REFRACTORIES FOR STEEL MILLS with ELECTRIC ARC FURNACES

ALLIED MINERAL PRODUCTS

Global Refractory Solutions

Corporate Headquarters: Columbus, Ohio, USA | +1-614-876-0244 | alliedmineral.com

ABOUT ALLIED

Allied Mineral Products is a world leader in the design and manufacture of monolithic refractories and precast shapes. With strong sales and service teams in the foundry, aluminum, steel, heat treat/forge and industrial markets, our success is based on our dedication to *Being There Worldwide with Refractory Solutions.*

Producing quality, consistent products is top priority at Allied and we have the products to meet your refractory needs. Our extensive product line includes innovative refractory technology and longstanding refractory alternatives.

Allied's focus on quality at every stage in the production process is unparalleled. A stringent raw material standard and global quality control testing before and after each batch is produced, provides customers with consistent products. We provide quick response times to any urgent request through flexible manufacturing systems at all our manufacturing facilities.

Global Refractory Solutions

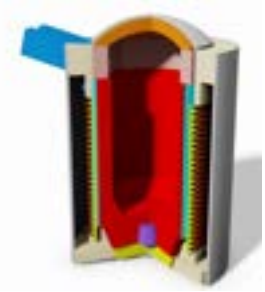
RESEARCH & ENGINEERING

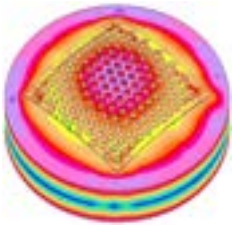
After gaining a detailed understanding of your specific needs, our team evaluates operating criteria and physical design parameters to create a detailed engineered design encompassing:

- Patented technologies
- Optimized product zoning
- Thermal models to optimize and validate designs
- Proven safety lining system designs
- Unique installation properties and techniques
- Leading edge refractory system designs

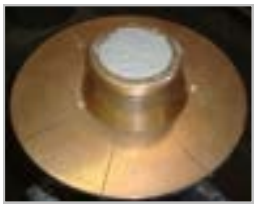
We're focused on developing new products, improving existing products and perfecting installation techniques. Our product development and testing is conducted in our state of the art research and technology center. We have an on-site gunning and shotcreting lab allowing extensive testing of installation properties.

As an innovative, technology-driven supplier we're devoted to providing customized refractory solutions for various industry operations. We offer a wide variety of high performance refractory products with superior raw material quality.



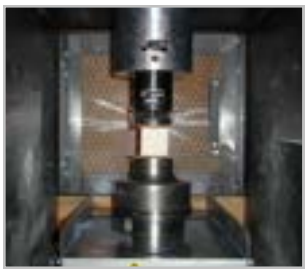


FEA Thermal Analysis



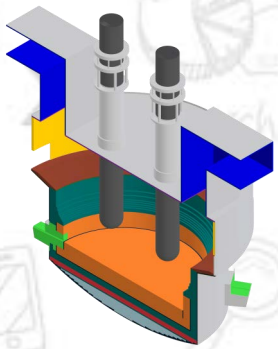
Flow Testing

Contact Tests



Strength Tests

ELECTRIC ARC FURNACE



Basic Practice

Allied's high magnesia gunning products like MAG-GUN 95 AF and MAG-GUN 90 AF are designed to maintain and repair high wear areas in electric arc furnaces.

The high MgO content and limited bond content make these mixes resistant to both basic and high iron oxide slags. The mixes adhere well to both hot and cold surfaces and have low rebound.

Product	Al_2O_3 %	SiO_2 %	CaO %	MgO %	Density	Maximum Temp
MAG-GUN 90 AF	0.9	5.5	2.4	89.6	2.34 g/cm^3 (146 lb/ft^3)	1750°C (3200°F)

Acid Practice

MELTZONA is a naturally occurring fireclay material. This product is a granular, free-flowing powder for gunning maintenance of Acid Practice Electric Arc Furnaces. MELTZONA is also well-suited for maintenance applications in ladles and cupolas.

Product	Al_2O_3 %	SiO_2 %	MgO %	Maximum Temp
MELTZONA 5/16	7.0	88.0	0.2	1540°C (2800°F)
MELTZONA #12	7.0	88.0	0.2	1540°C (2800°F)

EXHAUST DUCTS

Refractory in exhaust ductwork must withstand thermal shock and abrasion from air movement and particulate while also achieving desired thermal characteristics.

Allied has a range of low to medium alumina, insulating and dense refractory products designed to install using a range of methods including vibration casting, pumping, gunning, shotcreting. In addition, we offer rapid heat up products and fired shapes.

We produce superior performing products for challenging zones that experience high wear, abrasion and thermal shock.

Gunning

Product	Al_2O_3 %	SiO_2 %	CaO %	Density	Maximum Temp
GUNCAST® 28 LI	47.1	43.0	6.1	1.99 g/cm^3 (124 lb/ft^3)	1540°C (2800°F)
GUNMAX® M	55.5	38.3	2.5	2.10 - 2.16 g/cm^3 (131 - 135 lb/ft^3)	1650°C (3000°F)
REZIST ABRADE 50 G	49.4	44.1	2.4	2.15 g/cm^3 (134 lb/ft^3)	1650°C (3000°F)
REZIST ABRADE 65 G	66.5	26.8	1.8	2.31 g/cm^3 (144 lb/ft^3)	1650°C (3000°F)

Cast/Shotcrete

Product	Al_2O_3 %	SiO_2 %	CaO %	Density	Maximum Temp
TUFFCRETE® 47	47.1	46.5	2.1	2.21 g/cm^3 (138 lb/ft^3)	1540°C (2800°F)
FAST-TURN® 47	47.2	46.6	2.2	2.18 g/cm^3 (136 lb/ft^3)	1540°C (2800°F)

Backup Insulation

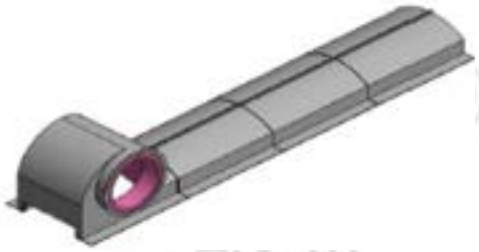
Product	Al_2O_3 %	SiO_2 %	CaO %	Density	Maximum Temp
INSULMIX® 2035 LI	37.9	42.3	14.2	0.6 g/cm^3 (36 lb/ft^3)	1100°C (2000°F)
PUMPLITE 40	37.2	40.4	12.9	0.7 g/cm^3 (41 lb/ft^3)	1095°C (2000°F)
PUMPLITE 60	40.7	43.3	10.4	0.9 g/cm^3 (57 lb/ft^3)	1315°C (2400°F)
PUMPLITE 60 LI	39.7	47.6	8.0	1.02 g/cm^3 (64 lb/ft^3)	1370°C (2500°F)

DUST/EXHAUST HOOD PREHEAT TUNNEL

Monolithic refractory products provide good insulating properties in areas like dust/exhaust hoods and preheat tunnels in steel mills with electric arc furnaces. This results in lower steel temperatures and longer life of structure by extending lining life in comparison to bricks. Monolithic linings are easy to repair using products designed to repair and patch existing linings.

Benefits of monolithic linings

- Good insulation
- Lower steel shell temperature
- Extending lining life
- Easy to maintain/patch lining

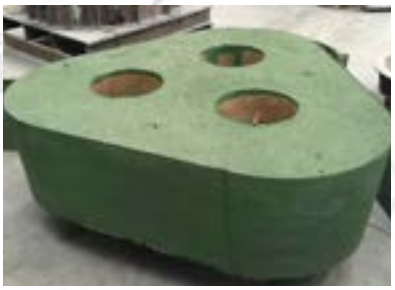


Product	Al_2O_3 %	SiO_2 %	CaO %	Density	Maximum Temp
DURACON® 32	63.1	31.6	1.3	2.54 g/cm^3 (158 lb/ft^3)	1760°C (3200°F)
TUFF-FLO 62M	62.7	31.1	2.4	2.48 g/cm^3 (153 lb/ft^3)	1760°C (3200°F)
ALAKAST 68-LC-P	69.0	25.2	1.5	2.62 g/cm^3 (163 lb/ft^3)	1650°C (3000°F)
BLAST KAST® 70 LC	65.3	29.0	1.9	2.36 g/cm^3 (147 lb/ft^3)	1650°C (3000°F)

PRECAST DELTA SHAPES

Allied manufactures a range of products to cast deltas in house or to make precast shapes from the same products. Precast shapes produced and dried under optimal conditions allow for quick installation and turnaround.

Low/ultra low cement dense refractory products with metallic fiber and chrome-oxide additions will perform well in this aggressive application. These products are designed to support operation at high temperatures, abrasion and corrosion.



Product	Al_2O_3 %	SiO_2 %	CaO %	Cr_2O_3 %	Density	Maximum Temp
ALAKAST® 68-LC-P	69.0	25.2	1.5	-	2.62 g/cm^3 (163 lb/ft^3)	1650°C (3000°F)
METAL KAST 85	82.6	12.4	1.7	-	2.85 g/cm^3 (178 lb/ft^3)	1760°C (3200°F)
ALAKAST® 85 ULC	85.7	9.3	1.4	-	2.81 g/cm^3 (176 lb/ft^3)	1705°C (3100°F)
L-CAST® 200A	82.6	9.9	0.5	-	2.92 g/cm^3 (182 lb/ft^3)	1705°C (3100°F)
LCF 208 CR	80.9	9.3	0.6	5.0	2.96 g/cm^3 (185 lb/ft^3)	1705°C (3100°F)

LARGE LADLES > 20 MT

Backup or safety linings

LADLE VIBE® and LADLE-LITE® are installed as a backfill refractory between a brick safety lining and working lining. These products may also be used as a full safety lining behind both bonded and unbonded hot face brick working linings.

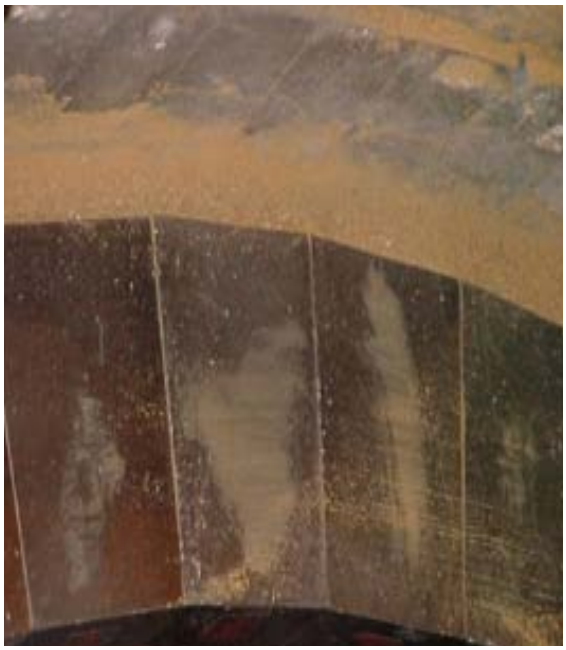
Benefits

- Completely dry with heat activated binder
- No mixing or curing required
- Rapid heating capacity
- Easy installation with low dust
- Easy removal of brick lining and back up lining

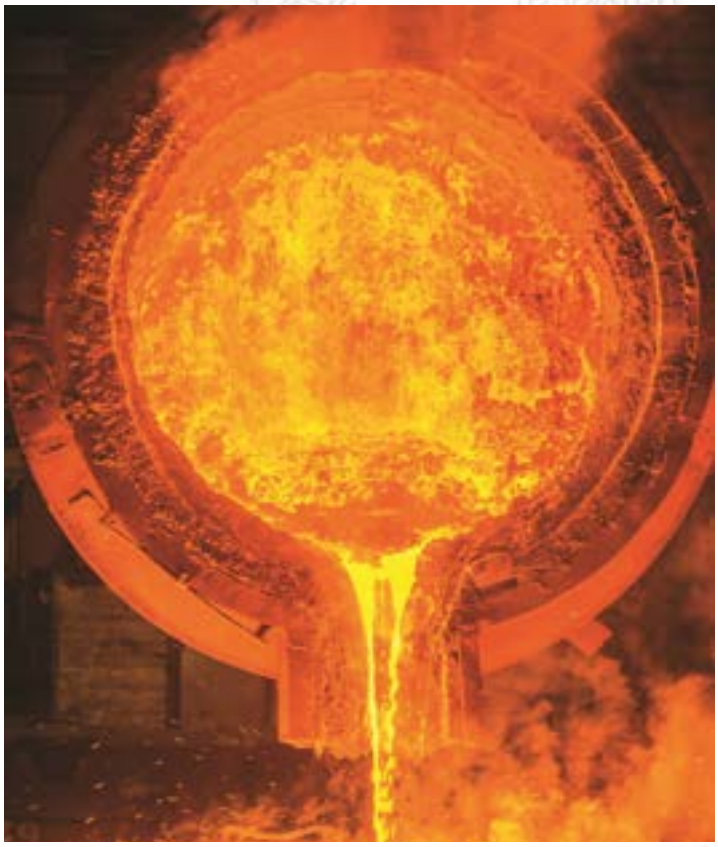
BACK UP LINING—LARGE LADLES > 20 MT

Product	Al_2O_3 %	SiO_2 %	Density	Maximum Temp
LADLE VIBE® 68M	1.4	35.4	2.00 g/cm^3 (123 lb/ft^3)	1650°C (3000°F)
LADLE VIBE® 88	83.5	8.6	2.55 g/cm^3 (159 lb/ft^3)	1760°C (3200°F)
LADLE-LITE® 123A	74.0	17.6	2.02 g/cm^3 (126 lb/ft^3)	1650°C (3000°F)

Product	Thickness	Width	Length
SKAMOL CLICK BOARD	1/2	12	24



LARGE LADLES > 20 MT



LADLES < 20 MT

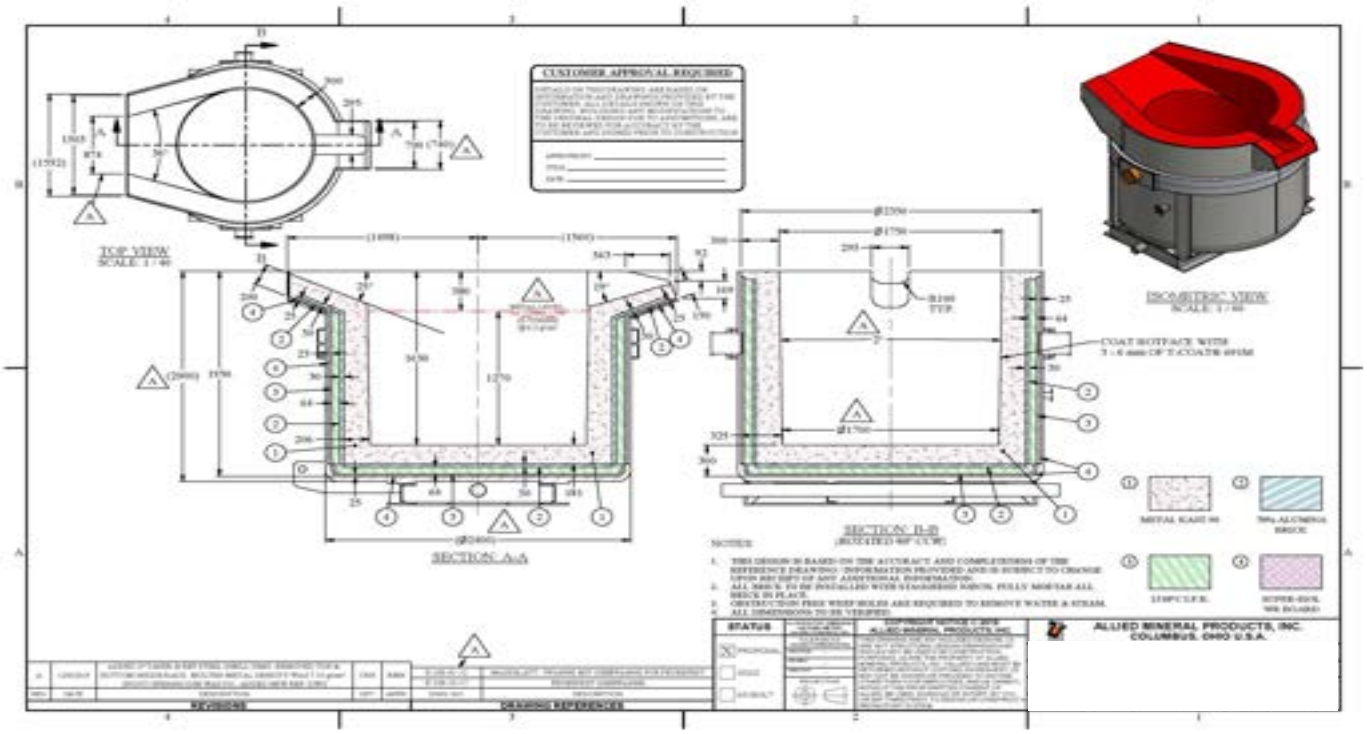
Allied manufactures a range of castable options for the hot face lining of ladles under 20 MT. Our high alumina, bauxite and mullite based castables have improved technology products that include versions containing additions of silicon carbide or chrome. Some benefits of castable linings over brick linings in ladles are quicker installation time, lower total cost of installation, improved performance, and ease of patching and maintenance.

CASTABLES — LADLES < 20 MT

Product	Al_2O_3 %	SiO_2 %	CaO %	Density	Maximum Temp
DURACON® 32	63.1	31.6	1.3	2.54 g/cm^3 (158 lb/ft^3)	1760°C (3200°F)
METAL KAST 85	82.6	12.4	1.7	2.85 g/cm^3 (178 lb/ft^3)	1760°C (3200°F)
LCF384A	80.0	13.0	1.6	2.64 g/cm^3 (165 lb/ft^3)	1705°C (3100°F)
METAL KAST 90	93.9	4.3	1.4	3.04 g/cm^3 (190 lb/ft^3)	1870°C (3400°F)

COVER

Product	Al_2O_3 %	SiO_2 %	CaO %	Density	Maximum Temp
BLAST KAST® 70 LC	65.3	29.0	1.9	2.36 g/cm^3 (147 lb/ft^3)	1650°C (3000°F)
QUICK CAST® 62	67.7	26.7	2.0	2.64 g/cm^3 (176 lb/ft^3)	1705°C (3100°F)
DURACON® 32	63.1	31.6	1.3	2.54 g/cm^3 (158 lb/ft^3)	1760°C (3200°F)
TUFF-FLO 62 M	62.7	31.1	2.4	2.48 g/cm^3 (155 lb/ft^3)	1760°C (3200°F)

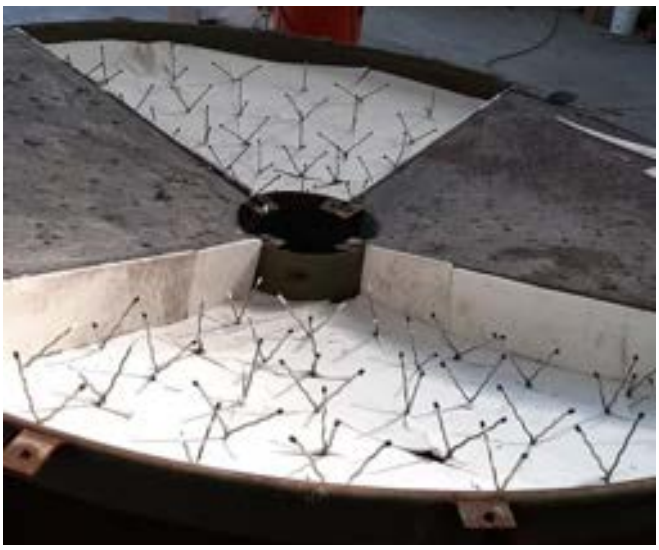


LADLES < 20 MT

LADLE COVERS

COVER

Product	Al_2O_3 %	SiO_2 %	CaO %	Density	Maximum Temp
BLAST KAST® 70 LC	65.3	29.0	1.9	2.36 g/cm^3 (147 lb/ft^3)	1650°C (3000°F)
QUICK CAST® 62	67.7	26.7	2.0	2.64 g/cm^3 (176 lb/ft^3)	1705°C (3100°F)
TUFF-FLO 62 M	62.7	31.1	2.4	2.48 g/cm^3 (155 lb/ft^3)	1760°C (3200°F)



TUNDISHES

The primary application for T-COAT® troweling mixes is a sacrificial insulative coating on the walls of tundishes used for continuous casting. Excessive labor costs and backfill materials are eliminated by applying T-COAT® troweling mixes.

MgO COATING - SACRIFICIAL LINING

Product	Application	MgO %	Al_2O_3 %	SiO_2 %	CaO %	C %	Density	Maximum Temp
T-COAT® TW-F68	*Trowel*	68.0	3.5	19.3	-	-	2.07 g/cm^3 (129 lb/ft^3)	1650°C (3000°F)
T-COAT® TW-F76	*Trowel*	76.2	3.5	11.7	-	-	2.13 g/cm^3 (133 lb/ft^3)	1705°C (3100°F)
T-COAT® 692M	*Trowel/ Slurry Gun*	56.0	-	-	-	-	2.00 g/cm^3 (125 lb/ft^3)	1650°C (3000°F)
T-COAT® 689M	*Trowel/ Slurry Gun*	83.0	3.5	8.5	-	-	2.05 g/cm^3 (128 lb/ft^3)	1705°C (3100°F)
CW KOTE 85	*Trowel/ Slurry Gun*	82.2	2.9	9.5	2.3	-	1.54 – 1.70 g/cm^3 (96 – 106 lb/ft^3)	-
LADLE WELL	*Hand Apply*	-	11.0	64.5	-	20.0	1.91 g/cm^3 (119 lb/ft^3)	1540°C (2800°F)

BACK UP LINING

Product	Al_2O_3 %	SiO_2 %	CaO %	Density	Maximum Temp
METAL KAST 85	82.6	12.4	1.7	2.85 g/cm^3 (178 lb/ft^3)	1760°C (3200°F)
LCF384A	80.0	13.0	1.6	2.64 g/cm^3 (176 lb/ft^3)	1705°C (3100°F)
ALAKAST® 68 LC P	69.0	25.2	1.5	2.62 g/cm^3 (163 lb/ft^3)	1650°C (3000°F)
METAL KAST 70	70.3	23.9	1.7	2.68 g/cm^3 (167 lb/ft^3)	1760°C (3200°F)
CW 965	69.0	28.0	0.7	2.65 g/cm^3 (165 lb/ft^3)	1705°C (3100°F)
DURACON® 32	63.1	31.6	1.3	2.55 g/cm^3 (159 lb/ft^3)	1760°C (3200°F)

COVERS

Product	Al_2O_3 %	SiO_2 %	CaO %	Density	Maximum Temp
BLAST KAST® 70 LC	65.3	29.0	1.9	2.36 g/cm^3 (147 lb/ft^3)	1650°C (3000°F)
TUFF-FLO 62 M	62.7	31.1	2.4	2.48 g/cm^3 (155 lb/ft^3)	1760°C (3200°F)

REPAIRS

The **DRI-CAST** family is a dry refractory powder designed for hot patching refractory linings of ladles, tundishes and other metal handling equipment. DRI-CAST is to be directly thrown on the hot surfaces of worn refractory where the DRI-CAST will instantly liquify and flow over the damaged area or fill in the gaps and cracks to extend service life. Other applications include the repair of nearly all horizontal surfaces in metal handling equipment which has been eroded or cracked during operation.

Product	Al_2O_3 %	SiO_2 %	CaO %	Density	Maximum Temp
DRI-CAST 581	70.0	15.0	1.7	2.64 g/cm^3 (165 lb/ft^3)	1650°C (3000°F)
DRI-CAST 591	69.0	16.0	1.6	2.96 g/cm^3 (185 lb/ft^3)	1700°C (3100°F)

The **STEEL-PAK** family of products is a phosphoric acid-bonded, high-alumina refractory plastic designed to have outstanding abrasion and corrosion resistance. STEEL-PAK is excellent for severe applications due to its chromium oxide addition. This additive combines with a coarse grain alumina matrix resulting in a construction grade refractory plastic well suited for a diverse number of applications. STEEL-PAK is ideal for iron runner spouts, arc furnace delta sections and spouts, BOF cones, tundish impact pads and patching, degasser snorkels, nozzle and well assemblies, spout repairs, and burner ports.

Product	Al_2O_3 %	SiO_2 %	Cr_2O_3 %	Density	Maximum Temp
STEEL-PAK 83 CR	80.0	11.6	1.0	2.82 g/cm^3 (176 lb/ft^3)	1760°C (3200°F)
STEEL-PAK 86 CR	75.5	11.9	4.2	2.92 g/cm^3 (182 lb/ft^3)	1760°C (3200°F)
STEEL-PAK 90 CR	73.1	12.3	7.3	2.93 g/cm^3 (183 lb/ft^3)	1760°C (3200°F)

The **STEEL-PAK** family of products is a phosphoric acid-bonded, high-alumina refractory plastic designed to have outstanding abrasion and corrosion resistance. STEEL-PAK is excellent for severe applications due to its chromium oxide addition. This additive combines with a coarse grain alumina matrix resulting in a construction grade refractory plastic well suited for a diverse number of applications. STEEL-PAK is ideal for iron runner spouts, arc furnace delta sections and spouts, BOF cones, tundish impact pads and patching, degasser snorkels, nozzle and well assemblies, spout repairs, and burner ports.

Product	Al_2O_3 %	SiO_2 %	Cr_2O_3 %	Density	Maximum Temp
STEEL-PAK 83 CR	80.0	11.6	1.0	2.82 g/cm^3 (176 lb/ft^3)	1760°C (3200°F)
STEEL-PAK 86 CR	75.5	11.9	4.2	2.92 g/cm^3 (182 lb/ft^3)	1760°C (3200°F)
STEEL-PAK 90 CR	73.1	12.3	7.3	2.93 g/cm^3 (183 lb/ft^3)	1760°C (3200°F)

REHEAT FURNACES

The process of reheating steel often involves thermal shock and mechanical abrasion. With cutting-edge, proven products we can help extend the life of your furnaces, improve efficiency and reduce maintenance costs.

Allied provides a complete line of products for floors, walls, pier blocks and burners for reheat furnaces.

- Pusher
- Walking Beam
- Rotary Hearth

PUSHER FURNACE

Roof/Sidewalls	Al_2O_3 %	SiO_2 %	CaO %	Density	Maximum Temp
BLAST KAST® 70-LC	65.2	29.0	1.9	2.36 g/cm^3 (147 lb/ft^3)	1650°C (3000°F)
TUFFCRETE® 60 M	61.3	32.8	1.9	2.52 g/cm^3 (157 lb/ft^3)	1700°C (3100°F)
FAST-TURN® 65 M	64.8	29.6	1.8	2.58 g/cm^3 (161 lb/ft^3)	1700°C (3100°F)
TUFF-FLO 62 M	62.7	31.1	2.4	2.48 g/cm^3 (155 lb/ft^3)	1760°C (3200°F)
FASTMAX® 70	68.0	28.0	-	2.45-2.51 g/cm^3	1705°C (3100°F)

Burner Walls	Al_2O_3 %	SiO_2 %	CaO %	Density	Maximum Temp
TUFFCRETE 60 M	61.3	32.8	1.9	2.52 g/cm^3 (157 lb/ft^3)	1700°C (3100°F)
BLAST KAST® 70- LC	65.2	29.0	1.9	2.36 g/cm^3 (147 lb/ft^3)	1650°C (3000°F)
RAM MAX® 65 AS	62.5	32.8	-	2.79 g/cm^3 (174 lb/ft^3)	1650°C (3000°F)

Burner Blocks	Al_2O_3 %	SiO_2 %	CaO %	Density	Maximum Temp
ALAKAST® 85-ULC	85.7	9.3	1.4	2.81 g/cm^3 (176 lb/ft^3)	1705°C (3100°F)
LCF 798A	61.5	35.0	2.1	2.64 g/cm^3 (165 lb/ft^3)	1705°C (3100°F)

Hearth	Al_2O_3 %	SiO_2 %	CaO %	Density	Maximum Temp
ALAKAST® 90 LC-P	90.4	7.9	1.3	2.89 g/cm^3 (181 lb/ft^3)	1760°C (3200°F)
ALAKAST® 85 LC-P-ES	87.5	8.4	1.4	3.01 g/cm^3 (199 lb/ft^3)	1760°C (3200°F)
FASTMAX® 90	91.0	7.0	-	2.85 g/cm^3 (178 lb/ft^3)	1870°C (3400°F)
TUFF-FLO 34 SP	89.5	-	1.6	3.04 g/cm^3 (190 lb/ft^3)	1870°C (3400°F)
TUFF-FLO 98	98.6	0.1	1.2	3.03 g/cm^3 (189 lb/ft^3)	1870°C (3400°F)

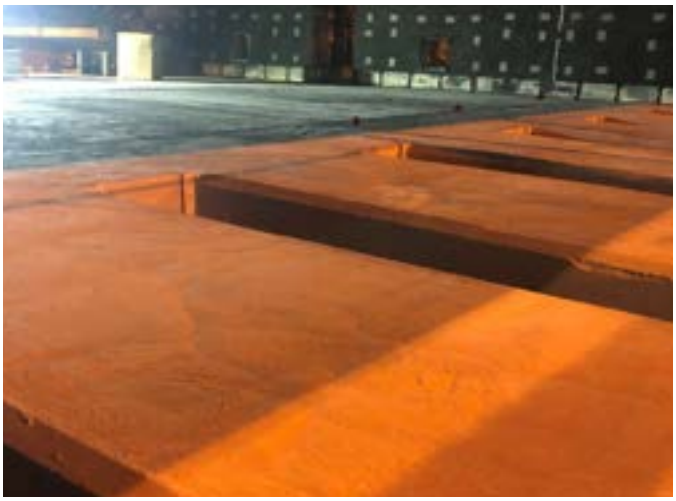


PUSHER FURNACE

Skid Blocks, Starter Blocks & Bumper Blocks	Al_2O_3 %	SiO_2 %	CaO %	Density	Maximum Temp
ALAKAST® 98-EZC	98.0	0.1	1.5	3.00 g/cm^3 (187 lb/ft^3)	1705°C (3100°F)
TUFF-FLO 34 SP	89.5	-	1.6	3.04 g/cm^3 (188 lb/ft^3)	1870°C (3400°F)

Insulating Castables	Al_2O_3 %	SiO_2 %	CaO %	Density	Maximum Temp
PUMPLITE 60	40.7	43.3	10.4	0.91 g/cm^3 (57 lb/ft^3)	1315°C (2400°F)
PUMPLITE 60 LI	39.7	47.6	8.0	1.02 g/cm^3 (64 lb/ft^3)	1370°C (2500°F)
PUMPLITE 80	41.6	43.7	9.0	1.25 g/cm^3 (78 lb/ft^3)	1425°C (2600°F)
PUMPLITE 80 LI	42.2	46.7	7.2	1.28 g/cm^3 (80 lb/ft^3)	1425°C (2600°F)

Back-up Linings	Al_2O_3 %	SiO_2 %	CaO %	Density	Maximum Temp
AMP-IFB	40.7	43.3	10.4	0.91 g/cm^3 (57 lb/ft^3)	1315°C (2400°F)
SKAMOL BOARD	39.7	47.6	8.0	1.02 g/cm^3 (64 lb/ft^3)	1370°C (2500°F)
CERAMIC FIBER	41.6	43.7	9.0	1.25 g/cm^3 (78 lb/ft^3)	1425°C (2600°F)



WALKING BEAM FURNACE

Roof/Sidewalls	Al_2O_3 %	SiO_2 %	CaO %	Density	Maximum Temp
BLAST KAST® 70-LC	65.2	29.0	1.9	2.36 g/cm^3 (147 lb/ft^3)	1650°C (3000°F)
TUFFCRETE 60 M	61.3	32.8	1.9	2.52 g/cm^3 (157 lb/ft^3)	1700°C (3100°F)
FAST-TURN® 62 M	62.7	31.1	2.4	2.42 g/cm^3 (151 lb/ft^3)	1700°C (3100°F)
TUFF-FLO 62 M	62.7	31.1	2.4	2.48 g/cm^3 (155 lb/ft^3)	1760°C (3200°F)
FASTMAX® 70	68.0	28.0	-	2.45-2.51 g/cm^3 (153-157 lb/ft^3)	1705°C (3100°F)

Burner Walls	Al_2O_3 %	SiO_2 %	CaO %	Density	Maximum Temp
ALAKAST® 85-ULC	85.7	9.3	1.4	2.81 g/cm^3 (176 lb/ft^3)	1705°C (3100°F)
BLAST KAST® 70-LC	65.2	29.0	1.9	2.36 g/cm^3 (147 lb/ft^3)	1650°C (3000°F)
RAM MAX® 65 AS	62.5	32.8	-	2.79 g/cm^3 (174 lb/ft^3)	1650°C (3000°F)

Burner Blocks	Al_2O_3 %	SiO_2 %	CaO %	Density	Maximum Temp
ALAKAST® 85-ULC	85.7	9.3	1.4	2.81 g/cm^3 (176 lb/ft^3)	1705°C (3100°F)
LCF 798A	61.5	35.0	2.1	2.64 g/cm^3 (165 lb/ft^3)	1705°C (3100°F)
FAST-TURN® 62 M	62.7	31.1	2.4	2.42 g/cm^3 (151 lb/ft^3)	1700°C (3100°F)

Slot and Defector Blocks	Al_2O_3 %	SiO_2 %	CaO %	Density	Maximum Temp
ALAKAST® 50-LC-P	53.1	42.0	1.5	2.62 g/cm^3 (163 lb/ft^3)	1650°C (3000°F)
ALAKAST® 45-P	45.8	46.6	3.6	2.21 g/cm^3 (138 lb/ft^3)	1370°C (2500°F)

Insulating Castables	Al_2O_3 %	SiO_2 %	CaO %	Density	Maximum Temp
PUMPLITE 60	40.7	43.3	10.4	0.91 g/cm^3 (57 lb/ft^3)	1315°C (2400°F)
PUMPLITE 60 LI	39.7	47.6	8.0	1.02 g/cm^3 (64 lb/ft^3)	1370°C (2500°F)
PUMPLITE 80	41.6	43.7	9.0	1.25 g/cm^3 (78 lb/ft^3)	1425°C (2600°F)
PUMPLITE 80 LI	42.2	46.7	7.2	1.28 g/cm^3 (80 lb/ft^3)	1425°C (2600°F)

Back-up Linings	Al_2O_3 %	SiO_2 %	CaO %	Density	Maximum Temp
AMP-IFB	40.7	43.3	10.4	0.91 g/cm^3 (57 lb/ft^3)	1315°C (2400°F)
SKAMOL BOARD	39.7	47.6	8.0	1.02 g/cm^3 (64 lb/ft^3)	1370°C (2500°F)
CERAMIC FIBER	41.6	43.7	9.0	1.25 g/cm^3 (78 lb/ft^3)	1425°C (2600°F)

WALKING BEAM FURNACE

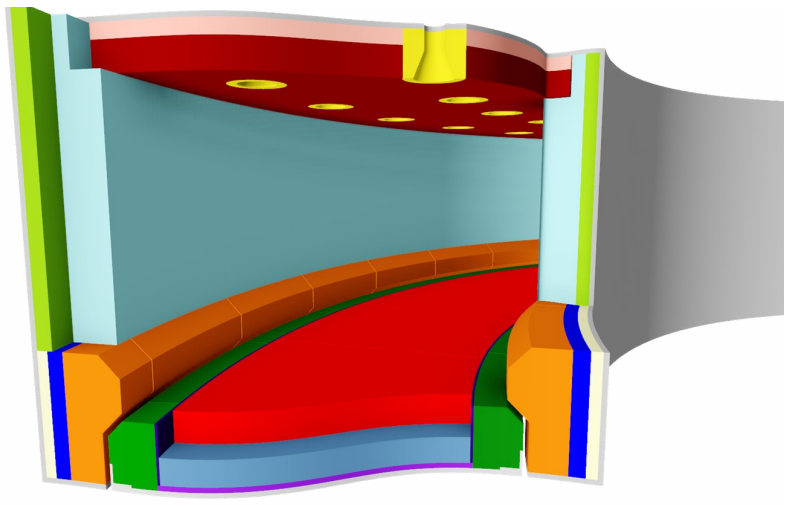
ROTARY HEARTH FURNACE

Roof/Sidewalls	Al_2O_3 %	SiO_2 %	CaO %	Density	Maximum Temp
BLAST KAST® 70-LC	65.2	29.0	1.9	2.36 g/cm^3 (147 lb/ft^3)	1650°C (3000°F)
TUFFCRETE® 60 M	61.3	32.8	1.9	2.52 g/cm^3 (157 lb/ft^3)	1700°C (3100°F)
FAST-TURN® 62 M	62.7	31.1	2.4	2.42 g/cm^3 (151 lb/ft^3)	1700°C (3100°F)
QUICK CAST® 62	67.7	26.7	2.0	2.64 g/cm^3 (165 lb/ft^3)	1705°C (3100°F)
FASTMAX® 70	68.0	28.0	-	2.45-2.51 g/cm^3	1705°C (3100°F)

Hearth (starter/skid blocks)	Al_2O_3 %	SiO_2 %	CaO %	Density	Maximum Temp
ARMORMAX 70® SR	70.4	24.8	2.1	2.66 g/cm^3 (166 lb/ft^3)	1430°C (2600°F)
ALAKAST® 68 LC-P	69.0	25.2	1.5	2.62 g/cm^3 (163 lb/ft^3)	1650°C (3000°F)
ALAKAST® 65 LC-P	64.7	30.7	1.5	2.40 g/cm^3 (150 lb/ft^3)	1650°C (3000°F)
ALAKAST® 50 LC-P	53.1	42.0	1.5	2.62 g/cm^3 (163 lb/ft^3)	1650°C (3000°F)
ALAKAST® 45-P	45.8	46.6	3.6	2.21 g/cm^3 (138 lb/ft^3)	1370°C (2500°F)

Subhearth	Al_2O_3 %	SiO_2 %	CaO %	Density	Maximum Temp
ALAKAST® 45-P	45.8	46.6	3.6	2.21 g/cm^3 (138 lb/ft^3)	1370°C (2500°F)

Curbs	Al_2O_3 %	SiO_2 %	CaO %	Density	Maximum Temp
ALAKAST® 65 LC-P	64.7	30.7	1.5	2.40 g/cm^3 (150 lb/ft^3)	1650°C (3000°F)
ALAKAST® 50 LC-P	53.1	42.0	1.5	2.62 g/cm^3 (163 lb/ft^3)	1650°C (3000°F)
ALAKAST® 45-P	45.8	46.6	3.6	2.21 g/cm^3 (138 lb/ft^3)	1370°C (2500°F)



ROTARY HEARTH FURNACE

Insulating Castables	Al_2O_3 %	SiO_2 %	CaO %	Density	Maximum Temp
PUMPLITE 60	40.7	43.3	10.4	0.91 g/cm^3 (57 lb/ft^3)	1315°C (2400°F)
PUMPLITE 60 LI	39.7	47.6	8.0	1.02 g/cm^3 (64 lb/ft^3)	1370°C (2500°F)
PUMPLITE 80	41.6	43.7	9.0	1.25 g/cm^3 (78 lb/ft^3)	1425°C (2600°F)
PUMPLITE 80 LI	42.2	46.7	7.2	1.28 g/cm^3 (80 lb/ft^3)	1425°C (2600°F)

Back-up Linings	Al_2O_3 %	SiO_2 %	CaO %	Density	Maximum Temp
AMP-IFB	40.7	43.3	10.4	0.91 g/cm^3 (57 lb/ft^3)	1315°C (2400°F)
SKAMOL 1100F CAL-SIL BOARD					
SKAMOL BOARD	39.7	47.6	8.0	1.02 g/cm^3 (64 lb/ft^3)	1370°C (2500°F)
CERAMIC FIBER	41.6	43.7	9.0	1.25 g/cm^3 (78 lb/ft^3)	1425°C (2600°F)






INDUSTRIAL FLOORING

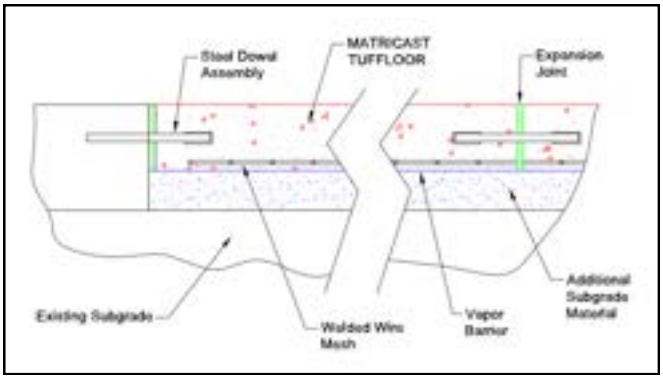
TUFFLOOR® is designed for areas exposed to extreme thermal cycling and intermittent exposure to liquid metal spills, dross, and slog. It is a versatile product that can be installed as a complete floor, over existing (or new) concrete, or as precast tiles. TUFFLOOR® has over 20 years of proven performance in ferrous and non-ferrous foundries, primary metal production (aluminum, steel, iron, zinc, copper, ferro-alloys), rolling mills and many other hot flooring applications.

Benefits

- Fast project turn around time due to early strength development
- Exceeds cold crushing strength of conventional concrete
- Reduced maintenance time and expense
- Safer working surfaces
- Minimized wear on mobile equipment
- Custom colors available
- Excellent freeze-thaw properties

TUFFLOOR® — excellent thermal shock resistance, often used to replace concrete in both original flooring construction and maintenance applications

ALAKAST 40-P-ES — high temperature, pumpable flooring material with thermal shock resistance. Can withstand temperatures to 1370°C (2500°F). Installed using pump-cast or cast vibration techniques.



Engineering design for high-load application

Variety of colors available

TUFFLOOR® vs Standard Concrete
Thermal Cycling to 760°C (1400°F)

THERMAL AND INTEGRATED MATERIALS

Streamline your process with a variety of solution-based insulation offerings by Gemcast. Years of experience in the industry allows for Gemcast to provide time-saving solutions to help maximize uptime and minimize installation time.

Benefits of working with Gemcast:

- Custom ceramic fiber vacuum-formed products and precast shapes
- Forms and shapes can be packaged into “kits” to save time and manpower
- Step-by-step instructions for quicker and easier installations
- Pre-fabricated insulation offerings to reduce the risk of injuries from field cuts
- Certified masons available
- Vacuum-formed products and precast shapes available in a variety of sizes and shapes

Gaskets are available for all high-temperature applications in various shapes, sizes, thicknesses and materials. Gaskets can be custom-made and used for either an atmospheric or airtight seal. In addition, Gemcast will stock custom insulating materials and seals for its customers.

Vacuum form pieces are provided in a variety of shapes and sizes. Gemcast can problem solve applications and recommend custom pieces by machining and rigidizing pieces to match the application as required.

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