

Direct Reduced Iron

Steel Industry

Gouda Refractories delivers complete alumina refractory solutions for all types of installations of DRI plants in the Iron & Steel Industry. Rather than supplying commodities, Gouda Refractories focusses on finding the best possible solution for critical areas.

Gouda Refractories is the worldwide reference in the field of refractory materials for critical areas in the Iron & Steel Industry.



Low
Creep

Low
CO-disintegration

Low
Porosity

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.

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. Longevity, ease of installation and consistency are all top priorities. Dialogue and cooperation with the customer mean that products for any specific application can be developed.

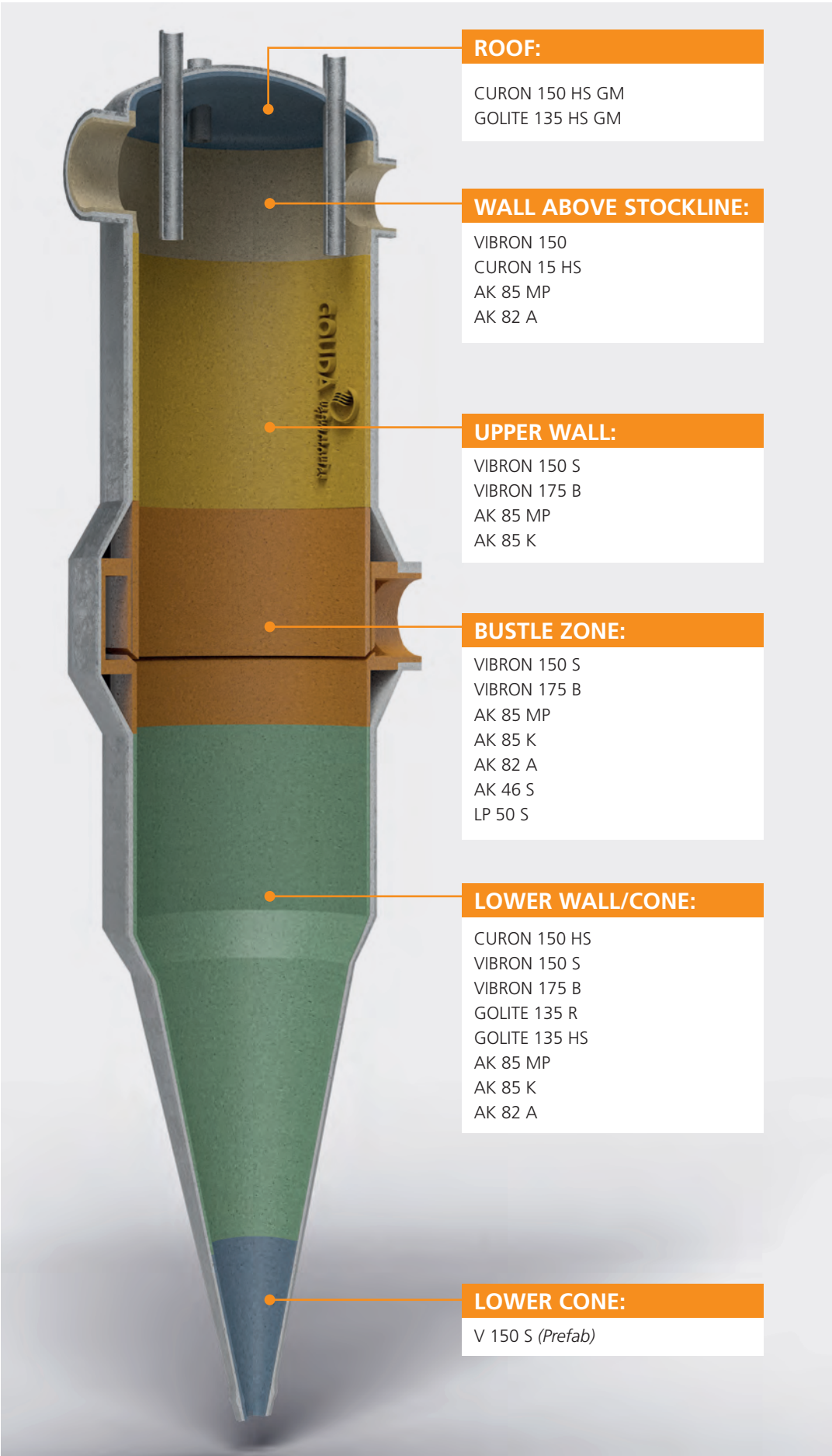
Driving Sustainable DRI Production through Innovation and Expertise

DRI units have specific requirements for refractory materials due to operating practices and energy sources & efficiencies. These differences in the process mean that different types of refractory material are required. With its unique product line, Gouda Refractories has solutions for process specific problems such as creep, CO- and H2-Disintegration, high wear, thermal shock, mechanical stresses and heat loss. This is the result of years of development based on specific knowledge of the design process, the organisation, the installation and the use of refractory systems.

In the ever-evolving landscape of steel production, Gouda Refractories collaborates with DRI plants to implement cutting-edge refractory materials and design improvements to enhance the sustainability of H2 Green Direct Reduced Iron (DRI) production.

The combination of Direct Reduced Iron (DRI) with hydrogen is an emerging and environmentally friendly approach in the steelmaking industry. Gouda Refractories, with its modern high-temperature tunnel kiln operating at an impressive 1.700°C, is known for its expertise in the field of refractory products and services.

When it comes to the energy transition and green initiatives such as H2 Green DRI production and the involvement of Gouda Refractories, it signifies a commitment to the application of advanced high-quality refractory materials and solutions within DRI production processes.



Material Properties								
DENSE BRICKS	Max. Temp. °C	Density kg/m³	Porosity %	CCS MPa	SiO ₂ %Wt	Al ₂ O ₃ %Wt	Fe ₂ O ₃ %Wt	Na ₂ O + K ₂ O %Wt
AK 46 S	1.550	2.400	< 15	50	47	49	< 1,2	< 0,5
LP 50 S	1.575	2.500	11	70	46	50	< 1	< 0,3
AK 59	1.550	2.450	17	70	39	59	< 1,2	< 0,3
AK 82 A	1.550	2.700	19	70	11	82	< 1,5	< 0,2
LP 60 MP	1.600	2.500	12	120	36	60	1,1	P ₂ O ₅ : 2%
LP 60 AAP	1.650	2.600	9	110	37	60	0,9	P ₂ O ₅ : 2%
AK 60 A	1.680	2.550	13	90	37	60	< 1	< 0,4
AK 60 X	1.680	2.550	13	100	35	62	< 1	< 0,4
AK 65 A	1.700	2.600	15	60	32	65	< 1	< 0,5
AK 85 K	1.750	3.000	13	90	13	85	< 0,2	< 0,3
AK 85 MP	1.500	2.850	14	130	8	83	< 1	P ₂ O ₅ : 3,5%
AK 94 M	1.760	3.150	16	100	5	94	< 0,2	< 0,3
AK 99	1.800	3.250	16	95	< 0,1	> 99	< 0,1	< 0,3
V 188	1.800	3.100	22	100	< 0,15	> 99	< 0,1	< 0,3

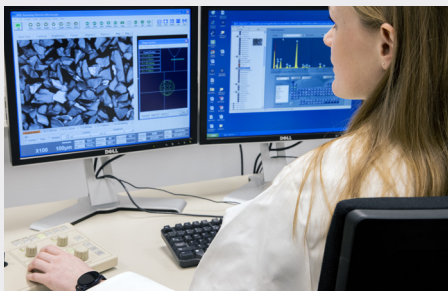
INSULATION BRICKS	Max. Temp. °C	Density kg/m³	PLC %	CCS 110 °C MPa	SiO ₂ %Wt	Al ₂ O ₃ %Wt	Fe ₂ O ₃ %Wt	Na ₂ O + K ₂ O %Wt
GI 32	1.760	1.230	-2	3	14	84	< 0,5	
GI 34	1.800	1.550	-0,4	8	1	99	< 0,2	< 0,2
FI 80-13	1.800	1.300	-0,4	6	1	99	< 0,4	

DENSE CASTABLES	Max. Temp. °C	Density kg/m³	PLC %	CCS MPa	SiO ₂ %Wt	Al ₂ O ₃ %Wt	Fe ₂ O ₃ %Wt	Na ₂ O + K ₂ O %Wt
Curon 150 HS	1.500	2.050	+0 / -0,3	60	42	50	< 2	< 0,3
Curon 150 HS GM	1.500	2.050	+0 / -0,3	30	34	56	< 2	< 0,3
Vibron 150 S	1.500	2.800	+0 / -0,3	100	15	75	1,3	< 0,4
Vibron 150 Z	1.500	3.200	+0 / -0,3	110	19	51	< 1	ZrO ₂ : 28%
Curon 165	1.650	2.250	+0 / -0,3	30	30	62	1,5	0,2
Vibron 170 H	1.700	2.600	+0 / -0,5	110	22	72	1	
Vibron 175 B	1.750	2.800	+0 / -0,3	100	12	83	1	
Curon 180 T Sp	1.870	2.750	+0 / -0,3	90	0,1	94	0,05	
Curon 180 T Sp GM	1.870	2.600	+0 / -0,3	90	0,1	92	0,2	

INSULATION CASTABLES	Max. Temp. °C	Density kg/m³	Porosity %	CCS MPa	SiO ₂ %Wt	Al ₂ O ₃ %Wt	Fe ₂ O ₃ %Wt	Na ₂ O + K ₂ O %Wt
Golite 110 XLW C&G	1.100	700	+0 / -2,0	1,5	39	30		CaO: 18%
Golite 1.0.6 Mix R (GM)	1.000	550	+0 / -0,8	1	27	29		
Golite 135 R	1.350	850	+0 / -0,2	1,5	15	70	< 0,5	
Golite 135 HS	1.350	1.250	+0 / -0,3	15		48	1,5	< 1
Golite 180	1.800	1.420	+0 / -0,2	25	0,5	94	0,05	

AIR SETTING MORTARS	Max. Temp. °C	SiO ₂ %Wt	Al ₂ O ₃ %Wt	Fe ₂ O ₃ %Wt	Na ₂ O + K ₂ O %Wt	Max. Grain Size mm
Adhesiet 155	1.550	51	43	1	3	< 0,5
Adhesiet 160	1.600	18	75	1,5	2	< 0,5
Adhesiet 180	1.800	3	90	< 0,5		< 0,5

Values are typical. Datasheets are available upon request.

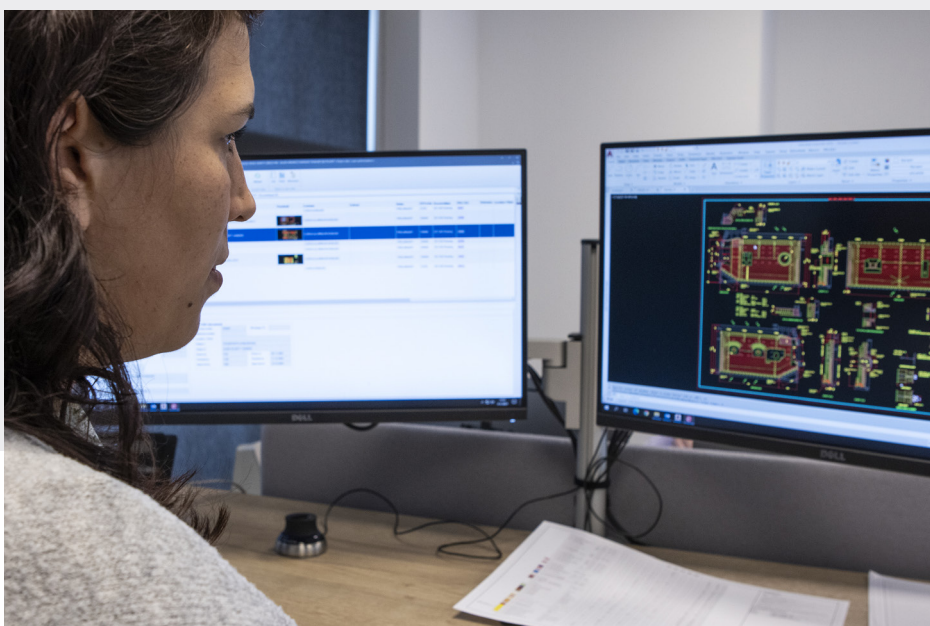


For more than 120 years - since 1901 - Gouda Refractories proves that the company adds extra value when designing and producing refractory linings. Its state of the art production facilities do not just deliver refractory bricks, monolithics and precast shapes, but offer worldwide customer-specific total solutions for every imaginable industry: non-ferrous metals, petrochemical, steel & iron, environment & energy and cement.

The team at Gouda Refractories has decades of experience working with Pusher Furnaces, Walking Beam Furnaces, Walking Hearth Furnaces, Rotary Furnaces, Soaking Pit Furnaces and Tunnel Kilns.

Because of their experience and expertise, the Product Management, Engineering, Research & Development and Production departments guarantee an efficient problem analysis and solution. When a change in processes demands modification of its products, Gouda Refractories responds promptly always taking into account important requirements, such as a competitive price, superior quality and total costs of ownership.

The **Research & Development** department, with an advanced, independent ISO-certified laboratory, develops products designed specifically to our customer's needs.



Product Managers at Gouda Refractories work with our customers to determine the best solutions for increasing thermal efficiency and durability to reduce their production costs.

The **Engineering** department is the beating heart of the technological know-how of Gouda Refractories. By using modern tools for mechanical strength calculations, heat transfer calculations, 3D modelling and CAD drawings, Gouda Refractories' engineering department is able to transform a customer's requirement into a fully functional refractory lining design - fit-for-purpose.

Our qualified **Supervisors & Installers** ensure that all products are installed correctly and efficiently.

Gouda Refractories welcomes the opportunity to discuss your requirements and optimal solutions for the betterment and longevity of your furnace.

