



TOUCHSTONE RESEARCH LABORATORY, LTD.
The Millennium Centre • Triadelphia, WV 26059
Phone 304-547-5800 • Fax 304-547-5802
www.cfoam.com

CFOAM Product Sheet—Page 1 of 2

PRODUCT DATA SHEET: CFOAM[®] Carbon Foams



CFOAM[®] carbon foam, developed by Touchstone Research Laboratory, Ltd., is a next-generation structural material which is inexpensive, lightweight, fire-resistant, impact-absorbing, thermally insulating or conducting, and with electrical conductivity that can be varied over seven orders of magnitude. It can be fabricated in a variety of shapes, sizes, and densities to meet the property requirements of specific applications.

CFOAM carbon foam is applicable to a broad spectrum of commercial, defense and aerospace markets. It is an enabling technology for a host of next-generation material systems and components – replacing those currently based on more conventional materials such as balsa wood, intumescent mats, polymer matrices, metallic honeycombs, ceramic fibrous insulation, ceramic tile, Kevlar-based structures, polystyrene, plastics, fiberglass, rubber and various metals.

Carbon foams are currently being developed for a variety of uses including fire-resistant ship decking and bulkheads, noise and impact mitigation for aircraft, structural panels and firewalls for automobiles, lightweight personnel and vehicular armor, modular construction, and as part of spacecraft thermal management systems.

These foams will not off-gas at elevated temperatures and will not support ignition. Unlike those of most metals and ceramics, CFOAM carbon foam mechanical properties do not deteriorate with increased temperature if protected from oxidation, making carbon foams an attractive thermal protection material. Carbon foams are also tolerant to impact damage and can be repaired in-place using carbonaceous adhesives. For additional oxidation or impact protection CFOAM carbon foam can be integrated easily with dissimilar materials such as metals or polymer matrix composites (PMCs).

CFOAM carbon foam is a domestically produced material offering advantages such as low cost, enhanced structural properties, fire resistance, radar cross-section, corrosion susceptibility, and low weight.



ISO 9001:2000 & AS9100B:2004
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Imagination, Invention, Innovation....

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TYPICAL CFOAM® PROPERTIES

Property	Test Method	Touchstone CFOAM®		Unit
		20	25	
Nominal Density	ASTM D1622	20 0.32	25 0.40	lbs/ft³ g/cc
Compressive Strength	ASTM C 365	>1200 8.3	>2000 >15	Psi MPa
Compressive Modulus	ASTM C 365	90 620	120 830	Ksi MPa
Tensile Strength	ASTM C 297	>300 >2.2	>500 >3.5	Psi MPa
Tensile Modulus	ASTM C 297	60 500	120 830	Ksi MPa
Shear Strength	Torsional Shear	>250 1.7	>300 2.1	Psi MPa
Coefficient of Thermal Expansion	ASTM E 228	3.0 5.0	3.0 5.0	ppm/°F ppm/°C
Thermal Conductivity	ASTM E 1225	.15 to 16 .25 to 25 Tailorable		BTU/ft-hr°F W/m°K
Maximum Operational Use Temperature		1100 Air 600 Air		°F °C
		5500 Inert 3000 Inert		
Electrical Resistivity	ASTM D 4496	4E-03 to 4E+06 1E-02 to 1E+07 Tailorable		ohm-in ohm-cm
Fire Resistance	ASTM E 1354, ASTM E 1515, MIL-STD-1623 Coast Guard IMO FTP Code Part I and III	Results indicate CFOAM will pass all key fire tests including: radiant panel, smoke generation, toxicity, cone calorimeter, fire resistance, and room corner tests.		



Ease in Machining



Composite Tooling



Sandwich Structures

The test data presented in this bulletin are believed by Touchstone to be representative of this product. Most ASTM methods mentioned above have been modified to test CFOAM. However, the test data are not a guaranty or warranty. Touchstone makes no warranty, whether expressed or implied, including warranties of merchantability or of fitness for a particular purpose. Under no circumstances shall Touchstone be liable for incidental, consequential, or other damages arising out of a claim from alleged negligence, breach of warranty, strict liability or any other theory, through the use or handling of this product or the inability to use the product. The sole liability of Touchstone for any claims arising out of the manufacture, use, or sale of its products shall be for the replacement of the quantity of this product which has proven to not substantially comply with the data presented in this bulletin. Users should make their own assessment of the suitability of any product for the purposes required. The above supersedes any provision in your company's forms, letters, or other documents.

CFOAM® is a registered trademark of Touchstone Research Laboratory, Ltd. CFOAM products are covered under the following patents with more patents pending: 6,656,238 – 6,656,239 – 6,689,470 – 6,749,652 – 6,814,765 – 6,833,011 – 6,833,011 – 6,833,012 – 6,849,098 – 6,860,910 – 6,861,151 – 6,869,455 – 6,899,970 – 7,192,537 – 7,247,368



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