Cerâmica do Liz, s.a.

Refractories and Systems

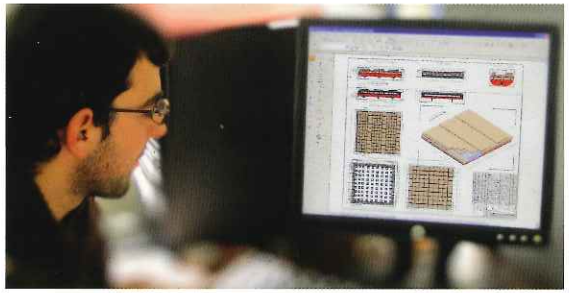
REFRACTORY SYSTEMS AND MATERIALS FOR THE CERAMIC INDUSTRY

ABOUT US

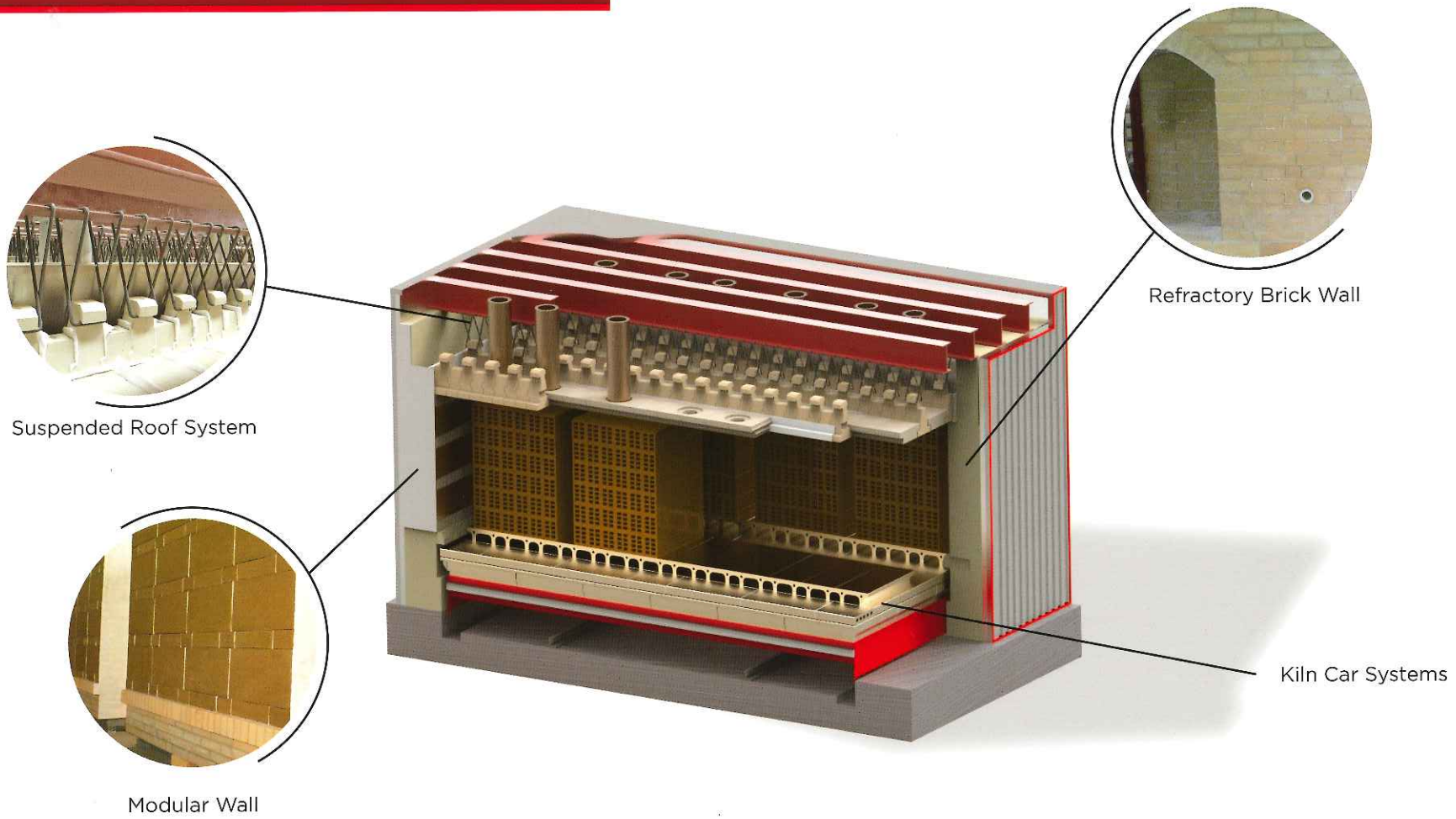
For many decades now Cerâmica do Liz has provided refractory materials and tailor-made concepts for use in ceramic kilns and thermal processes. LIZ refractories are manufactured in two different production sites equipped with fully automated extrusion lines, groups of hydraulic presses with capacity up to 1600 tons and high temperature state-of-the-art tunnel and intermittent kilns.

The LIZ product range for the ceramic industry is comprehensive and includes products and systems for use in tunnel kilns (walls and roof) and kiln cars. No short cuts are made and all refractories are manufactured at a quality standard that ensures reliability in order to withstand a long service life. The design and manufacturing for LIZ refractories and systems is certified through a rigorous quality management system in compliance with the ISO 9001 standard implemented and in full operation since the year 2000.

Tradition, experience, great flexibility and concepts geared towards the future make sure that our refractories and technical solutions are always as individual as our customer's needs.

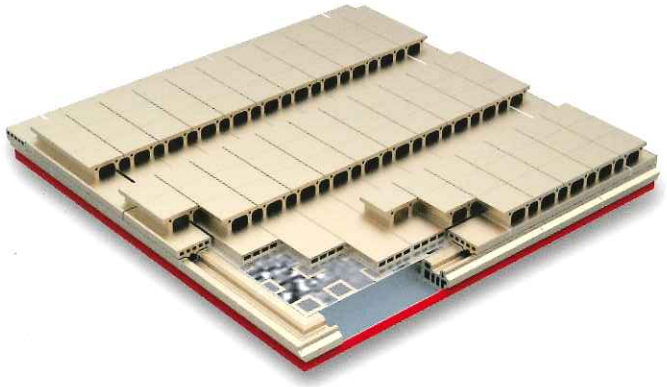


TUNNEL KILN SYSTEMS FOR THE ROOF AND WALLS

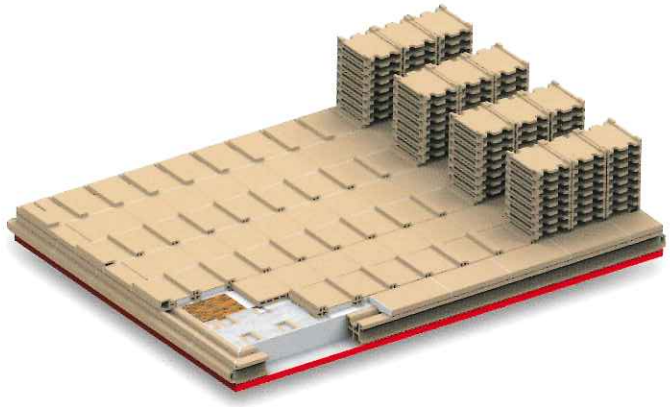


Liz latest generation tunnel kiln refractory roof systems are tailor-made and highly efficient, reliable and safe. Cerâmica do Liz also manufactures a complete range of high quality pressed refractory bricks for use in the construction of traditional tunnel kiln walls. For tunnel kilns that require a reduced construction time the new LIZ wall modules are a good alternative and have the following advantages: easy transportation inside containers, very fast assembling on site, reduced wall thickness.

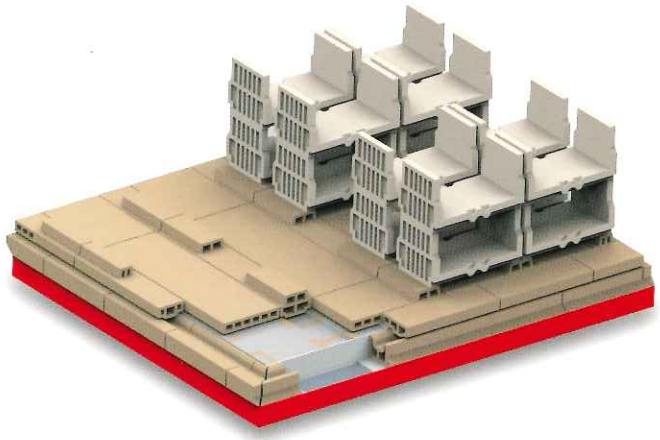
TAYLOR-MADE KILN CAR SYSTEMS



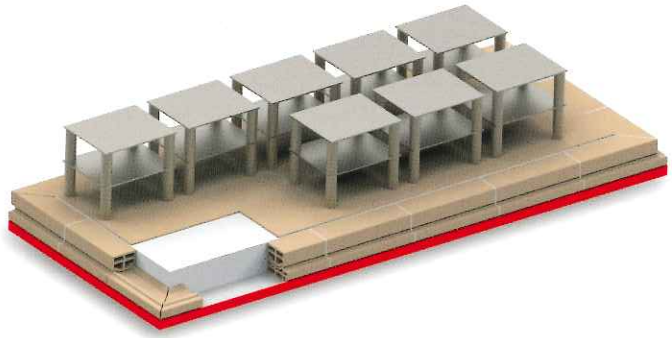
Kiln Car used for firing construction ceramic bricks



Kiln Car used for firing roof tiles inside H cassettes



Kiln Car used for firing various ceramic materials inside U cassettes



Car and kiln furniture used for firing ceramic tableware

LIZ kiln car systems are used in a wide variety of kilns firing construction bricks, roof tiles, special structural ceramic materials and tableware. They are designed to match the very specific requirements of clients and always taking into account fundamental aspects like lower weight and superior insulation in order to reduce energy consumption. All kiln car systems are designed to have a good mechanical resistance and the different refractory shapes are produced in alternative qualities with high thermal shock resistance and compatible with kiln's service temperatures.

LIZ REFRACTORY SYSTEMS AND MATERIALS PROVEN IN THE CERAMIC INDUSTRY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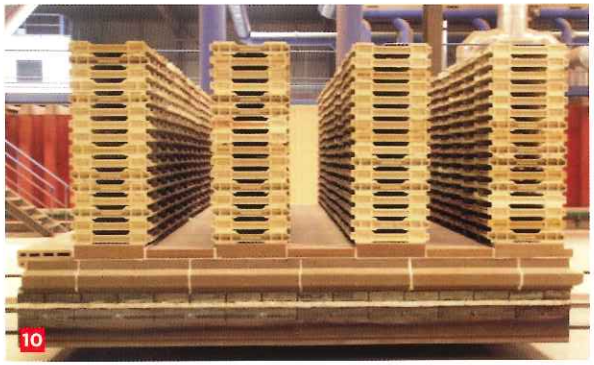
LIZ kiln cars, roof systems and refractories have been in operation for decades in the ceramic industry passing the test of time. Nowadays Liz refractories and systems equip a hugely extensive number of tunnel kilns of all sizes, located in different countries and continents, and fired with alternative combustibles like natural gas, heavy fuel oil, sawdust and petroleum coke. Our range of refractories for kiln cars and tunnel kiln suspended roof systems and walls has specific qualities that were developed to withstand the most severe operating conditions in terms of thermal shock, mechanical impacts and chemical attack and corrosion.

1 Spain: Kiln cars 9100x6400 mm 2 Spain: Kiln cars 6800x6400 mm 3 Morocco: Kiln cars 9100x5600 mm 4 France: Kiln cars 6400x3100 mm
5 Algeria:Tunnel kilns complete refractory package - walls, suspended roof system and kiln cars 6200x4200 mm 6 Russia: Kiln cars 6800x4200 mm



7 Venezuela: Kiln cars 6500x4300 mm 8 Mexico: Construction of kiln cars 6800x4500 mm 9 Algeria: Tunnel kiln walls and suspended roof under going construction
10 11 12 France: New generation energy saving kiln car system for H and U cassettes 13 14 15 16 Portugal: LIZCORITE batts, supports and kiln car perimeter blocks

TECHNICAL INFORMATION

	Tunnel kilns structural ceramics																	Kiln furniture Tableware and fine ceramics		
	Refractory bricks for kiln walls					Refractory shapes suspended roofs					Cordierite shapes for kiln car systems							Pressed batts		Extruded shapes
Quality	SAMOLIZ **SA 27-SS**	ARGILIZ **AR 33-SC**	ARGILIZ **AR 37-SC**	ARGILIZ **AR 40-SC**	ARGILIZ **AR 42-SC**	SAMOLIZ **SA 28-SS**	ARGILIZ **AR 33-SC**	ARGILIZ **AR 37-SC**	ARGILIZ **AR 40-SC**	ARGILIZ **AR 42-SC**	LIZCORITE **LC 30-CT**	LIZCORITE **LC 30-CTE**	LIZCORITE **AR 30-VA**	LIZCORITE **LC 40-CT**	LIZCORITE **LC 40-CTE**	LIZCORITE **LC 40 SR-CT**	LIZCORITE **LC 40 SR-CTE**	LIZCORITE **LC 50**	LIZCORITE **LC 60**	LIZCORITE **LC 60**
Product type	fireclay	fireclay	fireclay	fireclay	fireclay	fireclay	fireclay	fireclay	fireclay	fireclay	cordierite	cordierite	cordierite	cordierite	cordierite	cordierite	cordierite	cordierite	cordierite	cordierite
Al203+Ti02 (%)	25-28	32-34	36-40	39-42	40-43	27-30	32-34	36-40	38-41	40-43	30-32	30-32	30-32	35-38	35-38	35-38	35-38	37-39	38-40	38-40
Si02 (%)	65-70	59-63	55-60	55-60	53-58	66-70	59-63	55-60	51-56	53-58	52-55	52-55	52-55	50-53	50-53	50-53	50-53	51-53	50-52	50-52
Mg0 (%)											3,0-3,5	3,0-3,5	0,5-0,1	4,5-5,0	4,5-5,0	4,5-5,0	4,5-5,0	5,0-5,5	6,7-6,9	6,7-6,9
Fe203 (%)	2,0-2,3	2,3-2,5	2,1-2,5	2,1-2,3	2,1-2,5	2,0-2,3	2,3-2,5	2,3-2,5	2,1-2,4	2,1-2,3								1,0-1,5	1,0-1,5	1,0-1,5
Bulk Density (g/cm3)	2,00-2,05	2,10-2,15	2,10-2,15	2,10-2,15	2,15-2,20	2,10-2,15	2,10-2,15	2,15-2,20	2,15-2,20	2,25-2,30	1,98-2,03	1,95-2,00	1,90-1,95	2,05-2,10	2,05-2,10	2,15-2,20	2,10-2,15	2,05-2,10	2,00-2,05	2,00-2,05
Apparent Porosity (%)	≤ 21	≤ 19	≤ 19	≤ 20	≤ 19	≤ 18	≤ 18	≤ 18	≤ 20	≤ 16	≤ 20	≤ 20	≤ 25	≤ 20	≤ 20	≤ 15	≤ 15	≤ 25	≤ 22	≤ 22
Cold Crushing Strength (N/mm2)	≥ 20	≥ 28	≥ 25	≥ 25	≥ 25	≥ 27	≥ 35	≥ 40	≥ 40	≥ 40	≥ 35	≥ 35	≥ 25	≥ 40	≥ 40	≥ 50	≥ 50	≥ 70	≥ 100	≥ 70
Refractoriness Under Load Ta 0.5 (ºC)	1280	1330	1340	1350	1400	1280	1330	1330	1330	1400	1300	1300	1300	1310	1310	1310	1310	1340	1350	1350
Refractoriness (CS, SC)	29	33	33	33	33	29	32	33	33	33	30	30	28	30	30/31	30/31	30/31	31	31	31
Thermal Shock Resistance (cycles)	≥ 5	≥ 5	≥ 5	≥ 5	≥ 5	≥ 5	≥ 5	≥ 5	≥ 5	≥ 5	≥ 90	≥ 90	≥ 20	≥ 90	≥ 90	≥ 90	≥ 90	≥ 90	≥ 100	≥ 100
Permanent Linear Change 1300ºC 2 h (%)	≤ 0,5	≤ 0,5	≤ 0,5	≤ 0,5	≤ 0,5	≤ 0,5	≤ 0,5	≤ 0,5	≤ 0,5	≤ 0,5	≤ 0,5	≤ 0,5	≤ 0,5	≤ 0,5	≤ 0,5	≤ 0,5	≤ 0,5	≤ 0,2	≤ 0,2	≤ 0,2
Thermal Conductivity																				
200 ºC (W/mk)	1.07	1.21	1.23	1.25	1.26	1.09	1.23	1.26	1.28	1.31	1.14	1.11	1.04	1.45	1.45	1.46	1.46	1.44	1.34	1.34
400 ºC (W/mk)	1.11	1.23	1.25	1.28	1.30	1.13	1.25	1.29	1.30	1.34	1.18	1.16	0.95	1.43	1.43	1.43	1.43	1.42	1.43	1.43
800 ºC (W/mk)	1.18	1.27	1.30	1.32	1.34	1.17	1.28	1.31	1.33	1.37	1.20	1.18	0.98	1.40	1.37	1.41	1.39	1.40	1.23	1.23
1000 ºC (W/mk)	1.20	1.30	1.33	1.36	1.38	1.20	1.30	1.35	1.36	1.40	1.22	1.19	1.00	1.44	1.40	1.45	1.41	1.44	1.32	1.32
Dimensional Tolerances																				
<140 mm (+- mm)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1.5	2
>140 mm (+- %)	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	2	1,5	1,5	1,5	1,5	1	1	1,5

Note: The technical information presented above is given for guidance only and was compiled from the quality control tests made on standard products. This information is subjected to processes an raw material variations and doesn't constitute a specification. Cerâmica do Liz reserves the right to modify the presented values without previous notice.

Edition March 2018

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