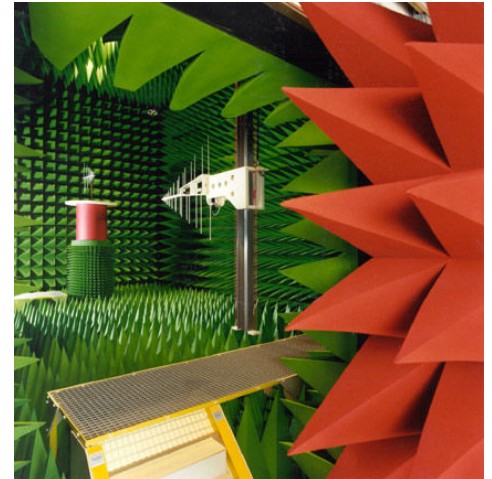


BROADBAND PYRAMIDAL ABSORBER HYFRAL APM

HYFRAL 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. HYFRAL APM 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 HYFRAL 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							-12	-13	-13	-17	-22
APM 5	55	2.2						-20	-21	-25	-31	-35	-38
APM 9	89	3.5					-15	-21	-33	-40	-43	-45	-45
APM 12	115	4.5					-18	-29	-35	-42	-50	-50	-50
APM 20	210	8.3				-15	-26	-36	-45	-50	-52	-52	-50
APM 30	305	12				-24	-36	-40	-48	-52	-52	-52	-50
APM 45	455	18				-25	-41	-42	-50	-52	-52	-52	-50
APM 55	550	21.6			-26	-34	-44	-46	-50	-52	-52	-52	-50
APM 66	660	26	-6	-21	-27	-38	-45	-47	-52	-52	-52	-52	-50
APM 85	850	33.5	-10	-24	-28	-42	-49	-52	-52	-52	-52	-52	-50
APM 100	1000	39.4	-13	-26	-33	-43	-52	-52	-52	-52	-52	-52	-50
APM 110	1110	43.7	-15	-28	-38	-43	-52	-52	-52	-52	-52	-52	-50
APM 120	1200	47.2	-19	-28	-38	-43	-52	-52	-52	-52	-52	-52	-50

“OPEN-CELL” STRUCTURE

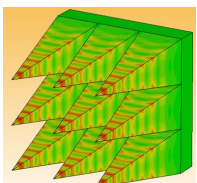
The percentage of open cells within the foam absorber material is of utmost importance. HYFRAL APM pyramidal absorbers are made from high tech polyurethane foam, with 90% open cells. This configuration allows a far better impregnation of the carbon solution, and therefore an incomparable distribution 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

HYFRAL APM pyramidal absorbers can be easily installed in shielded rooms or on any clean and flat surface using “HYFRAL 135” type 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.



BROADBAND PYRAMIDAL ABSORBER HYFRAL APM

www.siepel.com www.hyfral.com

UNIQUE PLASTIC PAINT

SIEPEL is the **only manufacturer in the world** to offer **plastic paint coating** for pyramidal absorbers. This special painting treatment was developed to optimise carbon binding (no finger marks, and no pollution or carbon dust, enabling work in 100,000 class clean room conditions) and excellent ageing.

This plastic paint comes in a range of colours: please contact us to print your company's name or logo on your chamber!

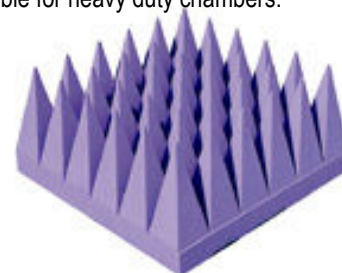
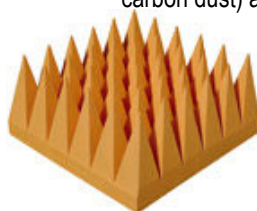
FIRE RETARDANT PROPERTIES

HYFRAL APM pyramidal absorbers are tested in SIEPEL's internal fire test lab as well as in independent test laboratories. HYFRAL 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
- NF P 92 501 M1 upon request

EXTREME SOFTNESS – SHAPE MEMORY

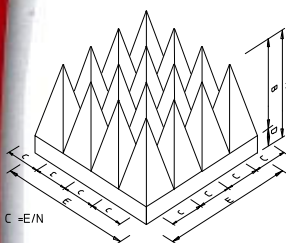
HYFRAL APM pyramidal absorbers have an excellent shape memory. The high quality materials used, in combination with the various paints we propose, provide the unique advantage of extreme softness, which is therefore not easily breakable (no carbon dust) and highly suitable for heavy duty chambers.



RF POWER HANDLING

HYFRAL APM pyramidal absorbers are designed to handle a power density up to **2 KW/m²**. For high power applications, SIEPEL has developed a special product range called HYFRAL 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 kg	Tips
	mm	in	mm	in	mm	in	mm	mm	in			
APM 3	28	1.1	18	0.7	10	0.4	610	±3	24	33x33	0.3	Painted
APM 5	55	2.2	37	1.5	18	0.7	610	±3	24	33x33	0.6	Painted
APM 9	89	3.5	76	3	13	0.5	610	±3	24	16x16	0.8	Painted
APM 12	115	4.5	90	3.5	25	1	610	±3	24	16x16	1.2	Painted
APM 20	210	8.3	147	5.8	63	2.5	610	±3	24	9x9	2.0	Painted
APM 30	305	12	245	9.6	60	2.4	610	±3	24	6x6	2.6	Painted
APM 45	455	18	380	15	75	3	610	±3	24	4x4	3.6	Painted
APM 55	550	21.6	475	18.6	75	3	610	±3	24	4x4	4.1	Black
APM 66	660	26	560	22	100	4	610	±3	24	3x3	5.1	Black
APM 85	850	33.5	750	29.5	100	4	305	±2	12	1	1.6	Black
APM 100	1000	39.4	900	35.4	100	4	305	±2	12	1	1.8	Black
APM 110	1110	43.3	1000	39.3	100	4	305	±2	12	1	2.1	Black
APM 120	1200	47.2	1100	43.3	100	4	407	±2	16	1	3.8	Black



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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