

### 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

##### Applications

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

##### 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.

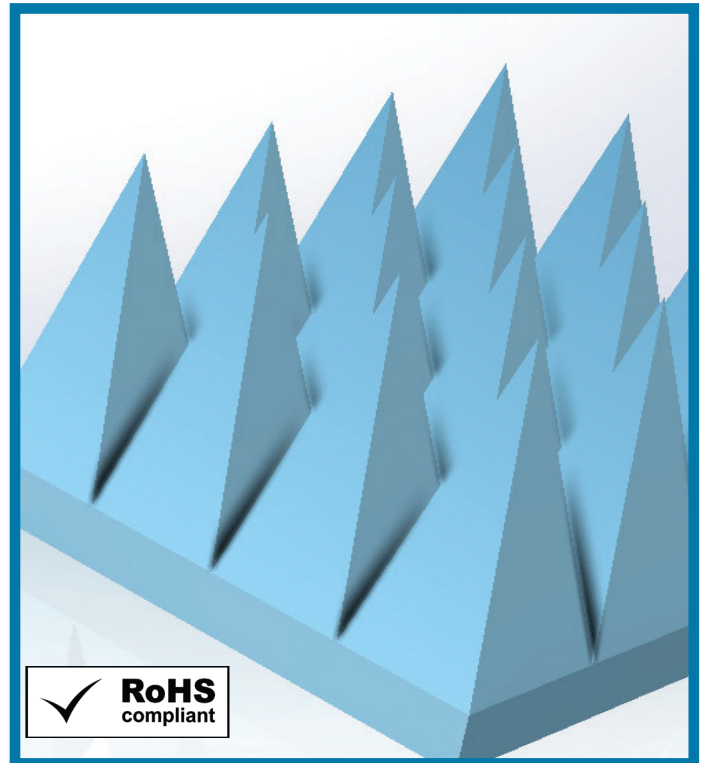
SFC-72 and larger are available in a twisted pyramid design.

The “twisted pyramid” design improves the wide angle performance and, because of the extended shoulder height, exhibits less drooping of the tips after installation.

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.



##### 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.



**Table 1**

Physical Characteristics, Typical and Minimum Reflectivity at Normal Incidence

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

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	1.0	3.0	6.0	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)	-50	-50	
SFC-12	12 (305)	6 (2.7)	36					-38 (-33)	-55 (-37)	-60 (-45)	-60 (-50)	-60 (-50)	-50	-50	
SFC-18	18 (457)	12 (5.4)	16			-20 (-10)	-33 (-30)	-38 (-35)	-55 (-44)	-60 (-49)	-60 (-50)	-60 (-50)	-50	-50	
SFC-24	24 (610)	17 (7.7)	9	-7 (-3)	-12 (-7)	-20 (-10)	-33 (-30)	-38 (-38)	-55 (-47)	-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)	-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)	-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	
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	

**Table 2**

Typical Reflectivity (Bistatic) at Off-Normal Incidence  
(Multiply numbers in chart by dB values in Table 1)

Absorber height in wavelengths	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	-	-

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