alfran®

www.alfran.com

STEEL & IRON INDUSTRY

grupo aldomer

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What is alfran®?

HIGH TEMPERATURE SOLUTIONS

alfran® is the first international company to offer refractories, insulation, passive fireproofing and heat treatment turnkey solutions for most industrial applications.

A company committed to continuous development in **technology and Innovation** in products and services.

Our goal is to achieve **the maximum benefit for our customers:** reduction in repair times, increased productivity and integral service.

What can we do?

alfran® is part of **GRUPO ALDOMER** providing innovative solutions for industry needs and meeting safety standards.

Activities

Refractory
Fireproofing
Thermal insulation
Ceramic Coating
Acidproofing
Heat Treatment

Design

alfran® provides its customers with integral engineering projects.

Services

Engineering services and materials design.

- **Manufacture.**
- **Demolition.**
- **Anchor Welding.**
- **Installation.**
- **Dry Out.**
- **On-site Supervision.**
- **After-Sale.**

Technology

Through the company's know-how, alfran® offers solutions for high temperature.

R&D + I

We create more value through our innovation strategy, with ambitious targets and measurable results.

Philosophy

MISSION

Be the reference partner for industrial high temperature

VISION

Growth, leadership, tailor made products & services, global, continuous transformation, best place for our workers

VALUES

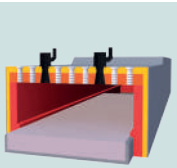
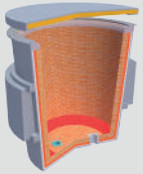
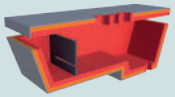
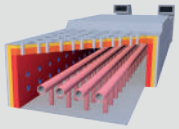
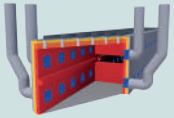
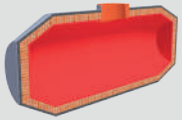
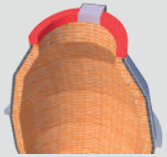
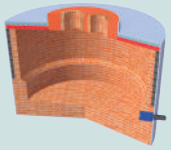
Health & safety, improvement, team work, passion, environmentally friendly, cultural diversity

Introduction

OUR VALUE OFFER

alfran is able to provide a **refractory integral maintenance** program for **STEEL & IRON** Industry: Reheat furnaces, Blast Furnace, Torpedo Ladles, Electric Arc Furnace, Tundish, Ladles, Convertors, etc.

We can bring our experience and knowledge in the **manufacturing** & **installation** of all types of refractory materials, both in the daily maintenance either daily maintenance or new equipment new installations.

RAW MATERIALS	REDUCTION	STEEL/FOUNDRY	REFINING	CASTING	HOT R. MILLS	COLD R. MILLS
						
						
						

Coke Oven Battery

In the coal coking process using the coke by-product furnace, the coal volatile matter is evaporated and expelled. This volatile matter leaves the coke oven chambers as a hot primary gas.

In the walls and roof of the Coke Oven Battery, we recommend our **Drytech** product range consisting of non-cement castables specifically designed for fast dry-out, reducing start-on time and risk of explosions.

For the doors lining we make repairs with gunning and additionally we design precast shapes solutions, dried out and thermally treated to get the best refractory properties to stand the stresses during operation.

alfran provides maintenance and repairs works with thermal shock and high abrasion resistance materials, which can be applied by vibrocasting, traditional gunning and pumpcrete system.

Pelletizer

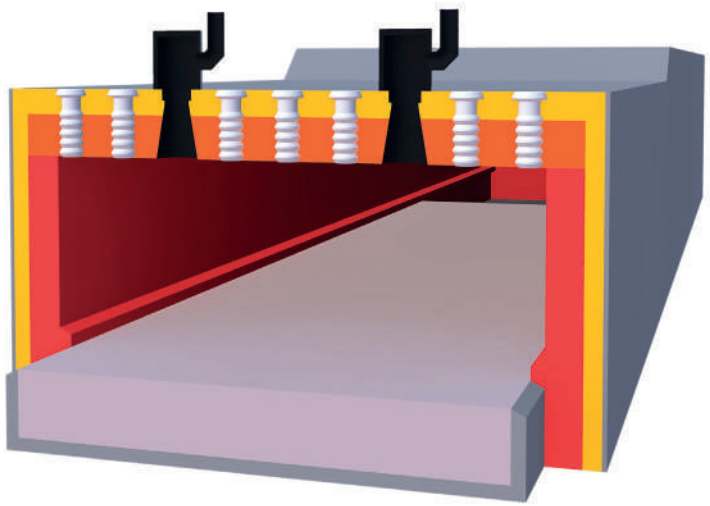
Pelletizing is an agglomeration process in which the fine ground minerals group in small quasi-spherical balls called pellets. These pellets have certain physical, chemical and mechanical properties for its effective utilization in the subsequent reduction process .

alfran recommends high alumina content materials with excellent mechanical and abrasion resistance. Can be applied by vibrocasting, traditional & high pressure gunning and shotcrete technology. To minimize the problems associated with start-ups and thermal shock, of this until Drytech range materials has been developed

AREA	VIBROCASTING	T. GUNNING	H.P GUNNING	SHOTCRETE
SECONDARY DRYING AREA	CAST 80 CAST 60	CAST 80 CAST 60	HIGH GUN 85	ALFRANJET DRYTECH 70
BURNERS	DRYTECH 85 TIX 85		HIGH GUN 85 CLEAN 85G	
DAWNCOMERS	DRYTECH 85 TIX 85			
LINTELS				ALFRANJET DRYTECH 70

Sinter Furnace

The sintering is a pre-treatment step in the iron making process. Sinter is made from iron ore fines and from metallurgical waste, and then is loaded in the blast furnaces.

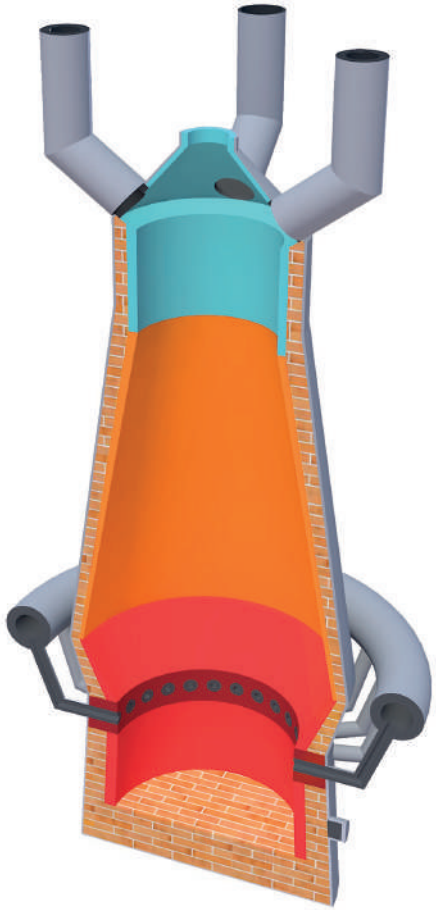


alfran recommends refractory castables with no cement content, Drytech range, specially designed for fast dried, reducing start-on times and risks of explosions. Can be applied by vibrocasting, traditional gunning, pumpcrete and shotcrete system.

AREA	VIBROCASTING	T. GUNNING	PUMPCRETE	SHOTCRETE
WALL	DRYTECH 70 DRYTECH 85		PUMP DRYTECH 70 PUMP DRYTECH 85	ALFRANJET DRYTECH70/DRYTECH 85
ROOF	DRYTECH 70 DRYTECH 85		PUMP DRYTECH 70 PUMP DRYTECH 85	ALFRANJET DRYTECH70/DRYTECH 85
SAFETY LINING		LITE SLW 23 LITE VLW 106		

Blast Furnace

A blast furnace is a special piece of equipment in which iron minerals get fused and chemically transformed into an iron-rich metal called pig-iron.

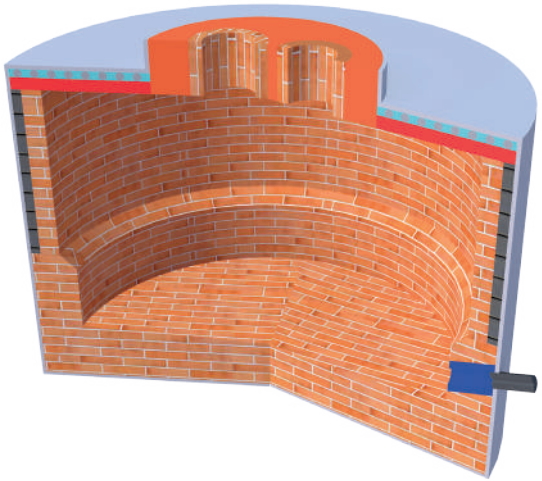


alfran® carries out the maintenance supplying refractory materials, *Drytech*® castables by shotcrete *alfranjet*® system technology reducing downtime and improving the performance of the shaft, bosh, drain and duct and repairs work by traditional gunning system.

AREA	T. GUNNING	SHOTCRETE
THROAT	CAST 40	ALFRANJET DRYTECH 70 / 70 SIC
STACK AND BELLY		ALFRANJET DRYTECH 70 / 70 SIC
HEART AND BOSH	ALFRAN SECURGUN B25	ALFRANJET DRYTECH 70 / 70 SIC

Electric Arc furnace

The electric arc furnace melts the steel scrap to produce steel. In this process, electric energy is used to melt the scrap steel. An electrical arc is generated between the scrap and the electrodes, releasing heat that melts the steel scrap.

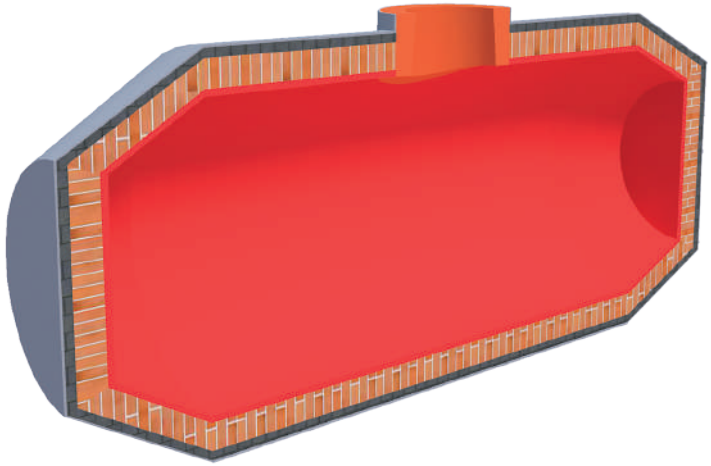


alfran recommends refractory castables with different qualities depending on areas. Can be applied by vibrocasting, trowelling, traditional and high pressure gunning systems.

AREA	VIBROCASTING	T. GUNNING	H.P. GUNNING	TROWELLING
DELTA	TIX 80 TIX 86 CR	TIX 80 MX TIX 15 SIC		
COOLER TUBES				CAST 80-3
ROOF			HIGH GUN 85	

Torpedo Ladles

Torpedo ladles are use to transport liquid pig iron from blast furnace to other processes. Our *alfranjet*® products by shotcrete technology in torpedo ladle repairs present an advantage in performance and durability compared to traditional gunning.



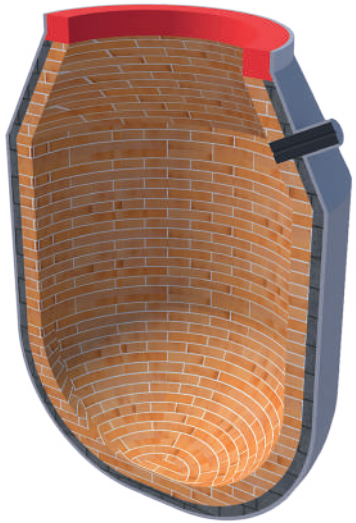
alfran® can provide an integral maintenance program for torpedo ladles, that include original brick linings and maintenance repairs with the *alfranjet*® shotcrete technology

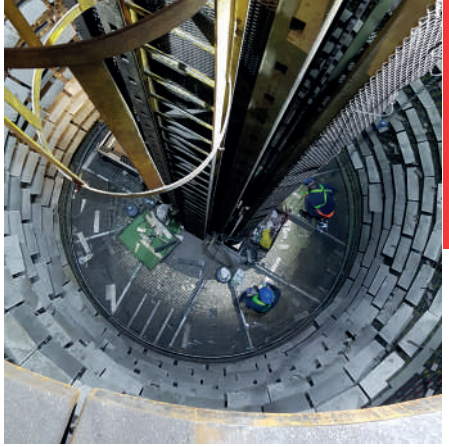
Drytech® Monolithics, are specially designed products for areas where initial heating is not easily achieved with kiln burners. We offer other materials in mouth area which can be applied by vibrocasting system.

AREA	VIBROCASTING	PUMCRETE	SHOTCRETE
MOUTH	TIX 80 TIX 15 SIC	PUMP DRYTECH 70	ALFRANJET DRYTECH 70 SIC
WALL			ALFRANJET DRYTECH 70 SIC

BOF Converter

Basic oxygen furnaces are elemental in integrated steel mills. They transform the pig-iron into steel.





alfran provides turn key maintenance for this equipment. We have wide range of aluminous products to satisfy the needs of our customers. We install and manufacture shaped and unshaped products.

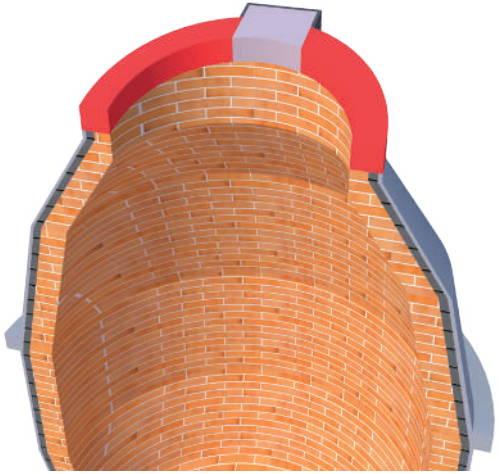
We have our *High Gun* & *Clean* castables, developed for application in areas of high thermal and mechanical stress, providing better resistance to erosion and abrasion. These can be applied by high pressure gunning system.

AREA	VIBROCASTING	H.P. GUNNING
TOP RING AND UPPER CONE	VK 3	HIGH GUN 55 / 70 SIC CLEAN 85G
DOG HOUSE (*)		HIGH GUN 55 / 70 SIC CLEAN 85G

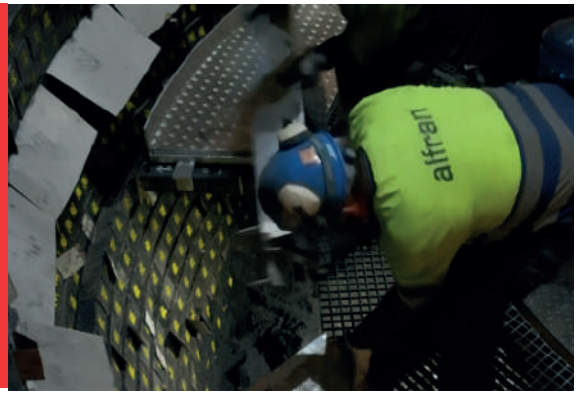
(*) This zone is not shown in the 3D model.

AOD Converter

In stainless steel production, liquid steel is taken into a converter for refining. After liquid steel is decarburized with oxygen, reduction of the slag chrome takes place. Desulphurization is carried out, if necessary before the final temperature and the alloy are set.



Our main tasks are maintenance repairs by traditional and high pressure gunning system and trowelling system. This job is made in a very short time. We also install any type of bricks thet meet the needs of our customers. Particulary, we manufacture precast shapes for the special part of the lip ring (doloblock).

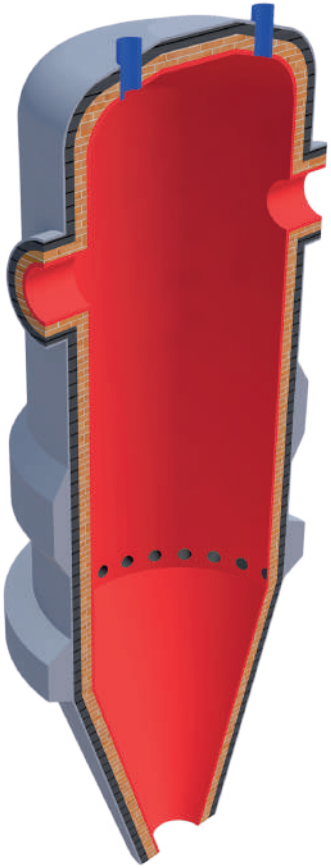


AREA	T. GUNNING	H.P. GUNNING
TOP RING	CAST 85	HIGH GUN 55 / 70 SIC
SPLASH SAFETY LINING AND GAS HOOD (*)	CAST 85	

(*) This zone is not shown in the 3D model.

DRI furnace

The DRI process removes the oxygen from the pelletized iron ore. The fuel used in this process is natural gas. From the DRI furnace, the iron goes to the electric arc furnace. These equipments can be either dynamic as rotary kiln, or static as Midrex and HYL technologies

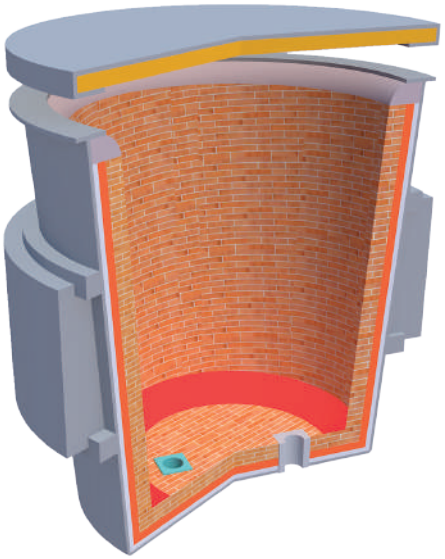


alfran provides maintenance works to get refractory lining thickness recovery through *alfranjet* and *High Gun* materials using Shotcrete and high pressure gunning technologies. With our turnkey solutions we can reduce the shutdown times and get a better performance for the refractories in the furnace.

AREA	H.P. GUNNING	SHOTCRETE
WALL	HIGH GUN 45 SIC	ALFRANJET 45 SIC

Ladles

Ladles are used to transfer a large amount of hot metal from one process to another.



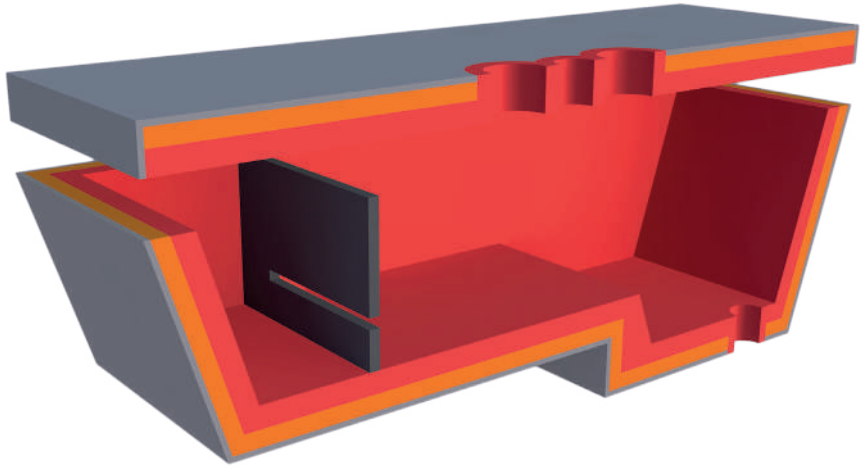
alfran provides turnkey solutions for this equipment. This includes original brick lining, maintenance repairs, design and installation of safety bottoms for ladles: flat bottom, or with different levels to facilitate the steel outflow.

We recommend low porosity materials with high mechanical resistance to provide good thermal stability and high resistance to abrasion for a good performance against chemical attack. These are available for installation by vibrocasting, trowelling, pumpcrete, traditional gunning and shotcreting system.

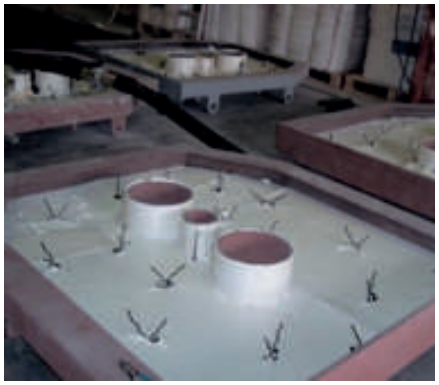
AREA	VIBROCASTING	T. GUNNING/ TROWELLING	PUMPCRETE	SHOTCRETE
COVER	DRYTECH 60 TIX 80	CAST 57		
TOP RING		CAST 85		
SAFETY LINING	DRYTECH 85 TIX 80	CAST 80-3 CAST 180W	PUMP 85 PUMP DT 85	AJ 85 AJ DT 85
BOTTOM	DRYTECH 85	CAST 85		
SPOUT	TIX 85			
POROUS PLUG		CAST 95 V		CAST 95 V

Tundish

The distributor (tundish) is a refractory recipient whose function is to provide a liquid steel reserve to ensure the continuous casting process.



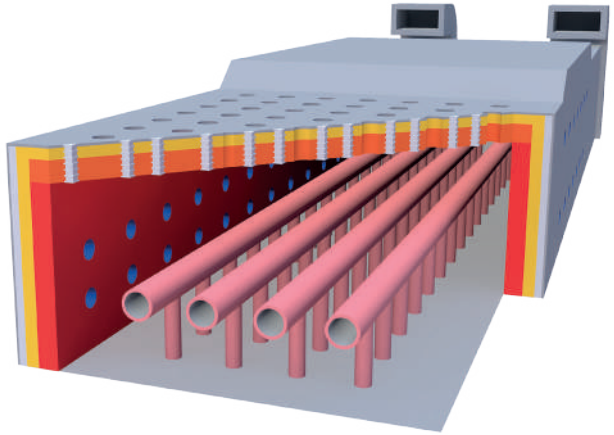
We offer maintenance and installation services with shaped and unshaped materials. alfran supplies and installs monolithic safety linings for tundish, and also manufactures special precast shapes like dams, wells, impact pads, and covers, which are thermally treated to ensure the highest performance. Our castables can be applied by gunning, pumpcrete and vibrocasting system.



AREA	VIBROCASTING	T. GUNNING	PUMPCRETE
COVER AND WALLS	TIX 80 TIX 86 CR		PUMP DRYTECH 70
SAFETY LINING	TIX 80 TIX 86 CR	CAST 60 CAST 80-3 CAST 85	PUMP DRYTECH 70

Reheat furnaces
Hot Rolling Mills

Hot rolling is a mill process that involves rolling the steel at a high temperature, which is above the steel's recrystallization temperature.



alfran supplies any refractory material needed for this type of works, like dense and insulating castables, bricks, ramming masses, mortars, metallic and ceramic anchors, and insulating boards. Our castables can be applied by vibrocasting, traditional and high pressure gunning, pumpcrete and shotcrete technology.

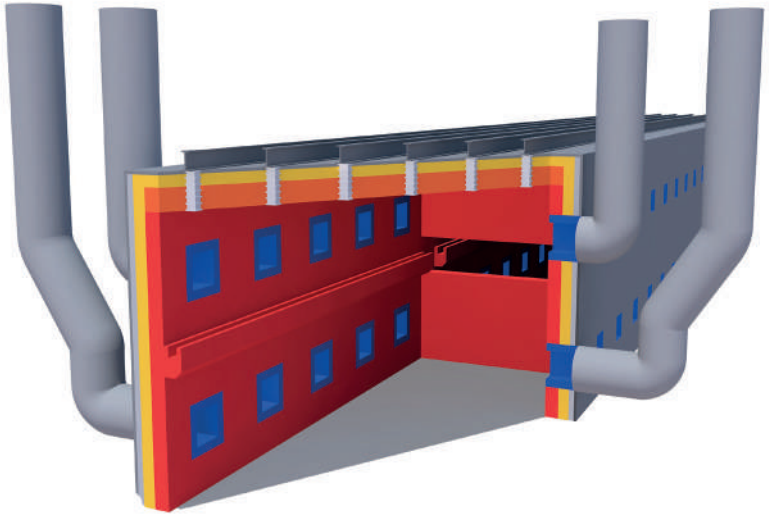
We also manufacture and install precast shapes for this unit, according to the requirementes of the area.

AREA	VIBROCASTING	T. GUNNING	H.P. GUNNING	PUMPCRETE	SHOTCRETE
WALL AND ECUALIZATION ZONE	DRYTECH 70 DRYTECH 85 TIX 80	CAST 60	CLEAN 85G	PUMP DT 70	ALFRANJET DRYTECH 70
ROOF	DRYTECH 70 DRYTECH 85			PUMP DT 70	ALFRANJET DRYTECH 70
INSULATING LINING		LITE SLW 23 LITE VLW 106			
BURNER	TIX 85				
WALKING BEAMS			CLEAN 85G		
FLOOR AND DISCHARGE HOPPER (*)	ABR CLEAN + TIX 85				ALFRANJET DRYTECH 70

(*) This zone is not shown in the 3D model.

Reheat furnaces
Cold Rolling Mills

Cold rolled steel is essentially hot rolled steel that has had further processing. The steel is processed further in cold reduction mills, where the material is cooled followed by annealing and/or tempers rolling.



We recommend materials with high thermal shock and abrasion resistance. Can be installed by vibrocasting, traditional and high pressure, gunning,pumpcrete and shotcrete technology.

Drytech® materials are specially designed for quick dry out, reducing start time and risk of explosions. Highly recommended for these furnaces.

AREA	VIBROCASTING	T. GUNNING	H.P. GUNNING	PUMPCRETE	SHOTCRETE
WALL	DRYTECH 70 DRYTECH 85		CLEAN 85G	PUMP DRYTECH 70	ALFRANJET DRYTECH 70
ROOF	DRYTECH 70 DRYTECH 85			PUMP DRYTECH 70	ALFRANJET DRYTECH 70
INSULATING LINING		LITE SLW 23 LITE VLW 106			
BURNER	TIX 60 TIX 85				

Precast Shapes

alfran designs manufacture and install monolithic precast shapes to comply with the customer needs together with anchoring and drying systems. The most commonly used precast shapes have been designed for: dams, wells, impact pads, covers, muffles, burner blocks, etc.

alfran has developed an innovative range of shaped products in metallic-ceramic material with a mixed bonding system designed to provide high mechanical and thermal performance ST *Steel-tech*, ready for installation and start-up without any need for drying.

Refractory Concrete

Reinforced refractory Concrete

STEEL TECH REFRACTORY

Castables

Brand Name	Recomm. Temp. (°C)	B.D. at 110°C (g/cm³)	C.C.S. 1000 °C (Mpa)	C.C.S. 1300 °C (Mpa)	Chemical Composition (%)				
					Al_2O_3	SiO_2	CaO	SiC	ZrO_2
Insulating Castables, Multipurpose									
LITE VLW 106	1100	0,72	-	-	34,2	26,4	20,4	-	-
LITE LW 23	1300	1,1	4,8 (800 °C)	-	32,0	36,8	18,5	-	-
LITE LW 125	1300	0,91	2,5 (800 °C)	-	33,8	31,4	18,2	-	-
LITE 16/18	1750	1,73	4,0 (800 °C)	-	94,8	0,4	4,5	-	-
Dense Castables, Multipurpose									
CAST 40	1200	1,89	20,0	-	40,1	45,3	7,3	-	-
CAST 40 F LI	1450	1,85	10,0	-	31,0	55,9	7,2	-	-
CAST 60	1500	2,06	10,0	-	58,9	27	8,2	-	-
CAST 80	1700	2,7	15,0	-	78,9	5,1	4,8	-	-
CAST 80-3	1700	2,26	10,0	-	79,6	9,1	5	-	-
CAST 85	1700	2,73	25,0	-	81,3	4,6	3,5	-	-
CAST 95	1700	2,85	30,0	-	95,0	0,4	4,3	-	-
CAST 180 W	1800	2,95	40,0	-	95,0	0,06	0,9	-	-
Dense Castables, Vibrocasting									
ABR CLEAN +	1600	2,7	120,0	120,0	41,1	35,1	2	5	14,3
TIX 15 SIC	1500	2,2	110,0	70,0	37,2	46,3	1,4	11,2	-
TIX 60	1500	2,25	105,0	90,0	56,2	36,7	2,1	!	-
TIX 80	1650	2,56	95,0	90,0	75,5	16,8	2	!	-
TIX 85	1700	2,78	100,0	100,0	81,7	11,3	1,8	!	-
TIX 86 CR	1700	3,03	90,0	120,0	81,1	6,5	1,5	!	6,7 Cr_2O_3
DRYTECH 60	1450	2,24	65,0	!	48,9	46,9	!	!	-
DRYTECH 70	1650	2,37	70,0	!	58,7	37,8	!	!	-
DRYTECH 85	1800	2,74	95,0	!	82	11,3	!	!	!
Dense Castables, High Gun									
CLEAN 85 G	1500	2,32	20,0	45	67,1	14,2	3,1	4,2	8,7
HIGH GUN 45 SIC	1400	1,8	15,0	!	37,4	48,5	5,8	3,8	-
HIGH GUN 55	1400	2,01	25,0	30	60,1	28,8	6,1	!	-
HIGH GUN 70 SIC	1400	2,09	30,0	30	61,8	22,3	6,1	4,4	-
HIGH GUN 85	1700	2,46	35,0	40	69,3	"#$%	4,5	!	-
Dense Castables, Shotcrete									
ALFRANJET 45 SIC	1500	2,1	110,0	!	37,5	52,2	2	4,2	-
ALFRANJET DRYTECH 70	1650	2,47	85,0	100	68	27,9	0,2	!	-
ALFRANJET DRYTECH 70 SIC	1600	2,5	100,0	80	55	27	0,1	14,8	-
Dense Castables, Pumpcrete									
ALFRANPUMP DRYTECH 70	1650	2,45	65,0	65	67,9	28,1	0,1	!	-

Mortars

alfran as a reference partner in high- temperature solutions, offers mortars suitable for any type of application. The main characteristics of these materials are their chemical setting and cold hardening.

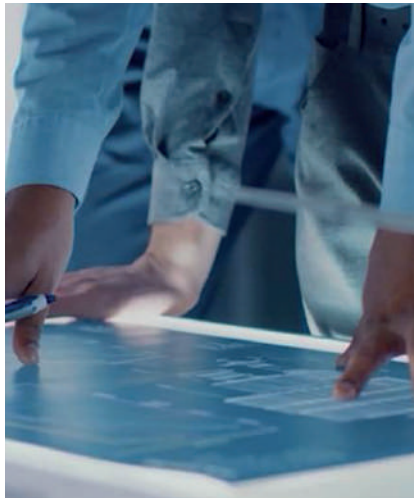
BRAND NAME	TYPICAL PROPERTY	RECOMM. TEMP. (ºC)	CHEMICAL COMPOSITION (%) Al_2O_3	Fe_2O_3
SILCAN QS	Chemical set and cold hardening	1400	29,3	0,7
BLACK BOND	Chemical set and cold hardening	1500	49,5	0,8

Anchors

alfran has a professional team who can advise those anchors or combinations more effective according to the area and workplace conditions. We can supply any anchoring system depending on the requirements of our customer.

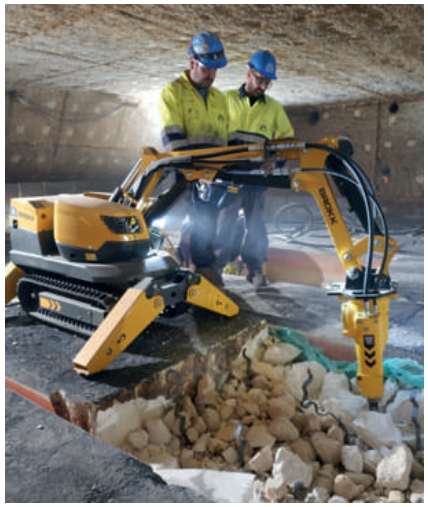
EQUIPMENT	AREA	TYPE OF ANCHOR	QUALITY
LADLES	WALL	Y V	AISI 310
	ROOF	Plate+V Y/V	
PELLETIZER	WALL	Y V	AISI 310
	ROOF	Plate+V	
HOT ROLLING MILL	WALL	DTH + Ceramic Anchor Y / V	AISI 310
	ROOF	DTH + Ceramic Anchor Y / V	
	DOOR	Plate+V Y	
COLD ROLLING MILL	WALL	DTH + Ceramic Anchor Plate+V Y	AISI 310
	ROOF	DTH + Ceramic Anchor Plate+V Y	
	DOOR	Y V	

Turnkey Service



Engineering

alfran offers engineering services performing detailed installation planning, real-time project monitoring, thermal conductivity analysis, etc.

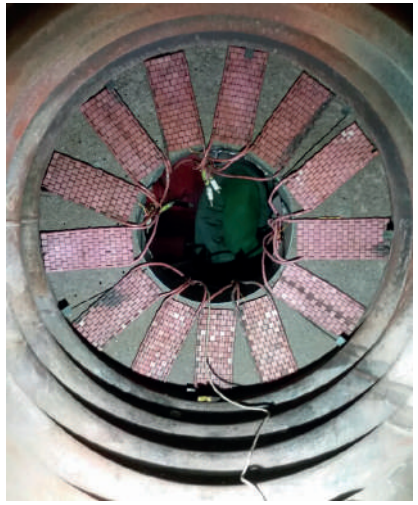


Demolition

We also offer manual and mechanical demolition services with demolition robots, machines that have maximum power in very compact sizes for interior places ensuring safety in our works.

Lining

For the lining design we have a technical department with highly qualified means and personnel to recommend methods of installation, material selection and formwork and anchors design.



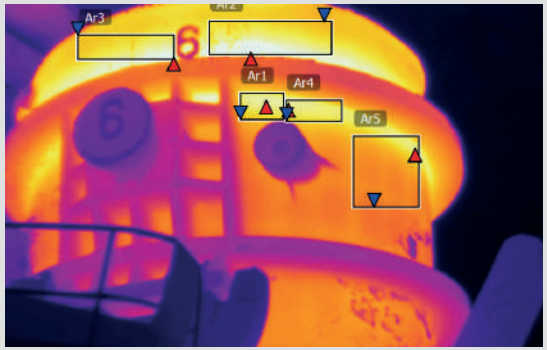
Dry out services

alfran assesses its customers about the required dry-out process for each lining and carries them out with its means, providing a bigger guarantee of their subsequent performance. We have specialized staff and the most advanced equipment to carry out these works (burners, specialized software, digital recorders, etc.).

Energy Efficiency

Diagnosis & Evaluation Of Linings

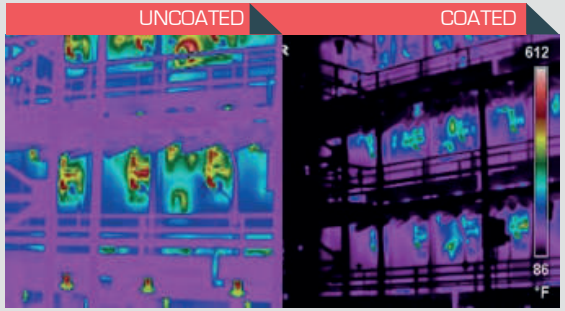
This analysis is essential for planning preventive maintenance and repair work, without any need to stop the equipment, as it makes it possible to estimate the wear produced on the STEEL & IRON lining as well as detect defects or anomalies during the operation of the equipment. In addition, it enables a record on the installation to be kept with a view to detecting areas of improvement on the lining to maximize energy savings.



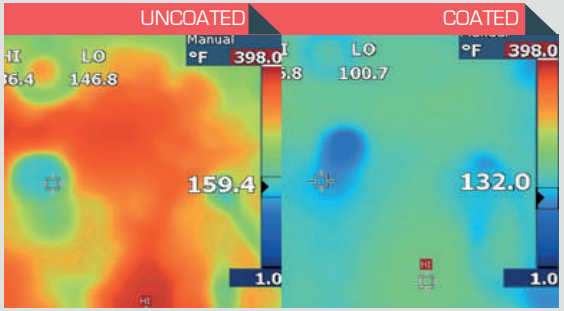
Ceramic Coatings

alfran is a distributor of ceramic coatings that increase the emissivity of the STEEL & IRON lining, improving its thermal efficiency and production capacity, as well as protecting against corrosion and erosion. This type of protection increases USEFUL life.

Maintenance decreases and reduces the frequency of stops. Depending on the substrate and the intended use there are several formats available depending on the needs of our customers.



FURNACE WALL



BURNER

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