

ALUMINUM FOUNDRY REFRACTORY SOLUTIONS



CALDERYS



160+ years of combined experience

4,500 employees in over 30 countries

50+ plants on the 5 continents

One of the world's largest suppliers in high temperature solutions



Enlarged portfolio of solutions from refractory bricks and monolithics to steel casting fluxes and green molding sand solutions

Calderys is a leading global provider for industries operating in high temperature conditions. We specialize in thermal protection for industrial equipment with a wide range of refractory products, and advanced solutions to enhance steel casting, metallurgical fluxes and molding processes.

In 2023, Calderys joined forces with HarbisonWalker International, (now HWI, a member of Calderys), one of the largest suppliers of refractory products and services in the United States.

Together, we form a high-growth, customer-centric provider with a comprehensive offering and a truly global reach. Drawing on over 160 years of combined experience, we support our customers in their energy transition needs. We count 4,500 employees in over 30 countries.

Our international network of experts ensures an end-to-end offer with tailored services. We are constantly developing innovative products and techniques in order to **optimize costs and performance**, combining world-class Research & Development and technical experts, as well as responsive supply chain and sales departments.

Our global structure allows us to design the customized solutions of today while **anticipating the industries' needs of tomorrow**. Calderys pays particular attention to the industry's impact on the environment and has a sustainability program articulated around three pillars: supporting our customers in their energy transition needs, improving our environmental footprint and being committed to people and local communities.

Health and safety is an integral part of how we do business. The same attention to detail that helps us provide personalized products and solutions is also applied to our rigorous health and safety criteria. Our activities require the highest level of professionalism to carry out our projects. To guarantee the strictest standards, Calderys employs a number of safety, occupational health and environmental protocols across all its entities worldwide – applicable to both our own employees as well as subcontractors and temporary workers.

CALDERYS IN INDIA

ALUMINUM FOUNDRY



Calderys in India stands as one of the nation's premier refractory solutions providers, combining global expertise with deep local market knowledge. Our extensive infrastructure and dedicated team deliver innovative, cost-effective solutions tailored to India's diverse industrial landscape.

- 6 manufacturing plants strategically located across India
- 3 brick merchandise units for comprehensive product availability
- Over 50 distributors ensuring nationwide reach and service
- Serving over 5,000 customers across the country
- More than 1,500 formulations developed for Indian market needs
- A world leader in acidic monolithic refractories
- First refractory company in India to launch an e-commerce platform



Industries We Serve



Iron and steel: Our product portfolio ranges from acidic monolithics to basics and bricks, while our services include everything from ironmaking and continuous casting to the supply of equipment for the full steel process.



Foundry: As expert in ferrous foundries, we offer an array of turnkey solutions for foundry refractories, as well as core and molding sand additives.



Thermal: We offer a wide range of end-to-end refractory solutions for industrial furnaces, including projects for aluminum, cement, glass, energy and environment industries, and many others.



WHAT WE BRING TO THE FOUNDRY INDUSTRY

Calderys is a one-stop shop for all aspects of metal processing for both ferrous and non-ferrous foundries, from melting, treating and transferring to the casting process. As one of India's leading foundry refractory providers, we offer a complete range of solutions: refractory castables and bricks, melt shop additives, slag coagulants, coatings materials, and molding sand additives.

Our market leadership in foundry spans from three core pillars:

- **R&D focus:** Continuously bringing new products to support energy and cost-efficiency gains
- **Expert network:** Foundry industry "insiders" combining local knowledge with global expertise
- **Quarry to furnace:** Mining asset ownership ensures process control, consistent quality and competitive pricing

What we bring to the foundries

- Close watch over ESG topics, including: energy optimization & CO₂ emission, eco-profile, product stewardships, safety culture and innovation
- Complete portfolio of customized solutions from the melting shop to the molding shop
- Full set of refractory services: from engineering & design, installation, project management, dry-out & commissioning, to maintenance and refractory assessments
- Foundry service facilities: off site relining and other refractory-related services
- Digital solutions: easier silo management through smart sensors, remote assistance and troubleshooting with CALDE® Smart Lens, molding sand materials analysis
- Casting defect consulting
- Technical support



WHAT WE BRING TO **ALUMINUM FOUNDRY**

Calderys is a world leader in monolithic refractory solutions for the aluminum industry. We are serving over 1,500 customers on 5 continents: from primary & secondary producers to casting foundries.



With a dedicated refractory range specially formulated for aluminum contact, Calderys provides world-class solutions to the top OEMs and largest end users in the field.

The ALKON® brand is known worldwide as the gold standard for refractory specific to the aluminum industry. These products are created specifically to defend against major impacts in your furnaces and other equipment in contact with liquid aluminum, particularly corundum formation and mechanical abuse.

References

Calderys is a reliable choice for all your refractory needs. Ask us about our references around the world in:

- Primary Aluminum (from potcells to tank furnaces)
- Secondary Aluminum (including rotary kilns, melting and holding furnaces)
- Aluminum Foundry (from twin chamber furnaces to transfer ladles)

OUR SERVICES



Engineering & Design

Our engineers work closely with you to optimize price and performance based on the needs of your specific operations. They use the latest tools and techniques to custom design your projects from start to finish, including heat-transfer calculations and drawings. Thanks to our familiarity with a wide range of bricks, fibers, anchors and other accessories, and our full portfolio of monolithic products, you can rest assured that your refractory lining is best-in-class.



Installation

To ensure our products fulfill your needs and deliver optimal performance, our in-house certified engineers will visit your premises to install your refractories quickly and efficiently using our own cutting-edge equipment. Calderys' supervisors and installers are trained to observe the highest safety and quality standards while working on your site. They will minimize downtime during installation while maintaining the high performance and long-term cost-effectiveness you expect from our products.



Dry Out & Commissioning

Proper dry-out is crucial to the lifetime of a refractory lining. Our experienced engineers will optimize your dry-out schedule, ensuring energy savings and refractory reliability.



Maintenance

Calderys' global project expertise at leading industrial sites means we provide a world-class, wide-ranging, bespoke maintenance service. We offer regular and predictive refractory maintenance, including shutdown maintenance services, as well as rapid round-the-clock response to emergencies. This leaves you free to focus on your core processes and maximize productivity.



Refractory Assessments

Before we start a job, we complete an extensive analysis of your process, equipment, and working conditions in order to provide the best solution for your needs. Our team pair their experience with the latest assessment techniques (from specialized checklists to thermal imaging) to optimize your refractory lining and related processes. Equipment that performs smoothly will deliver the best productivity and cost-efficiency. Personnel safety is a key element of Calderys' assessments. We also offer safety assessments for subcontractors undertaking refractory installation work at your site.



Machinery Service

CALDE® SPRAY MACHINE

Our machine for coating applications in Foundries completes our machinery services for our customers.

Main areas of use include ladles, runners, spouts or CIF furnaces, further reducing the time needed for daily maintenance and additionally improving the ergonomic aspects of this tasks.

CALDE® PAC

We offer a range of arm and base vibrators and automatic lifters for the hassle-free installation of our dry refractory materials such as CALDE® SILICA MIX and CALDE® MIX in Coreless Induction Furnaces.

These devices allow a highly efficient, consistent and correct compaction with low-maintenance components, independent from the operator. Easy-to-read installation manuals and reusable packing cases for safe storage on site highlight our understanding of our customer's processes.



Digital Solutions

Remote assistance and troubleshooting with CALDE® SMART LENS: Remote technical service via smart glasses linked to a secure web-based platform, as well as quick access to the Caldeys foundry networks.



Heat Loss Calculation

Get an optimized refractory lining for your furnace and improve your energy savings

REFRACTORY SOLUTIONS FOR THE ALUMINUM FOUNDRY



We have been working for years with worldwide engineering companies, contractors and end users in the Aluminum industry. Our international presence and expertise allow us to propose the most suitable technical solutions in order to contribute to your productivity improvements.

We are considered by our customers as a major specialist. We are developing high performance products and offer a complete range of monolithic solutions specifically for the primary and secondary industries as well as for foundries.

Expertise in Aluminum

We have been present in the Aluminum industry all over the world for many years and worked in all fields, primary, secondary and foundry, with all major producers.

Our understanding of the corundum formation with new modern alloys containing magnesium, zinc and other elements like strontium has led to the development of specific dense castables.



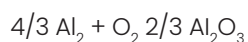
They are not wetted and not impregnated by these alloys, thanks to special additives added to LC or ULC castables which present low porosity and high mechanical strength to avoid the mechanical abuse during charging and cleaning.

Stresses

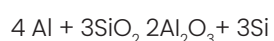
The major stresses to the lining in Aluminum (Al) furnaces with Al contact are corundum formation by oxidation and/or corrosion and mechanical abuse.

Corundum formation by oxidation:

At the surface of the bath, molten Al oxides with oxygen in the atmosphere:

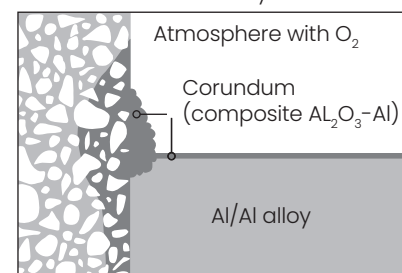


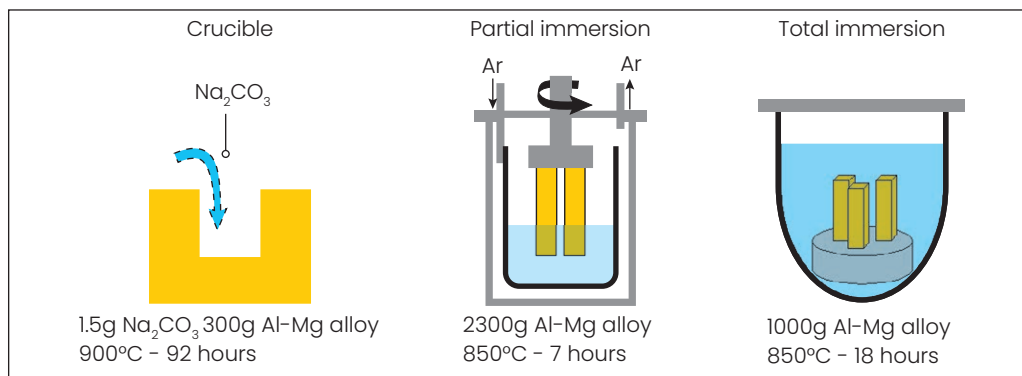
Liquid Aluminum and its alloys react with the refractories to form corundum by reduction of silica.



This corundum is very hard to remove and its growth decreases the capacity of the furnace, up to its stoppage in the worst case.

Corundum formation by corrosion





Aluminum reduces the silica of the refractories as well as all other reducible oxides with the formation of internal and external corundum. Internal corundum grows and destroys the lining. External corundum decreases the capacity of the furnace up to its complete stoppage. The modern Aluminum alloys contain magnesium, zinc, copper and other element such as strontium. These additions accelerate the corrosion of refractories with corundum growth. (For example instable alumina- magnesia spinel)

Mechanical abuse

Before each casting the bath surface needs to be cleaned and dedrossed (to avoid pollution of the metal), and it is also necessary to mechanically clean the furnace periodically. It suffers from the impact during charging. This bottom as well as the sidewalls and the ramps can be damaged during cleaning and dedrossing.

Products

We have significantly improved the low cement technology, compared to conventional castables, and patented it: very high mechanical strength in a wide range of temperatures and low porosity to reduce the infiltration of liquid metal. LC castables have been used to line aluminum furnaces. With the arrival of new alloys, our research has developed a new range of low cement castables with additives which prevent the wetting and the impregnation by aluminum and its alloys and suppress quite completely the corrosion stresses. As the corrosion starts in the matrix, our newly developed castables have a silica-free matrix. These castables are installed by casting, vibrating, pumping of self flowing products and also by gunning of LC castables. To ease the installation, we have kept phosphate bonded high quality fire bricks and insulating bricks in our range of solution. A combination lining of bricks and castables can be worked out to optimize overall operational cost.

Engineering

Starting with the shell design, we conceptualize full linings with heat transfer calculations, showing the intermediate and the casing temperature. We define the thicknesses of different layers:

Bath: Hot face with Al contact castable, insulating castable, non-wetting (no damage in case of accidental infiltration) and insulating boards.

Upper walls: Hot face dense castable with good thermal shock resistance, insulating layers and anchoring with anchor-bricks or metallic anchors, expansion joints, burners blocks with ramming mixes.

Roofs: They are suspended with ceramic (or metallic) anchors. Hot face dense castable with good thermal shock resistance and insulating layers to ensure low external temperature under the metallic supporting beams. We provide engineering drawings with bill of materials, we also propose the supervision of the installation of the refractories and the first heating up schedule.

PRIMARY ALUMINUM

We propose specific and successful products in Primary Aluminum.

Anode Baking Furnace

CALDE® CAST BETON N	FIRECRETE N
CALDE® CAST MW 130 M	INSULYTE 13
CALDE® CAST XL 116 C/G	INSULYTE 11
Bricks	
UPPER WALL	AC-42D & 42S
LOWER WALL	AC-50S & 55S

Alumina Flash Calciner

CALDE® CAST 1560	ACCCEM 60 A
CALDE® CAST LF 46 G3	ACCMON 45
CALDE® CAST LW 134 CO C/G	ACCGUN INS 8 HS
CALDE® CAST XL 106 C/G	INSULYTE 4G
CALDE® GUN 815	ACCMON GUN BF

Alumina Calcining Rotary Kiln

Operation-1250°C	
CALDE® CAST M 28 HR	ACCMON 45 H
CALDE® CAST M 32	ACCMON 80 H
Operation-1550°C	
CALDE® CAST LX 85	ACCMON 80
CALDE® CAST UT 94	ULTRAMON 95

Precast Piece



Transfer Ladles

Wall	
ALKON® FLOW LB 85	FLOWMON 80 SF AL
Roof	
ALKON® CAST MW 14 C/G	INSULYTE 13 AL

Electrolysis Cells

ALKON® PATCH F 45	WHYTPATCH-C AL
CALDE® CAST BETON N	FIRECRETE-N
CALDE® FLOW LA 60 Z	FLOWMON 60 Z
CALDE® TROWEL HQ 82 U	HS MORTAR
Bricks	
	AC-42D



TANK MELTING AND HOLDING FURNACES

Roof & Upper Walls

CALDE® CAST MF 46 G 10		ACCMON 45 H
CALDE® GUN C 28		ACCGUN 55

Bath Lining

Melting Furnace - Hot Face

ALKON® CAST 204		ACCMON 80 AL
ALKON® CAST MB 80		ACCMON 80 SF AL
ALKON® CAST MM 60		ACCMON 60 SF AL
ALKON® GUN B 80		ACCGUN 80 AL
ALKON® GUN F 50		ACCGUN 55 AL

Bricks

| AC 80/85 P & 45S

Intermediate Layer

CALDE® CAST BETON N		FIRECRETE - N
ALKON® CAST MF 44		ACCMON 45 AL

Insulation

Roof/Wall

CALDE® CAST LW MIX 124 C/G		INSULYTE 11 AL
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Chimney

CALDE® CAST MW 130 M		INSULYTE 13
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Doors

ALKON® CAST MF 44		ACCMON 45 AL
ALKON® CAST MM 60		ACCMON 60 SF AL
ALKON® CAST MW 14 C/G		INSULYTE 13 AL

Burner Blocks

CALDE® CAST 1560		ACCMON 70 M/ ACCMON 70 LI
CALDE® PLAST P 85		ACCPLAST 80

Lintel & Pillars

CALDE® CAST GIBRAM		ACCMON 80
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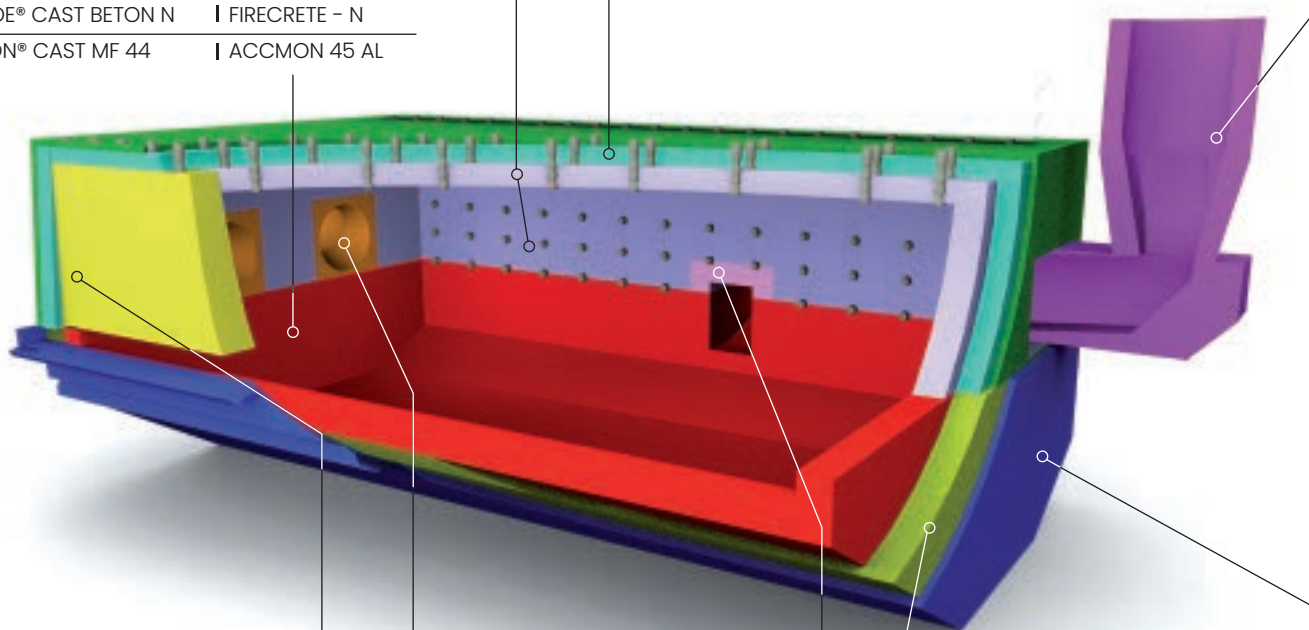
Bath Insulation & Safety Lining

ALKON® CAST LW 10 C/G		INSULYTE 11 AL
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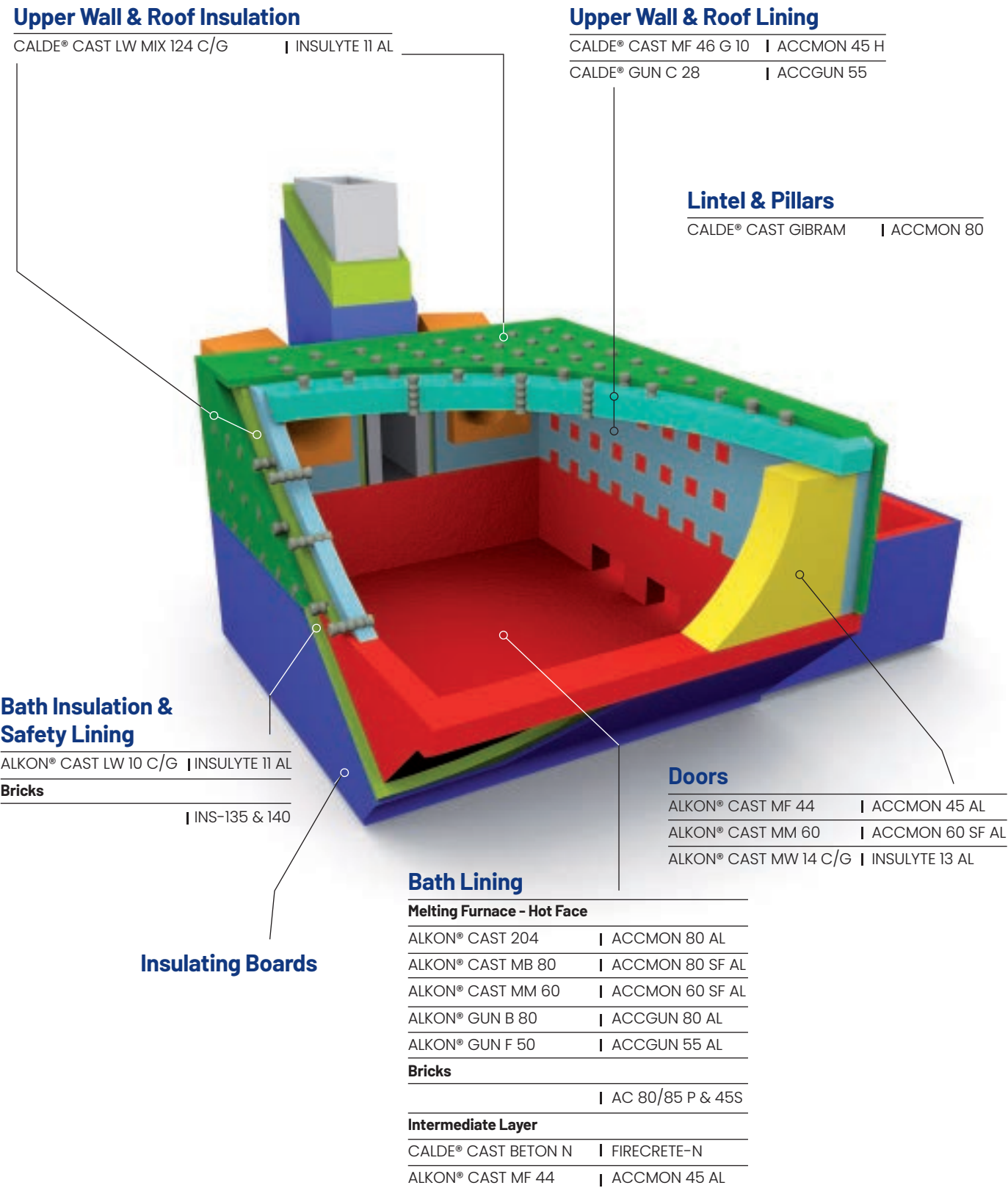
Bricks

AC-INS-135 & 140

Insulating boards



RECYCLING FURNACES



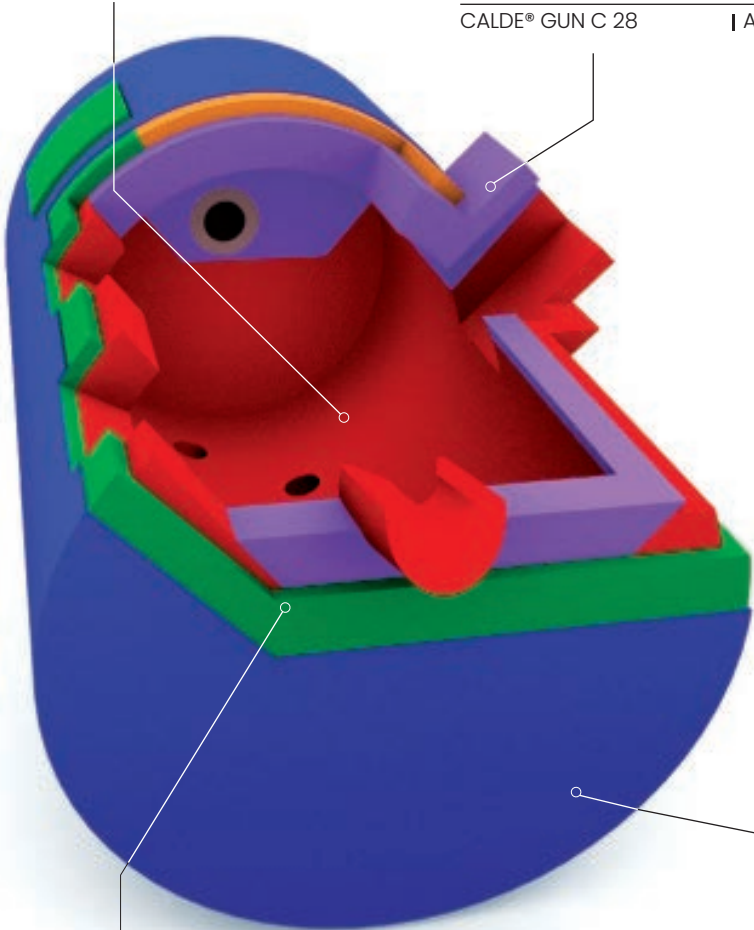
BARREL MELTING FURNACES

Bath Lining

Melting Furnace - Hot Face	
ALKON® CAST 204	ACCMON 80 AL
ALKON® CAST MB 80	ACCMON 80 SF AL
ALKON® CAST MM 60	ACCMON 60 SF AL
Bricks	
AC 80/85 P & 45S	
Intermediate Layer	
CALDE® CAST BETON N	FIRECRETE - N
ALKON® CAST MF 44	ACCMON 45 AL

Roof & Upper Walls

CALDE® CAST MF 46 G 10	ACCMON 45 H
CALDE® GUN C 28	ACCGUN 55



Bath Insulation & Safety Lining

ALKON® CAST LW 10 C/G	INSULYTE 11 AL
Bricks	
INS-135 & 140	

Insulating Boards

SINGLE CHAMBER SHAFT MELTING FURNACES

Bath Safety & Insulation

ALKON® CAST MW 14 C/G | INSULYTE 13 AL



Charging Shaft

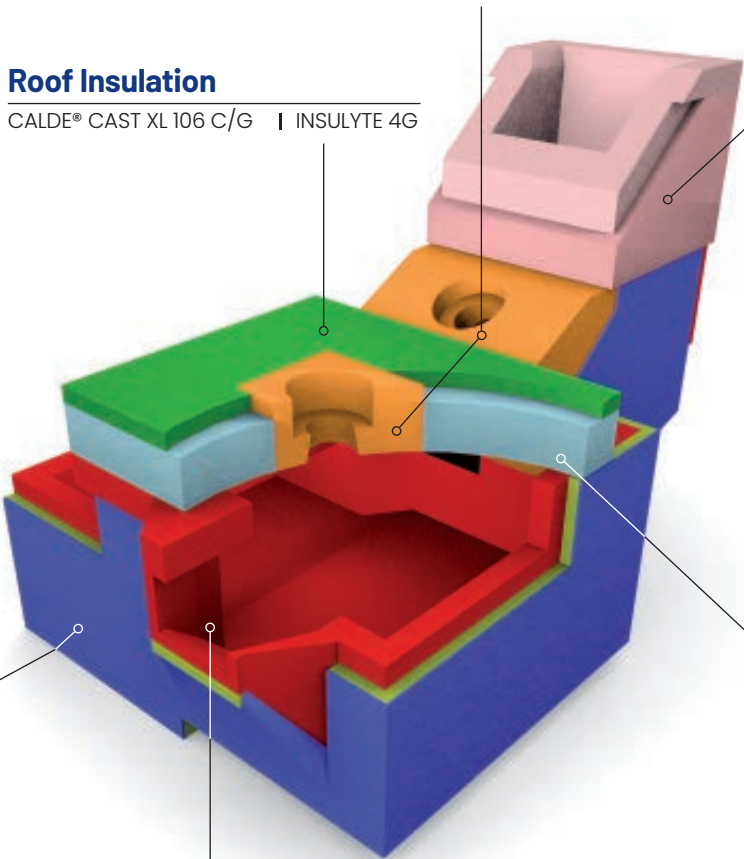
CALDE® CAST 1560 | ACCMON 60 A
CALDE® CAST M 32 | ACCMON 80 H

Burner Blocks

ALKON® CAST MM 60 | ACCMON 60 SF AL

Roof Insulation

CALDE® CAST XL 106 C/G | INSULYTE 4G



Insulating Boards

Bath Lining

ALKON® CAST 204 | ACCMON 80 AL
ALKON® FLOW LB 85 | FLOWMON 80 SF AL

Roof Lining

ALKON® CAST MM 60 | ACCMON 60 SF AL

BI CHAMBER SHAFT MELTING FURNACES

Burner Blocks

ALKON® CAST MM 60 | ACCMON 60 SF AL

Charging Shaft

CALDE® CAST 1560 | ACCMON 60 A
CALDE® CAST M 32 | ACCMON 80 H

Roof Lining

ALKON® CAST MM 60 | ACCMON 60 SF AL

Roof Insulation

CALDE® CAST XL 106 C/G | INSULYTE 4G

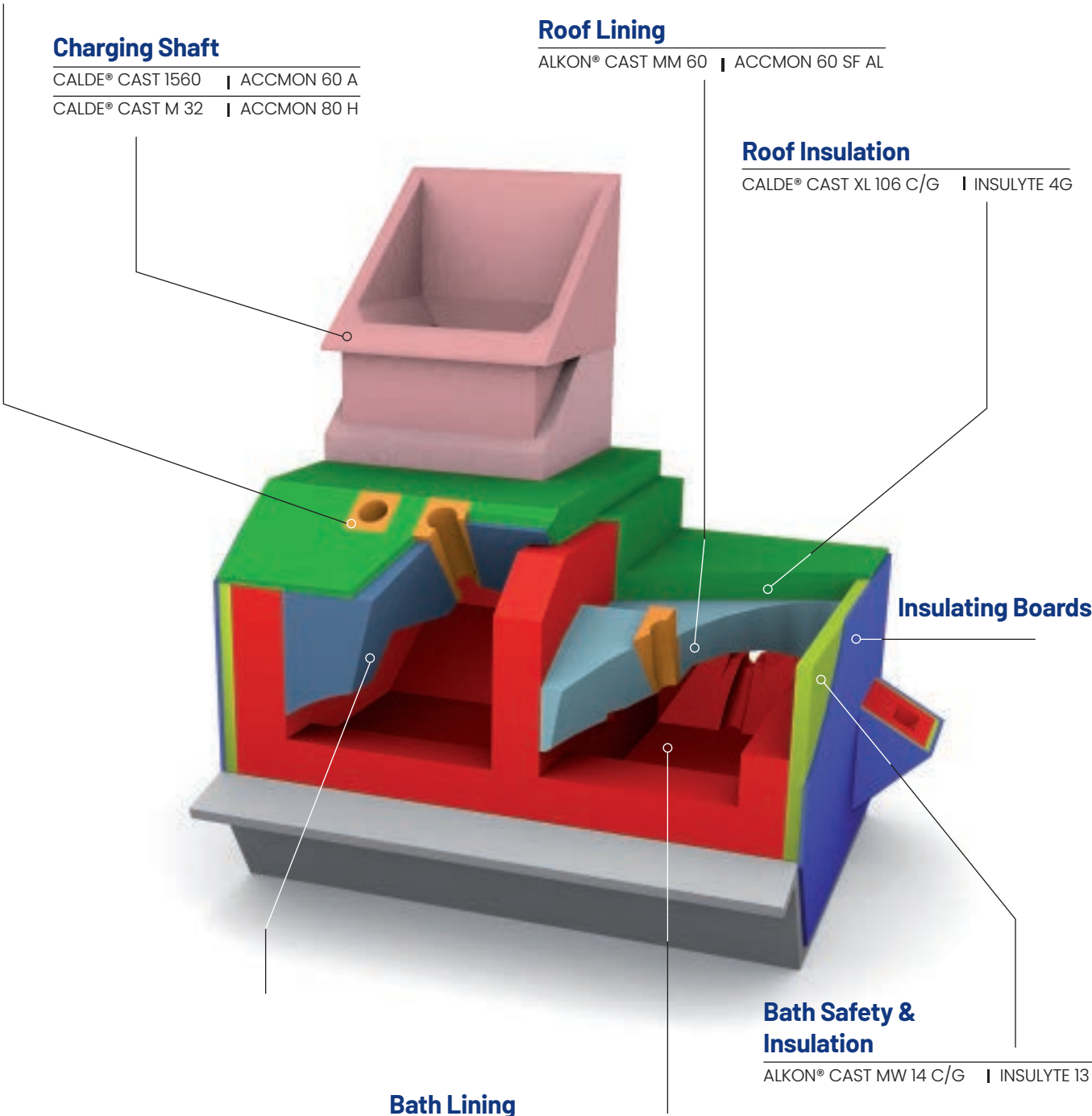
Insulating Boards

Bath Safety & Insulation

ALKON® CAST MW 14 C/G | INSULYTE 13 AL

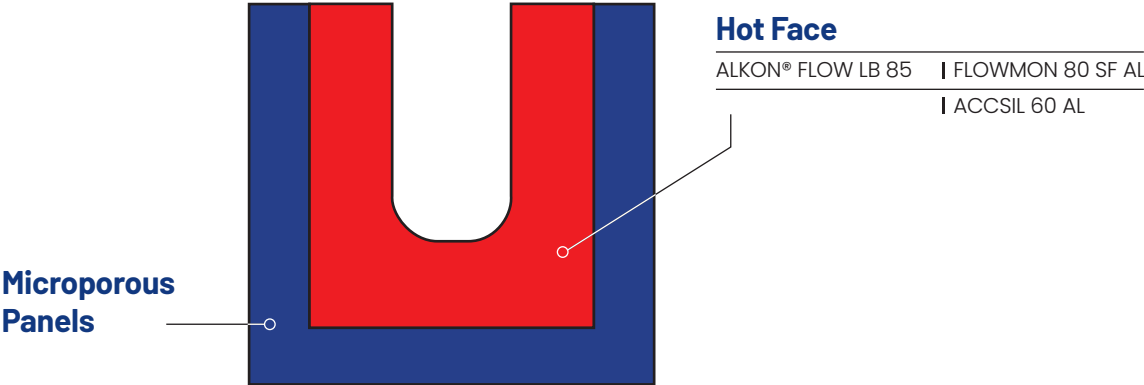
Bath Lining

ALKON® CAST 204 | ACCMON 80 AL
ALKON® FLOW LB 85 | FLOWMON 80 SF AL



LAUNDERS & ALPUR VESSELS

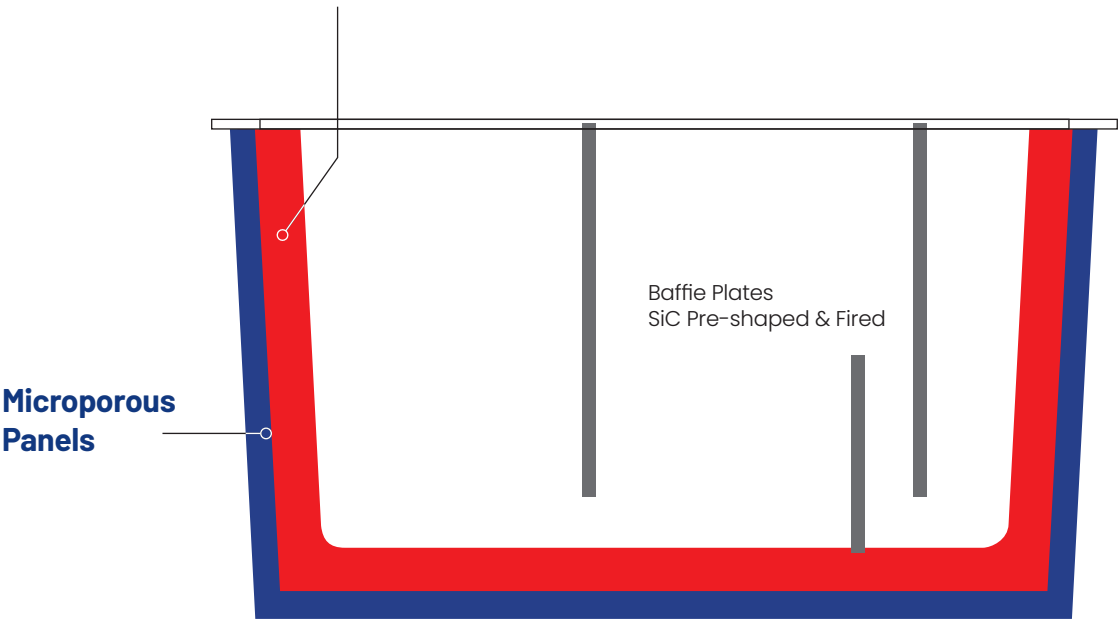
Launder (Cast In-Situ)



Hot Face

ALKON® FLOW LB BS	FLOWMON 80 SF AL
ALKON® CAST 204	ACCMON 80 AL

Alpur Vessel



DOSING FURNACES

Bath Lining

Melting Furnace - Hot Face	
ALKON® CAST 204	ACCMON 80 AL
ALKON® CAST MB 80	ACCMON 80 SF AL
ALKON® CAST MM 60	ACCMON 60 SF AL
Bricks	
	AC 80/85 P & 45S
Intermediate Layer	
CALDE® CAST BETON N	FIRECRETE - N
ALKON® CAST MF 44	ACCMON 45 AI

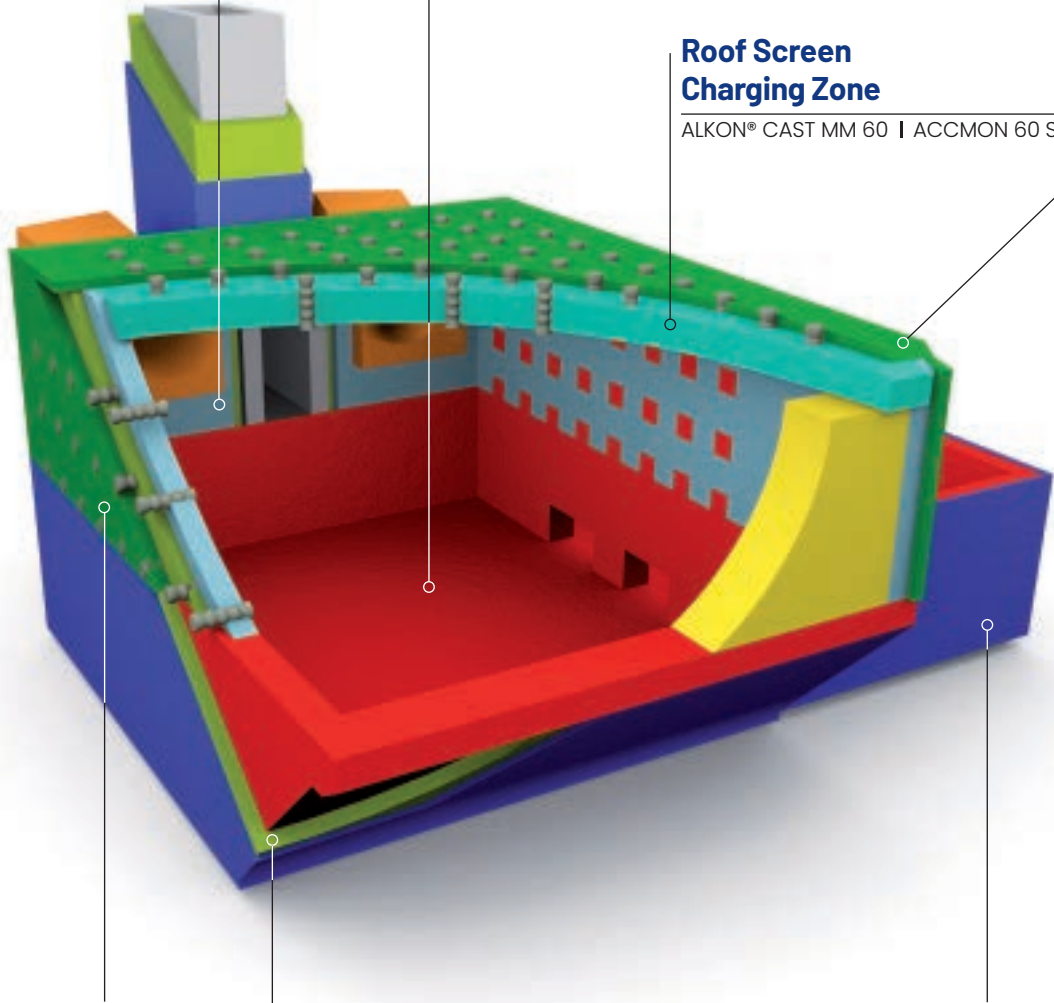
Chimney

CALDE® CAST MW 130 M | INSULYTE 13

Insulating Boards

Roof Screen Charging Zone

ALKON® CAST MM 60 | ACCMON 60 SF AL



Insulating
Boards

Insulating
Bricks

Microporous
Panels

ROAD TRANSPORT LADLES

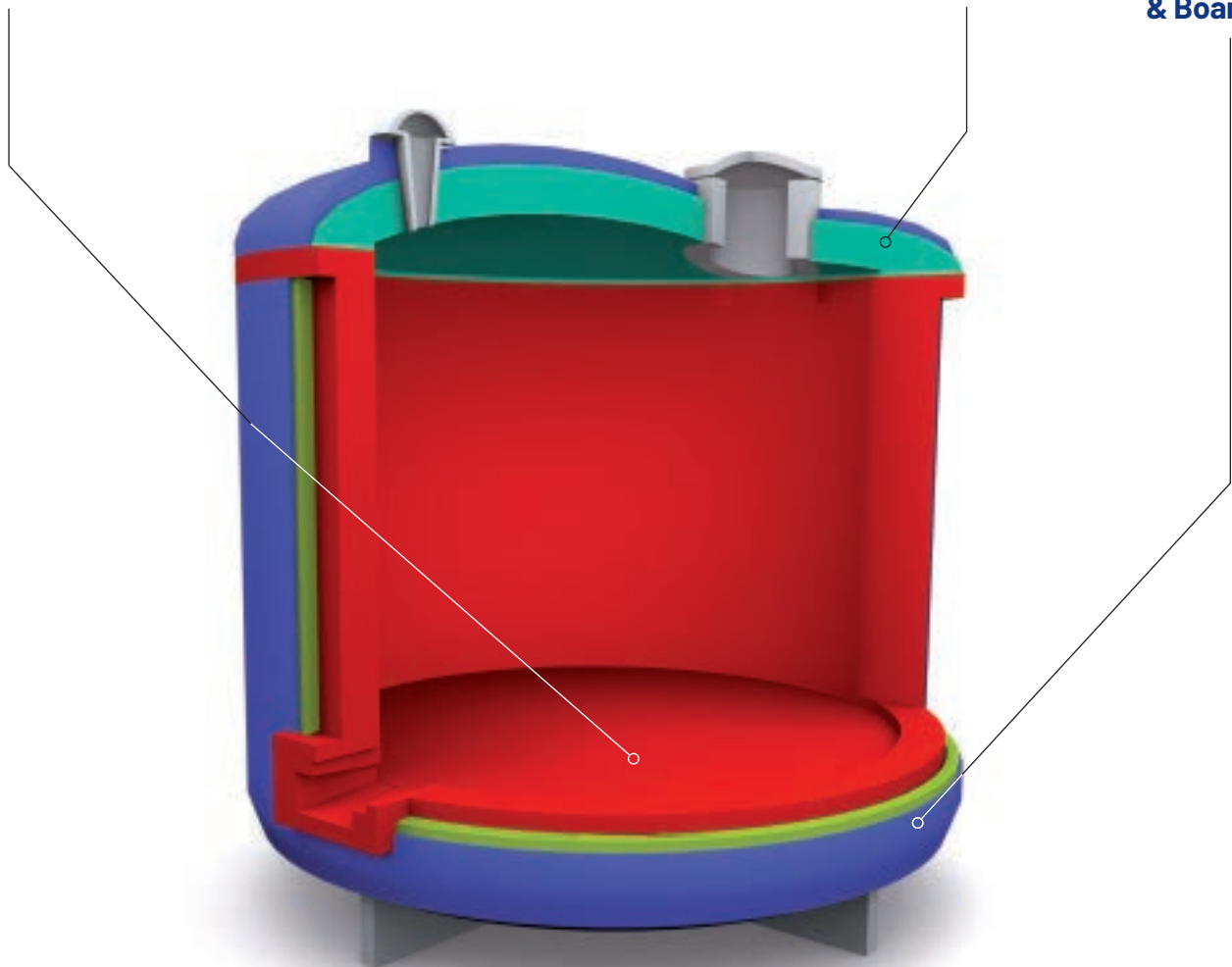
Bath Lining

ALKON® FLOW LB 85 | FLOWMON 80 SF AL

Cover Lining

ALKON® CAST MW 14 C/G | INSULYTE 13 AL

Insulating Bricks & Boards



CALDERYS RANGE

Sr. No.	Product Name	Main Component	Max. Recomm. Temp (°C)	Chemical Analysis (wt%)			Material Required t/m ³
				Al ₂ O ₃	Fe ₂ O ₃	CaO	
1	ALKON® CAST 204	Bauxite	1,200	79.50	1.10	4.30	2.82
2	ALKON® CAST LW 10 C/G	Insulating Chamotte	1,200	44.50	1.70	9.40	1.05 (Cast) 1.20 (Gun)
3	ALKON® CAST MB 80	Bauxite	1,400	81.00	1.30	3.10	2.84
4	ALKON® CAST MF 44	Chamotte	1,000	42.50	4.40	1.40	2.18
5	ALKON® CAST MM 60	Chamotte	1,450	61.00	0.90	3.00	2.60
6	ALKON® CAST MW 14 C/G	Insulating Chamotte	1,200	40.00	3.00	14.00	1.42 (Cast) 1.70 (Gun)
7	ALKON® FLOW LB 85	Bauxite	1,200	84.50	1.00	2.70	2.90
8	ALKON® GUN B 80	Bauxite	1,500	81.00	1.10	4.50	2.65
9	ALKON® GUN F 50	Chamotte	1,400	50.00	1.00	6.30	2.30
10	ALKON® PATCH F 45	Low Iron Chamotte	1,400	47.00	1.00	3.90	1.85
11	ALKON® PATCH PT 85 U	Tabular Alumina	1,200	85.00	0.10	-	-
12	CALDE® CAST 1560	Andalusite	1,650	59.00	1.10	2.20	2.50
13	CALDE® CAST BETON N	Chamotte	1,350	39.50	4.50	8.10	1.93
14	CALDE® CAST GIBRAM	Bauxite	1,600	82.50	1.50	1.20	2.90
15	CALDE® CAST LF 46 G 3	Chamotte	1,500	46.50	1.40	1.30	2.24
16	CALDE® CAST LW 134 CO C/G	Chamotte/Perlite	1,340	42.00	1.00	8.50	0.95 (Cast) 1.25 (Gun)
17	CALDE® CAST LX 85	Bauxite	1,600	83.00	1.10	2.20	2.83
18	CALDE® CAST M 28 HR	Chamotte	1,550	45.50	1.30	3.00	2.20
19	CALDE® CAST M 32	Bauxite	1,600	77.70	1.00	3.10	2.65
20	CALDE® CAST MF 46 G 10	C	1,450	46.50	3.20	4.60	2.25
21	CALDE® CAST MW 130 M	Insulating Chamotte	1,300	37.50	6.00	10.00	1.45
22	CALDE® CAST UT 94	Tabular Alumina	1,800	93.00	0.10	0.40	3.15
23	CALDE® CAST XL 106 C/G	Vermiculite	1,060	22.00	9.00	17.50	0.51 (Cast) 0.73 (Gun)
24	CALDE® CAST XL 116 C/G	Insulating Chamotte, Vermiculite	1,160	31.00	7.00	22.00	0.73 (Cast) 1.1 (Gun)
25	CALDE® FLOW LA 60 Z	Zircon	1,650	60.00	0.60	1.30	2.75
26	CALDE® GUN 815	Chamotte	1,450	55.00	0.80	7.50	2.40
27	CALDE® GUN C 28	Chamotte	1,500	46.00	1.30	5.80	2.25
28	CALDE® PLAST P 85	Bauxite	1,650	82.00	1.30	0.00	3.10
29	CALDE® TROWEL HQ 82 U	Quartzite	1,350	82.50 (SiO ₂)	0.40	0.00	1.75



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