CUMING MICROWAVE

Technical Bulletin 390-6

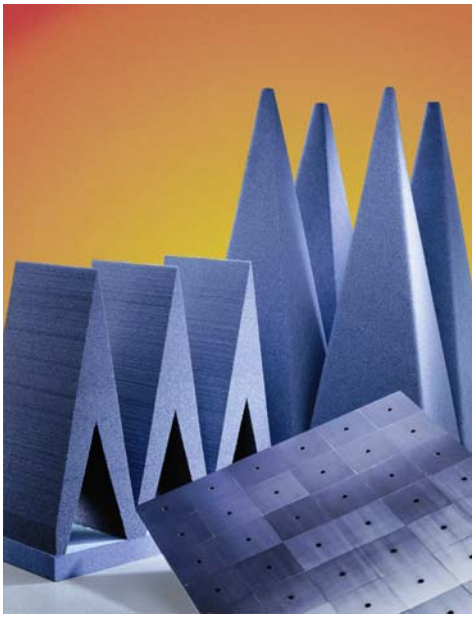
C-RAM HFP

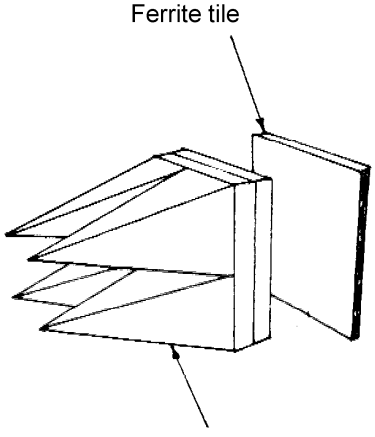
HYBRID RF ABSORBER FOR LOW FREQUENCIES

RoHS Compliant

C-RAM HFP is a hybrid RF absorber designed for low-frequency EMI test rooms and anechoic chambers. The "hybrid" construction consists of specially-formulated urethane foam pyramidal or wedge absorber panels mounted on top of ferrite tiles, resulting in almost all the performance normally seen with ferrite tiles alone in the 30 – 1000 MHz range, plus up to -30dB reflectivity from 1 – 20GHz. For many testing applications, C-RAM HFP achieves comparable performance in less than half the volume occupied by conventional pyramidal absorbers.

One should note that the pyramidal foam component of C-RAM HFP is specially designed to match the impedance of the ferrite tiles, and is not the same material as standard C-RAM SFC pyramidal foam absorbers. Customers can discuss application details with Cuming Microwave engineers to arrive at an optimal solution for their application.





TYPICAL PROPERTIES

The table on the reverse side gives dimensions, weights and reflectivity characteristics of the various grades of C-RAM HFP.

C-RAM HFP grades can typically handle up to 1.0 W/in^2 (1.5 kW/m^2) of RF power in a temperature controlled room. Actual limits depend upon frequency and application.

FIRE RETARDANCY

C-RAM HFP meets the fire retardancy requirements of NRL Specifications 8093, Tests 1, 2, and 3, as well as those of MIT Document MS-8-21 tests 1, 2, and 3, T.I. drawing 2693066, and ASTM E-84-97a, Class A.

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METHOD OF APPLICATION

C-RAM HFP, in either the pyramidal or wedge shaped design, are supplied in standard 24 in x 24 in. (610 x 610 mm) base dimensions, are bonded to the front of the already installed ferrite tiles, using adhesive or Velcro fasteners in the same way that normal C-RAM SFC pieces would be mounted.

When installing the wedge-shaped grades, alternate the orientation of the wedges in a checkerboard design.

AVAILABILITY

C-RAM HFP comes in 6 height grades as given in the table below. Typically, the larger the chamber, the lower the resonant frequencies of concern, so a larger absorber grade must be used. Generally, HFP-48 is needed in 10-meter test length chambers, HFP-18, -24 and -36 are used in 3-meter chambers, depending upon the room size, and HFP-12 is used in Mil-STD-461 C, D, and E rooms. Depending upon the application and the room dimensions, Cuming Microwave engineers can provide full chamber design and computer molded chamber performance.

One should note that ferrite tiles, such as C-RAM FT-10 are sold in metric units, and C-RAM HFP grades are 24 inch squares, so it is important to calculate requirements carefully.

GRADE	HEIGHT in. (mm)	WEIGHT lbs. (kg)	TIPS PER PIECE	Reflectivity in dB at Frequency (GHz)					
				0.03	0.10	0.30	1.0	3.0	10.0+
HFP-12 pyramidal	13 (330)	50 (23)	36	-12	-17	-16	-10	-10	-17
HFP-18 wedge	18 (457)	55 (25)	3 wedges	-15	-18	-20	-13	-12	-17
HFP-24 wedge	26 (660)	58 (26)	3 wedges	-15	-18	-20	-15	-12	-17
HFP-36 pyramidal	38 (965)	60 (27)	4	-20	-24	-23	-18	-20	-30
HFP-48 pyramidal	50 (1270)	66 (30)	4	-22	-24	-25	-23	-25	-30
HFP-72 wedge	72 (1828)	70 (32)	1 wedge	-24	-25	-26	-27	-27	-30