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/
**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.

<table>
<thead>
<tr>
<th>Original Allied Line</th>
<th>Industry-trusted Products</th>
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<tbody>
<tr>
<td><strong>HC3F</strong></td>
<td>Single-component, clean carbon mortar</td>
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<tr>
<td><strong>HC4F</strong></td>
<td>Single-component, water-based grout for cold grout applications</td>
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<tr>
<td><strong>HC5F</strong></td>
<td>Single-component grout for hot installations</td>
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<tr>
<td><strong>HC6F</strong></td>
<td>Two-component collector bar and cathode block bonding mix with visible metal beads.</td>
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<tr>
<td><strong>HC8F</strong></td>
<td>High conductivity, multi-purpose ramming mix</td>
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**TAPHOLE MATERIALS**

Allied is the leader in high-alumina & 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.

<table>
<thead>
<tr>
<th>Taphole Materials for Blast Furnaces</th>
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<tr>
<td><strong>RSR 101</strong></td>
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<tr>
<td><strong>RSR 1170 R-AM</strong></td>
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<td><strong>RSR 1170R Modified</strong></td>
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<tr>
<td><strong>RSR 963-14</strong></td>
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<td><strong>Restoration Clay</strong></td>
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<tr>
<td><strong>RSR Green Tap</strong></td>
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</table>
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.

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, including 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.
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
FAST • FLEXIBLE • FOCUSED

Allied Mineral Technical Service, Inc. (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 | alliedmineraltechnicalservices.com
**BLAST FURNACE**

**UPPER STACK**
- STACKCRETE® 62M

**MIDDLE STACK**
- STACKCRETE® 21V
- STACKCRETE® 608
- STACKCRETE® 62M

**LOWER STACK**
- STACKCRETE® G
- STACKCRETE® AZS 5R
- STACKCRETE® 62M

**BOSH**
- STACKCRETE® G
- STACKCRETE® 62M

**TAPHOLE CLAY**
- RSR 101
- RSR 1170R-AM
- RSR 1170R-Modified
- RSR 963-14
- RSR GREEN TAP 5
- RESTORATION CLAY

**TAPHOLE STRUCTURE**
- V-CAST® 133A
- V-CAST® 720A
- V-CAST® 739A
- Carbon Blocks

**TUYERE SLEEVE**
- LCF 798A (Precast)

**HEARTH**
- STACKCRETE® 20V
- STACKCRETE® 18V
- HC3F Mortar
- C34 Cement
- HC4F Grout
- HC5F Grout
- STACKCRETE® 62M
- GUNCAST 12

**BUSTLE PIPE**
- PUMPLITE 80 LI
- LCF 798A Pump

**BOTTOM & HEARTH CORNER**
- Ceramic Pad Shapes
CASTHOUSE

TROUGH / RUNNER

WORKING LINING
- V-CAST® 218A
- V-CAST® FA2L
- 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

MAINTENANCE
- TEK-GUN 408A
- DRI-VIBE® 348A
- DRI-VIBE® 512A

INSULATION
- Super Firetemp X

IRON TILTER

WORKING LINING
- V-CAST® 133A
- V-CAST® 712A
- V-CAST® 720A

SAFETY LINING
- MATRIPUMP 60

LADLE

WORKING LINING
- TUFFCRETE® 62M-FR

SAFETY LINING
- MATRIPUMP 60
# REHEAT - PUSHER FURNACE

## Extractor Shapes
- ALAKAST 98 EZC
- ALAKAST 90 LC-P
- ULTRACON 34C

## Leading Edge
- ALAKAST 98 EZC
- ALAKAST 90 LC-P
- TUFFCRETE® 90

## Hearth
- ALAKAST 98 EZC
- ALAKAST 90 LC-P
- TUFFCRETE® 90
- ALAKAST 85 LC-P-ES

## Subhearth
- ALAKAST 45-P
- ALAKAST 50 LC-P
- TUFF-FLO 50
- Super Firetemp X

## Bumper & Skid Blocks
- ALAKAST 98 EZC (Precast shape)
- ULTRACON 34C
- ALPHAMAX T

## Burner Walls & Roof
- BLAST KAST 70 LC

## Side Walls
- BLAST KAST 70 LC
- TUFF-FLO 50
- BLAST KAST 45 LC

## Wet Skid System
- ALAKAST 68 LC-P
- ALAFLOW 60 LC-P
- TUFF-FLO 65M
REHEAT - WALKING BEAM FURNACE

**SIDE WALLS**
- BLAST KAST 70 LC
- TUFF-FLO 50
- BLAST KAST 45 LC

**HEAT ZONE SLOT & DEFLECTOR BLOCKS**
- ALAKAST 45 LC (Precast shape)
- TUFF-FLO 50 (Precast shape)
- ALAFLOW 60 LC-P (Precast shape)
- TUFF-FLO 65M (Precast shape)

**BURNER WALLS & ROOF**
- BLAST KAST 70 LC

**WET SKID SYSTEM**
- ALAKAST 68 LC-P
- ALAFLOW 60 LC-P (Precast shape)
- TUFF-FLO 65M
Visit alliedmineral.com for more information.