

# Zircore™ and Kyasill™

## Foundry and Refractory Mineral Sands

### Product Information

Chemours' Zircore™ and Kyasill™ are loose blends of aluminosilicates and zircon mineral sands that are well-graded and have clean, sub-rounded to sub-angular surfaces. Mined from Chemours' mineral deposits in the southeastern United States, these naturally occurring sands are washed to ensure freedom from dirt, dust, and ultrafines. These minerals are separated from other heavy minerals by physical processing techniques to produce uniform, high-quality products.

#### Foundry and Refractory Applications

Zircore™ and Kyasill™ mineral products vary in the level of zircon (zirconium silicate) and aluminosilicates. The differences in mineral composition yield different physical and chemical properties, which are outlined in the tables below. Zircore™ and Kyasill™ are ideal for many foundry applications, such as core and mold sand, greensand molding, and no-bake applications, as well as refractory applications like back-up stucco for investment casting molds.

#### Zircore™ and Kyasill™ Advantages

- Low thermal expansion
- Excellent refractory properties
- High dimensional stability
- Corrosion resistance
- Significant mechanical strength
- Excellent recyclability
- Good permeability

Reclaimable by mechanical, thermal, and microwave methods

#### Personal Safety

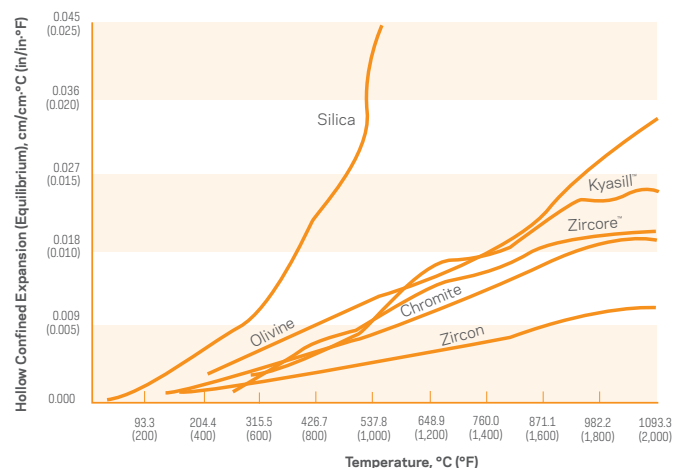
For safety information, please visit the product Safety Data Sheet (SDS).

#### Packaging

Zircore™ and Kyasill™ are available in 50-pound multiwall paper bags, semi-bulk (2-ton) bags, bulk hopper rail cars, and bulk pneumatic trucks. Department of Transportation (DOT) Hazard Classification: NOT REGULATED.

\* Due to changing governmental regulations, such as those of the Department of Transportation, Department of Labor, U.S. Environmental Protection Agency, and the Food and Drug Administration, references herein to governmental requirements may be superseded. Each user should consult and follow the current governmental regulations, such as Hazard Classifications, Labeling, Food Use Clearances, Worker Exposure Limitations, and Waste Disposal Procedures for the products described in this literature.

**Figure 1. Thermal Expansion Coefficients of Mineral Sands**



**Table 1. Mineral, Chemical, and Physical Properties**

Typical Screen Analysis**					
U.S. Sieve No.*	Sieve Opening, $\mu\text{m}$	Zircore™ % Retained on Sieve		Kyasill™ % Retained on Sieve	
		Mean	Std. Dev.	Mean	Std. Dev.
50	300	<1	—	1	0.3
70	212	12	3.0	13	2.3
100	150	42	5.7	44	4.7
140	106	36	4.0	36	3.9
200	75	7	2.4	6	1.9
PAN	<53	1	0.5	1	0.5
AFS Grain Fineness Number		85	3.6	84	3.2
Chemical Composition					
	Zircore™		Kyasill™		
	Specifications %	Typical %**	Specifications %	Typical %**	
ZrO <sub>2</sub>	27 min.	38	27 max.	22	
Al <sub>2</sub> O <sub>3</sub>	—	23	—	41	
Free Silica	10 max.	3	15 max.	5	
Mineral Composition					
	Zircore™		Kyasill™		
	Specifications %	Typical %**	Specifications %	Typical %**	
Zircon	40 min.	50	40 max.	35	
Kyanite + Sillimanite	—	34	—	47	
Staurolite	7 max.	3	10 max.	5	
Corundum	—	3	—	4	
Quartz	10 max.	3	15 max.	5	
Other	-	6	—	2	
Physical Properties					
Range	Zircore™		Kyasill™		
Bulk Density (Uncompacted)	2403–2563 kg/m <sup>3</sup> (150–160 lb/ft <sup>3</sup> )		2003–2163 kg/m <sup>3</sup> (125–135 lb/ft <sup>3</sup> )		
Specific Gravity	3.6 – 4.2		3.3 – 3.9		
Hardness (Mohs)	6.5 – 7.0		6.5 – 7.0		
Melting Point	1815–2038 °C (3300–3700 °F)		1538–1815 °C (2800–3300 °F)		
Coefficient of Linear Expansion	10.8 × 10 <sup>-6</sup> cm/cm·°C (6 × 10 <sup>-6</sup> in/in·°F)		12.6 × 10 <sup>-6</sup> cm/cm·°C (7 × 10 <sup>-6</sup> in/in·°F)		
pH	6.0 – 8.5		6.0 – 8.5		

\*U.S. Sieve Series according to ASTM E-11-70.

\*\*These columns give typical values based on historical production performance. Chemours does not make any express or implied warranty that future production will conform to these typical values.

**Table 2. Uses of Zircore™ and Kyasill™ Foundry Sands**

Features	
Shell Mold and Cores	<ul style="list-style-type: none"> <li>Low binder requirements</li> <li>Good casting quality</li> <li>Low cost</li> <li>Low thermal expansion aids dimensional accuracy</li> <li>Excellent recycle qualities</li> <li>Good refractory properties</li> <li>Thermal stability</li> </ul>
Investment Casting Molds	<ul style="list-style-type: none"> <li>Back-up stucco</li> <li>Excellent casting surface</li> <li>Low thermal expansion</li> <li>Good refractory properties</li> <li>Low-cost stucco alternatives</li> </ul>
Green Sand Molding	<ul style="list-style-type: none"> <li>Requires a minimum amount of clay and water</li> <li>Easy mulling and ramming</li> <li>Low thermal expansion</li> <li>Good refractory properties</li> </ul>
No-Bake Binders	<ul style="list-style-type: none"> <li>Good mold strengths</li> <li>Low binder requirements</li> <li>Good permeability for venting of gases and wash penetration</li> <li>Low cost</li> </ul>
Silicate-CO <sub>2</sub> Process and Oil Sand Cores	<ul style="list-style-type: none"> <li>Low binder requirements</li> <li>Good permeability to aid rapid setting</li> <li>Low cost</li> </ul>

**CAUTION:** Do not use or resell Chemours™ materials in medical applications involving implantation in the human body or contact with internal body fluids or tissues unless agreed to by Seller in a written agreement covering such use. For further information, please contact your Chemours representative. These products may not be directly added to food, pharmaceuticals, cosmetics, or cigarette papers/filters for tobacco products.

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