6.5 %	2.0 %	1.0 %	-	-	-	-	-	Rhemagun MA-IV 90-95
Preheater mix	Ceramic	60.0 %	8.0 %	6.0 %	20.0 %	7.0 %	-	-	-	-	-	Preheater mix. oiled
Preheater mix	Ceramic	1.5 %	55.0 %	15.0 %	-	0.5 %	-	-	-	-	25.0 %	Preheater mix. alumina

# Steel ladles

## Mixes

Application example	Bonding	MgO	Al <sub>2</sub> O <sub>3</sub>	SiO <sub>2</sub>	CaO	Fe <sub>2</sub> O <sub>3</sub>	Na <sub>2</sub> O	Cr <sub>2</sub> O <sub>3</sub>	TiO <sub>2</sub>	P <sub>2</sub> O <sub>5</sub>	ZrO <sub>2</sub>	Na <sub>2</sub> O + K <sub>2</sub> O	B <sub>2</sub> O <sub>3</sub>	Product
Sealing mix	Ceramic	70.0 %	2.5 %	16.5 %	2.0 %	6.0 %	-	-	-	-	-	-	-	Rhema MF
Backfill and ramming mix	Organic	90.0 %	1.5 %	3.5 %	2.0 %	2.5 %	-	-	-	-	-	-	-	Rhema 108
Backfill / ramming mix / castable concrete	Inorganic-chemical	89.0 %	-	3.0 %	1.5 %	1.0 %	-	2.0 %	-	2.0 %	-	-	-	Rhemag CPS
Backfill mix	Organic-chemical	90.0 %	1.0 %	3.5 %	2.0 %	2.5 %	-	-	-	-	-	-	-	Rhemasit M 90
Backfill mix	Organic	87.0 %	3.5 %	5.0 %	2.5 %	1.5 %	-	-	-	-	-	-	-	Rhemadur GT
Backfill mix	Ceramic	57.0 %	1.0 %	1.5 %	38.5 %	1.0 %	-	-	-	-	-	-	-	Rhedo 803
Backfill mix	Ceramic	90.0 %	1.5 %	3.5 %	2.0 %	2.5 %	-	-	-	-	-	-	-	Rhema 803
Backfill mix	Organic-chemical	89.0 %	1.5 %	3.5 %	2.0 %	2.5 %	-	-	-	-	-	-	-	Rhemasit M 90/3
Backfill mix	Chemical	-	81.0 %	10.0 %	-	2.0 %	-	-	3.5 %	-	-	-	-	Rhenit B90/R3
Low-cement castable	Hydraulic	90.0 %	0.8 %	3.0 %	2.0 %	1.6 %	-	-	-	-	-	-	0.3 %	Rhemasit M 90 C
Low-cement castable	Hydraulic	-	67.0 %	14.0 %	1.4 %	0.3 %	-	-	0.1 %	-	16.0 %	-	-	Rhenit 65 LC AZS
Low-cement castable	Hydraulic	-	96.5 %	0.1 %	2.5 %	-	-	-	-	-	-	-	-	Rhenit 95 M/1
Low-cement castable	Hydraulic	-	80.0 %	13.5 %	2.2 %	1.5 %	-	-	2.9 %	-	-	0.2 %	-	Rhenit 80 G
Purger maintenance dry vibratable mix	Chemical-ceramic	6.0 %	88.0 %	1.0 %	2.5 %	0.6 %	-	-	0.4 %	-	-	-	-	Rhenit 86 AMC
Fireclay mortar	Chemical-ceramic	-	79.0 %	11.0 %	-	1.0 %	5.1 %	-	1.1 %	-	-	-	-	Rhenit B 77
Gunning mix	Chemical	-	56.5 %	34.5 %	0.2 %	1.5 %	-	-	2.0 %	-	-	3.5 %	-	Rhebond 45 C
Gunning mix	Inorganic-chemical	83.5 %	-	3.5 %	2.5 %	6.5 %	-	1.5 %	-	-	-	-	-	Rhemagun MA 85 CH
Ramming, gunning, patching mix and castable concrete	Inorganic-chemical	5.0 %	90.0 %	1.2 %	2.0 %	0.2 %	-	-	-	-	-	-	-	Rhenit SP 92
Ramming mix	Inorganic-chemical	89.0 %	1.5 %	4.0 %	2.0 %	1.5 %	-	-	-	-	-	-	-	Rhema GSR 4/3
Ramming mix	Ceramic	93.0 %	1.1 %	2.5 %	1.5 %	1.5 %	-	-	-	-	-	-	-	Rhemag 95 XH
Ramming mix in lump form	Ceramic	-	81.0 %	13.0 %	0.5 %	2.0 %	-	-	3.0 %	-	-	-	-	Rhenit 85 ST
Ramming mix in slab form	Ceramic	-	69.0 %	27.0 %	0.5 %	1.5 %	-	-	1.5 %	-	-	1.5 %	-	Rhenit 65 plast





# Vacuum systems (VOD / RH)

Application example	Bonding	MgO	Al <sub>2</sub> O <sub>3</sub>	SiO <sub>2</sub>	CaO	Fe <sub>2</sub> O <sub>3</sub>	Cr <sub>2</sub> O <sub>3</sub>	TiO <sub>2</sub>	ZrO <sub>2</sub>	Na <sub>2</sub> O + K <sub>2</sub> O	Product
Low-cement castable	Hydraulic	-	76.0 %	18.0 %	1.1 %	1.2 %	-	2.1 %	-	0.4 %	Rhenit 76 N
Low-cement castable	Hydraulic	6.0 %	80.5 %	1.5 %	2.2 %	0.1 %	8.0 %	-	-	-	Rhenit 82 CK
Medium-cement castable	Hydraulic	-	82.0 %	7.0 %	5.0 %	2.0 %	-	3.5 %	-	-	Rhenit 70 CN
Medium-cement castable	Hydraulic	-	76.0 %	12.0 %	5.5 %	2.0 %	-	3.0 %	-	-	Rhenit 70 G-R
Gunning mix	Hydraulic	-	66.0 %	26.5 %	3.5 %	1.5 %	-	1.0 %	-	-	Rhenit SP 64 LC
Gunning mix	Hydraulic	-	72.0 %	16.0 %	6.0 %	2.5 %	-	2.5 %	-	-	Rhenit 70 SP-R

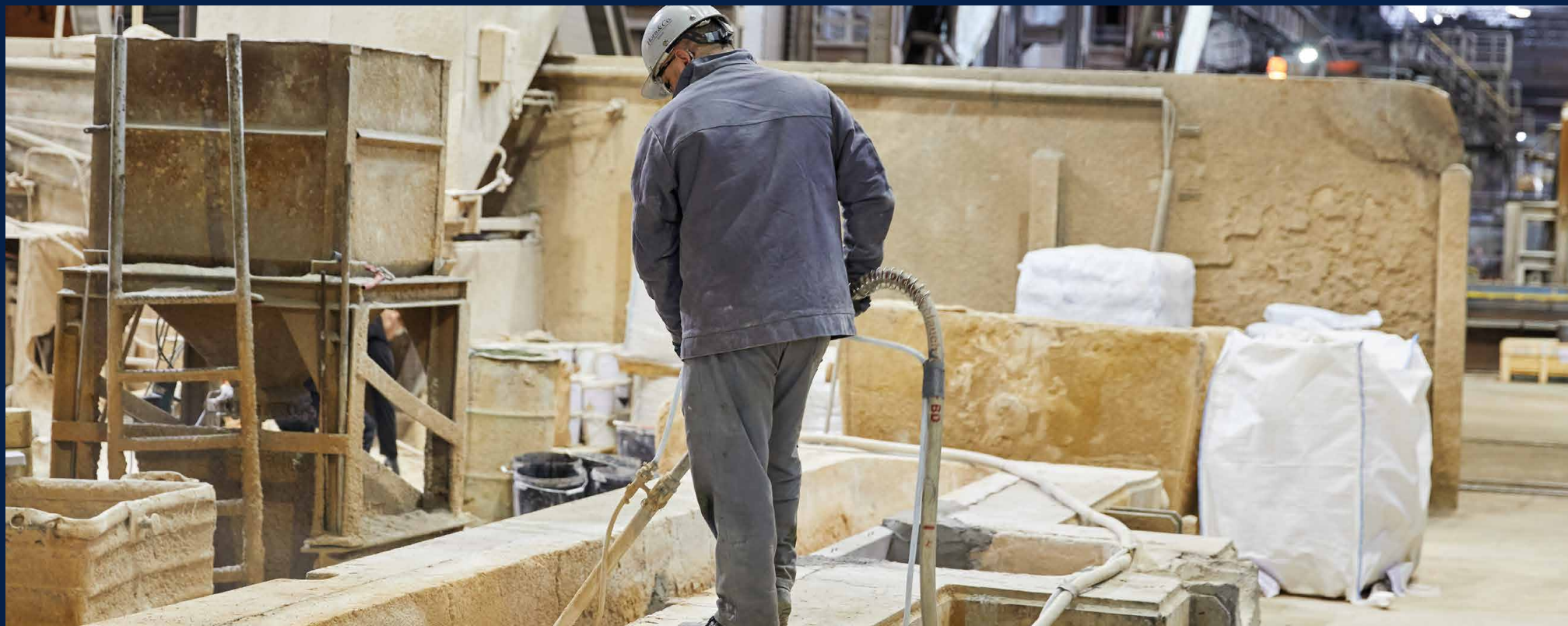
All values given are for orientation.



# Tundishes

Application example	Bonding	MgO	Al <sub>2</sub> O <sub>3</sub>	SiO <sub>2</sub>	CaO	Fe <sub>2</sub> O <sub>3</sub>	TiO <sub>2</sub>	P <sub>2</sub> O <sub>5</sub>	Product
Castable concrete for prefabricated parts	Hydraulic-ceramic	80.0 %	4.0 %	5.0 %	4.5 %	5.4 %	-	-	Rhema 82
Insulating light gunning mix	Chemical	92.0 %	-	3.0 %	2.5 %	0.4 %	-	-	Rhemagun TS/6
Insulating light gunning mix	Chemical	88.0 %	-	5.5 %	3.0 %	2.5 %	-	-	Rhemagun TS LS
Insulating light gunning mix	Chemical	72.0 %	1.5 %	16.0 %	3.0 %	6.0 %	-	-	Rhemagun TSWK
Permanent lining low-cement castable	Hydraulic	-	64.0 %	30.4 %	2.4 %	1.2 %	0.7 %	-	Rhenit 60 LC
Permanent lining low-cement castable	Hydraulic	-	78.0 %	14.5 %	2.0 %	1.5 %	3.0 %	-	Rhenit TK5
Patching mix	Hydraulic	-	73.0 %	19.0 %	2.3 %	2.0 %	3.0 %	-	Rhenit 166
Ramming mix	Chemical	-	82.0 %	10.5 %	-	2.0 %	3.5 %	-	Rhenit TSR-PT 85

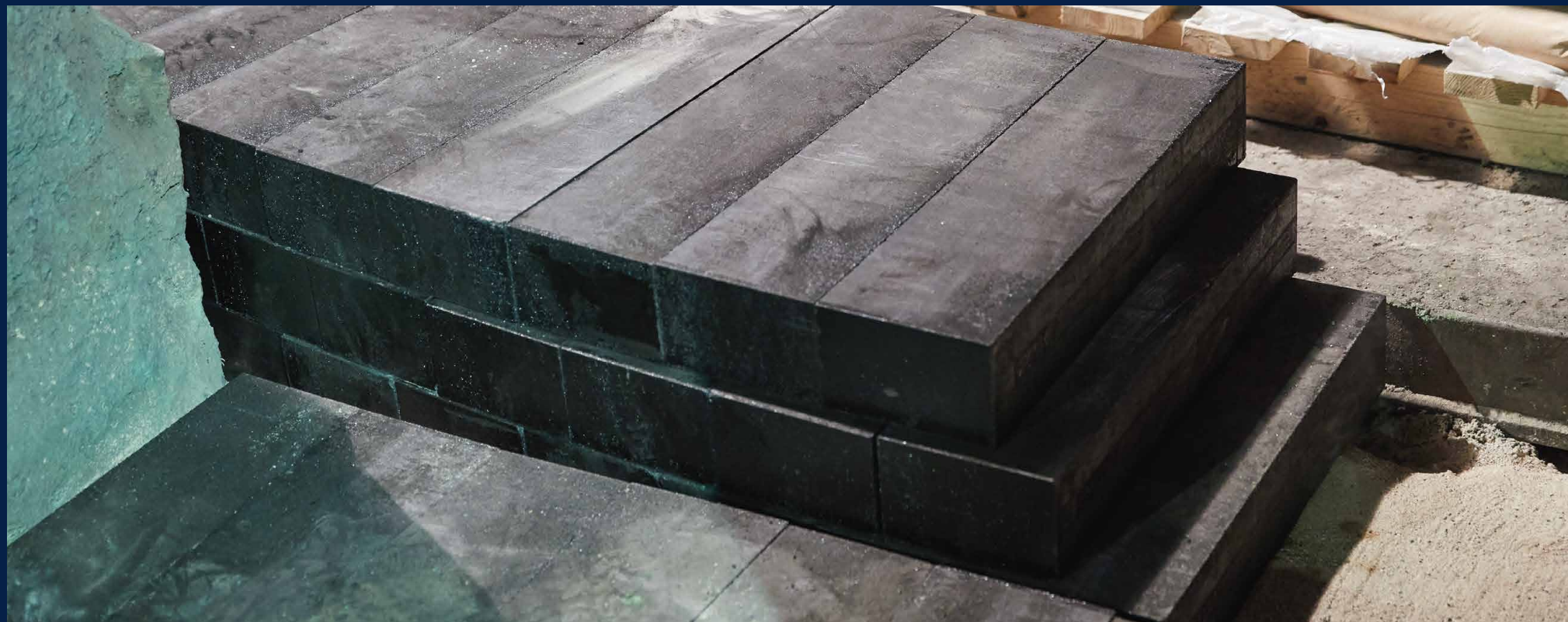
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# Non-ferrous metallurgy

Application example	Bonding	MgO	Al <sub>2</sub> O <sub>3</sub>	SiO <sub>2</sub>	CaO	Fe <sub>2</sub> O <sub>3</sub>	Cr <sub>2</sub> O <sub>3</sub>	TiO <sub>2</sub>	Na <sub>2</sub> O + K <sub>2</sub> O	Product
Low-cement castable	Hydraulic	-	96.5 %	0.1 %	2.5 %	-	-	-	-	Rhenit 95 M/1
Low-cement castable	Hydraulic	-	82.5 %	10.4 %	2.1 %	1.5 %	-	2.8 %	-	Rhenit TK4/M
Medium-cement castable	Hydraulic	-	81.0 %	10.5 %	3.0 %	1.7 %	-	3.2 %	0.3 %	Rhenit AO-G
Patching mix	Hydraulic	-	80.0 %	10.5 %	4.0 %	1.5 %	-	2.0 %	-	Rhenit 166/5M
Furnace maintenance gunning mix	Chemical	90.0 %	1.0 %	3.5 %	2.0 %	1.5 %	1.5 %	-	-	Rhemagun MA IV CSK
Furnace maintenance gunning mix	Inorganic-chemical	92.0 %	0.5 %	3.0 %	2.0 %	1.0 %	1.5 %	-	-	Rhemagun MA IV CS

All values given are for orientation.



# Allrounders

Application example	Bonding	MgO	Al <sub>2</sub> O <sub>3</sub>	SiO <sub>2</sub>	CaO	Fe <sub>2</sub> O <sub>3</sub>	Cr <sub>2</sub> O <sub>3</sub>	TiO <sub>2</sub>	Na <sub>2</sub> O + K <sub>2</sub> O	Product
High-alumina castable	Hydraulic	-	78.0 %	11.4 %	5.3 %	1.6 %	-	3.0 %	0.3 %	Rhenit KBS
Low-cement castable	Hydraulic	-	64.0 %	30.4 %	2.4 %	1.2 %	-	0.7 %	-	Rhenit 60 LC
Medium-cement castable	Hydraulic	-	73.0 %	12.5 %	5.0 %	1.0 %	5.5 %	1.0 %	-	Rhenit CK 14
Medium-cement castable	Hydraulic	-	46.0 %	44.0 %	4.5 %	1.7 %	-	-	-	Rhenit 43 RW
Medium-cement castable	Hydraulic	-	82.0 %	7.0 %	5.0 %	2.0 %	-	3.5 %	-	Rhenit 70 CN
Medium-cement castable	Hydraulic	-	76.0 %	12.0 %	5.5 %	2.0 %	-	3.0 %	-	Rhenit 70 G-R
Slag ladle gunning mix	Inorganic-chemical	73.0 %	2.0 %	15.0 %	3.0 %	5.0 %	-	-	-	Rhemagun SKD
Gunning mix	Hydraulic-ceramic	0.7 %	72.0 %	15.5 %	6.5 %	2.0 %	-	2.5 %	-	Rhenit SP-CH
Gunning mix	Hydraulic	-	72.0 %	16.0 %	6.0 %	2.5 %	-	2.5 %	-	Rhenit 70 SP-R

All values given are for orientation.



# Customer Benefits of Horn & Co. Products



**Security of supply**  
through vertical integration  
with regenerative raw materials



**Process-oriented  
product selection**



**German quality**  
with extensive QA



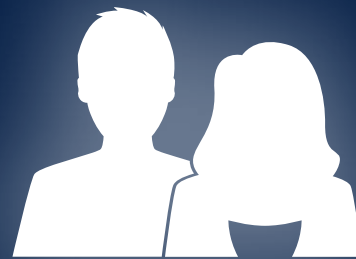
**Excellent price-  
performance relationship**  
with products tailored precisely  
to the application



**Performance/  
Process security**



**Synergy benefits**  
with a group of companies geared  
towards the steel industry with  
a diverse range of services and  
process knowledge (interlinked  
specialist knowledge and expertise  
from each sector)



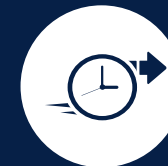
**CUSTOMER**



**Customized solutions**  
not just products: Concepts / innovation

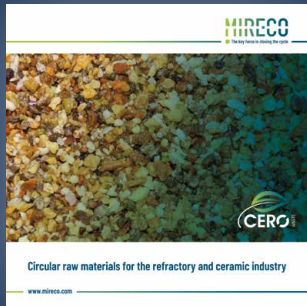


**Competent and experienced  
points of contact**  
Field service / technical advice /  
development rolled into one, supervisors



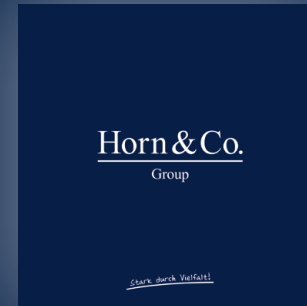
**Fast response / delivery times**  
Back office availability, personal contact  
persons, close to production

# Horn & Co. Group - Strength through diversity



## Circular raw materials for the refractory and ceramic industry

You can find this and other brochures on [www.mireco.com](http://www.mireco.com)



## A brief introduction to Horn & Co. Group

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Minerals Recovery

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Products

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*Strength through diversity!*