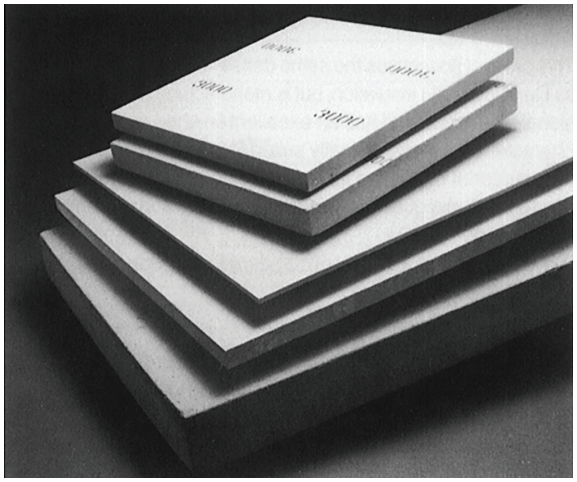
Product Information Sheet

Fiberfrax® Duraboard®

INTRODUCTION

Fiberfrax® Duraboard® products are a family of rigid, high temperature ceramic fiber boards manufactured in a wet forming process using Fiberfrax alumina-silica fibers and binders. **All Duraboard products offer low thermal conductivity, high temperature stability, uniform density, and excellent resistance to thermal shock and chemical attack.** They are also well-suited for applications experiencing vibration, mechanical stress, and strong erosive forces. The excellent rigidity and modulus of rupture possessed by these boards makes them strong and self-supporting, yet relatively lightweight and easy to cut or machine.

These product features allow for quick, efficient handling and high installation rates, thereby enabling fast turnaround times in a variety of industrial insulation applications. Once installed, they can help reduce energy costs and cycling times due to their high insulating capability, as well as serving to protect refractory surfaces from thermal shock. The Fiberfrax Duraboard family exhibits excellent chemical stability, resisting attack by most corrosive agents. Exceptions are hydrofluoric, phosphoric, hydrochloric, and sulfuric acids as well as concentrated alkalies. Fiberfrax Duraboard products also resist oxidation and reduction. If wet by water, steam or oil, thermal and physical properties are completely restored upon drying.



In order to provide handling strength during the manufacturing process, small quantities of organic and inorganic binders are typically added to the board formulation. Where present, the organic binding agents burn out at temperatures between 450°F (232°C) to 600°F (316°C) during initial heat-up by the end user. Following burnout of the organic binder, the boards are white in color.

PRODUCT RANGE

Temperature Grade	Target Density	Board Type	Description
2300°F (1260°C)	14-24 lb/ft³ (224-384 kg/m³)	RG	A rolled, rigidized surface finish and high modulus of rupture (MOR) give a tough, **economic refractory grade product.**
	16-20 lb/ft³ (256-320 kg/m³)	LD	A higher **quality surface finish** and tighter dimensional tolerances make this board suitable for use in situations where aesthetic quality, as well as performance, is important.
	23-27 lb/ft³ (369-433 kg/m³)	HD	The addition of clay gives a **higher density, MOR, and strength.**
	18-21 lb/ft³ (288-336 kg/m³)	ES	Unique family of **highly machinable** lightweight boards manufactured with three to four times the green strength as standard board products.
2600°F (1427°C)	10-14 lb/ft³ (160-224 kg/m³)	2600	Formed from a special blend of regular Fiberfrax alumina-silica fibers and Saffil® Mullite Fibers. These boards give **high stability** at temperatures up to 2450°F (1343°C).
3000°F (1649°C)	9-12 lb/ft³ (144-193 kg/m³)	3000	Formed from a special blend of regular Fiberfrax alumina silica fibers and Saffil® Mullite Fibers. These boards give **high stability** at temperatures up to 2700°F (1482°C).

Refer to the product Safety Data Sheet (SDS) for recommended work practices and other product safety information.

Product Information Sheet

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DURABOARD® PRODUCTS

Duraboard RG
Duraboard RG (Refractory Grade) insulation is **a cost-effective insulating board** manufactured with the specific requirements of the refractory industry in mind. It has a rolled, rigidized surface which gives it a high modulus of rupture and compressive strength as well as high abrasion and hot gas erosion resistance. These properties make Duraboard RG insulation ideally suited for use both as a backup to dense refractories, such as those used in the glass industry, and as a hot face protective layer over blanket linings where the rigidized surface aids in dust suppression during both installation and operation.

Duraboard LD
This product possesses the same density and temperature rating as Duraboard RG insulation but is **manufactured to tighter dimensional tolerances** and has an excellent finished surface. These characteristics make it ideally suited for use as a sandwich or core material or for use in the manufacture of components where aesthetic quality, as well as uniformity and performance, is important. It is available in a variety of standard thicknesses ranging from 1/8" to 2". Duraboard LD has been recognized under certain categories at Underwriters Laboratories Inc (UL file number E75289).

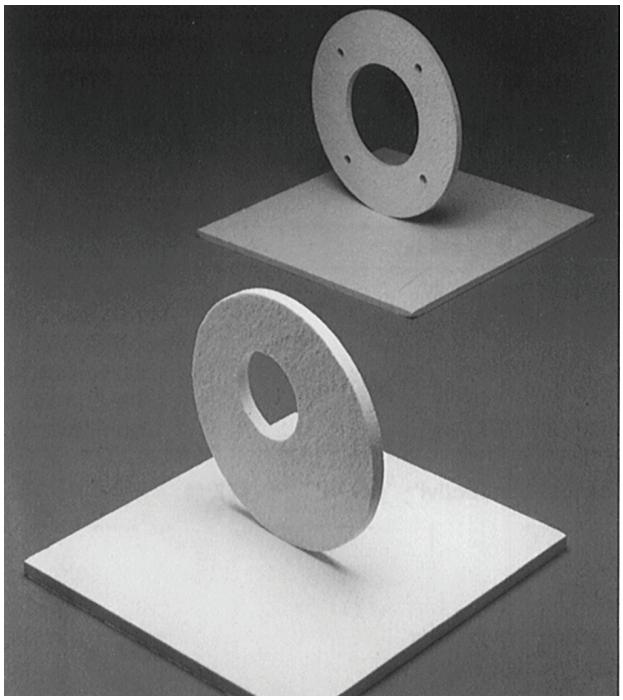
Duraboard HD
Duraboard HD insulation is a high-density board product that offers the same **high level of dimensional and surface uniformity** as Duraboard LD insulation but provides enhanced compressive strength and a higher modulus of rupture. This higher density is achieved through the inclusion of clay additives during the manufacturing process. Its higher strength makes Duraboard HD insulation particularly well-suited to weight load support applications such as refractory brick backup or for covering larger unsupported spans.

Duraboard 350ES
These products use a unique fiber formulation to obtain high strength and machinability not normally achieved in lightweight ceramic fiber board products. The innovative composite binder system using both inorganic and organic components result in a strength-to-weight ratio of more than three times that of standard refractory ceramic fiber boards. Improved physical characteristics of these products allow for easier handling and fabrication. **Duraboard 350ES has more than three times the strength of standard boards** of similar densities and thicknesses.

Duraboard 2600
Duraboard 2600 insulation is a high-temperature insulating board **designed to provide high stability at elevated temperatures**. This capability is achieved by manufacturing a board formulated with a blend of Fiberfrax® alumina-silica fibers and Saffil. This unique formulation controls thermal shrinkage to a level less than 1.0% after 168 hours at 2450°F (1343°C).

Duraboard 3000
Duraboard 3000 insulation, **the highest temperature rated board manufactured by Alkegen**, provides maximum high-temperature stability and shrinkage resistance. Also formulated from a blend of Fiberfrax alumina-silica fibers and Saffil fibers, Duraboard 3000 insulation derives its exceptional high-temperature capability from an increased Saffil fiber concentration in the blend. This unique formulation controls shrinkage to a level of only 1.2% after 168 hours at 2700°F (1482°C).

Inorganic Boards
Duraboard products are manufactured using a combination of both organic and inorganic binding agents. In certain applications, the presence of organic binders and the low temperature burnout that is associated with them may be unacceptable. These products may be ordered with the organic binding agents already removed by heat treating following the manufacturing process. Heat treated boards display a reduced modulus of rupture and an increase in dustiness. **For additional information about inorganic boards, contact the Alkegen Application Engineering Group at 716-768-6460.**



Shown above are fabricated pieces of Fiberfrax Duraboard 350ES. die-cut from parent sheet stock. It is easily and accurately machined with reduced dusting.

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Fiberfrax® Duraboard®

APPLICATIONS

Board						
RG	LD*	HD	ES	2600	3000	Application
•		•		•	•	Full thickness refractory lining
•	•	•	•	•	•	Insulating backup to dense refractories
•	•	•	•	•	•	Insulating backup to brick & castable
•	•	•		•	•	Furnace hot face lining in ceramic kiln, box furnace & petrochemical furnace
•	•	•		•	•	Board over blanket hot face lining
•	•					Use in industrial heat processing equipment
•	•	•	•			Rigid high-temperature gaskets & seals
•	•	•		•	•	High-temperature baffles & muffles
•	•	•		•	•	Flue & chimney linings in furnaces & kilns
	•	•		•	•	Infrared element supports
•	•	•		•	•	Glass tank side & end wall & port neck insulation
•	•	•				Trough linings for conveying molten metals
•	•	•				Molten metal trough covers
•	•	•		•	•	Thermal insulation where high velocities are encountered
•	•	•		•	•	Heat shields for personnel protection
•	•	•		•	•	Hot gas duct linings
•	•	•		•	•	Low- & high-temperature dryers
	•	•	•			Pouring forms for castable
•	•	•				Expansion joints
	•		•			Industrial heat shields & thermal barriers
	•			•	•	Industrial combustion chamber construction
	•		•			Domestic appliance & light-duty industrial combustion chamber construction
	•					Wood-burning stove backup insulation

*Duraboard LD has been recognized under certain categories at Underwriters Laboratories Inc (UL file number E75289 and MH7514 respectively).

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Product Information Sheet

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TYPICAL PRODUCT PROPERTIES

Duraboard	RG	LD	HD	350ES	2600	3000
Physical Properties						
Color	Cream to Tan	White to Cream	Cream	White to Cream	Cream	Cream
Classification Temperature* °F (°C)	2300 (1260)	2300 (1260)	2300 (1260)	2300 (1260)	2600 (1427)	3000 (1649)
Continuous Use Temperature** °F (°C)	2100 (1149)	2100 (1149)	2100 (1149)	2100 (1149)	2450 (1343)	2700 (1482)
Melting Point °F (°C)	3200 (1760)	3200 (1760)	3200 (1760)	3200 (1760)	3300 (1816)	3400 (1871)
Nominal Density, lb/ft³ (kg/m³)	16 (258)	16 (258)	26 (419)	18 (288)	14 (224)	12 (192)
LOI (wt. %)	5-7	6-7	6-7	3-7	4-6	4-6
Typical Chemical Analysis (wt. %)						
SiO_2	55	55	55	55	45-50	40-45
Al_2O_3	45	45	45	45	50-55	55-60
ZrO_2	-	-	-	-	-	-
Compression Properties						
Deformation (% compression) in "Green" State	Applied Pressure, psi (kPa)					
5%	48 (330)	42 (290)	59 (410)	40 (280)	22 (150)	42 (290)
10%	61 (420)	50 (340)	70 (480)	59 (410)	25 (170)	44 (300)
15%	71 (490)	57 (390)	81 (560)	76 (520)	27 (190)	47 (320)
Deformation (% compression) after 24 Hour Soak @ Continuous Use Temperature	Applied Pressure, psi (kPa)					
5%	25 (170)	23 (160)	32 (220)	27 (190)	19 (130)	15 (100)
10%	25 (170)	23 (160)	33 (230)	32 (220)	19 (130)	15 (100)
15%	25 (170)	23 (160)	35 (240)	33 (230)	19 (130)	15 (100)
Permanent Linear Shrinkage						
After 24 Hour Soak @ Continuous Use Temperature	< 5%	< 5%	< 5%	< 5%	< 2%	< 2%
Strength Properties						
MOR in "Green" State, psi (kPa)	250 (1724)	200 (1379)	300 (2068)	350 (2412)	150 (1034)	150 (1034)
MOR after 24 Hour Soak @ Continuous Use Temperature, psi (kPa)	110 (758)	80 (552)	125 (862)	90 (620)	65 (449)	55 (379)
Electric Properties						
Dielectric Strength, V/mil (V/mm)	27 (1.1)	27 (1.1)	27 (1.1)	27 (1.1)	27 (1.1)	27 (1.1)

*The Classification Temperature is not a definition of the operational temperature use limit of these products, especially when long-term physical or dimensional stability is a factor. The classification temperature is the temperature at which irreversible linear shrinkage does not exceed a given value after a 24-hour heat soak test. For applications where long-term stability is not a requirement, products may be successfully used at temperatures well in excess of their Classification Temperature. For continuous use applications requiring long-term stability, routine practice is to utilize materials in respect to their continuous use temperature.

**The Continuous Use Temperature is a recommended maximum operating temperature for the material usage under clean, oxidizing atmosphere conditions. For certain application conditions (specific chemical contaminants, reducing atmospheres, etc.), the Continuous Use Temperature may be reduced.

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Product Information Sheet

Fiberfrax® Duraboard®

AVAILABILITY

Thickness						
Sheet Size*	1/8" (3 mm)	1/4" (6 mm)	1/2" (13 mm)	1" (25 mm)	2" (51 mm)	3" (76 mm)
24 x 36 inch (610 x 914 mm)				LD 2600 3000	LD	2600
24 x 48 inch (610 x 1220 mm)				RG LD HD 2600 3000	LD HD 2600 3000	2600
42 x 48 inch (1067 x 1220 mm)	LD	LD ES	LD ES	LD		

*Other sizes not listed available on special request, subject to MOQ. Duraboard® HD & Duraboard LD are available 3" & 4" thick by special order. Subject to MOQ.

HEALTH AND SAFETY INFORMATION

A Material Safety Data Sheet has been issued describing the health, safety, and environmental properties of these products, identifying the potential hazards and giving advice on handling precautions and emergency procedures. This must be consulted and fully understood before handling, storage, or use.

Alkegen
Headquarters
5215 N. O'Connor Blvd, Suite 2300
Irving, TX 75039
Telephone: 716-768-6500
Website: www.alkegen.com
Email: info@alkegen.com

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