EMCPIONEER®

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EMC SOLUTION

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CHANGZHOU PIONEER ELECTRONIC CO.,LTD.

RF ABSORBER

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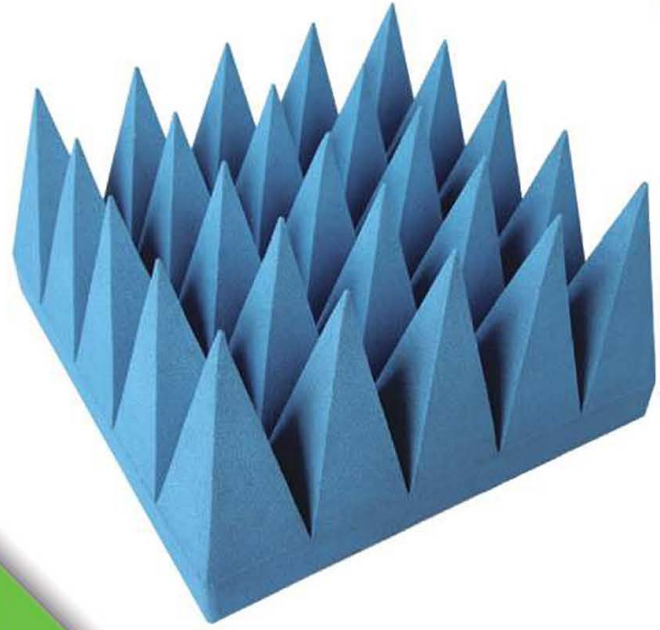


CREDITABLE

PROFESSIONAL

EFFICIENT

Absorber Introduction

Welcome to our absorbers catalog. This catalog is designed to help you know our full product range and help you select the appropriate RF shielding materials for your testing needs. With more than 15 years of experience in the EMC industry, Changzhou Pioneer Electronic Co., Ltd. has become one of the top absorber manufacturing experts in the world.

Our RF absorbers meet the latest certification standards and have been independently tested by an approved 3rd party organisation. They can be customized in different shapes and colors and size to fit any anechoic chamber or shielded room.

We provide a variety of absorbers, including pyramid absorbers, truncated absorbers, hybrid absorbers, polystyrene absorbers, etc. Can also be painted for indoor and outdoor use.

EMCPIONEER also offers a global service and support network, so we can work with you wherever you are. If you would like to learn about our absorbers, please visit **www.emc-emi.com** or email us by **sales@emc-emi.com**. We are always here to help you.

Credit establishs basis, Profession creates brand, Efficiency wins market!

Below we will introduce the application of absorbing materials and how to choose suitable absorbing materials for your anechoic chamber. Help you avoid some mistakes when choosing absorbing materials.

Application of absorbing materials.

The anechoic chamber is lined with absorbing material, which can absorb electromagnetic waves and reduce or eliminate the reflection and scattering of radio waves.

The performance of the anechoic chamber is closely related to the absorbing performance, frequency band characteristics, shape, thickness and type of the absorbing material. The more electromagnetic waves absorbed by absorber, the smaller the reflection, so that the surrounding environment is getting closer to free space, and the performance of the anechoic chamber is better.

How to choose suitable RF absorber.

(1) Absorbing materials include polyurethane foam, polystyrene, rubber and other materials. Select the size, shape and material of the RF absorber according to the size and application of the anechoic chamber. It is also necessary to consider the absorbing performance, price and weight of the RF absorber.

(2) Test performance. For the selected absorbing material, its absorbing performance and frequency band should be measured before installation. If it is not possible to measure all of them, sampling inspection is also required to select materials with good performance.

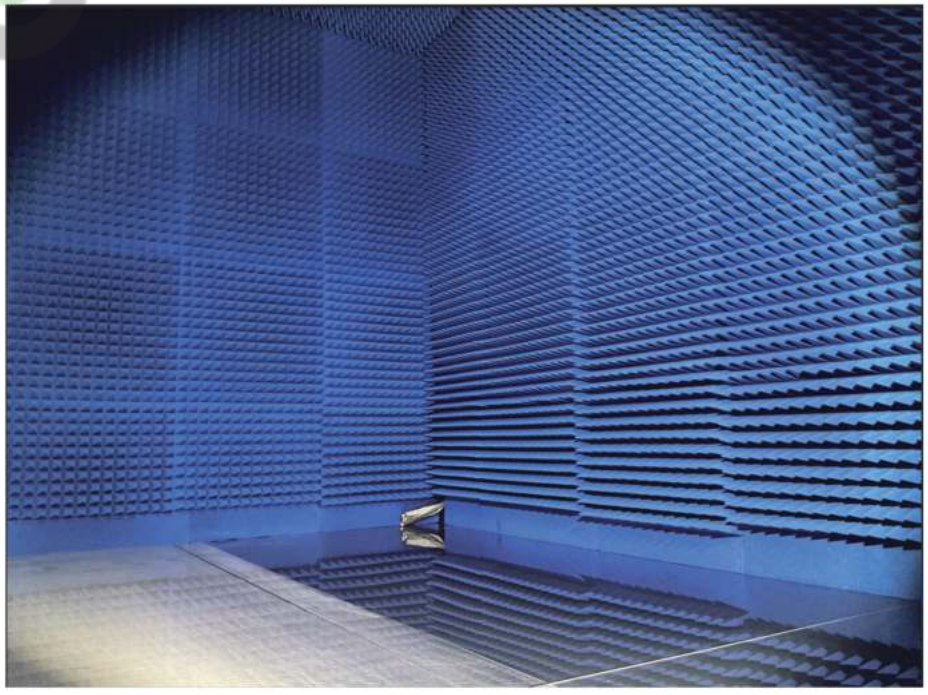
(3) Different types of RF absorbing materials should be used for different parts of the anechoic chamber. For example, corners, door handles, turntables, etc. should use special-shaped absorbing materials.

(4) There should be as few or no gaps as possible between the absorbing materials, and the gaps that are difficult to eliminate should be filled with soft absorbing materials to ensure the good performance of the anechoic chamber.

4. Our commonly available absorber sizes.

The typical base size of most absorber is 500*500mm, 600*600mm.

The height of the absorbing material is: 30mm, 70mm, 300mm, 500mm, 600mm...



Polystyrene Absorber for Microwave Chamber

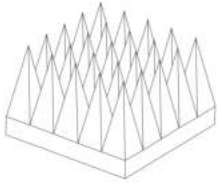
PE-PSPY Series

- Model: PE-PSPY series for microwave chamber
- Basic composition: Polystyrene foam
- Operation temperature: -50°C ~+70°C
- Retardancy: NRL 8093 I, II, III
- Power handing: 1000w/sqm
- Environment: indoor use
- Made by mould, more precise size

Application

It is used in microwave anechoic chamber, OTA measurement anechoic chamber, antenna chamber, and ground's VSWR in EMC chamber.

Specification (mm)



Model Name	Size	Number of Pyramidal
PE-PSPY-300	600*600	6*6
PE-PSPY-500	600*600	4*4
PE-PSPY-700	600*600	3*3
PE-PSPY-1000	300*300	1*1
PE-PSPY-1200	400*400	1*1
PE-PSPY-1600	400*400	1*1

Frequency reflectivity

Model Name	Vertical incident maximum reflectivity Rw (-dB) at specific frequency (GHz)						
	0.5	1	3	6	8	18	40
PE-PSPY-300	20	30	45	45	45	45	45
PE-PSPY-500	30	35	45	55	50	50	50
PE-PSPY-700	35	40	50	55	50	50	50
PE-PSPY-1000	40	45	55	55	55	55	55
PE-PSPY-1200	40	45	55	55	55	55	55
PE-PSPY-1600	45	50	55	55	55	55	55

Polystyrene Absorber for EMC Chamber

PE-PSHY Series

- Model: PF-PSHY working with ferrite tile
- Basic composition: polystyrene foam
- Operation temperature: -50°C ~+70°C
- Retardancy: NRL 8093 I, II, III
- Power handing: 1000w/sqm
- RoHS compliance

Feature

- Environment: Indoor use
- More longer service life
- Light weight and easy installation
- Closecell structure,more stable performance and more clean environment and resistant to himidity.

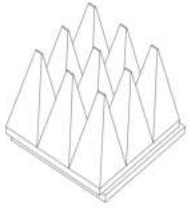
Application

Polystyrene absorbing materials are manufactured in different sizes through molding process.

It is lightweight, Fire retardant and easy to install with simple screws. And more environmentally friendly.

Widely used in EMC chamber.

Specification (mm)



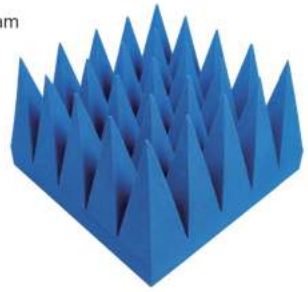
Model Name	Size	Weight (Kg/m²)	Number of Pyramidal
PE-PSHY-300	600*600	2	6*6
PE-PSHY-500	600*600	3	4*4
PE-PSHY-700	600*600	5	3*3
PE-PSHY-900	600*600	2.2	1*1
PE-PSHY-1300	600*600	3.5	1*1

Frequency reflectivity

Model Name	Vertical incident maximum reflectivity Rw (-dB) at specific frequency (GHz)						
	0.03	0.08	0.5	1	10	18	40
PE-PSHY-300	14	21	15	15	20	30	40
PE-PSHY-500	15	22	17	17	22	30	45
PE-PSHY-700	17	25	20	20	25	35	45
PE-PSHY-900	18	22	19	18	20	25	25
PE-PSHY-1300	22	25	20	25	25	25	30

Pyramidal Foam Microwave Absorber

PE-PY Series



- Compostion: carbon and retardant chemicals loaded polyurethane foam
- Operation temperature: -50°C ~ + 80°C or -85°F ~ 176°F
- Color: Light blue or according to customers' demand
- RoHS: 2011/65/EU
- Amending Directive (EU) 2015/863 Annex II
- Reach: EC 1907/2006

Feature

The traditional material for anechoic chambers, outstanding absorbing over a wide frequency range, flexible.

Maximum power handling in watt/square meters, 1KW/M², can reach 1.5KW/M² in a short time.

Retardancy: 1)NRL report 8093 I, II, and III

2)GB 8624-2012 B2 (can customized B1)

3)DIN 4102-1 B2

4)ISO 11925-2 E

5)UL94 HBF

Applications

PE-PY type provides premium performance over a very broad frequency range, hence it is the most widely used in all kinds of anechoic chamber. Low height of PE-PY type may be used for antenna, radar and test facilities to reduce the surface current and unwanted reflection, indoor use.

Installations

Generally neoprene contact adhesive is recommended for installation.

Firstly, draw grids according to the base size of applied absorbers.

Then adhesive is brushed on the substrate and wait till it dry to tack-free.

Then apply the adhesive to the back of absorber and wait for a short while.

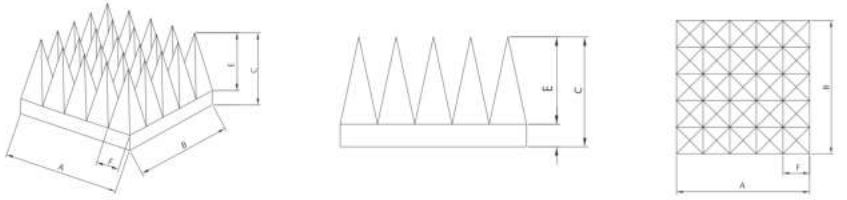
Finally press absorber onto the substrate.

Pyramidal Foam Microwave Absorber

Frequency reflectivity

Model Name	Vertical incident maximum reflectivity Rw (-dB) at specific frequency (GHz)									
	40	15	10	5	3	1.5	0.5	0.3	0.2	0.1
PE-PY-30	30	28	25	15	15					
PE-PY-50	40	35	30	25	20					
PE-PY-70	45	40	35	30	25					
PE-PY-100	50	45	40	35	30	15				
PE-PY-150	50	50	45	40	35	20				
PE-PY-200	50	50	50	45	38	28	15			
PE-PY-300	60	55	55	45	40	30	20			
PE-PY-400	60	60	55	50	42	32	25	17		
PE-PY-500	60	60	60	50	45	35	28	20	17	
PE-PY-600	60	60	60	52	48	37	30	22	18	
PE-PY-700	60	60	60	55	50	40	30	25	20	12
PE-PY-800	60	60	60	55	52	40	35	30	20	13
PE-PY-1000	60	60	60	60	55	45	37	32	27	15
PE-PY-1200	60	60	60	60	60	48	40	35	30	17

Specification (mm)



Model Name	A	C	E	F	Weight (Kg/m²)	Number of Pyramidal
PE-PY-30	500*500	30	15	14	1.2	36*36
PE-PY-50	500*500	50	30	25	1.8	20*20
PE-PY-70	500*500	70	50	25	2.5	20*20
PE-PY-100	500*500	100	75	38	3.3	14*14
PE-PY-150	500*500	150	120	56	4.8	9*9
PE-PY-200	500*500	200	160	71	6.3	7*7
PE-PY-300	500*500	300	240	100	9	5*5
PE-PY-400	500*500	400	330	125	12	4*4
PE-PY-500	500*500	500	420	167	15	3*3
PE-PY-600	400*400	600	510	200	18	2*2
PE-PY-700	500*250	700	600	250	21	1*2
PE-PY-800	500*250	800	700	250	24	1*2
PE-PY-1000	334*334	1000	850	334	30	1*1

Hybrid Foam Absorber

PE-HY Series

PE-HYT Series

PE-HY/HYT Series

- Basic composition: Carbon and retardant chemicals loaded polyurethane foam
- Retardancy: NRL report 8093 I, II, and III
- Working temperature: -50°C ~ + 80°C or -85°F ~ 176°F
- Color: Light blue or according to customers' demand
- The Hybrid foam absorber is matched with ferrite tile, good performance at 30MHz~40GHz
- PE-HY series shape is pyramidal, PE-HYT series shape is truncated pyramidal

Applications

- Used for 3 meters, 5 meters, 10 meters EMC chamber
- Truncated pyramidal hybrid absorber is got by cutting the pyramidal hybrid absorber by 20% to improve the performance of low frequency.

Specification (mm)

Model Name	Height	Base size	Number of Pyramidal	Reflectivity at Normal Incidence Rw(-dB)							
				0.03	0.1	0.5	1	5	10	15	40
PE-HY-300	300	600*600	5*5	12	14	15	17	20	25	30	40
PE-HY-500	500	600*600	3*3	14	16	20	20	22	25	35	40
PE-HY-1000	1000	334*334	1*1	18	20	25	35	40	40	40	40
PE-HYT-240	240	600*600	5*5	12	14	15	17	20	25	30	40
PE-HYT-400	400	600*600	3*3	14	16	20	20	22	25	35	40
PE-HYT-800	800	334*334	1*1	18	20	25	35	40	40	40	40

High Power Handling Pyramidal Absorber

PE-HP Series

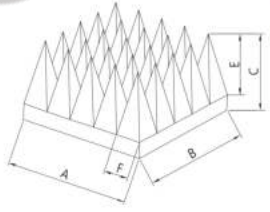
- Name: High power handling Pyramidal absorber
- Standard color: Black
- Working temperature: 150°C
- Power handing: No force air, 10kw/m²
- With forced air cooling, <15 kw/m²
- Environmental protection: RoHS
- Basic composition: Carbon and retardant chemicals loaded honeycomb

Application

PE-HP type is used in area with high power.

For over 5kw/sqm, forced air cooling should be used.

Specification (mm)



Model Name	A	C	E	F	Number of Pyramidal
PE-HP-300	500*500	300	290	100	5*5
PE-HP-500	500*500	500	490	167	3*3
PE-HP-700	500*500	700	690	250	2*2
PE-HP-900	610*610	900	880	152.5	2*2
PE-HP-1000	334*334	1000	980	334	1*1

Frequency reflectivity

Model Name	Vertical incident maximum reflectivity Rw (-dB) at specific frequency (GHz)						
	40	15	10	5	3	1.5	0.5
PE-HP-300	40	40	40	35	32	25	20
PE-HP-500	45	45	45	40	37	32	25
PE-HP-700	45	45	45	42	40	35	28
PE-HP-900	45	45	45	45	43	38	30
PE-HP-1000	45	45	45	45	44	40	32

Millimeter-wave Foam Absorber

PE-PUMM Series

- Name: PE-PUMM, solid foam pyramidal absorber
- Standard color: Black
- Material: polyurethane soft foam, carbon black, fire retardant
- Working temperature : -50°C~+80°C, short time can be 100°C
- Antiflaming: NRL8093(1977)
- Environmental protection: RoHS

Feature

- Tetrahedral pyramid, the shape is neat, beautiful and clean, flexible, good physical properties.
- High-quality polyurethane foam body, the absorbing component is carbon black, no dust, no slag.
- Product surface is generally light blue, customized color is acceptable.
- Meet the US Naval Laboratory Report NRL8093 (1977) three tests:

  1)withstand voltage;

  2)flame ignition and spread is difficult;

  3)smoldering.

Application

Microwave chamber, test chamber, absorbing screen and other millimeter-wave test environment.

Used for automotive millimeter-wave radar testing, 5G testing and other millimeter-wave frequency use.

Frequency reflectivity

Model Name	Size	Number of Pyramidal	Reflectivity at Normal Incidence Rw(-dB)			
			100	75	50	40
PE-PUMM-100	500*500	13*13	45	45	45	45

Truncated Pyramid Absorber

PE-TR Series

- Used for military EMC chamber
- Retardancy NRL report 8093 I, II, and III
- Power capacity: 1KW/ m^2, can up to 1.5KW/ m^2 in short time.
- Working temperature: -50°C ~ + 80°C, can up to 100°C in short time.
- Meet RoHS standard
- Soft, high anti-mechanical extrusion characteristics, can rebound

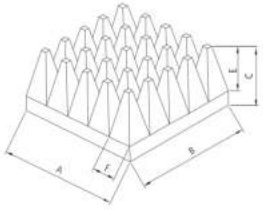
Application

Microwave anechoic chamber, absorbing screen, microwave anechoic box etc.

Materials with different types, heights and structures according to the shape of microwave anechoic chamber, performance request and using parts.

Performance optimization of frequency division as per customers' request.

Specification (mm)



Model Name	A	E	C	F	Weight (Kg/m^2)	Number of Pyramidal
PE-TR-220	500*500	160	220	100	7	5*5
PE-TR-440	500*500	360	440	167	10	3*3
PE-TR-550	500*250	450	550	250	14	1*2

Frequency reflectivity

Model Name	Vertical Incidence Maximum Reflectivity Rw(-dB) under Frequency (GHz)								
	40	15	10	3	1	0.5	0.3	0.2	0.1
PE-TR-220	50	50	50	40	33	20			
PE-TR-440	50	50	50	45	40	30	20	17	
PE-TR-550	50	50	50	50	43	35	30	20	17

Flat Foam Absorber

PE-FL Series

- Model: PE-FL foam flat absorber
- Color: Blue or black
- Material: Polyurethane foam, conductive material
- Working temperature: -50°C~+80°C
- Flame retardancy meets NRL8093(1977), Oxygen index: ⩾28%
- Flexible and can be bended, good physical properties 1-18GHz, the vertical reflectivity ⩽ -10dB

Application

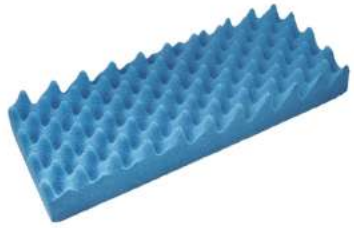
1. It is suitable for both near field and far field.
2. Good properties for reflection attenuation and transmission attenuation.
3. Stick it to the interior of shielding container to solve the problem of cross-talk, to absorb electromagnetic wave reflection, to reduce electromagnetic interference of components.
4. Stick it to the surface of the radiation source components to reduce electromagnetic radiation.
5. Specific usage:
   1) Anechoic testing box or small anechoic chamber.
   2) At the corner of big anechoic chamber.
   3) Shelter from the reflective surface under the test environment.

Specification (mm)

Model Name	Size	Thickness
PE-FL-20	500*500	20
PE-FL-30	500*500	30
PE-FL-50	500*500	50
PE-FL-80	500*500	80
PE-FL-100	500*500	100

Convoluted Microwave Absorber

PE-PUCV Series



- Material: Polyurethane foam
- Standard color: Blue, customized acceptable
- Height:20mm~80mm
- Working temperature: -50°C~80°C
- Power: 1500W/m^2
- RoHS: 2011/65/EU; Amending Directive (EU) 2015/863 Annex II
- Reach: EC 1907/2006

Application

Convoluted Microwave Absorber are mainly used in millimeter wave test chambers, areas where non-specular/ near field scattering is to be minimized, for camouflaging, interference suppression application and low performance anechoic chamber in non-critical areas.

Frequency reflectivity

Model Name	Height	Weight (kg/m^2)	Vertical incident maximum reflectivity Rw (-dB) at specific frequency (GHz)					
			1.5	3	5	10	15	40
PE-PUCV-20	20	1.0		8	10	15	20	25
PE-PUCV-50	50	2.5	8	15	20	25	30	35
PE-PUCV-80	80	3.6	10	18	25	30	40	45