PRODUCT INFORMATION SHEET

calderys

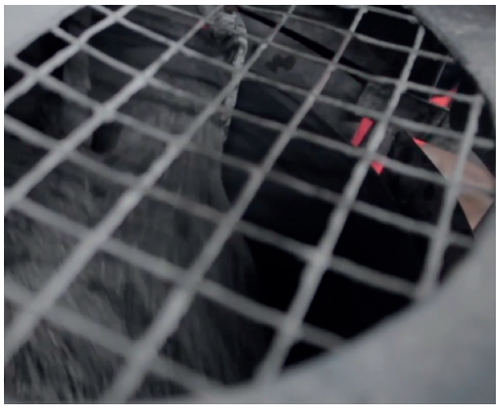
UNIVERCEM®
CEMENT INDUSTRY

PRODUCT DESCRIPTION

UniverCEM® is a deflocculated low cement dry gunning material which can be installed also by casting. Even rodding, ramming and patching installation are possible. The mechanical properties of these products are on the same level as those of low-cement castables.

It is currently available as follows:

- UniverCEM® HAR 10
- UniverCEM® HAR 20
- UniverCEM® HAR 70
- UniverCEM® Multi 1



MAJOR BENEFITS

- Combining the excellent properties of LC casting with the installation speed of dry gunning application
- Reducing the shut down time
- Decreasing installation costs
- Increasing life time
- Reducing storage and waste disposal costs

TYPICAL USE & APPLICATION

The product is suitable for high impact areas:

- High abrasion
- Thermal shock
- High Alkali load
- CO Atmosphere

A modified and adapted dry gunning machine has to be used.
Calderys offers the following options:

- for sale or on rental basis
- as a full equipment
- on a spare parts basis to adapt your own gunning machine
- as part of a full installation service solution

UniverCEM® has already been successfully installed at various customers across the EMEA region.

Please note:
Installation photo taken for demonstration purposes only, fully facial protection (visor) is required.

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ALUMINA & BASIC BRICK FOR ROTARY KILN SYSTEMS

Calderys is a leading global provider for industries operating in high temperature conditions, it now offers an extended portfolio of products and services together with subsidiary Haznedar Durer Refractories and HWI, a member of Calderys.

In 2020, Calderys acquired 60% of the highgrade monolithic refractories and refractory bricks manufacturer Haznedar Durer, providing a complete refractory solution offering to customers, particularly those in Europe and the Middle East.

In 2023, Calderys and HWI combined in one unified Group and HWI became a member of Calderys, and the brand for the Americas region of the Group.

Together, Calderys and HWI form one of the largest high temperature solutions providers in the world, offering customers an enlarged portfolio of products and services.

The Calderys group has more than 150 years of history, providing industry specified products that increase up-time for the cement and lime industries. From abrasion at feed ends of lime kilns to calciners and burning zones of cement plants.

The result is unprecedented value for customers from a global leader with a customer-centric, safety-first culture and a strong commitment to sustainability, inclusivity, and corporate social responsibility.

ALUMINA BRICK

We offer one of the most complete lines of alumina brick of any refractory supplier. In fact, many of our brands such as KALA®, UFALA®, CORAL BP®, AC, HAZAL have been industry specified brick for decades.

BASIC BRICK

We offer a complete line of magnesia-spinel brick for kiln systems. Compositions with fused and sintered spinels are available for use in all basic zones of cement and lime kilns. We also offer unique options for burning zones of cement kilns.

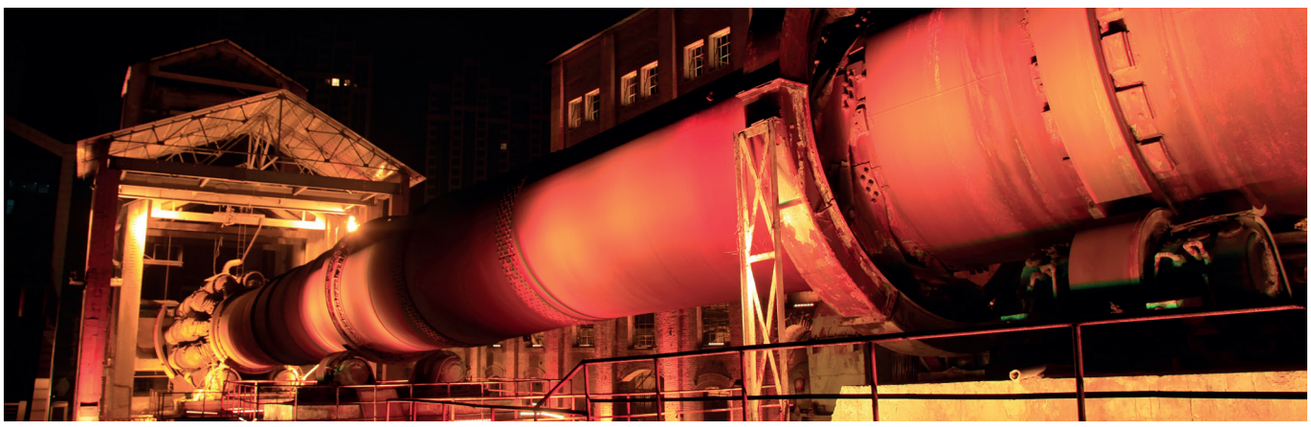
FEATURED PRODUCTS

Alumina Brick

KX-99®-BF
KALA®
UFALA®
ARK-70
KRUZITE®-70
ALADIN® 80
CORAL® BP
AC CAR
AC 40 S
AC 60SC
AC 70/20 SPL
AC KH SUPER
HAZAL T2AR
HAZAL ASC 30

Basic Brick

MAGNEL® BZ
MAGNEL® RS
MAGNEL® ULTRA
MAGNEL® UTLRA AF
VESTA
VESTA HP



REFRACTORY SPECIFICATIONS

Calderys has been providing refractory solutions for the cement industry for decades and is a favored supplier among major cement producers and specialist engineering companies worldwide.
Our success is based on a global network of engineers and experts that we have built up over the past 150 years, enabling us to select the products and services best suited to your process requirements.

ALUMINA BRICK

TECHNICAL DATA	KX-99®-BF	KALA®	UFALA®	ARK-70	KRUZITE® 70	ALADIN® 80	CORAL® BP
Bulk Density, lb/ft³ (g/cm³)	143 (2.29)	151 (2.42)	155 (2.48)	161 (2.58)	165 (2.64)	173 (2.77)	179 (2.87)
Apparent Porosity, %	12.8	14.1	15.0	17.5	16.8	18.0	15.7
Modulus of Rupture, lb/in² (MPa) at 70°F (21°C)	1700 (12)	2000 (14)	2300 (16)	1550 (11)	1800 (12)	1900 (13)	2800 (19)
Crushing Strength, lb/in² (MPa) at 70°F (21°C)	4700 (32)	9700 (67)	7000 (48)	9000 (62)	8000 (55)	8500 (59)	11,000 (76)
CHEMICAL ANALYSIS, % CALCINED BASIS	**KX-99®-BF**	**KALA®**	**UFALA®**	**ARK-70**	**KRUZITE® 70**	**ALADIN® 80**	**CORAL® BP**
Silica (SiO_2)	52.6	46.5	36.7	28.5	25.0	16.7	9.6
Alumina (Al_2O_3)	42.5	49.6	59.0	66.2	69.8	77.6	82.3
Titania (TiO_2)	2.2	2.3	2.6	2.8	3.0	3.2	2.7
Iron Oxide (Fe_2O_3)	1.3	1.3	1.4	1.6	1.4	1.8	1.3
Lime (CaO)	0.2	0.1	0.1	0.3	0.2	0.3	0.2
Magnesia (MgO)	0.3	0.1	0.1	0.2	0.2	0.1	0.1
Phos. Pentoxide (P_2O_5)	–	–	–	–	–	–	3.7
Alkalies (Na_2O+K_2O)	0.9	0.1	0.1	0.4	0.4	0.3	0.1

KX-99®-BF - High fired, superduty firebrick. Exhibits low porosity, high strength, good dimensional uniformity and resistance to carbon monoxide disintegration. Typical applications are roofs, barrels and cones of middle and upper stage cyclones and riser ducts as well as tertiary air ducts.

KALA® - High purity, 50% alumina brick with low porosity, excellent high temperature strength and exceptional resistance to alkali attack. Ideally suited for all areas of preheater cyclones and risers where alkali salts are present. Cost effective kiln brick alternative to 70 and 80% alumina brick in preheating and calcining zones.

UFALA® - A 60% alumina brick manufactured with high purity, domestic calcines. Exhibits low porosity and good hot strength and thermal shock resistance. Good resistance to chemical attack. May be used for all areas of preheater cyclones and risers where chemical attack is present. Cost effective kiln brick in preheating and calcining zones.

ARK-70 - Bauxite-based, 70% alumina brick with improved alkali resistance. Developed for demanding applications in cement & lime kilns where improved alkali resistance is required.

KRUZITE®-70 - Conventional 70% alumina brick manufactured with imported bauxitic calcines. Displays good thermal shock resistance and good hot strength. Ideally suited for use in calcining and safety zones of all rotary kilns where normal operating conditions are present.

ALADIN® 80 - An 80% alumina brick produced with imported calcined bauxite. Exhibits good hot strength, predictable reheat expansion and good thermal shock resistance. Can be used in the lower calcining and cooling zones where higher refractoriness is required.

CORAL® BP - An 80% alumina, phosphate-bonded, burned brick with excellent high temperature strength and low porosity. High degree of phosphate-bonding gives this product excellent strength and abrasion resistance throughout all temperature ranges. Ideally suited for use in charge zones of rotary kilns and in association with lime kiln internals where improved abrasion is required. Also used exclusively for ceramic anchor brick in cement & lime applications.

TECHNICAL DATA	AC 40S	AC CAR	AC 60SC	AC 70/20 SPL	AC KH SUPER	HAZAL T2AR	HAZAL ASC30
Bulk Density (g/cm³)	2.27	2.30	2.50	2.70	2.60	2.65	2.70
Apparent Porosity %	17-22	12-16	17-22	15-18	13-17	9.0	12.5
Crushing Strength (MPa)	35-55	50-70	45-70	65-95	60-100	140	85
CHEMICAL ANALYSIS, % CALCINED BASIS	**AC 40S**	**AC CAR**	**AC 60SC**	**AC 70/20 SPL**	**AC KH SUPER**	**HAZAL T2AR**	**HAZAL ASC30**
Alumina (Al_2O_3)	38-42	38-43	57-61	70min	48-52	58	45
Iron Oxide (Fe_2O_3)	2.0-2.5	1.4-2.0	2.2-2.8	2.0 max.	1.3-1.8	0.9	0.7
Silicon Carbide (SiC)	–	–	–	–	15	–	30

AC 40S - High fired, super duty firebrick. Exhibits low porosity, high strength, good dimensional uniformity and resistance to Alkalis. Typical applications are roofs, barrels and cones of middle and upper stage cyclones and riser ducts as well as tertiary air

AC CAR - High purity, Low alumina brick with low porosity, excellent high temperature strength and exceptional resistance to alkali attack. Ideally suited for all areas of preheater cyclones and risers where alkali salts are present. Cost effective kiln brick alternative to 70 and 80% alumina brick in preheating and calcining zones.

AC 60 SC - A 60% alumina brick manufactured with Chamotte and Bauxite. Exhibits low porosity and good hot strength and thermal shock resistance. Good resistance to chemical attack. May be used for all areas of preheater cyclones and risers where chemical attack is present. Cost effective kiln brick in preheating and calcining zones.

AC 70/20 SPL - Conventional 70% alumina brick manufactured with imported bauxitic calcines. Displays good thermal shock resistance and good hot strength. Ideally suited for use in calcining and safety zones of all rotary kilns where normal operating conditions are present.

AC KH SUPER - Medium Alumina with SiC added brick manufactured with Chamotte and bauxitic calcines. Displays good thermal shock resistance and good hot strength. Ideally suited for use in calcining and safety zones of all rotary kilns where normal operating conditions are present.

HAZAL ASC 30 - Medium Alumina with 30% SiC added brick manufactured with Andalusite. Displays Excellent Alkali resistance, good thermal shock resistance and good hot strength. Highly recommended for the Rotary Kiln with higher capacity, thermal load and AFR Usage.

HAZAL T2AR - T(Thermal shock) 2AR(Alkali & Abrasion Resistance)

HAZAL T 2AR is Andalusite based product has excellent resitanc against Thermal shock, Alkalies and Abrasion. It has only 9% porosity which helps to resist components consist of acid gases such as alkali, chlorine and Sulphur. Lower conductivity compared to the SiC containing bricks which is an added advantage with exceptional properties.

BASIC BRICK

TECHNICAL DATA	MAGNEL® BZ	MAGNEL® RS	MAGNEL® ULTRA	MAGNEL® ULTRA AF	VESTA	VESTA HP
Bulk Density, lb/ft³ (g/cm³)	181 (2.91)	185 (2.96)	184 (2.95)	180 (2.88)	183 (2.93)	188 (3.01)
Apparent Porosity, %	17.0	15.5	15.5	16.8	16.3	15.5
Modulus of Rupture, lb/in² (MPa)						
at 70°F (21°C)	1000 (7)	800 (6)	725 (5)	760 (5)	800 (6)	1050 (7)
at 2300°F (1260°C)	1650 (11)	1200 (8)	–	–	1300 (9)	1800 (12)
Crushing Strength, lb/in² (MPa) at 70°F (21°C)	5400 (37)	5200 (36)	4800 (33)	4000 (28)	7600 (52)	1000 (69)

CHEMICAL ANALYSIS, % CALCINED BASIS	MAGNEL® BZ	MAGNEL® RS	MAGNEL® ULTRA	MAGNEL® ULTRA AF	VESTA	VESTA HP
Silica (SiO_2)	0.8	0.4	0.3	0.3	0.9	0.8
Alumina (Al_2O_3)	5.8	10.9	10.7	7.4	10.8	7.7
Titania (TiO_2)	0.1	0.1	0.1	0.1	0.1	0.2
Iron Oxide (Fe_2O_3)	0.8	0.3	0.2	0.2	1.0	0.7
Lime (CaO)	1.4	1.2	1.2	1.2	1.3	1.1
Magnesia (MgO)	90.1	87.0	87.5	90.8	85.9	89.5
Manganese Oxide (MnO)	1.0	–	–	–	–	–

MAGNEL® BZ - High purity, magnesia-spinel brick diffused with coating enhanced additives. Lower spinel content and iron-rich matrix provide enhanced coatability. Good flexibility and resistance to high temperatures. Developed for burning zones of rotary cement kilns.

MAGNEL® RS - A combination of high purity, synthetic magnesite, fused spinel, and a matrix of reinforced spinel (RS) give this brick excellent physical properties. The high amount of fused spinel provides low thermal conductivity and low thermal expansion. Ideally suited for all areas of the basic zones of cement & lime kilns.

MAGNEL® ULTRA - Magnesia-spinel brick manufactured from high purity magnesite and high purity, fused spinel grain. Highly resistant to cyclical redox conditions and attack by sulfur, alkali salts and chlorine. Ideally suited for high thermal stress zones in rotary cement kilns or for use in the high wear areas of kilns burning waste fuels and/or high levels of petroleum coke.

MAGNEL® ULTRA AF - Magnesia-spinel brick manufactured from high purity magnesite and an alumina-rich synthetic, sintered spinel grain. Unique spinel formation and subsequent distribution within the matrix provides excellent coatability. Resistant to clinker liquid phase attack and overheating. Designed for use in upper and lower transition zones of cement kilns and burning zones in lime kilns. May also be used in kilns with high temperature issues or in kilns with a high silica modulus.

VESTA - Magnesia-spinel brick manufactured with high purity magnesite and fused spinel. Bonded with reinforced spinel matrix for improved coatability and good flexibility. High amount of fused spinel provides low thermal conductivity and low thermal expansion. Preferably used in upper and lower transition zones of rotary cement kilns and all basic zones of lime kilns.

VESTA HP - Magnesia-spinel brick manufactured with high purity magnesite and high purity, fused spinel. Additional special plant treatment yields low porosity and excellent corrosion resistance. VESTA HP is designed for use in high wear areas of cement kilns burning waste fuels and/or high levels of petroleum coke. It is also well suited for cement kilns utilizing oxygen enrichment.

AVAILABILITY, EDUCATION & TRAINING

Dedicated sales personnel ready to respond 24/7/365

- ~50 plants on the 5 continents
- Staging and shipping to anywhere in the world
- Ready-to-ship inventory of our best selling refractories
- On-site training for customers upon request
- Webcasts and video training modules upon request

INSTALLATION, SERVICE & SUPPORT

- On-demand installation and supervision services
- Quick response times, minimizing outages and downtime
- 150 years of customers process insights, yielding the best refractory solutions
- Embedded team members and resources at your site

GLOBAL PROJECTS & ENGINEERING

Offering a full set of services, from material selection to full turnkey solutions

- Greenfield construction
- Manufacturing and plant modernization

SERVING THE ADVANCED ENGINEERING NEEDS OF EXISTING FACILITIES

- End to end delivery of refractories: engineering and drawings, products and installation

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