

## C-RAM™ SFC

### High performance broadband pyramidal RF absorber

#### Description

C-RAM™ SFC is a series of high performance broadbanded RF absorbers made from specially treated low density polyurethane foam.

Using a steep pyramid design which provides an impedance gradient, C-RAM™ SFC provides premium performance in anechoic chambers at both normal and off-normal incidence angles.

These products meet all of the fire retardancy requirements:

- NRL Specification 8093 tests 1, 2, and 3
- MS-8-21 tests 1, 2, and 3
- T.I. drawing 2693066
- ASTM E-84-97a, Class A
- UL94 rated HF-1

#### Availability

Standard sizes of C-RAM™ SFC are listed below, ranging from a 3 inch to 96 inch height. C-RAM™ SFC-3 up through SFC-72 are shaped as conventional pyramids and supplied as square 24 inch (610 mm) panels.

A twisted design is offered in a 72" and 96" grade. The twisted pyramid design improves the wide angle performance, and because of the extended shoulder height, exhibits less drooping of the tips for some applications.

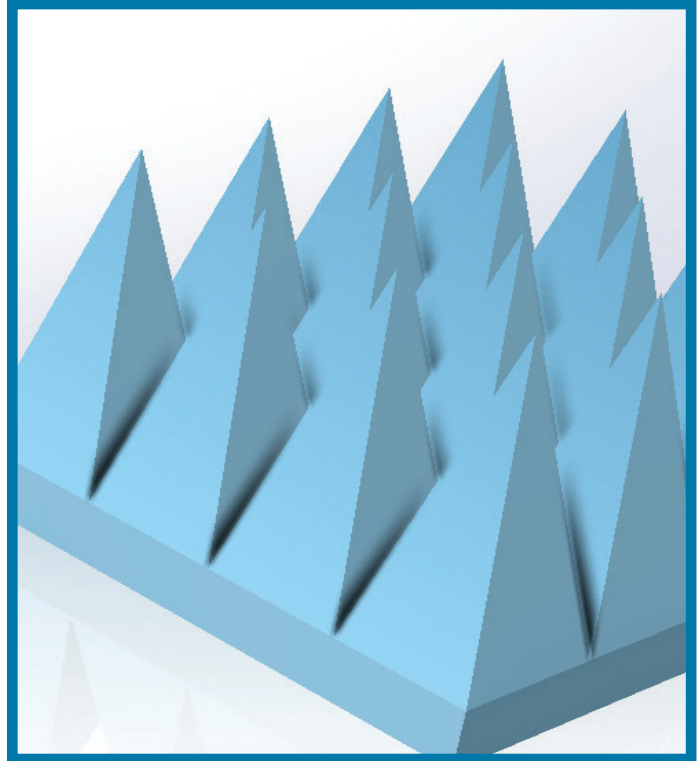
In addition to simply supplying a bill of materials, Cuming Microwave designs and installs complete anechoic chambers.

Chambers can be designed to meet your specifications, and an entire kit of materials is supplied, including factory pre-cuts of special fitting parts.

We can install all materials or supply technical support to help you complete your own installation.

#### Applications

- Lining of anechoic chambers to reduce reflections inside the chamber.
- Reduce reflections in radar cross section (RCS) facilities and test ranges.



#### Instructions for use

Absorber panels are generally installed in a chamber using solvent-based neoprene contact adhesive.

Alternatively, C-RAM™ SFC up through the 24 inch grade can be supplied with a Velcro backing.

A clip & rail system is also available as a method of installation in the field.

#### Typical properties

Typical weight, dimensions, and reflectivity of the various grades of C-RAM™ SFC are given in the table on the next page.

Typically, C-RAM™ SFC absorbers can handle up to 1.0 W/in<sup>2</sup> (1.55 kW/m<sup>2</sup>) of RF energy in a temperature controlled room, but this is dependent upon frequency and application.

The product is black throughout, and generally is sprayed with a light blue surface coating, both for cleanliness and to provide better light reflection inside a chamber.

The absorber can be left unpainted if requested.

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**Table 1**

Physical characteristics, typical and minimum reflectivity at normal incidence

Grade	Height In. (mm)	Weight Lbs. (kg)	Tips per piece	Typical reflectivity at frequency in GHz (minimum reflectivity at frequency in GHz)											
				0.08	0.10	0.3	0.5	1	3	6	10	18	36*	50*	
SFC-3	3 (76)	2.25 (1.25)	256							-25 (-25)	-34 (-31)	-44 (-35)	-50 (-40)	-50	-50
SFC-4	4 (102)	3.0 (1.4)	144							-33 (-30)	-45 (-35)	-48 (-39)	-50 (-42)	-50	-50
SFC-5	5 (127)	3.2 (1.5)	144							-41 (-34)	-54 (-38)	-55 (-40)	-55 (-43)	-50	-50
SFC-6	6 (152)	3.5 (1.6)	100							-33 (-29)	-50 (-40)	-55 (-45)	-55 (-50)	-50	-50
SFC-8	8 (203)	4.5 (2.0)	64					-30 (-30)	-40 (-34)	-50 (-45)	-59 (-50)	-60 (-50)	-60 (-50)	-50	-50
SFC-12	12 (305)	6 (2.7)	36					-38 (-33)	-55 (-37)	-60 (-45)	-60 (-50)	-60 (-50)	-60 (-50)	-50	-50
SFC-18	18 (457)	12 (5.4)	16			-20 (-10)	-31 (-28)	-38 (-35)	-55 (-44)	-60 (-49)	-60 (-50)	-60 (-50)	-60 (-50)	-50	-50
SFC-24	24 (610)	17 (7.7)	9	-7 (-3)	-12 (-7)	25 (-20)	-33 (-30)	-38 (-38)	-55 (-47)	-60 (-50)	-60 (-50)	-60 (-50)	-60 (-50)	-50	-50
SFC-36	36 (914)	24 (10.9)	4	-20 (-9)	-28 (-13)	-27 (-25)	-40 (-35)	-46 (-42)	-55 (-48)	-60 (-50)	-60 (-50)	-60 (-50)	-58 (-50)	-50	-50
SFC-48	48 (1219)	35 (16)	4	-20 (-10)	-28 (-21)	-43 (-35)	-48 (-36)	-49 (-45)	-70 (-50)	-70 (-50)	-62 (-50)	-58 (-50)	-58 (-50)	-50	-50
SFC-72	72 (1829)	50 (22.7)	1	-14 (-10)	-20 (-15)	-36 (-35)	-47 (-39)	-48 (-40)	-57 (-50)	-60 (-50)	-50 (-50)	-50 (-50)	-50 (-50)	-50	-50
SFC-72T**	72 (1829)	45 (20.5)	1	-14 (-10)	-20 (-15)	-36 (-35)	-47 (-39)	-48 (-40)	-57 (-50)	-60 (-50)	-50 (-50)	-50 (-50)	-50 (-50)	-50	-50
SFC-96T**	96 (2438)	58 (26.5)	1	-28 (-25)	-32 (-30)	-37 (-37)	-40 (-40)	-47 (-45)	-60 (-50)	-50 (-50)	-50 (-50)	-50 (-50)	-50 (-50)	-50	-50

NOTE: \*SFC has been characterized at 36 and 50 GHz but is not routinely measured at these frequencies. \*\*"Twisted" configuration

**Table 2**

Typical reflectivity (bistatic) at off-normal incidence  
(Multiply numbers in chart by dB values in Table 1)

Absorber height in wavelength	Off-normal angle (0° = normal, 90° = grazing)							
	45°	50°	55°	60°	65°	70°	75°	80°
4.0	1.00	0.95	0.86	0.75	0.70	0.60	0.51	0.43
2.0	0.90	0.82	0.74	0.66	0.58	0.49	0.42	0.34
1.0	0.72	0.65	0.58	0.50	0.44	0.37	0.31	0.25
0.5	0.48	0.43	0.37	0.31	0.25	0.20	--	--

All recommendations, statements, and technical data contained herein are based on tests we believe to be reliable and correct, but accuracy and completeness of said tests are not guaranteed and are not to be construed as a warranty, either expressed or implied. User shall rely on his own information and tests to determine suitability of the product for the intended use and assumes all risks and liability resulting from his use of the product. Seller's and manufacturer's sole responsibility shall be to replace that portion of the product of this manufacturer which proves to be defective. Neither seller nor manufacturer shall be liable to the buyer or any third person for any injury, loss, or damage directly or indirectly resulting from use of, or inability to use, the product. Recommendations or statements other than those contained in a written agreement signed by an officer of the manufacturer shall not be binding upon the manufacturer or seller.

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