REFRACTORIES

FOR

THERMAL WASTE PROCESSING

Municipal - Industrial - Hazardous

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

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.

HAZARDOUS WASTE INCINERATION

Rotary Kiln Incineration System

KILN HEAD

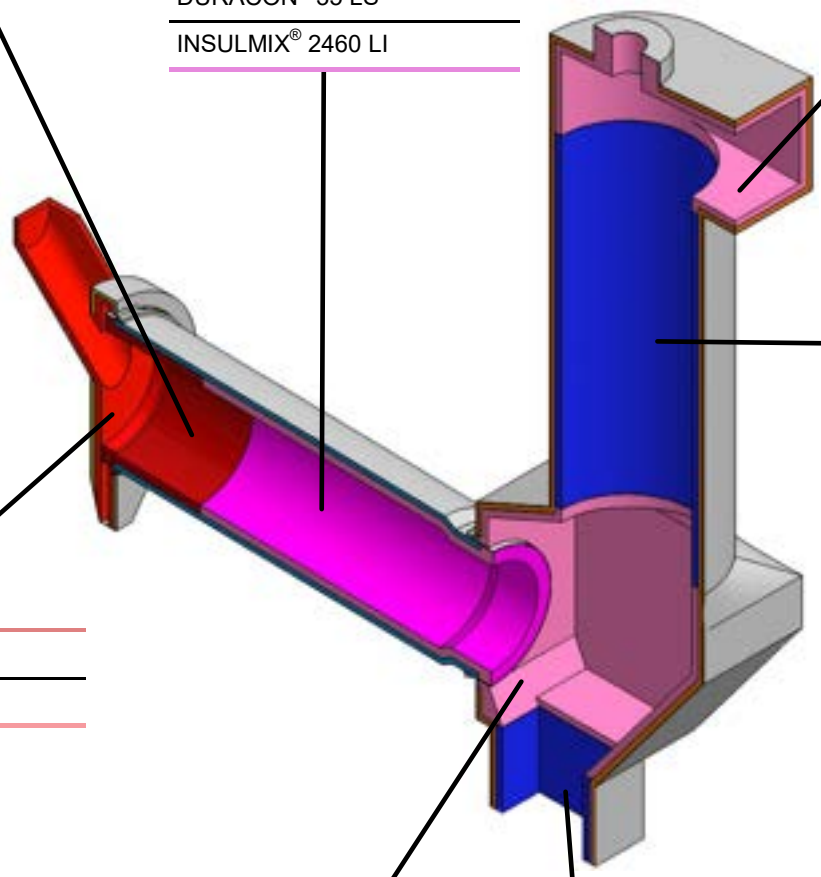
- TUFFCRETE® ARZ
- TUFFCRETE® 65 M
- TUFFCRETE® 608
- INSULMIX® 2460 LI

ROTARY KILN

- TUFFCRETE® 60 M ARZ
- TUFFCRETE® 65 M
- TUFFCRETE® AZS 5R
- TUFF-FLO 90-10 ULC
- DURACON® 35 LS
- INSULMIX® 2460 LI

SECONDARY COMBUSTION CHAMBER - FLUE

- TUFF-FLO 50
- TUFFCRETE® 60 M
- REZIST ABRADE 608 G
- INSULMIX® 2035 LI



SECONDARY COMBUSTION CHAMBER

- TUFFCRETE® 65M
- TUFF-FLO 50
- REZIST ABRADE 50 G
- INSULMIX® 2035 LI

KILN HEAD HOOD

- TUFFCRETE® 60 M
- TUFFCRETE® 608

BURNER

- DURACON® 34
- TUFF-FLO 60A

TRANSITION AREA

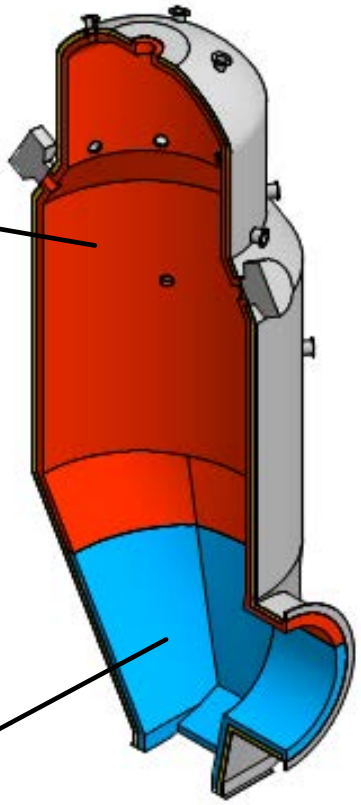
- TUFFCRETE® 65 M
- TUFFCRETE® 47
- TUFFCRETE® 608
- INSULMIX® 2035 LI

SLAG DISCHARGING AREA

- TUFFCRETE® 47
- INSULMIX® 2035 LI

HAZARDOUS WASTE INCINERATION

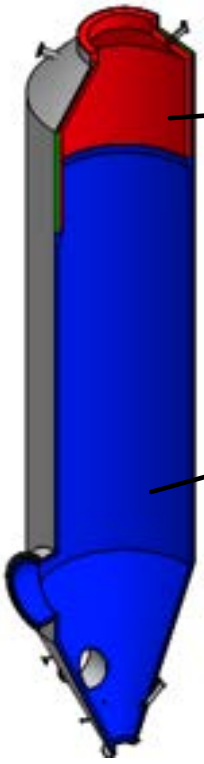
Liquid Waste Incinerator



UPPER AREA
TUFFCRETE® 60MARZ
FAST-TURN® 65M
TUFFCRETE® 608
NANOTEK® BZSC
TUFF-FLO 32 ARZ
INSULMIX® 2460 LI
INSULMIX® 2035 LI

LOWER AREA
TUFFCRETE® 608
TUFFCRETE® 20SIC
TUFFCRETE® ARZ
INSULMIX® 2460 LI
INSULMIX® 2035 LI

Cooling Tower

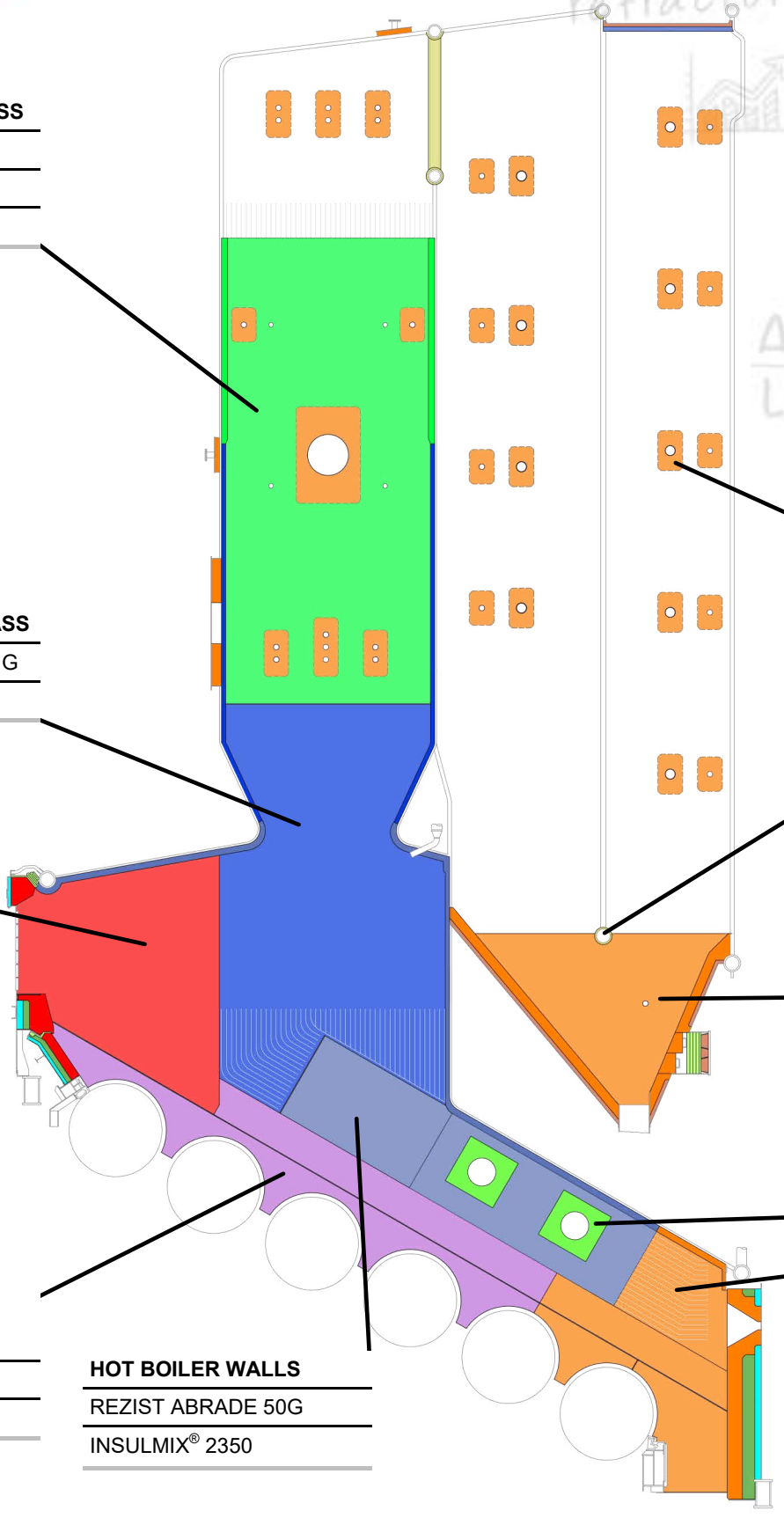


UPPER AREA
TUFFCRETE® FS
STACKLINE B PC
NANOTEK® FS ULTRA
INSULMIX® 2035 LI

MIDDLE/LOWER AREA
We recommended precoating the furnace shell with anti-corrosion paint.
REZIST ABRADE 50 G
NANOTEK® 55 A SR
TUFFCRETE® 47
GUNCAST® 26 LI

ENERGY RECOVERY

Grate Fired Boilers



UPPER PART FIRST PASS

- REZIST ABRADE 608G
- ECONORAM SIC 75 TR
- RAM MAX® 80 SIC

LOWER PART FIRST PASS

- REZIST ABRADE 80 SIC G
- TUFFCRETE® 60 SIC F

FUEL ENTRY BOILER WALLS

- REZIST ABRADE 65G
- TUFF-FLO 608

WEAR ZONE GRATE TRANSITIONS

- TUFFCRETE® 60 SIC F
- TUFF-FLO 608

HOT BOILER WALLS

- REZIST ABRADE 50G
- INSULMIX® 2350

NOZZLES

- TUFF-FLO 50
- TUFFCRETE® 47

COLLECTOR 2ND PASS

- RAM MAX® 80 SIC P

ASH HOPPER

- REZIST ABRADE 50 G
- INSULMIX® 2035 LI

BURNERS

- LCF 798
- TUFF-FLO 60A
- RAM MAX® BR 70P

SLAG OUTLET

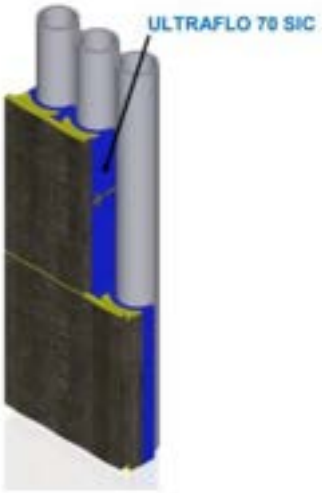
- TUFF-FLO 47
- TUFF-FLO 608
- REZIST ABRADE 50G

THERMAL WASTE PROCESSING SYSTEMS

Allied has a complete list of refractory products and installation services to develop and maintain these critical processes. Allied is committed to support the market needs with new products like ULTRAFLO 70 SIC and the REZIST ABRADE family of gunning products.

Sample products and applications in Energy from Waste Boilers

Product Name	Product Description	Application
ULTRAFLO 70 SIC	Silicon carbide based self flow casatble	Backfill requiring excellent self flow, and thermal conductivity
REZIST ABRADE 80 SIC G	Silicon carbide based low cement refractory gun mix	Requiring high heat transfer, abrasion resistance, volume stability, and low rebound gunning
REZIST ABRADE 608 G	Mullite based low cement gunning mix, with alkali resistant additives	Requiring excellent abrasion resistance, and resistant to alkali attack
RAM MAX® 80 SIC P	Silicon carbide based phosphate bonded plastic	Ramming plastic for where high heat transfer is required



The thermal waste-processing market continues to develop because of the increasing focus on resource recovery and the demand for eco-friendly energy. In these application environments the dynamic process of thermal, mechanical and chemical loads is a constant challenge.

Allied's team is always actively collaborating with customers to focus on continual improvement, with a systems level approach. This mindset to technical challenges applies very well to waste-processing industry, the energy-generating industry and the industry for incinerating chemical waste.

PRODUCT DATA

Product Name	Al_2O_3 %	SiO_2 %	Cr_2O_3 %	SiC %	ZrO_2 %	Density g/cm^3 (lb/ft^3)	Maximum Temperature
CASTMAX® 28 S HR	40.7	45.6	-	7.3	-	2.28 (142)	1535°C (2800°F)
DURACON® 34	98.6	0.1	-	-	-	3.12 (195)	1870°C (3400°F)
DURACON® 3450CR	89.2	-	9.2	-	-	3.29 (205)	1870°C (3400°F)
FAST-TURN® 65 M	64.8	30.5	-	-	-	2.58 (161)	1700°C (3090°F)
GUNCAST® 26 LI	45.9	41.1	-	-	-	2.07 (129)	1425°C (2600°F)
INSULMIX® 2035 LI	36.7	42.5	-	-	-	0.60 (37)	1100°C (2010°F)
INSULMIX® 2460 LI	44.8	34.9	-	-	-	1.0 (62)	1315°C (2400°F)
METAL-ROK® 70 M*	70.2	25.4	-	-	-	3.06 (191)	1350°C (1500°F)
MINRO-AL® PLASTIC A89	85.3	9.1	-	-	-	2.93 (183)	1700°C (3090°F)
NANO-TEK® BZSC	62.5	15.4	-	7.9	10.6	2.87 (179)	1538°C (2800°F)
NANO-TEK® 91 HS	91.3	6.0	-	-	-	2.88 (180)	1705°C (3100°F)
RAM MAX® 80 SIC P	11.5	5.3	-	77.6	-	2.68 (167)	1500°C (2732°F)
REZIST ABRADE 50G	69.7	23.4	-	-	-	2.39 (149)	1650°C (3000°F)
REZIST ABRADE 608G	58.9	27.0	-	7.9	-	2.38 (149)	1650°C (3000°F)
REZIST ABRADE 80 SIC G	8.6	5.3	-	81.1	-	2.55 (159)	1500°C (2730°F)
TUFFCRETE® ARZ	41.3	46.7	-	4.1	1.5	2.32 (145)	1650°C (3000°F)
TUFFCRETE® FS	10.5	86.8	-	-	-	2.00 (125)	1315°C (2399°F)
TUFFCRETE® 20 SIC	41.8	31.7	-	21.4	-	2.32 (145)	1650°C (3000°F)
TUFFCRETE® 47	47.1	46.5	-	-	-	2.16 (135)	1540°C (2800°F)
TUFFCRETE® 608	59.3	28.3	-	7.9	-	2.60 (162)	1650°C (3000°F)
TUFFCRETE® 60 M	64.6	30.2	-	-	-	2.53 (158)	1700°C (3090°F)
TUFFCRETE® 65 M	65.8	28.1	-	-	-	2.58 (161)	1700°C (3090°F)
TUFFCRETE® 60 M ARZ	54.0	38.5	-	4.2	1.5	2.48 (155)	1700°C (3090°F)
TUFF-FLO 32 ARZ	75.4	10.9	-	4.2	3.4	3.00 (187)	1760°C (3200°F)
TUFF-FLO 50	49.7	44.7	-	-	-	2.32 (145)	1700°C (3090°F)
ULTRAFLO 70 SIC	15.3	4.8	-	69.2	-	2.48 (154)	1650°C (3000°F)

*Stainless Steel Fibers are not included in the chemical analysis.

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