

# ECCOSORB® VHP-NRL

## VERY HIGH PERFORMANCE BROADBAND PYRAMIDAL ABSORBER

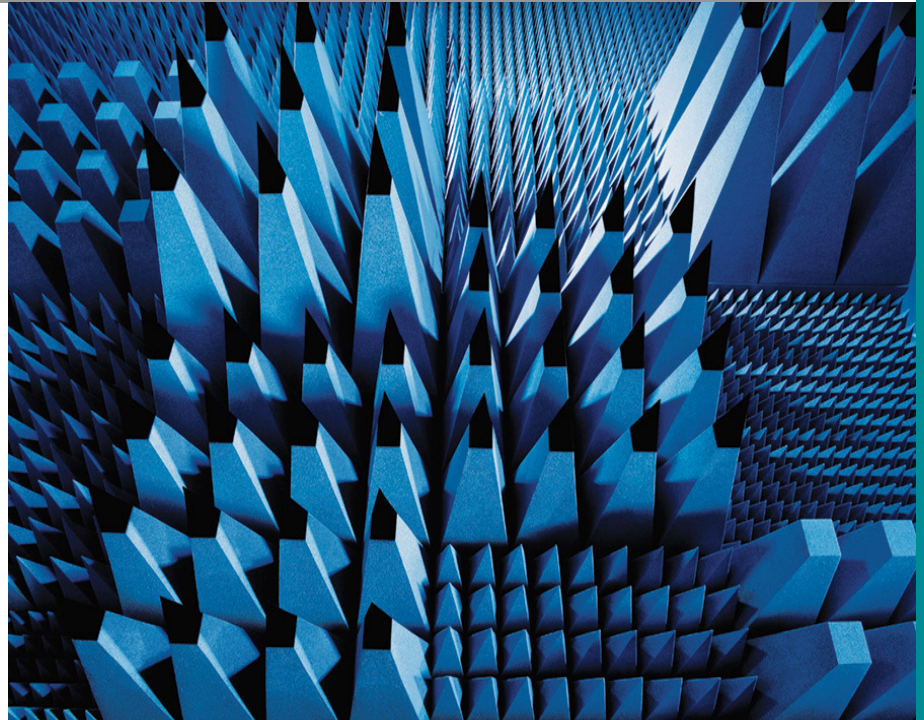
### Description

ECCOSORB VHP is a solid, pyramidal shaped, carbonloaded, urethane foam absorber.

The main application for this material is in the construction of anechoic chambers or for covering test equipment, pedestals, etc. within anechoic chambers.

It provides the highest broadband performance at both normal incidence and at wide incidence angles of all known absorbers.

The NRL-suffix refers to its compliance with the fire retardancy requirements of the U.S. Naval Research Laboratory (NRL) test 8093.



### Application

ECCOSORB VHP is the preferred solution for Antenna, RCS and EW anechoic chambers because of excellent performance at microwave frequencies.

While primarily designed for low scatter, i.e. angle of incidence equals angle of reflection, it offers favourable backscatter properties at off-normal incidence as well. It is thus well suited for use in all regions of anechoic chambers. It is available in a variety of thicknesses, giving the chamber designer the opportunity to choose grades appropriate for specific frequencies and incidence angles.

### Physical properties

|                         | ECCOSORB VHP   |
|-------------------------|--|
| Standard color          | Blue   |
| Base size (cm)          | 61 x 61  |
| Max service temperature | 90°C   |
| Power handling          | 1,5 kW / m <sup>2</sup>                                    |
| Fire retardancy         | NRL8093 Tests 1, 2 and 3<br>DIN 4102 Class B2, ISO 11925-2 |

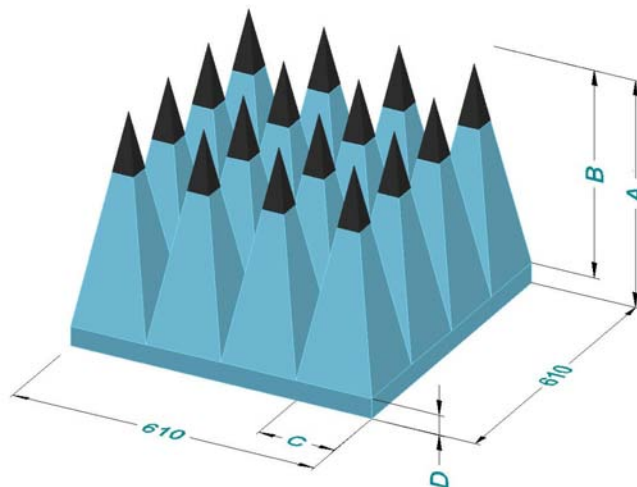
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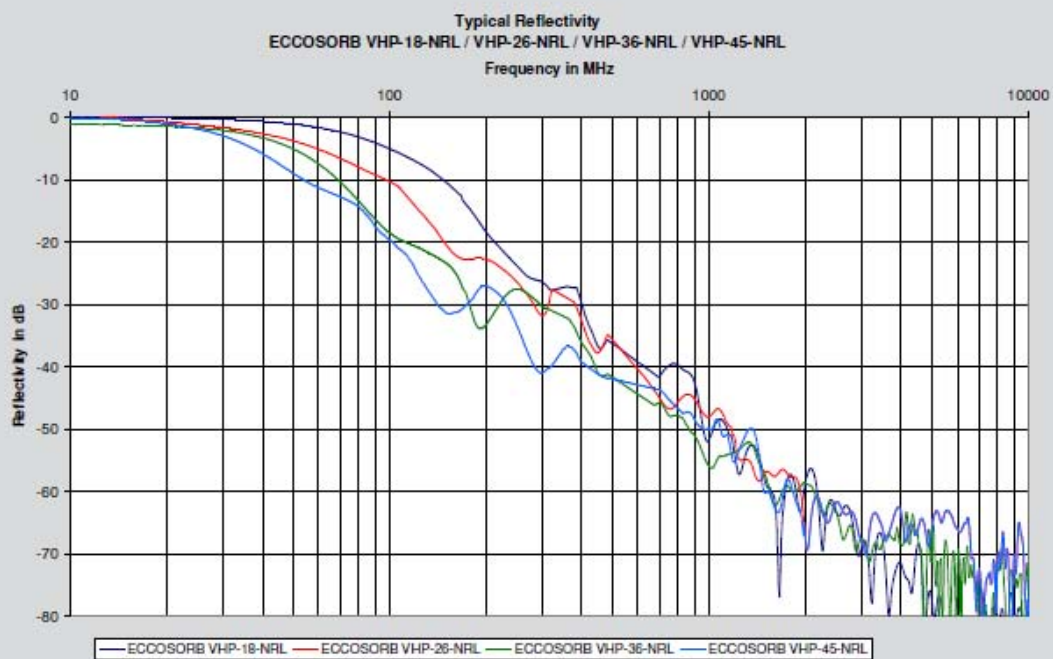
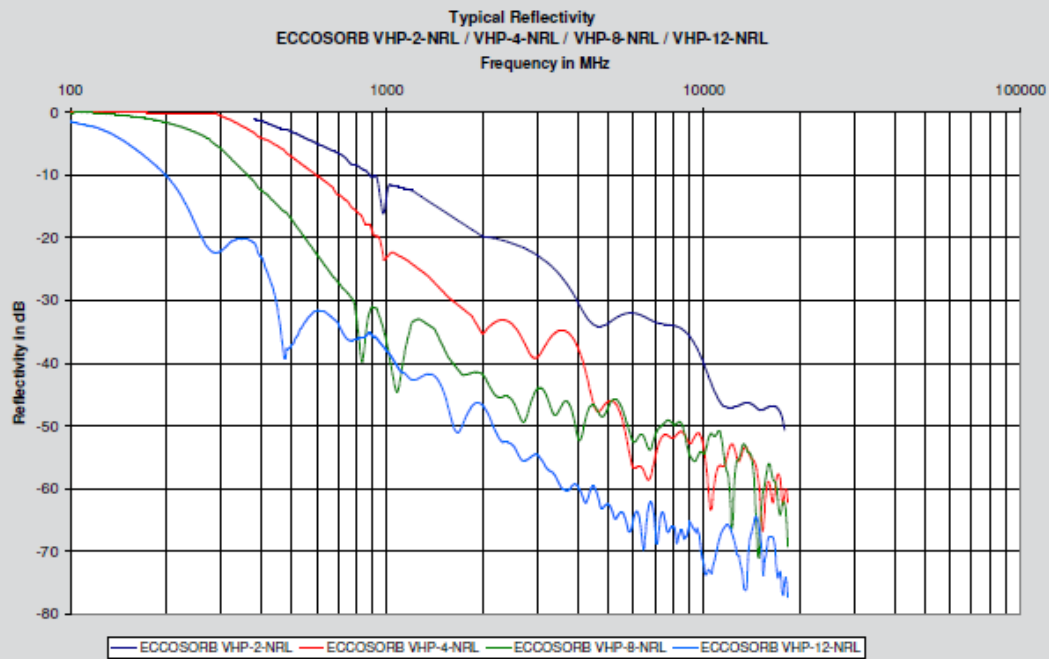
### Nominal dimensions and weights of ECCOSORB VHP



|                 | Total height A (cm) | Pyramid height B (cm) | Pyramid width C (cm) | Base height D (cm) | Number of pyramids per piece | Nominal weight (kg) |
|-----------------|---------------------|-----------------------|----------------------|--------------------|------------------------------|---------------------|
| ECCOSORB VHP-2  | 5.6                 | 4.0                   | 1.9                  | 4.6                | 1024                         | 1.2                 |
| ECCOSORB VHP-4  | 10.2                | 7.7                   | 3.8                  | 2.5                | 256                          | 1.3                 |
| ECCOSORB VHP-8  | 20.3                | 17.8                  | 6.8                  | 2.5                | 81                           | 1.6                 |
| ECCOSORB VHP-12 | 30.5                | 27.8                  | 10.2                 | 2.7                | 36                           | 2.2                 |
| ECCOSORB VHP-18 | 45.7                | 41.7                  | 15.3                 | 4.0                | 16                           | 2.9                 |
| ECCOSORB VHP-26 | 66.1                | 55.9                  | 20.3                 | 10.2               | 9                            | 5.4                 |
| ECCOSORB VHP-36 | 91.4                | 76.4                  | 30.5                 | 15.0               | 4                            | 6.3                 |
| ECCOSORB VHP-45 | 114.0               | 93.7                  | 30.5                 | 20.3               | 4                            | 9.0                 |

### Electromagnetic properties

|                 | 120 MHz | 200 MHz | 300 MHz | 500 MHz | 1 GHz | 3 GHz | 5 GHz | 10 GHz | 15 GHz | 24 GHz |
|-----------------|---------|---------|---------|---------|-------|-------|-------|--------|--------|--------|
| ECCOSORB VHP-2  |         |         |         |         |       |       | -30   | -40    | -45    | -50    |
| ECCOSORB VHP-4  |         |         |         |         |       | -30   | -40   | -45    | -50    | -50    |
| ECCOSORB VHP-8  |         |         |         |         | -30   | -40   | -50   | -50    | -50    | -50    |
| ECCOSORB VHP-12 |         |         |         | -25     | -35   | -40   | -50   | -50    | -50    | -50    |
| ECCOSORB VHP-18 |         |         |         | -30     | -40   | -45   | -50   | -50    | -50    | -50    |
| ECCOSORB VHP-26 |         |         | -25     | -35     | -40   | -50   | -50   | -50    | -50    | -50    |
| ECCOSORB VHP-36 |         | -20     | -30     | -35     | -45   | -50   | -50   | -50    | -50    | -50    |
| ECCOSORB VHP-45 | -20     | -25     | -35     | -40     | -45   | -50   | -50   | -50    | -50    | -50    |



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### ■ Availability

ECCOSORB VHP is available in pieces with base dimensions of 61 x 61 cm. There are eight standard grades, ranging from ECCOSORB VHP-2 with a height of 5.6 cm to ECCOSORB VHP-45 with a height of 114 cm.

The number of individual pyramids on a piece increases with decreasing piece height, keeping the aspect of the individual pyramids fairly constant independent of grade.

The reflectivity versus frequency is dependent upon the height of the particular grade, with larger pieces giving better absorption performance at lower frequencies.

In addition to the standard grades, for sizeable orders, special sizes may be available to attain specific reflectivity performance at certain frequencies.

This includes sizes larger than ECCOSORB VHP-45. For specific application, i.e. EMC, applications with weight restrictions or with high-power demands, we recommend hollow type absorbers.

ECCOSORB VHP is also available on special order as corner- and edgeblocks. These are made by cutting pieces at 45 degree angles and adhering two or three pieces together to be used at the intersections of walls and ceiling. A floor version, ECCOSORB VHP-FL, is also available (see technical bulletin EB-105 for details).

ECCOSORB VHP is a black material. The pyramidal surfaces are painted with a fire retardant light blue paint. On special order, other colours, such as white, can be made available or the pieces can be left unpainted.

Leaving the absorbers unpainted is especially important for millimetre wave applications. At 94 GHz, for example, painting the absorbers deteriorates the performance about 5 dB.

Therefore the standard ECCOSORB VHP-2 is delivered unpainted for millimetre wave applications.

### ■ Instructions for use

ECCOSORB VHP is typically bonded to metallic surfaces using either E&C ADHESIVE 13111, velcro fasteners or Z-bar mounting if the pieces are going to be changed. Velcro fasteners should only be used on grades up to ECCOSORB VHP-18.

**Safety Considerations:** It is recommended to consult the E&C ANECHOIC CHAMBERS product literature, including material safety data sheets, prior to use E&C ANECHOIC CHAMBERS products. These may be obtained from your local sales office.

**WARRANTY:** Values shown are based on testing of laboratory test specimens and represent data that falls within the normal range of properties of the material. These values are not intended for use in establishing maximum, minimum or ranges of values for specification purposes. Any determination of the suitability of the material or any use contemplated by the user and the manner of such use is the sole responsibility of the user who must assure that the material as subsequently processed meets the needs of this particular product or use.

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