



REFRACTORIES

— FOR —

HEAT TREATING & FORGING



ALLIED
MINERAL
PRODUCTS

Global **Refractory** Solutions



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





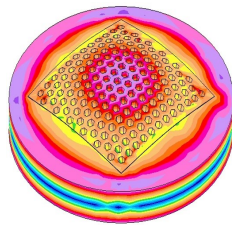
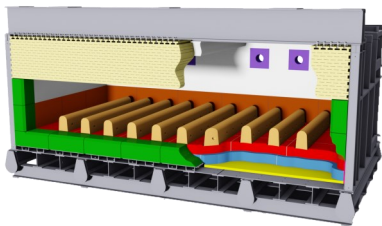
RESEARCH & ENGINEERING

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



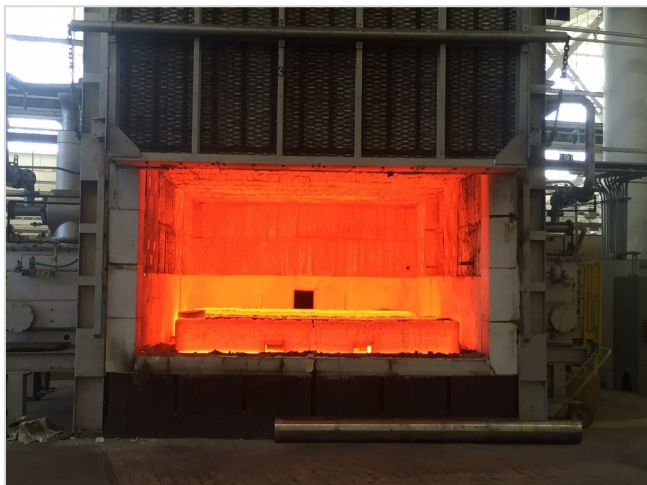
Strength Tests





PRODUCT INNOVATIONS

ARMORMAX®



ARMORMAX® 70SR is a 70% alumina low-cement castable which is part of a family of high needle containing refractories. ARMORMAX is ideal for heat treating and forging applications where thermal shock can shorten refractory life.

The high needle content also provides resistance to mechanical impact and abrasion. ARMORMAX has high fracture toughness that allows it to remain in service long after conventional refractories start to fail.

ARMORMAX®

Product line benefits

- High thermal shock resistance
- Can withstand severe impact and abrasion conditions
- High strength retention after repeated thermal cycling



ARMORMAX® sill after 1 month in service



ARMORMAX® sill after 18 months in service



ARMORMAX® sill after 36 months in service



BOX FURNACE

JAMBS

ARMORMAX® 70SR

TUFF-FLO 60A

ALAKAST 50 LC-P+SS

ALAKAST 50 TSR+SS

BURNERS

LCF 798A

KAST TECH 60

MATRIPHOS 85AC

BRICKMIX 81

BLAST KAST 70 LC

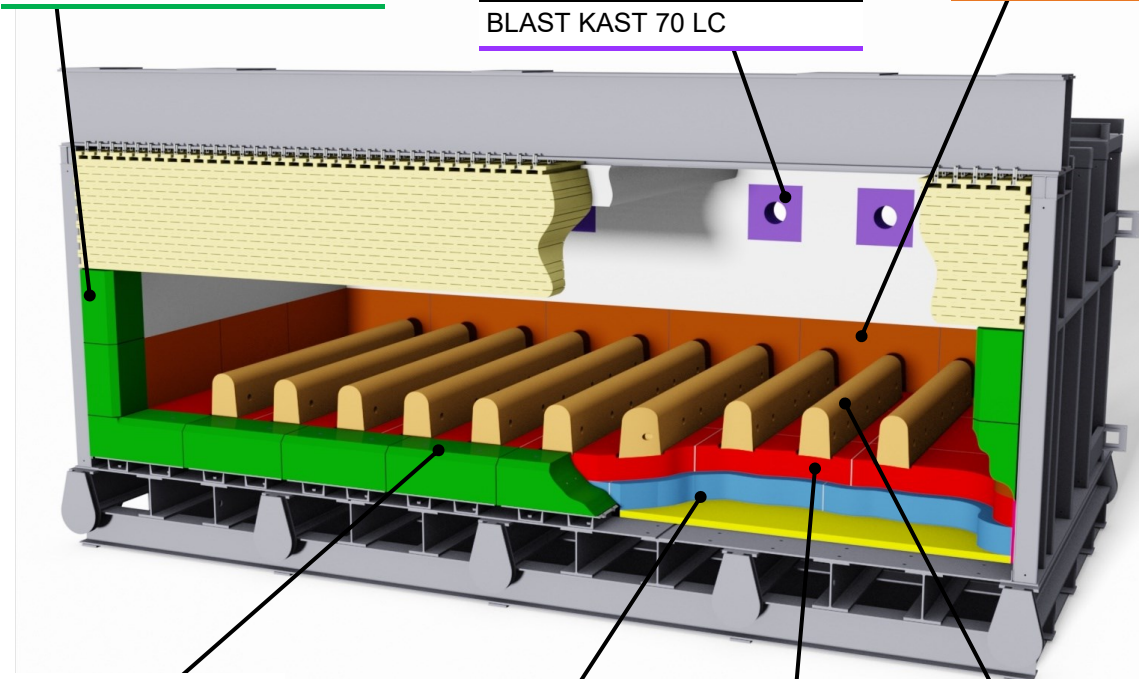
CURB WALLS

TUFF-FLO 50

PS SUPER PLASTIC

BLAST KAST 70 LC

ALAKAST 68 LC-P



SILL

ARMORMAX® 70SR

TUFFCRETE® 70X

ALAKAST 50 TSR

ALAKAST 98 EZC

SUBHEARTH

TUFFCRETE® 47

MATRILITE 24AC

INSULMIX 60 LIP

INSULMIX 80 LIP

ALAKAST 45-P

HEARTH

DURACON 32

TUFF-FLO 60A

TUFFCRETE® 70X

ALAKAST 68 LC-P

ALAKAST 50 LC-P

PIER BLOCKS

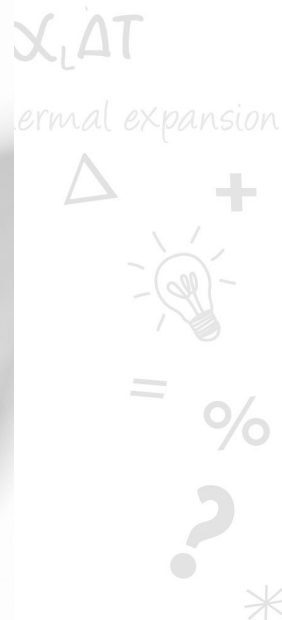
TUFF-FLO FSM

ARMORMAX® 70SR

DURACON 32

ALAKAST 50 TSR

ALAKAST 98 EZC





CAR BOTTOM FURNACE



PERIMETER

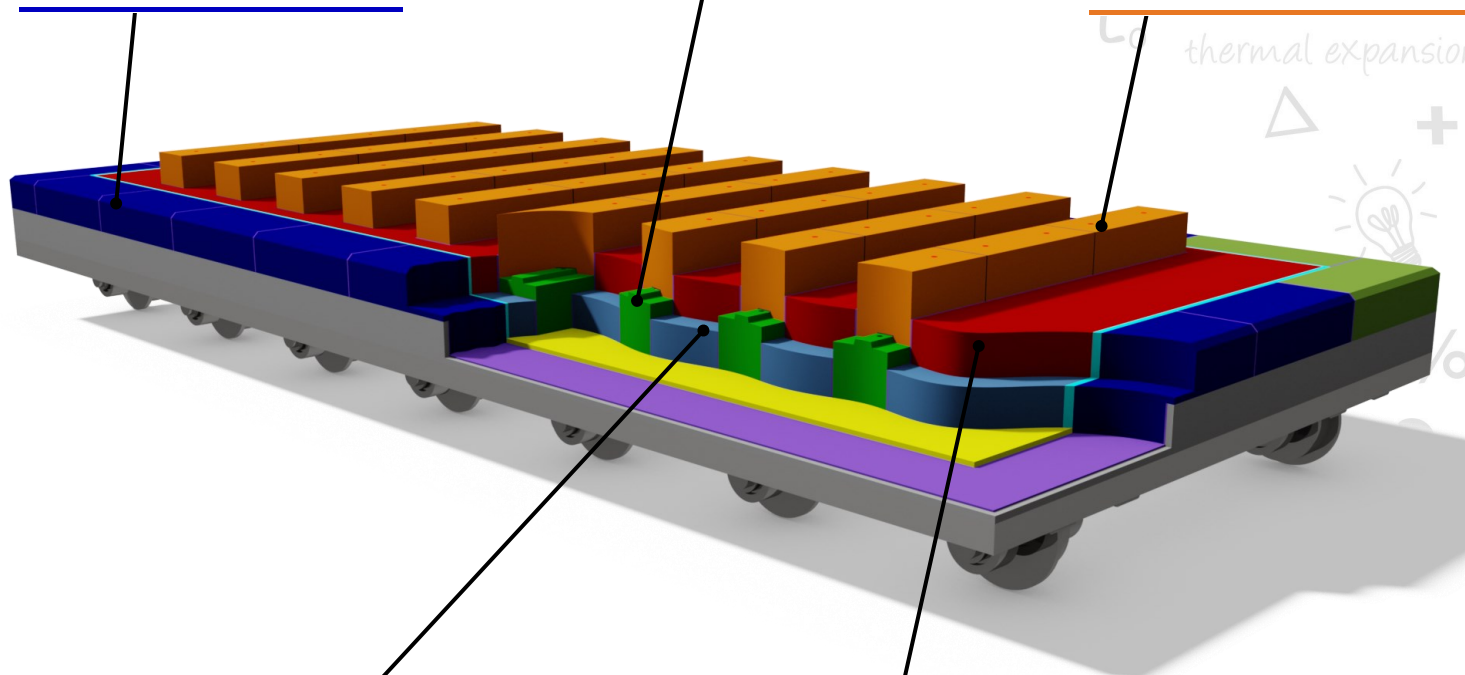
TUFF-FLO 50
TUFFCRETE® 70X
ARMORMAX® 70SR
ALAKAST 50 TSR
ALAKAST 50 LC-P

SUB-PIER BLOCKS

DURACON 28
TUFF-FLO 50
ALAKAST 50 LC-P

PIER BLOCKS

TUFF-FLO FSM
ARMORMAX® 70SR
DURACON 32
ALAKAST 50 TSR
ALAKAST 98 EZC



SUBHEARTH

MATRILITE 24AC
INSULMIX 60 LIP
INSULMIX 80 LIP
DRI-LITE 79AL-M
ALALITE 2460 PUMP
ALALITE 2675 PUMP
SUPER FIRETEMP X BOARD

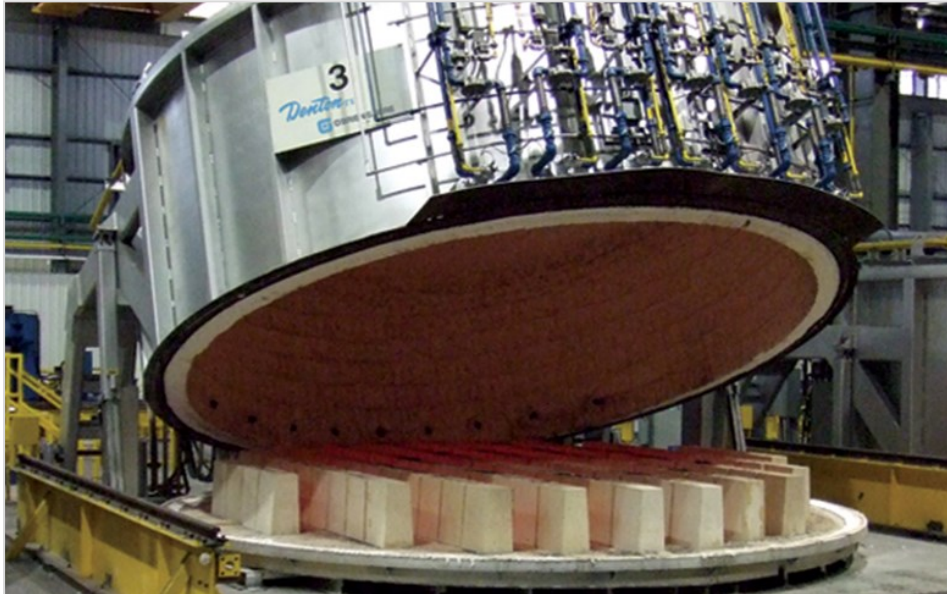
HEARTH

DURACON 32
DRI-VIBE® 434A
TUFF-FLO 50
TUFFCRETE® 70X
ALAKAST 50 LC-P
ALAKAST 65 LC-P



TIP-UP & ROTARY HEARTH FURNACE

TIP-UP



HEARTH

DURACON 32

DRI-VIBE® 434A

TUFF-FLO 50

ALAKAST 50 LC-P

SUBHEARTH

DRI-LITE® 79AL-M

MATRILITE 24AC

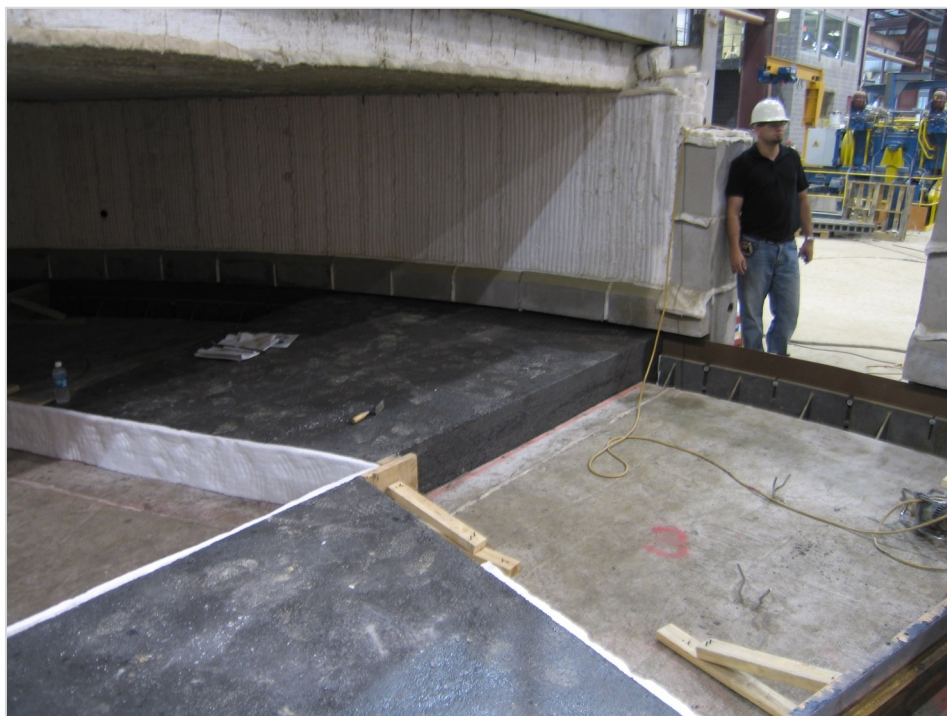
INSULMIX 60

INSULMIX 80

ALALITE 2460 PUMP

ALALITE 2675 PUMP

ROTARY HEARTH



HEARTH

DURACON 32

TUFF-FLO 60A

ARMORMAX® 70SR

ALAKAST 50 LC-P

ALAKAST 68 LC-P

ALAKAST 85 LC-P-ES

SUBHEARTH

MATRILITE 24AC

INSULMIX 60

INSULMIX 80

ALAKAST 45-P



INDUCTION HEATING & PRECAST SHAPES

INDUCTION HEATING



PRODUCTS

COIL CAST FS /
COIL CAST FS - FAST

CAST 217 FS /
CAST 217 FS FINE

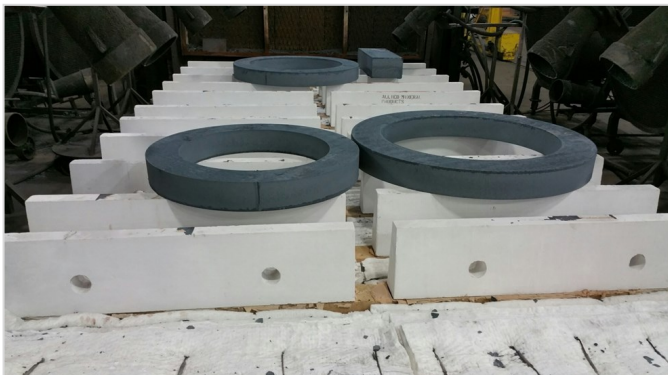
COIL CAST M

LCF798 FINE

COIL CAST 97A

TUFFLOOR

PRECAST SHAPES



HEARTHES

DURACON 32

TUFFCRETE FS

ARMORMAX® 70SR

ALAKAST 50 LC-P

ALAKAST 68 LC-P

CAR PERIMETERS

TUFF-FLO 50

TUFF-FLO 60A

ALAKAST 50 TSR

JAMBS / LINTELS

ARMORMAX® 70SR

LCF798A

ALAKAST 50 LC-P

DURACON® 32

BURNERS

LCF798A

ALAKAST 85 ULC

KAST TECH 60

MATRICAST 3110C

CURB WALLS

TUFF-FLO 50

ALAKAST 68 LC-P

BLAST KAST 70 LC

TUFFCRETE 47

DURACON 32

PIER BLOCKS

TUFF-FLO FSM

DURACON 32

ALAKAST 65 LC-P

ARMORMAX® 70SR

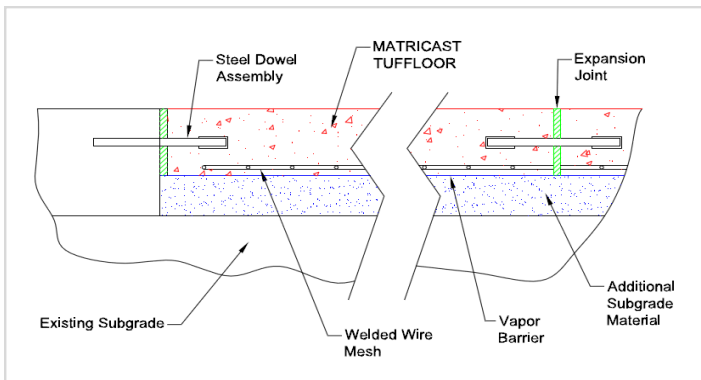


TUFFLOOR is designed for areas exposed to extreme thermal cycling and intermittent exposure to scale, liquid metal spills, dross and slag. It is a versatile product that can be installed as a complete floor, over existing (or new) concrete, or as precast tiles.

TUFFLOOR has over 20 years of proven performance in forging and heat treating plants, primary metal production facilities (aluminum, steel, iron, zinc, copper, ferro-alloys), rolling mills and many other hot flooring applications.

Benefits include:

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



Engineering Design for a High-Load Application



A variety of colors



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





MAINTENANCE

DRI-VIBE®	Dry vibratable, heat-set refractories for restoring hearth hot face.
TUFFCRETE®	Shotcrete refractories ranging from 50% to 70% alumina.
MATRIGUN	Gunite refractories ranging from super duty to 70% alumina.
MATRIPHOS	Phosphate-bonded plastics for repairing most types of refractory surfaces.
QUICK-FIRE®	Two component phosphate bonded castables & gun mixes. Product ranges from 55% - 90% alumina.
ALAGUN	General purpose gunite castable for a wide range of applications. Ranging from 10% to 70% alumina.
BLAST KAST®	Shotcrete refractory mixes ranging from 45% to 70% alumina.



QUICK-FIRE® 65 perimeter repair



Lower jamb and curb wall repair with TUFFCRETE® 70X shotcrete



TECHNICAL DATA

Name	Al ₂ O ₃ %	SiO ₂ %	Density	Max. Temp
ARMORMAX® 70SR	70.1	25.5	2.66 g/cm ³ (166 lb./ft ³)	1430°C (2600°F)
BRICKMIX 81	80.9	14.9	2.72 g/cm ³ (170 lb./ft ³)	1760°C (3200°F)
CAST 2550 LI C	46.1	39.9	2.13 g/cm ³ (133 lb./ft ³)	1400°C (2550°F)
COIL-CAST FS	68.7	27.5	2.03 g/cm ³ (127 lb./ft ³)	1316°C (2400°F)
COIL-CAST FS FAST	68.7	27.5	2.03 g/cm ³ (127 lb./ft ³)	1316°C (2400°F)
COIL-CAST 217FS	80.5	16.5	1.89 g/cm ³ (118 lb./ft ³)	1316°C (2400°F)
COIL-CAST 217 FS FINE	76.0	20.5	1.81 g/cm ³ (113 lb./ft ³)	1316°C (2400°F)
COIL-CAST M	66.3	26.7	2.37 g/cm ³ (148 lb./ft ³)	1650°C (3000°F)
COIL-CAST 97A	96.6	0.1	3.03 g/cm ³ (189 lb./ft ³)	1650°C (3000°F)
DRI-VIBE® 434A	54.9	38.3	2.32 g/cm ³ (145 lb./ft ³)	1650°C (3000°F)
DURACON® 28	45.3	48.7	2.31 g/cm ³ (144 lb./ft ³)	1540°C (2800°F)
DURACON® 32	63.1	31.6	2.54 g/cm ³ (158 lb./ft ³)	1760°C (3200°F)
INSULMIX 3A	40.0	39.1	1.18 g/cm ³ (74 lb./ft ³)	1315°C (2400°F)
INSULMIX 60 LIP	39.7	47.7	1.02 g/cm ³ (64 lb./ft ³)	1370°C (2500°F)
INSULMIX 80 LIP	42.4	46.8	1.28 g/cm ³ (80 lb./ft ³)	1425°C (2600°F)
LCF 798 FINE	61.3	34.9	2.75 g/cm ³ (173 lb./ft ³)	1705°C (3100°F)
LCF 798A	61.5	35.0	2.64 g/cm ³ (165 lb./ft ³)	1705°C (3100°F)
MATRILITE 24AC	41.8	39.3	1.23 g/cm ³ (77 lb./ft ³)	1345°C (2450°F)
MATRIPHOS 70AC	73.0	19.7	2.59 g/cm ³ (162 lb./ft ³)	1650°C (3000°F)
MATRIPHOS 85AC	80.7	12.2	2.80 g/cm ³ (175 lb./ft ³)	1650°C (3000°F)
QUICK CAST® 62	66.1	27.2	2.64 g/cm ³ (165 lb./ft ³)	1705°C (3100°F)
QUICK-FIRE® 65	64.7	27.2	2.48 g/cm ³ (155 lb./ft ³)	1650°C (3000°F)
TUFFCRETE 47	47.1	46.5	2.21 g/cm ³ (138 lb./ft ³)	1540°C (2800°F)
TUFFCRETE 70X	68.0	25.8	2.63 g/cm ³ (164 lb./ft ³)	1650°C (3000°F)
TUFF-FLO 50	50.2	44.4	2.32 g/cm ³ (145 lb./ft ³)	1650°C (3000°F)
TUFF-FLO 60A	59.6	36.2	2.58 g/cm ³ (161 lb./ft ³)	1700°C (3100°F)
TUFFLOOR	35.1	42.5	2.11 g/cm ³ (132 lb./ft ³)	1040°C (1900°F)
TUFFLOOR HT	45.3	39.2	2.08 g/cm ³ (130 lb./ft ³)	1370°C (2500°F)

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