



REFRACTORIES — FOR — INTEGRATED STEEL



Global **Refractory** Solutions



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.

Refractory Solutions and Technical Support for every step of the process

ENGINEERING & RESEARCH

We start by gaining a detailed understanding of your specific needs. Our team then evaluates operating criteria and physical design parameters to create a detailed Engineered Design encompassing:

- Optimized product zoning
- Thermal models to optimize and validate designs
- Proven safety lining system designs

We are focused on developing new products, improving existing ones and perfecting installation techniques. Product testing and development is conducted in our state of the art research and technology centers. Our wide variety of high performance refractories use superior raw materials vigorously tested in our modern labs and tailored to unique installation and application condition requirements.



Contents

- About Allied
- Innovative product technology
- Technical Support from AMTS
- Blast Furnace Solutions
- Casthouse Solutions
- Reheat Furnace Solutions



Learn more at
alliedmineral.com/solutions/steel/



PRODUCT INNOVATIONS

NEW TECHNOLOGY

GRAPHITE & CARBON ANCILLARY PRODUCTS

GC and HC Product Lines | WE CAN FILL THE VOID

Allied offers a comprehensive collection of carbon and graphite based cements, mortars, ramming materials and grouts. These dependable, industry-leading products are designed to fulfill ancillary needs in blast furnaces, cupolas and ferroalloy furnaces.



Original Allied Line	
HC3F	Single-component, clean carbon mortar
HC4F	Single-component, water-based grout for cold grout applications
HC5F	Single-component grout for hot installations
HC6F	Two-component collector bar and cathode block bonding mix with visible metal beads.
HC8F	High conductivity, multi-purpose ramming mix

Industry-trusted Products	
C34	Two-component carbonaceous heat setting cement
C38	Two-component carbonaceous heat setting cement
C46	Single-component carbonaceous heat setting cement
CP9	Carbonaceous hot ramming paste
EZRAM RP10	Highly thermally conductive graphitic ram
SMART RAM® RP20	Thermally conductive, self-correcting ram with specially treated graphite flake
GR37	Two-component carbonaceous grout with expanding flake graphite
EZRAM RP3	Single component carbonaceous ram
EZRAM RP4	Single-component carbonaceous ram

TAPHOLE MATERIALS

Allied is the leader in high-alumina and anhydrous taphole clay sales in North America. We offer a comprehensive line of taphole clays that span from siliceous plugging pastes for the alloy industry to high-alumina clays designed for high production, multiple-taphole blast furnaces.

Taphole Materials for Blast Furnaces

RSR 101	For conventional drilling practice on medium-size furnaces producing 4000 - 6000 tons of hot metal per day
RSR 1170 R-AM	For blast furnaces producing 4000 - 6000 tons of hot metal per day with shorter gap times (25 - 30 minutes)
RSR 1170R Modified	Ideal for plants in urban environments
RSR 963-14	For high-production blast furnaces
RESTORATION CLAY	Formulated to fill cracks and fissures in the taphole clay column of blast furnaces
GREEN TAP	Low volatile products that promote easy drilling and extended hole length





PRODUCT INNOVATIONS

ALLIED PRODUCT FAMILIES

STACKCRETE®

The STACKCRETE® line features several products with **silicon carbide additions**, designed to match the unique properties and temperatures of each zone of blast furnace stacks. These products are suitable for **maintenance throughout the stack lining** and are designed to **withstand impact, abrasion, temperature fluctuation, slag attack, CO attack and alkali attack**. The STACKCRETE® line also features a **wide range of installation methods**.

STACKCRETE® G is Allied's innovative graphitic castable that can be used as both a repair and replacement material for carbonaceous refractory/brick. STACKCRETE® G offers:

Shortened installation time | Reduced labor cost | Reduced lead time compared with brick refractories | Can install using cast in place, gun or shotcrete technique



ALAKAST®

ALAKAST is a line of castable refractories ranging from no cement to conventional cement, that are ideal for various areas of steel reheat furnaces. Each ALAKAST mix is designed to meet a unique application requirement, such as volume stability, excellent flowability and high strength. These products also feature a variety of installation options.

BLAST KAST®

Our trademarked BLAST KAST™ products are designed for shotcrete installation, making them ideal for wall and roof applications in reheat furnaces. These low cement mixes are noted for their versatility and dependable delivery and performance.

V-CAST®

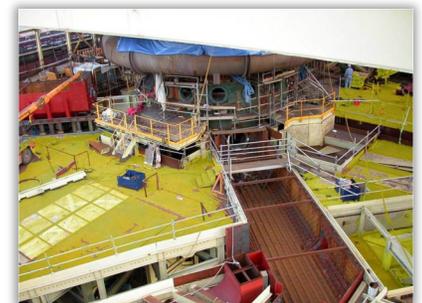
The V-CAST® line for iron-making is a collection of alumina-based castables with additions of silicon carbide and carbon. These products are recommended for use in a variety of applications that include blast furnace and cupola troughs, slag and iron runners, tilting runners, spouts, and tap holes. There is a V-CAST® product tailored to each application's unique operating temperature and conditions.



FLOORING: TUFFLOOR®

TUFFLOOR® is designed for areas exposed to extreme thermal cycling and intermittent exposure to 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 years of success in repairs and rebuilds of casthouse floors and has also proven successful in a wide variety of coke oven blast furnace and other integrated steel equipment areas.





ADDITIONAL PRODUCTS

FILLING THE GAPS

SKAMOL

INSULATION BOARD

Allied carries SKAMOL's line of vermiculite based insulation boards that help save energy and reduce costs.

- SKAMOL VIP-12 HS BOARD
- SKAMOL VIP-12 HS CLICKBOARD

SKAMOL insulation board products help steel ladles preserve heat and maintain internal temperature. These products reduce lining thickness, increasing ladle capacity.

SKAMOL VIP-12 HS CLICKBOARD features an innovative perforated design that allows simple and fast installation.



INSULATING FIREBRICK

SKAMOL's collection of insulating firebrick, supplied by Allied, is the ideal choice for back-up insulation systems for hot blast stoves. These systems can be customized for high insulation properties or high strength.

- HIPOR 450
- POROS
- SUPRA

Benefits of SKAMOL insulating firebricks include low thermal expansion, reduced heat loss, high cold-crushing strength and resistance to alkali and acid attack.

OTHER SUPPORTING PRODUCTS

Allied carries the ancillary products you need to complete your process.

- Carbon firebrick
- Installation equipment
- Thermocouples and wire



TECHNICAL SUPPORT



FAST • FLEXIBLE • FOCUSED

Allied Mineral Technical Service, LLC (AMTS) offers value added technical assistance in the critical areas of the blast furnace, hot blast stove and cupola. The AMTS team has decades of experience in the industry and is backed by Allied Mineral Products, a global leader in refractory technology and production.

AMTS Supports:

- Blast Furnaces
- Hot Blast Stoves
- Hot Blast Systems
- Casthouse Design
- Cupolas

Engineering and Design Services

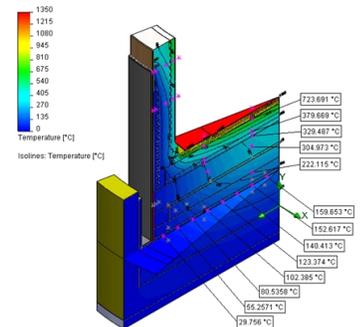
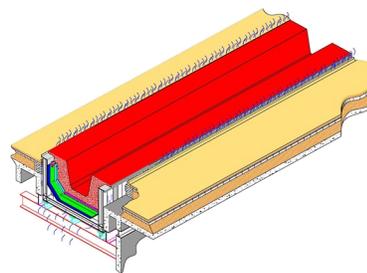
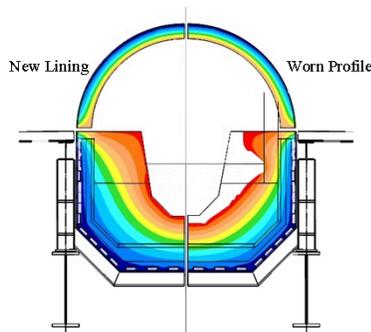
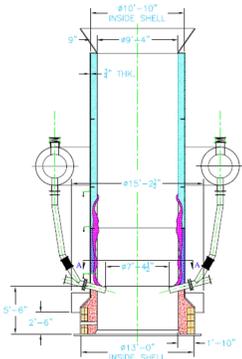
Our value added technical assistance includes a range of data collection and analysis and engineering design capabilities to help optimize furnace operation.

- Hearth monitoring and modeling
- Failure diagnostics of hearth and taphole
- Innovative refractory selection
- New and spent refractory testing
- Advanced cooling systems
- STACKCRETE® high conductivity grout

Field Services

Our team is on site providing supervision and assistance to ensure your operations run safely and efficiently. Our support includes:

- Assistance for:
 - Core drilling
 - Grouting
 - Installation
 - Maintenance
- Emergency responsiveness
- Data collection equipment placement
- Refractory properties and behavior monitoring
- Analysis of melt practices
- Training on refractory best practices



Allied Mineral Technical Services

AMTS@alliedmin.com | amtsgo.com



UPPER STACK

- STACKCRETE® 62M
- STACKCRETE® 65M
- STACKCRETE® 70 ABR

MIDDLE STACK

- STACKCRETE® 21V
- STACKCRETE® 608
- STACKCRETE® 62M
- STACKCRETE® 65M

LOWER STACK

- STACKCRETE® G
- STACKCRETE® AZS 5R
- STACKCRETE® 62M

BOSH

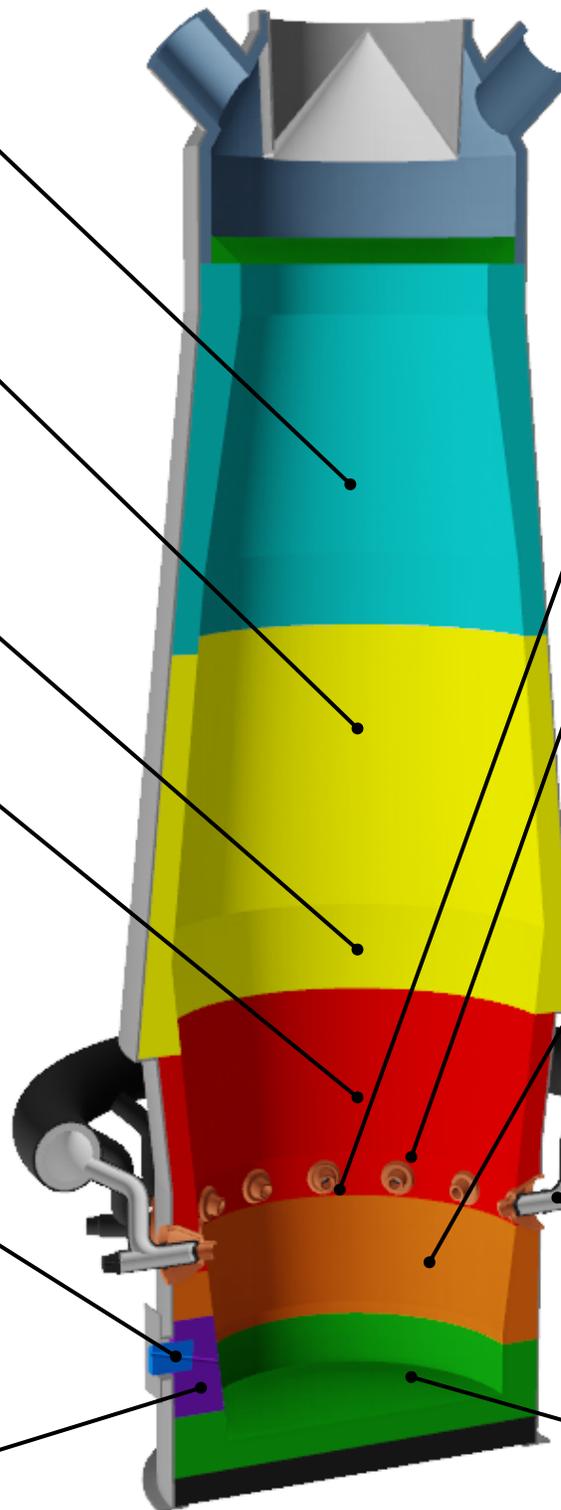
- STACKCRETE® G
- STACKCRETE® 62M
- STACKCRETE® 65M
- STACKCRETE® 608

TAPHOLE CLAY

- RSR 101
- RSR 1170R-AM
- RSR 1170R-MODIFIED
- RSR 963-14
- RSR GREEN TAP 5
- RESTORATION CLAY

TAPHOLE STRUCTURE

- STACKCRETE® 133 NTM
- V-CAST® 133A
- V-CAST® 720A
- V-CAST® 739A
- CARBON BLOCKS



TUYERE PLUGGING

- SUPER BLACK

TUYERE SLEEVE

- LCF 798A (Prest)

HEARTH

- HC3F MORTAR
- C34 CEMENT
- HC4F GROUT
- HC5F GROUT
- HC8F RAM

STACKCRETE® 62M

STACKCRETE® 133 NTM

STACKCRETE® 418 NTM

GUNCAST® 12

V-CAST® 418

V-CAST® 720

BUSTLE PIPE

- PUMPLITE 80 LI
- LCF 798A PUMP

TUYERE STOCK

- LCF 798A PUMP
- CW HI AL KASTITE

BOTTOM & HEARTH CORNER

- CERAMIC PAD SHAPES
- PRECAST SHAPES



CASTHOUSE

TROUGH / RUNNER

WORKING LINING

- V-CAST® 218A

- V-CAST® 418A

- V-CAST® 712A

- V-CAST® 719A

- V-CAST® 739A

- RAPID PUMP 2750 SC

SAFETY LINING

- DRI-VIBE® 660A

- RAM 491A

- CW 7929 Castable
(Precast retainer shape)

- MATRIPUMP 80

- TEK-PAK 664A

INSULATION

- SUPER FIRETEMP X

SLAG RUNNER

- V-CAST SL 50

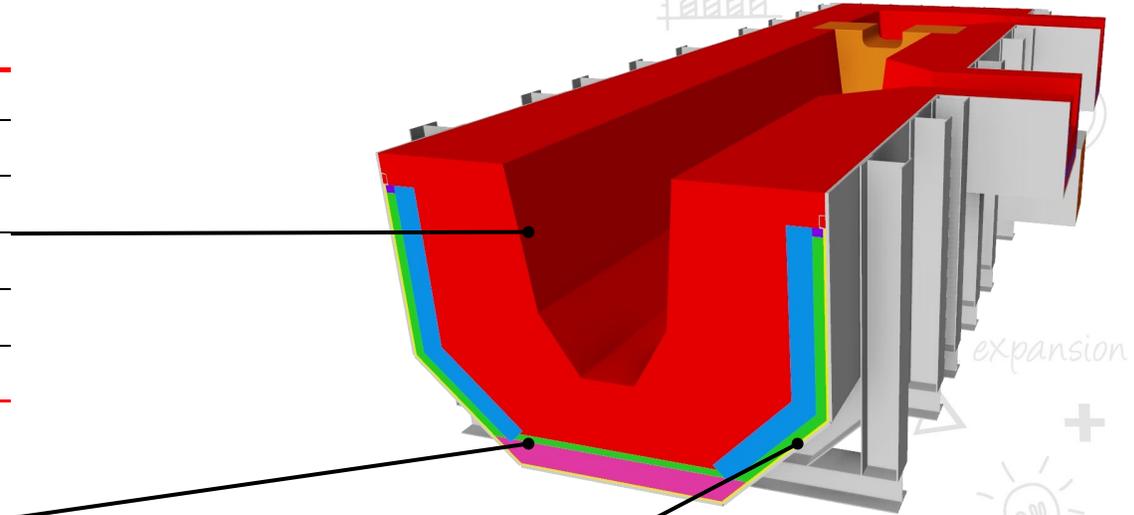
- V-CAST 750

MAINTENANCE

- TEK-GUN 408A

- DRI-VIBE® 348A

- DRI-VIBE® 512A



IRON TILTER

WORKING LINING

- V-CAST® 133A

- V-CAST® 712A

- V-CAST® 720A

SAFETY LINING

- MATRIPUMP 60

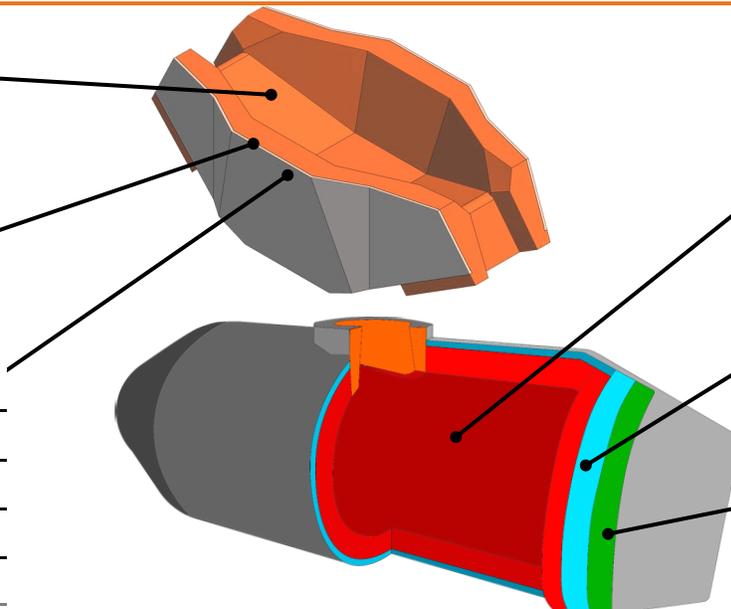
INSULATION

- SKAMOL VIP 12 HS

- FIREBOARD HS

- CERAMIC FIBER BOARD

- MG 1900



LADLE

WORKING LINING

- TUFFCRETE® 62M-FR

- BLAST KAST 70

SAFETY LINING

- TUFFCRETE® 60 M

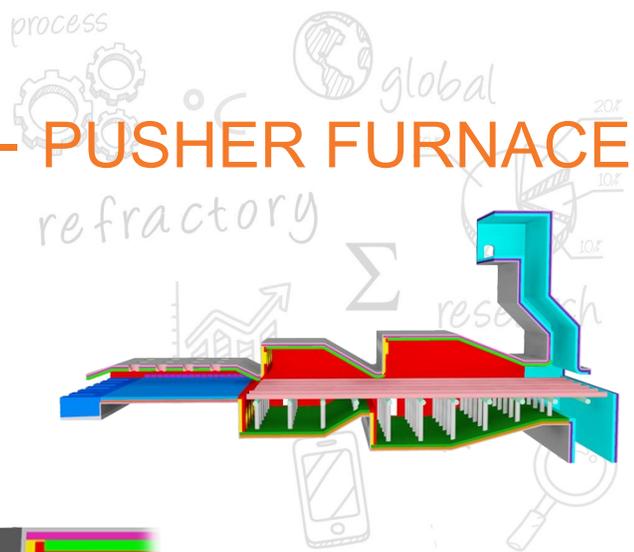
- TUFFCRETE® 62 M

INSULATION

- SKAMOL VIP 12 HS

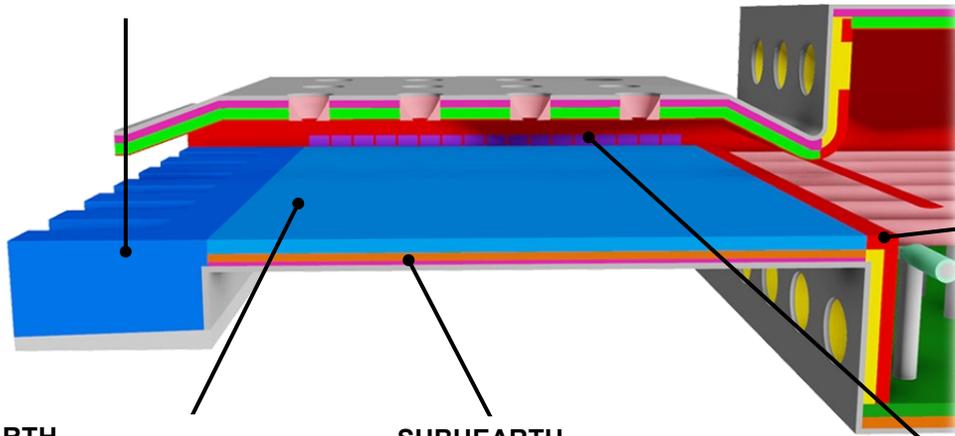


REHEAT - PUSHER FURNACE



EXTRACTOR

- ALAKAST® 85 LC-P-ES
- ALAKAST® 90 LC-P



HEARTH

- TUFF-FLO 98
- ALAKAST® 90 LC-P
- TUFF-FLO 34SP
- ALAKAST® 85 LC-P-ES

SUBHEARTH

- ALAKAST® 50 LC-P
- TUFFCRETE® 2800
- SUPER FIRETEMP X

BUMPER & SKID BLOCKS

- ALAKAST® 98 EZC (Precast Shape)
- ULTRACON 34C
- ALPHAMAX® T

LEADING EDGE

- ALAKAST® 90 LC-P
- TUFF-FLO 98

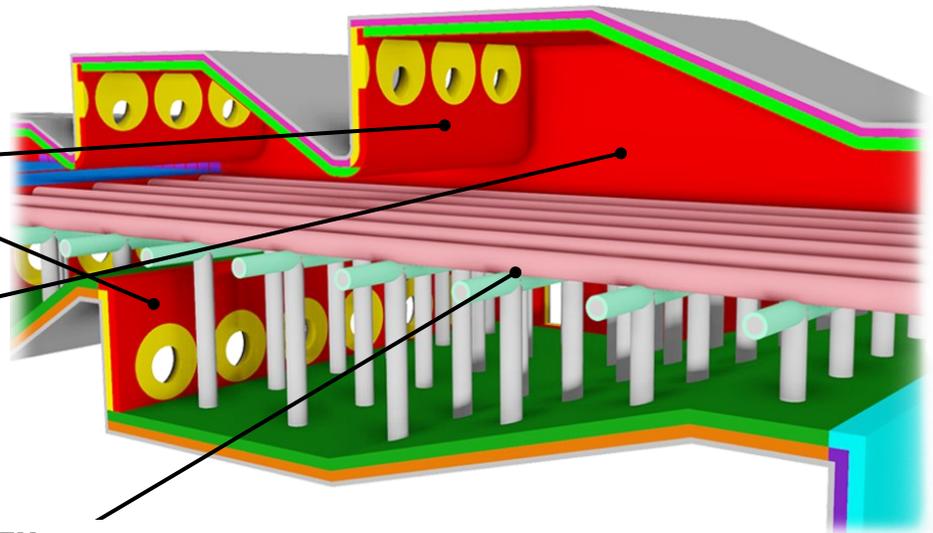
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BURNER WALLS & ROOF

- BLAST KAST® 70 LC

SIDE WALLS

- BLAST KAST® 70 LC
- BLAST KAST® 45 LC



WET SKID SYSTEM

- ALAKAST® 68 LC-P
- TUFF-FLO 65M

in our
element

REHEAT - WALKING BEAM FURNACE



SIDE WALLS

BLAST KAST® 70 LC

BLAST KAST® 45 LC

INSULATION

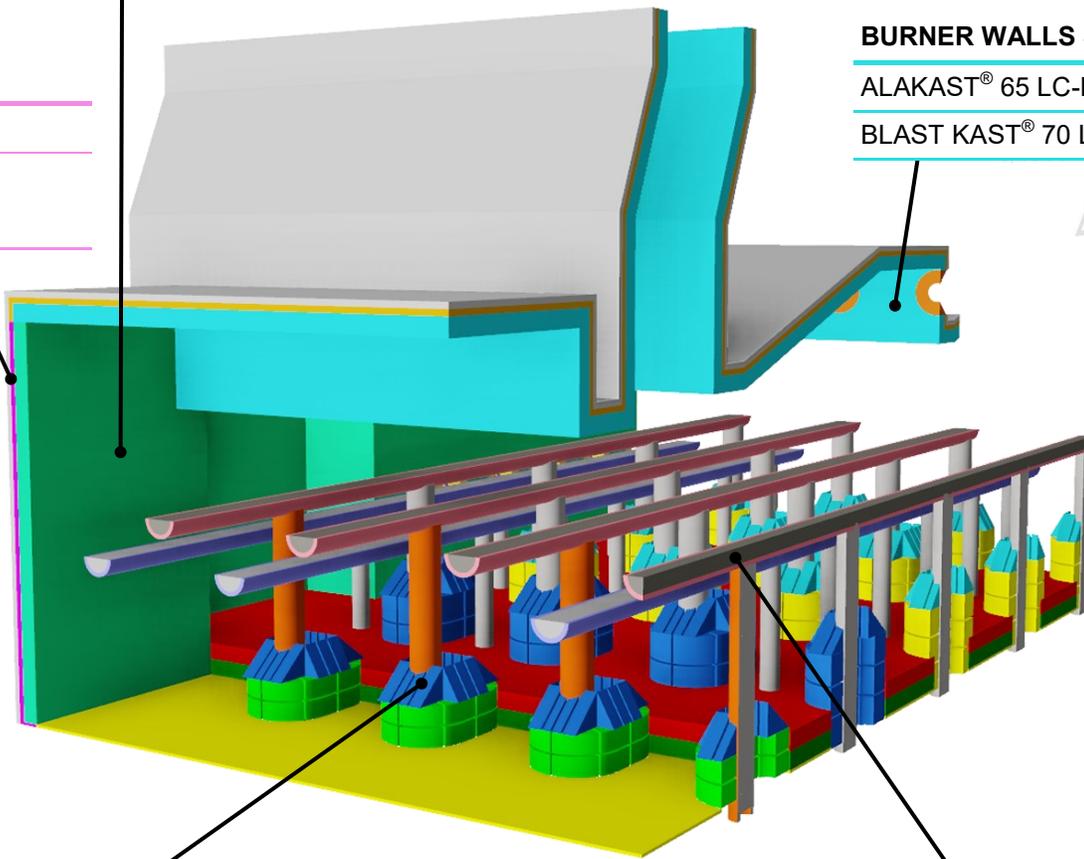
PUMPLITE 60

INSULATING
FIREBRICK

BURNER WALLS & ROOF

ALAKAST® 65 LC-P

BLAST KAST® 70 LC



HEAT ZONE SLOT & DEFLECTOR BLOCKS

TUFFCRETE® 2800

TUFF-FLO 50 (Precast Shape)

TUFF-FLO 65M (Precast Shape)

WET SKID SYSTEM

ALAKAST 68 LC-P

ALAFLOW 60 LC-P (Precast Shape)

TUFF-FLO 65M





REHEAT - ROTARY HEARTH



INSULATION

INSULATING FIREBRICK
CERAMIC FIBER BOARD
SKAMOL SUPER 1100 E

SIDE WALLS

BLAST KAST® 70 LC
TUFF-FLO 50
BLAST KAST® 45 LC

CURBS

ALAKAST® 68 LC-P
ALAKAST® 50 LC-P
TUFF-FLO 65M

SKID BLOCKS

ALAKAST® 98 EZC
(Precast Shape)
ALPAHMAX T
ULTRACON 34C

HEARTH

ALAKAST® 90 LC-P
ALAKAST® 68 LC-P
TUFF-FLO 60A
ALAKAST® 50 LC-P

ROOF

BLAST KAST® 70 LC
ALAKAST® 65® LC-P

BURNER BLOCKS

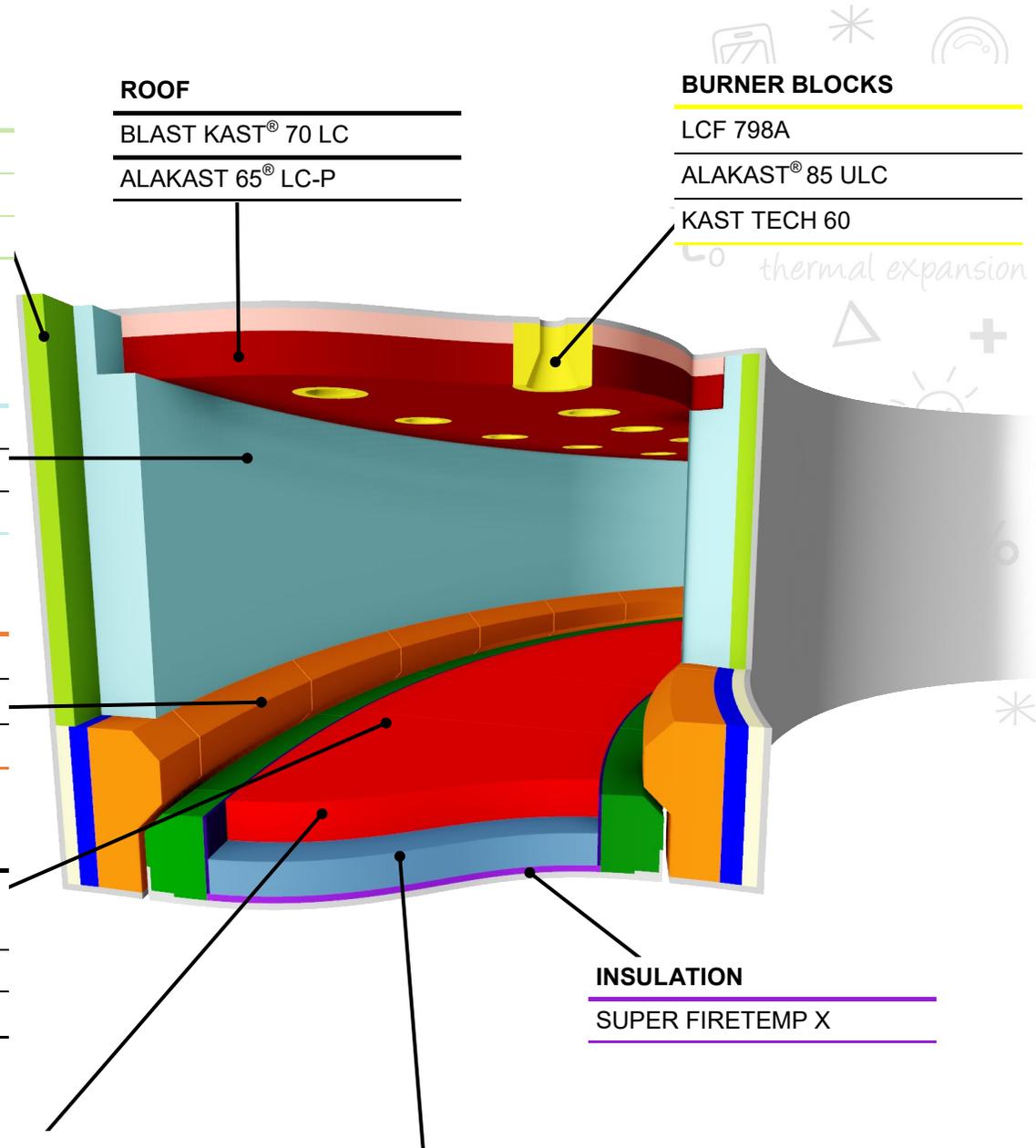
LCF 798A
ALAKAST® 85 ULC
KAST TECH 60

INSULATION

SUPER FIRETEMP X

SUBHEARTH

ALAKAST® 50 LC-P
TUFFCRETE® 2800





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