



CUMING MICROWAVE

PERFORMANCE OF C-RAM FAC @ W-BAND (77 GHz)

APPLICATION NOTE 300-12

RoHS
Compliant

With the increasing need for anechoic test chambers for proving automotive distance control radars at (77 GHz), Cuming Corporation has provided samples of C-RAM FAC-5 to Daimler-Benz Research Center in Ulm, Germany, for independent testing.

C-RAM FAC is the material of preference for mm-wave chambers. The convoluted (egg-carton) shape of the face of the material provides the electrical gradient necessary for very low levels of reflected signals. The rounded convolutions minimize diffractions which would occur with straight-edged pyramid shaped absorber materials.

C-RAM FAC-5 is specified to have reflectivity less than -50 dB at 30 GHz. At frequencies of 30 GHz and above, we recommend that the absorber material is not painted with the typical blue surface coating, as the high dielectric constant of the pigments in the coating may affect performance. It is instead lightly coated with a clear acrylic plastic coating.

TEST RESULTS

Two production samples were sent for testing. Each piece was tested at 10 different incidence angles, for 0° (normal incidence) to 40° bistatic (each horn 40° off normal).

The worst case measurement was -45 dB reflectivity, with a typical value of -53 dB.

TESTING DETAILS

Absorber pieces were tested in a bistatic RCS antenna range at Daimler-Benz. Transmission length is 5.5 meters. The range is calibrated with a spherical target, and a reference reflection is taken with corner reflector of known radar cross section.

The two samples were then tested at 10 different bistatic angle, from 0° (normal incidence) to +/- 40°, in both horizontal and vertical polarizations. Reflectivity was then calculated from the absolute RCS of the test samples, correlating the RCS of the corner reflector to that of an equivalent flat metal plate.

The worst case of any measurement (all angles, both polarizations) was -45 dB; a measurement of -53 dB was typical.

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