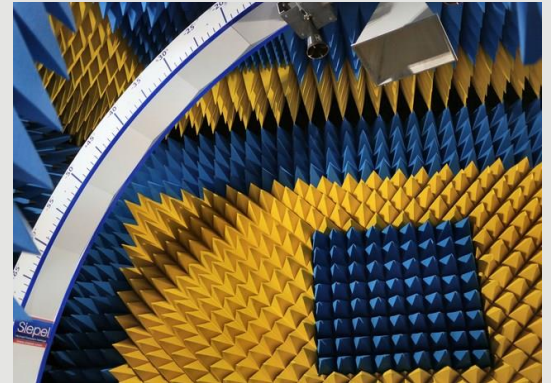


MICROWAVE PYRAMIDAL ABSORBER APM



APM is a range of high performance broadband electromagnetic absorbers. Each absorber consists of a single block of high tech polyurethane foam, pyramidal-shaped and impregnated with a sophisticated carbon-based aqueous solution. APM absorbers are suitable for broadband applications, and are used to line semi-anechoic and fully anechoic chambers for antenna measurements, Radar Cross Section, compact ranges, telecom, EMC, and military applications.

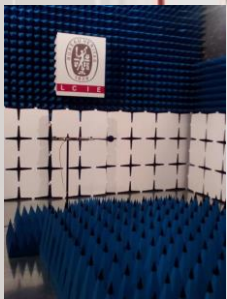


GUARANTEED PERFORMANCES

These reflectivity performances are exceptional; the **values are guaranteed for 20 years**. These values are the fruit of extensive experience in electromagnetic absorber manufacturing. The reflectivity performances of our absorbers are factory checked, using cutting edge broadband equipment (14 m long coaxial line 1.83 x 1.83 m section, optimised design fully anechoic chamber, Vector Network Analyzers). In addition, we offer to take care of the reflectivity measurements in our factory with SIEPEL engineers, for the customer.

GUARANTEED REFLECTIVITY PERFORMANCES (dB) OF APM ABSORBERS (normal incidence)

| TYPE | Total overall height | | 80 MHz | 200 MHz | 300 MHz | 500 MHz | 1 GHz | 2 GHz | 4 GHz | 8 GHz | 12 GHz | 18 GHz | 40 GHz |
|---------|----------------------|------|--------|---------|---------|---------|-------|-------|-------|-------|--------|--------|--------|
| | mm | in | | | | | | | | | | | |
| APM 3 | 28 | 1.1 | | | | | | | -17 | -17 | -23 | -23 | -30 |
| APM 5 | 55 | 2.2 | | | | | | -20 | -21 | -25 | -31 | -35 | -38 |
| APM 9 | 89 | 3.5 | | | | | -16 | -20 | -29 | -35 | -40 | -43 | -40 |
| APM 12 | 115 | 4.5 | | | | | -19 | -20 | -33 | -40 | -45 | -50 | -40 |
| APM 20 | 210 | 8.3 | | | | -13 | -25 | -36 | -45 | -46 | -52 | -51 | -44 |
| APM 30 | 305 | 12 | | | | -25 | -36 | -40 | -48 | -52 | -52 | -51 | -45 |
| APM 45 | 455 | 18 | | | | -27 | -40 | -42 | -50 | -52 | -52 | -51 | -45 |
| APM 55 | 550 | 21.6 | | | -26 | -36 | -44 | -44 | -50 | -52 | -52 | -51 | -45 |
| APM 66 | 660 | 26 | -6 | -21 | -26 | -37 | -45 | -46 | -52 | -52 | -52 | -51 | -45 |
| APM 85 | 850 | 33.5 | -10 | -25 | -28 | -42 | -49 | -50 | -52 | -52 | -52 | -51 | -45 |
| APM 100 | 1000 | 39.4 | -11 | -26 | -36 | -45 | -50 | -52 | -52 | -52 | -52 | -51 | -45 |
| APM 115 | 1150 | 43.7 | -16 | -26 | -36 | -45 | -50 | -52 | -52 | -52 | -52 | -51 | -45 |



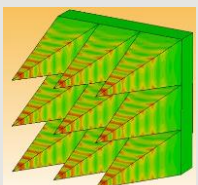
The percentage of open cells within the foam absorber material is of utmost importance. APM pyramidal absorbers are made from high tech polyurethane foam, with 90% open cells. This configuration allows a far better impregnation of the carbon solution, and therefore an incomparable distribution of the carbon load through the absorber. The carbon is fixed through the use of a polymerised acrylic binder. All these features lead to unique homogeneity and accurate control of electromagnetic parameters (complex permittivity ϵ^*).

INSTALLATION / DISMANTLING

APM pyramidal absorbers can be easily installed in shielded rooms or on any clean and flat surface using NEOPRENE contact glue, to be applied on both sides to be glued.

NUMERICAL SIMULATION

SIEPEL R & D engineers work with state-of-the-art electromagnetic numerical simulation software, in order to continuously optimize both the shape and impregnation agents of the absorbers, over broad frequency ranges.





MICROWAVE PYRAMIDAL ABSORBER APM



UNIQUE PLASTIC PAINT

SIEPEL **plastic paint coating** was developed to optimise carbon binding (no finger marks, and no pollution or carbon dust, enabling work in class clean room conditions), improve aesthetics (brightness) and is excellent ageing.

This coating is proposed in whatever colour you want: contact us to customize your chamber with your company's name or logo

COMPLIANCE TO STANDARDS & DIRECTIVES

APM pyramidal absorbers are tested in SIEPEL's internal fire test lab as well as in independent test laboratories. APM absorbers are **compliant with the following tests and standards:**

- ISO 11925-2 Euroclass E
- NRL 8093 – tests 1, 2 & 3
- DIN 4102 – B2
- UL 94 HBF upon request

Our raw materials are **compliant to RoHS / REACH** and free of substances in the current list of Substances of Very High Concern (SVHC) published by the European Chemicals Agency (ECHA).

Both aqueous and plastic paint coating were developed to comply with ISO class 4 clean room conditions according to ISO 14644-1 : 2015.

EXTREME SOFTNESS – SHAPE MEMORY

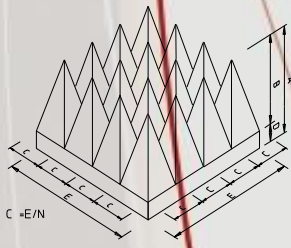
APM pyramidal absorbers have an excellent shape memory. The high quality materials used, in combination with the various paints we propose, provide the unique advantage of extreme softness, which is therefore not easily breakable (no carbon dust) and highly suitable for heavy duty chambers.



RF POWER HANDLING

APM pyramidal absorbers are designed to handle a power density up-to **2 000W/m²** max CW. For high power applications, SIEPEL have developed a special product range called AHP, with an open honeycomb structure for better heat dissipation (see data sheet: AHP High Power Pyramidal Absorber).

DIMENSIONS



| Type | A overall height | | B Pyramid height | | D Base height | | E ± T Base length | | | N Pyramids per absorber | Weight | | Tips* |
|---------|---------------------|------|---------------------|------|------------------|-----|----------------------|----|----|----------------------------------|--------|-------|---------|
| | mm | in | mm | in | mm | in | mm | mm | in | | kg | Lb | |
| APM 3 | 28 | 1.1 | 18 | 0.7 | 10 | 0.4 | 610 | ±3 | 24 | 33x33 | 0.3 | 0,66 | Painted |
| APM 5 | 55 | 2.2 | 37 | 1.5 | 18 | 0.7 | 610 | ±3 | 24 | 33x33 | 0.6 | 1,32 | Painted |
| APM 9 | 89 | 3.5 | 76 | 3 | 13 | 0.5 | 610 | ±3 | 24 | 16x16 | 0.8 | 1,76 | Painted |
| APM 12 | 115 | 4.5 | 90 | 3.5 | 25 | 1 | 610 | ±3 | 24 | 16x16 | 1.2 | 2,65 | Painted |
| APM 20 | 210 | 8.3 | 147 | 5.8 | 63 | 2.5 | 610 | ±3 | 24 | 9x9 | 2.0 | 4,41 | Painted |
| APM 30 | 305 | 12 | 245 | 9.6 | 60 | 2.4 | 610 | ±3 | 24 | 6x6 | 2.6 | 5,73 | Painted |
| APM 45 | 455 | 18 | 380 | 15 | 75 | 3 | 610 | ±3 | 24 | 4x4 | 3.6 | 7,94 | Painted |
| APM 55 | 550 | 21.6 | 475 | 18.6 | 75 | 3 | 610 | ±3 | 24 | 4x4 | 4.1 | 9,04 | Black |
| APM 66 | 660 | 26 | 560 | 22 | 100 | 4 | 610 | ±3 | 24 | 3x3 | 5.1 | 11,24 | Black |
| APM 85 | 850 | 33.5 | 750 | 29.5 | 100 | 4 | 305 | ±2 | 12 | 1 | 1.6 | 3,53 | Black |
| APM 100 | 1000 | 39.4 | 900 | 35.4 | 100 | 4 | 305 | ±2 | 12 | 1 | 1.8 | 3,97 | Black |
| APM 115 | 1150 | 43.3 | 1050 | 39.3 | 100 | 4 | 305 | ±2 | 12 | 1 | 2.1 | 4,63 | Black |

*for plastic paint only

INTEGRATED MANUFACTURING

These electromagnetic absorbers are designed and manufactured in our premises (France): **no subcontracting**.

In our laboratory, absorbers are tested by our skilled staff on reflectivity performances, fire resistance (also performed by external laboratories).

Absorbers are submitted to quality controls as per the procedures in force within the company.

A permanent stock of finished / semi-finished products available on the shelf enables **high reactivity and fast delivery**.

These data are the result of tests performed in our laboratory. The use of the material and the performance specifications are the entire responsibility of the users who should ensure that the material is suitable for their purposes

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