

LOSSY FLEXIBLE FIRE RETARDANT FOAM ABSORBER

Eccosorb QR-13AF is an environmentally friendly UL-94-HF-1 rated material, free of antimony and chlorinated polymers. It is a high loss, flexible, non-magnetic, low-dusting microwave absorber sheet. Eccosorb QR-13AF is electrically conductive.

FEATURES AND BENEFITS

- Flexible, foam material
- High loss, low density
- Fire retardant

MARKETS

- Commercial Telecom
- Security and Defense

SPECIFICATIONS

TYPICAL PROPERTIES	ECCOSORB QR-13AF
Service Temperature °C (°F)	-70 to 93 (-94 to 200)
Frequency Range	≥ 1 GHz
Fire Retardancy	UL94-HF-1
Dusting	Negligible

Data for design engineer guidance only. Observed performance varies in application. Engineers are reminded to test the material in application.

**Please note that Eccosorb QR-13AF with PSA or with a coating is not UL rated.*

APPLICATIONS

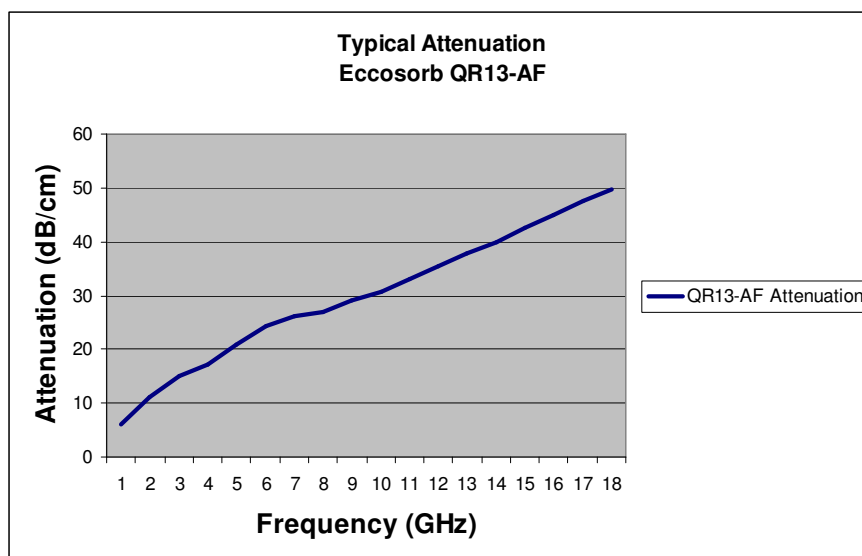
- Eccosorb QR-13AF is designed to suppress cavity resonances in shielded high-frequency modules and to absorb parasitic radiation emanating from high speed electronic circuits by insertion loss.

AVAILABILITY

- Standard sheets are 610mm x 610mm (24"x24").
- Standard thicknesses are 3.2 mm (1/8") and 6.4 mm (1/4"), other thicknesses available upon request.
- It is available in other sizes and customer specified configurations upon request
- Eccosorb QR-13AF can also be supplied with a pressure sensitive adhesive (PSA)*
- Eccosorb QR-13AF can be supplied with a coating to prevent moisture uptake in high humidity to moderately wet environments upon request.*

INSTRUCTIONS FOR USE

- Eccosorb QR-13AF can be securely bonded to itself or to other materials such as metal, wood and common plastic composites. The recommended adhesive is our Eccostock® foam Adhesive.
- It can be easily cut with a knife, scissors, or die.



Flexible Foam Sheet Broadband Microwave Absorber



FLEXIBLE FOAM SHEET BROADBAND MICROWAVE ABSORBER:

Eccosorb AN is a lightweight, flexible, polyurethane foam sheet broadband microwave absorber. It is designed to reflect less than -17 dB of normal incident energy above specified frequencies and relative to a metal plate.

FEATURES AND BENEFITS

- Carbon loaded, multilayer absorber
- Broadband free space absorber
- Low weight
- RoHS/Reach compliant

MARKETS

- Commercial Telecom
- Security and Defense
- Test & Measurement

SPECIFICATIONS

TYPICAL PROPERTIES	ECCOSORB AN
Front surface color (facing oncoming EMI)	White
Back surface color	Black
Max. Service Temperature °C (°F)	90 (194)
Power Handling, W/cm ²	0.15
Fire Retardancy	UL94-HBF

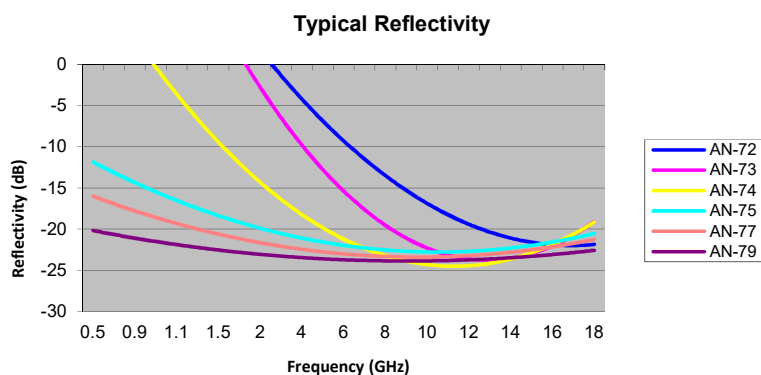
Data for design engineer guidance only. Observed performance varies in application. Engineers are reminded to test the material in application.

APPLICATIONS

- Eccosorb AN is commonly used for the lining of small test chambers to reduce reflections.
- Eccosorb AN is being used for reducing crosstalk between adjacent antennas, shrouding antennas to improve the antenna patterns and undesired backlobes, as well as selective shadowing of parts of a target for RCS measurements.
- Shadowing of posts and supports in anechoic chambers, and as absorbing blankets for testing radar systems without harm to personnel.
- For isolation of components or antennas by means of insertion loss, it can be used without a metal backing.

AVAILABILITY

- Eccosorb AN is available in six standard grades depending upon the lowest desired frequency of operation, starting from 600 MHz.
- Standard sheets are 61 cm X 61 cm (24" x 24")
- Eccosorb AN is available in other sizes and customer specified configurations, incorporating miter cuts or attachment to metal parts.
- It can be manufactured, on special order, on a mandrel, to take a contoured shape.



	Reflectivity range	Nominal Thickness	Nominal Weight
	(>17 dB)	cm (inch)	kg/piece (lb/piece)
AN-72	>20 GHz	0.6 (0.24)	0.25 (0.6)
AN-73	>7.5 GHz	1.0 (0.39)	0.50 (1.1)
AN-74	>3.5 GHz	1.9 (0.75)	0.70 (1.5)
AN-75	>2.4 GHz	2.9 (1.14)	0.80 (1.8)
AN-77	>1.2 GHz	5.7 (2.24)	1.50 (3.3)
AN-79	>600 MHz	11.4 (4.49)	2.95 (6.5)

ENVIRONMENTAL PROPERTIES

- Eccosorb AN is not waterproof and will not operate correctly when wet. Since there is no washout, it will function as expected after being allowed to dry.
- A special CERSEAL coating to prevent moisture uptake in high humidity to moderately wet environments is available on special request.
- For high humidity to moderately wet environments, sealed versions of Eccosorb AN are available. They are essentially the same material as Eccosorb AN but the absorber is sealed to provide improved outdoor properties.

The available types are :

Eccosorb AN-xx-W :sealed with neoprene coated nylon fabric, color olive green.

Eccosorb AN-xx-WPC : sealed with a poly-urethane coating, different colors available on request

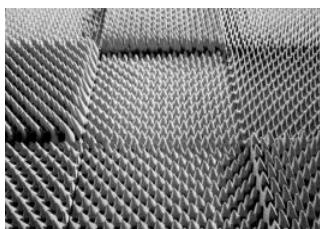
Eccosorb AN-xx-WPVC :sealed with a PVC plastic, different colors are available on request and can be provided with eye-lets for fixing

- Reflectivity performance is similar to the standard Eccosorb AN product;

INSTRUCTIONS FOR USE

- To obtain low reflectivity, the absorbers must be mounted on a metal surface. If a metal surface is not available, Eccosorb AN can be supplied metal backed with aluminum foil (ML).
- For correct operation, Eccosorb AN must have the white (front) face towards the signal to be attenuated.
- Layering of multiple pieces or slicing off part of the thickness will degrade the overall performance.
- Reflectivity performance also degrades for off-normal bistatic incidence and at different rates for different polarizations.
- Eccosorb AN can be securely bonded to itself or to other materials such as metal, wood, and common plastic composites. Our specific Eccostock® foam adhesive is recommended.

Broadband, Convoluted, Foam Microwave Absorber



BROADBAND CONVOLUTED FOAM ABSORBER

Eccosorb CV is a premium quality tapered broadband microwave absorber. It is a moderately flexible urethane foam material having a front surface cut to a convoluted (egg-carton) shape. Because of the rounded convolutions and lack of sharp corners and points, Eccosorb CV is the preferred absorber for mm wave frequencies and for very wide incidence angles. There is no degradation in performance at incidence angles out to 60° off-normal.

FEATURES AND BENEFITS

- Convoluted
- Broadband absorption due to high thickness
- High reflectivity due to geometric structure

MARKETS

- Commercial Telecom
- Test and Measurement

SPECIFICATIONS

TYPICAL PROPERTIES	ECCOSORB CV
Frequency Range	>1.5 GHz
Max. Service Temperature °C (°F)	90 (194)
Power Handling kW/m ²	1.5
Fire Retardancy	UL-94-HBF

Data for design engineer guidance only. Observed performance varies in application. Engineers are reminded to test the material in application.

APPLICATIONS

- Absorbing collars (shrouds) around the edges of high performance antennas
- MM-wave applications
- Small test boxes

AVAILABILITY

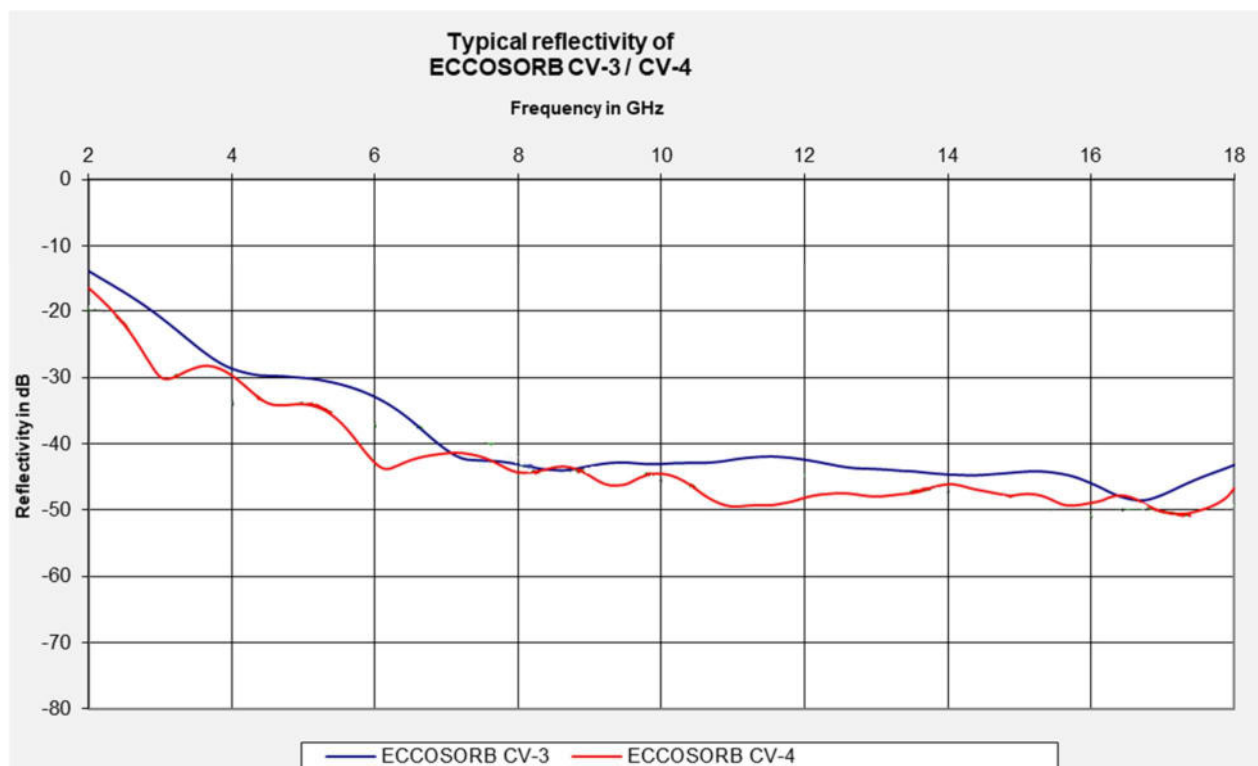
- Eccosorb CV is available in standard piece sizes of 61 cm x 61 cm.
- Two grades are available, Eccosorb CV-3 and CV-4, with resp. heights of 6.7 cm and 9.8 cm. The thickness (height) determines primarily the low frequency end of performance, all grades have similar performance at millimeter wave frequencies.
- Eccosorb CV is supplied with the front surface painted white.
- If the primary application is for millimeter wave frequencies, it is recommended to ask for absorber to be supplied without paint, as it can have a negative effect on the reflectivity performance.

FREQUENCY LIMIT (IN GHZ) FOR A GIVEN REFLECTIVITY			
Grade	-20 dB	-30 dB	-40 dB
ECCOSORB CV-3	4	7	8
ECCOSORB CV-4	4	6	8

The table gives the specified reflectivity values, showing the frequency at which a particular reflectivity can be expected for each grade.

INSTRUCTIONS FOR USE

- The Eccostock® foam adhesive, a contact adhesive, is recommended and will bond the absorber securely to clean surfaces of metal, wood and common plastics or plastic composites. It is brushed or sprayed onto both the back surface of the absorber and the substrate surface, allowed to become tacky in 3 to 5 minutes, and then the two surfaces are pushed together with slight pressure to form a contact adhesion. The bonded piece should be allowed to sit overnight for complete evaporation.
- The curved absorber tips should be pointed in the direction of the transmit signal.



RFP-DS-CV 113015

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Lightweight, Open-cell, Broadband Microwave Absorber

LIGHTWEIGHT BROADBAND FOAM ABSORBER



Eccosorb HR is a lightweight, flexible, flat-sheet, broadband absorber based on a reticulated (open-cell) polyurethane foam material impregnated with carbon black dispersions with controlled conductivity. Automated impregnation methods are used in order to obtain a gradient loading of the absorber.

FEATURES AND BENEFITS

- Lightweight
- Open-cell
- Different thicknesses, different frequencies
- High free space reflectivity performance

MARKETS

- Commercial Telecom
- Parabolic Antennas
- Security and Defense
- Test and Measurement

SPECIFICATIONS

TYPICAL PROPERTIES	ECCOSORB HR
Frequency Range (GHz)	5 to 90
Max. Service Temperature °C (°F)	90 (194)
Density kg/m ³ (lb/ft ³)	45 (2.8)
Tensile Strength (kPa)	70
Elongation (%)	170

Data for design engineer guidance only. Observed performance varies in application. Engineers are reminded to test the material in application.

APPLICATIONS

- Lining of antenna shrouds for low side-lobe reflector antennas.
- Decoupling of adjacent antennas and array elements.
- Camouflaging and interference suppression applications.
- Masking of reflecting structures i.e. masts in anechoic chambers.

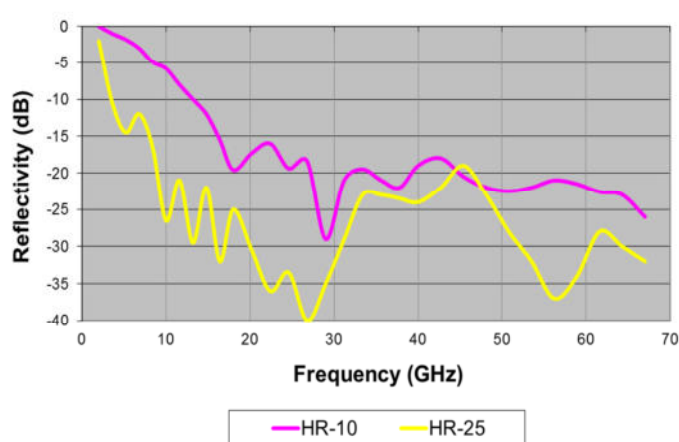
AVAILABILITY

- Standard sheets are 610mm x 610mm (24"x24").
- The material is available in 3 standard thicknesses :
Eccosorb HR-10 - nominal thickness 10mm
Eccosorb HR-15 - nominal thickness 15mm
Eccosorb HR-25 - nominal thickness 25mm
- Other sizes and customer specified configurations can be delivered upon request.

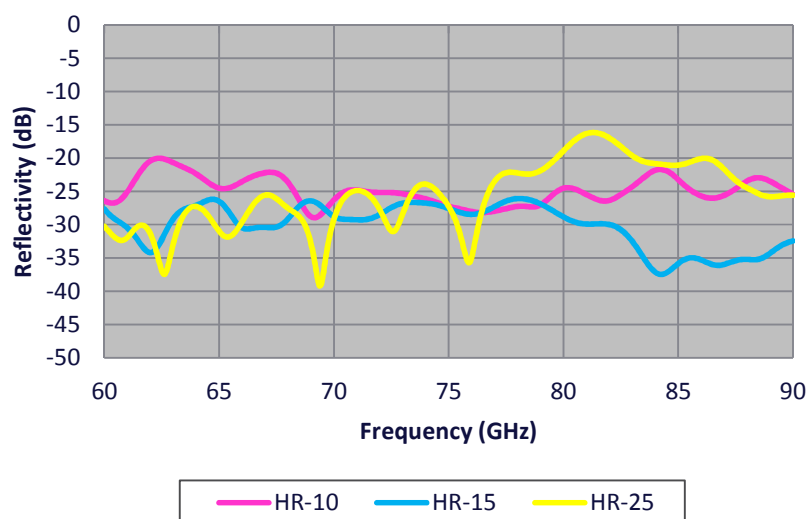
INSTRUCTIONS FOR USE

- As the material is a gradient loaded absorber, the back side of the absorber is marked and this side should be bonded to the surface. The front surface should face the incident electromagnetic energy for proper performance.
- For optimal performance, Eccosorb HR should be bonded to a metal surface. If a metal surface is not available, the absorber can be supplied with an aluminium foil backing (ML) designated as HR-XX-ML.
- Our specific Eccostock® foam adhesive is recommended to bond Eccosorb HR.

HR Reflectivity



HR Reflectivity



RFP-DS-HR 092815

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Lossy, Flexible, Foam Microwave Absorber



LOSSY, FLEXIBLE FOAM ABSORBER

Eccosorb LS is the most widely known, used, and recommended polyurethane foam absorber for both isolation/ insertion loss as well as cavity resonance purpose. Eccosorb LS obtains its microwave properties via impregnation with a carbon black dispersion and is therefore electrically conductive. It is a cost efficient solution for many applications over the thinner rubber absorbers.

FEATURES AND BENEFITS

- Flexible, foam material
- High loss, low density
- Tuned serie

MARKETS

- Commercial Telecom
- Test Boxes
- Security and Defense
- Sensor

SPECIFICATIONS

TYPICAL PROPERTIES	ECCOSORB LS
Max. Service Temperature °C (°F)	90 (194)
Frequency Range	≥ 1 GHz

Data for design engineer guidance only. Observed performance varies in application. Engineers are reminded to test the material in application.

	Attenuation (dB/cm)		Relative Impedance (Z /Z ₀)	
	3 GHz	10 GHz	3 GHz	10 GHz
LS-14	1.0	1.7	0.83	0.89
LS-16	1.5	2.3	0.78	0.87
LS-18	3.2	4.7	0.69	0.82
LS-20	4.2	7.0	0.61	0.78
LS-22	7.4	14.9	0.55	0.74
LS-24	11	24	0.25	0.44
LS-26	16	34	0.18	0.31
LS-28	20	40	0.16	0.27
LS-30	24	46	0.13	0.22

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Asia: +86.755.2714.1166

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APPLICATIONS

- Eccosorb LS is used to lower cavity Q's in RF amplifiers, oscillators, cabinets containing microwave devices, computer housings, LNB's and isolation of antennas by insertion loss.
- Eccosorb LS is also used to reduce surface currents on radiating elements and outer ground-plane type surfaces.
- Reflectivity of an object (metal or otherwise) can be reduced somewhat by applying one or more layers of Eccosorb LS to its surface.

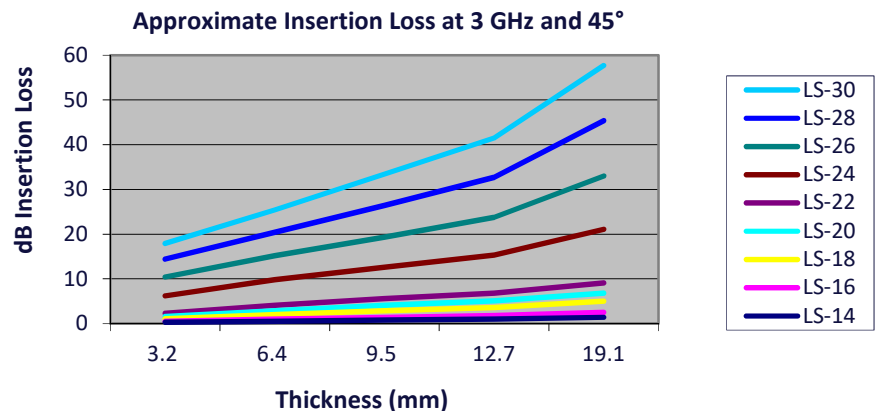
Lossy, Flexible, Foam Microwave Absorber

AVAILABILITY

- Standard sheets are 610mm x 610mm (24"x24").
- Standard thicknesses are 3.2 mm (1/8"), 6.4 mm (1/4"), 9.5 mm (3/8"), 12.7 mm (1/2"), 19.1 mm (3/4").
- All Eccosorb LS types can be delivered in special sizes or customer specified configurations upon request. This includes die-cut and kiss cut parts to reduce installation labor by allowing quick assembly.
- Usually Eccosorb LS is supplied with a pressure sensitive adhesive.
- Upon special request, Eccosorb LS can be supplied with an anti-dust coating to prevent carbon fallout.
- It can also be supplied, upon request, with a coating to prevent moisture uptake in high humidity to moderately wet environments.

INSTRUCTIONS FOR USE

- For optimal performance, Eccosorb LS should be bonded to a metallic surface.
- To obtain a strong bond, the surface should be thoroughly cleaned with a degreasing solvent.
- It can be securely bonded to itself or to other materials such as metal, wood and common plastic composites. Our specific Eccostock® foam adhesive is recommended or the self-adhesive version can be used.
- The material can be easily cut with a sharp knife, scissors or die.



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RFP-DS-LS 070116

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Broadband, Convoluted, Open-Cell, Foam Absorber



BROADBAND CONVOLUTED OPEN-CELL FOAM ABSORBER

Eccosorb OCF is a series of premium-grade tapered broadband absorbers. It has a convoluted shape similar to the Eccosorb CV material, but is made from a much more open-cell foam material. This open structure allows the piece to be used at high humidity although long term exposure to water and UV should be avoided. For indoor higher power requirements, cooling air can be circulated through the foam structure, either by natural convection or by fan, to keep the temperature of the piece down. Because of the rounded convolutions and lack of sharp corners and tips, Eccosorb OCF is the preferred absorber for mm wave frequencies and for grazing incidence angles out to 60° off-normal.

FEATURES AND BENEFITS

- Open-cell
- Broadband absorption due to high thickness
- High reflectivity due to geometric structure

MARKETS

- Commercial Telecom
- Test and Measurement

SPECIFICATIONS

TYPICAL PROPERTIES	ECCOSORB OCF
Frequency Range	>1.5 GHz
Max. Service Temperature °C (°F)	90 (194)
Power handling with unimpeded airflow	8 kW/m ²

Data for design engineer guidance only. Observed performance varies in application. Engineers are reminded to test the material in application.

APPLICATIONS

- Absorbing collars (shrouds) around the edges of high performance antennas
- MM-wave applications
- Small test boxes

AVAILABILITY

- Eccosorb OCF is available in standard piece sizes of 61 cm x 61 cm.
- Two grades are available, Eccosorb OCF-3 and OCF-4, with resp. heights of 7.5 cm and 10 cm an.. The thickness (height) determines primarily the low frequency end of performance, all grades have similar performance at millimeter wave frequencies.
- Eccosorb OCF is supplied with the front surface painted white.
- If the primary application is for millimeter wave frequencies, it is recommended to ask for absorber to be supplied without paint, as it can have a negative effect on the reflectivity performance.

LOW FREQUENCY LIMIT (IN GHz) OF INDICATED REFLECTIVITY				
GRADE	-20 dB	-30 dB	-40 dB	-50 dB
OCF-3	3	6	9	25
OCF-4	2.5	5	8	25

The table gives the specified reflectivity values, showing the frequency at which a particular reflectivity can be expected for each grade. Just as with Eccosorb CV, a reflectivity of -40 dB can be expected at 94 GHz. There is little degradation of the reflectivity for incidence angles as wide as 60° off-normal incidence.

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Broadband, Convoluted, Open-Cell, Foam Absorber

INSTRUCTIONS FOR USE

- Eccosorb OCF can be bonded to structures using a contact adhesive such as the Eccostock® foam adhesive. In this case, several coatings of the adhesive should be applied to the back surface of the absorber and allowed to dry, to create a solid back surface.
- It is preferred to use mechanical means to supplement the adhesive, impaling the piece on plastic pins or hooks which is particularly effective.
- The curved absorber tips should be pointed in the direction of the transmitting signal.

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RFP-DS-OCF 113015

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