



PRECAST

REFRACTORY SHAPES



Global **Refractory** Solutions



ALLIED'S PRECAST CENTERS

Allied's first precast shapes facility was founded in 1995 in Columbus, Ohio when it acquired American Precast Refractories. Since then, our precast capabilities have grown significantly with the expansion of our first facility and the addition of four others around the globe. Allied has become a leading manufacturer of custom engineered precast, pre-fired refractory shapes for a variety of industries.

Allied's precast shape centers have access to over 1,000 refractory product formulations to cater to the requirements of specific applications. With more than 50 years of experience in refractory shapes production, we pride ourselves on delivering high quality shapes to our customers all over the world.

- **Solution driven** - Collaboration between sales, research, engineering and manufacturing
- Commitment to superior **quality**
- **Extensive product** offerings including the ultimate ceramic-metal composite for shapes, METAL-ROK®
- Shapes manufactured from Allied's **proven successful product lines**
- Shapes from **1 kg to 15 metric tons** (2 lbs. to 10 tons)
- Engineering capabilities at **all Allied locations**

Some of our most popular shape capabilities include foundry crucibles, furnace structural parts, EAF deltas and spouts, filters and skimmer blocks, incinerator shapes, and rotary furnace shapes.

We have application engineering capabilities that allow us to design and manufacture complex pieces of virtually any shape and size. Precast shapes can be designed and created based on existing drawings or an existing shape.

Allied's **five** precast shapes centers are located in Ohio, USA, Alabama, USA, Tianjin, China and Tholen, Netherlands

Allied's flagship precast shapes center



Allied Mineral Products
Headquarters - Columbus, Ohio, USA



COLUMBUS CASTING FACILITY

process global refractory

Allied's Columbus, Ohio casting facility was constructed specifically for forming, firing and finishing precast refractory shapes. Being at the forefront of quality materials and outstanding technical support is critical.

Our capabilities include:

- 9290 sqm (100,000 sq. ft.) casting facility constructed specifically for shapes production
- High intensity paddle mixers capable of handling material quantities for large cast shapes
- Two 18 metric ton (20 ton) overhead cranes with full-building bridge travel range
- Improved firing abilities and a flexible daily firing schedule
- Casting room with atmospheric control for specialty applications
- High-temperature firing capabilities up to 1260°C (2300°F)



AFFILIATE LOCATIONS

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Allied's precast division has expanded to meet the growing demands of our customers and their markets.

In 2012 our Tianjin, China precast facility expanded by adding high fire capacity and additional casting process abilities.

Allied opened its European precast facility in Tholen, Netherlands in 2014. This expansion enabled Allied to provide refractory shapes to the foundry, industrial and steel markets in Europe.

We've recently added two more USA precast locations: Chehalis, Washington and Pell City, Alabama.

Benefits & capabilities:

- Monolithic refractories and precast shapes purchases from one location
- Locally sourced materials for lower cost estimates
- Over 50 years of precast shape experience
- Dedicated research and engineering teams that provide technical expertise



Tianjin, China



Tholen, Netherlands



FOUNDRIY INDUSTRY

Allied uses innovative technology to create unique precast shapes that withstand harsh temperature changes in molten metal transfer applications. Our customers have access to expert recommendations and backed by extensive engineering and design capabilities. Additionally, Allied's vast product catalog ensures the right product for your vessel and operating conditions.

Our foundry shapes offerings encompass:

- Coreless Furnaces
- Channel Induction Furnaces
- Cupolas
- Gas-fired Furnaces
- Resistance Rod Furnaces
- Heat Treating & Forging Furnaces
- Reverberatory Furnaces
- Vacuum Tundishes
- Transfer Ladles
- Ductile Treatment Ladles
- Pouring Tundishes / Boxes
- Launderers
- Centrifugal Casting Feed Equipment
- Impact Shapes





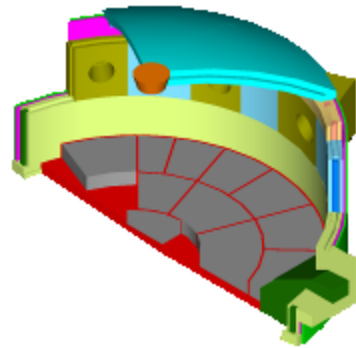
ALUMINUM INDUSTRY

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We have a large, diverse collection of refractory products designed specifically for the aluminum industry, which ensures a perfect material for each area of your furnace/vessel. We apply these standards of product specialization to our precast shapes, bringing high-performing, specialized pieces to your molten aluminum applications.

In 2010, Allied Mineral Products, Inc. and Pyrotek joined efforts to better serve the aluminum industry with precast shape solutions. Some of our unique capabilities include:

- Reverberatory Furnaces
- Diecasting Holding Furnaces
- Runners
- Tundishes
- Funnels
- Custom Pouring Components
- Reverb Dome Covers





HEAT TREATING & FORGING INDUSTRY



Allied has several tradename refractories designed for use in the heat treating and forging industries. We use these industry-leading products to create customized precast shapes for high temperature applications.

Our capabilities:

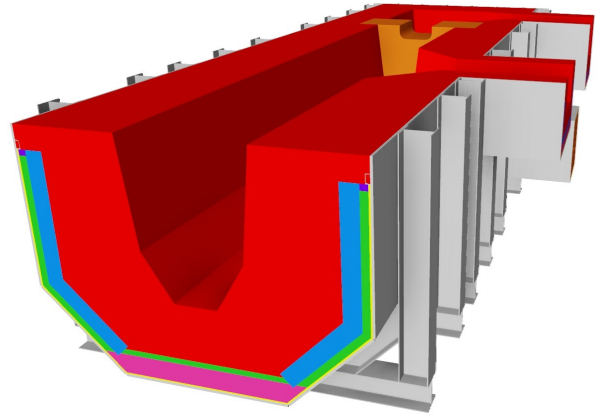
- Car Decks
- Pier Blocks
- Burner Tiles
- Lintels
- Jambs
- Flues





Allied's precast centers work closely with the engineering and research departments to enhance furnace productivity through design innovations. We offer a complete line of specialized precast, pre-fired refractory shapes for the steel industry including:

- Iron Troughs
- Runners
- Slag Runners
- Tilting Runners
- Transfer Equipment
- Blast Furnace Subhearth / Hearth
- EAF Roof Deltas
- EAF Spouts
- EAF Electrode Rings



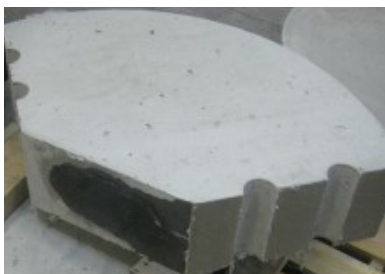
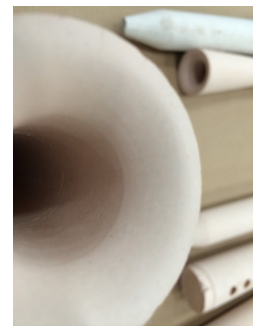
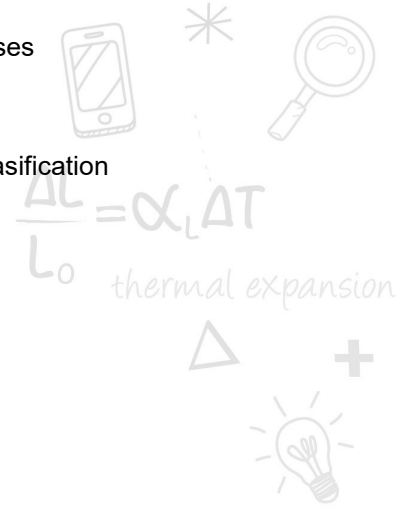


INDUSTRIAL MARKET

process global refractory

Allied precast shape materials for industrial applications include a variety of durable, versatile products. One such product is METAL-ROK[®], our ultimate ceramic-metal composite for pre-fired shapes. Allied's Research and Development team created METAL-ROK[®] to be strong and dependable in a variety of abrasive conditions. In addition to METAL-ROK[®], we have an extensive product arsenal to manufacturer shapes specifically suited for the following:

- Asphalt Processes
- Boilers
- Cement
- Hazardous & Bio-incineration
- Iron Ore Processing
- Incineration Processes
- Lime Kilns
- Power Generation
- Waste to Energy Gasification Processes

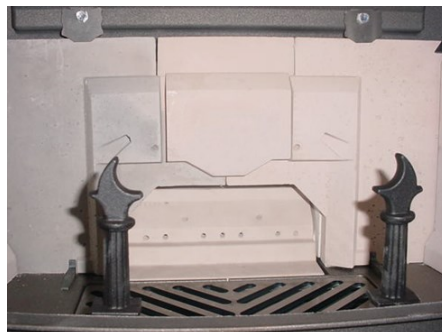
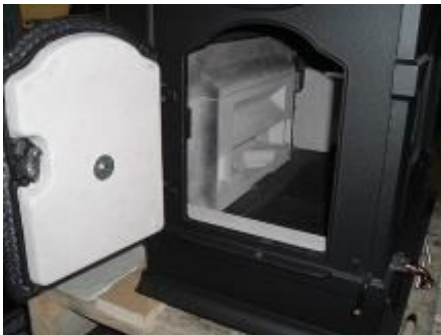
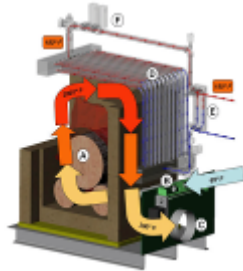




HEARTH RELATED PRODUCTS

Precast shapes for the home and hearth industry are designed to be resistant to alkali attack, mechanical abuse and high temperatures. Allied can create unique precast shapes for the following:

- Fireplaces
- Woodstoves
- Pellet Stoves
- Bio-mass Stoves
- Indoor / Outdoor Wood Boilers
- Gasifiers





Allied Mineral Products is a world leader in the design and manufacture of monolithic refractories. Allied's presence spans 100 countries with strong sales and service teams in the foundry, aluminum, steel, heat treating, forging and industrial markets. Allied can offer cutting edge precast refractory solutions to a wide range of markets thanks in part to the following:

- New product development programs
- Extensive product selection
- Manufacturing facilities in 7 countries
- Sales presence in over 100 countries
- Over 140 sales representatives in across the globe

Allied's success is based on our dedication to *Being There Worldwide with Refractory Solutions*. We're proud to offer high-quality, innovative refractory technology that is designed to meet each customer's unique needs.

We have your refractory solution.



Corporate Headquarters



Research and Technology Center

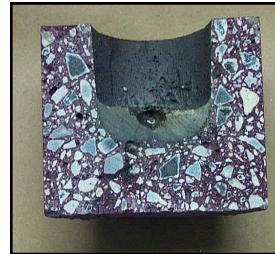
ABOUT ALLIED

Producing quality, consistent products is top priority at Allied. Our focus on quality at every stage of the production process is unparalleled. Allied's stringent raw material standards and quality control testing—before and after each batch is produced—ensures consistent products with excellent performance.

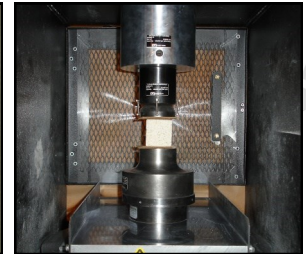
Allied provides quick response times to any urgent product request through flexible manufacturing systems at all 12 of its global manufacturing facilities.

Quality Control:

- Strict raw materials qualifications
- Batch testing
- Global quality management
- ISO certified since 1985, quality focus since 1961



Contact Tests



Strength Testing



A variety of packaging options, extensive stock and flexible manufacturing to meet urgent orders.

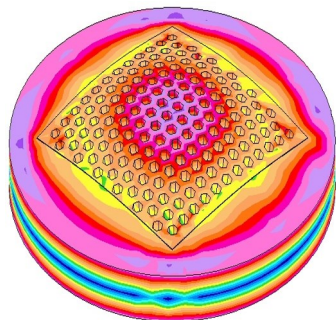


ENGINEERING & RESEARCH

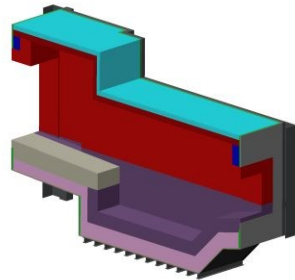
Allied Mineral Products prides itself on *being there worldwide with refractory solutions*. Allied's manufacturing facilities, worldwide sales and service networks and extensive product line formulations enables us to provide customers with the best refractory solutions and the fastest response times.

Allied starts the product selection process by gaining a detailed understanding of your specific needs. Next, Our team evaluates operating criteria and physical design parameters to create a detailed engineered precast or monolithic system 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 designs



FEA Thermal Analysis



Refractory Design Engineering

Allied is focused on developing new products, improving existing products and perfecting installation techniques. Product testing and development is conducted in Allied's state of the art research and technology centers. On-site gunning and shotcreting labs allow extensive hands-on testing of installation properties.

Allied is an innovative, technology-driven supplier devoted to providing customized refractory solutions for several industry operations including:

- Wide variety of high performance refractory products
- Superior raw material quality
- Tailored product selection to reduce chemical attack
- Unique installation properties - vibration cast, pump cast, gunning and shotcrete
- Modern laboratory for refractory design and testing
- On-site gunning and shotcreting lab



XRF



XRD



Design Engineering



Flow Testing



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