

TOKIN

Radio Wave Absorber

vol.2

Token EMC Engineering Co.,Ltd.

Radio Wave Absorber

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vol.2

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Radio wave absorber for microwave bands

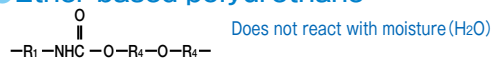
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Feature of soft urethane foam

Radio wave absorber material

Since ether-based soft polyurethane is adopted, no degradation by hydrolysis will occur. Conventional ester-based type is subject to hardening, collapse, or breaking due to hydrolysis within 5 to 10 years.

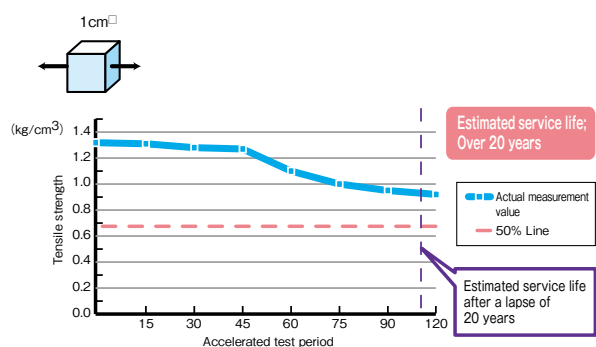
● Ether-based polyurethane



● Ester-based polyurethane



Estimated aging speed and actual measurement

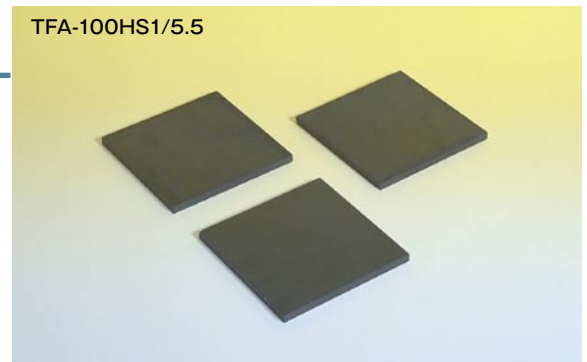


TFA-100HS1/5.5

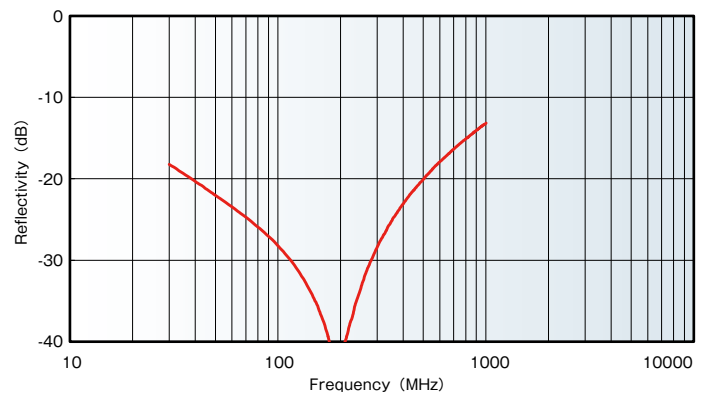
It has the magnetic characteristic that is appropriate for combination type radio wave absorbers, and the broadband electric wave absorption characteristic is achieved by the combination with our radio wave absorber.

Specifications

Type	TFA-100HS1/5.5
Features	Ferrite tile / Broadband
Main uses	EMC / Basic measurement / Each anechoic chamber
Base material	Sintered ferrite body
Basic shape	10cm×10cm Flat board
Operating temperature	-20 ~ +50°C
Frequency range / Absorption performance	50 ~ 500MHz / -20dB
Thickness	0.57cm
Weight	0.3kg



Characteristic example



TUA / TUHA

The TUA Series is a wedge-type absorber with packed structure urethane foam, which is used in combination with TFA. Excels in performance in high frequency bands, which is also the feature of a packed structure. Has a track record in ultra broadband over 30 MHz to millimeter-wave bands. Urethane foam with a base material that has the oldest history as a wave absorber material, which is more sensitively controllable for ferrite tile matching characteristics than other materials. The TUHA Series with a hollow structure, which saves weight and cost, is also available.

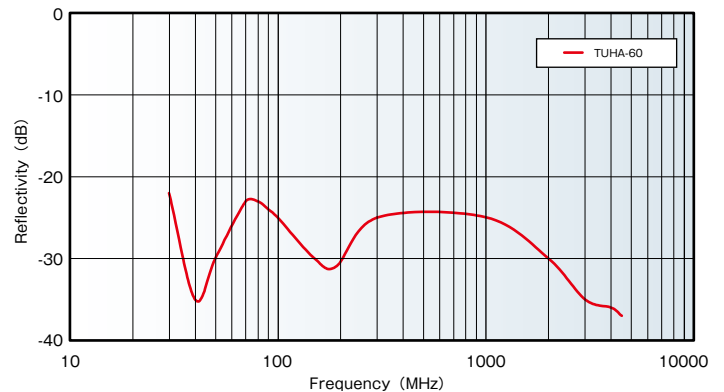


Specifications

Type	TUA / TUHA					
Features	Wedge-type urethane compounds (TUHA hollow wedge structure) Ultra broadband					
Main uses	EMC / Basic measurement / Each anechoic chamber					
Base material	Urethane foam					
Basic shape	60cm ² Wedge-type					
Operating temperature	-20 ~ +50°C (for a ferrite compound)*1					
Tensile strength	1kg/cm ² (Urethane foam)					
Frequency range / Absorption performance*2		TUA-13B	TUA-24	TUA-40	TUHA-40	TUHA-60
	30MHz	-13dB	-15dB	-18dB	-18dB	-20dB
	100MHz	-15dB	-20dB	-23dB	-23dB	-25dB
Height		35cm	60cm	100cm	100cm	150cm
	Weight*3	1.9kg	2.4kg	4.6kg	3.6kg	6.0kg

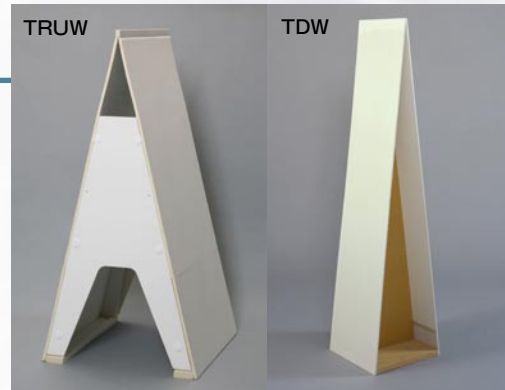
*1 Based on temperature characteristics of ferrite tile.
 *2 Typical characteristics (based on individual specifications).
 *3 Excluding ferrite tile (according to individual specifications).

Characteristic example



TRUW / TDW

A wedge-type absorber of hard urethane foam used for EMC measurement in large anechoic chambers. The lightweight and knockdown system contributes to reducing storage space and transportation costs. The TDW Series uses a rock wool laminated board as a base material, and is proud of the perfect nonflammability. Realizes a bright chamber, since the appearance color makes the keynote white.



TRUW / TDW

Specifications

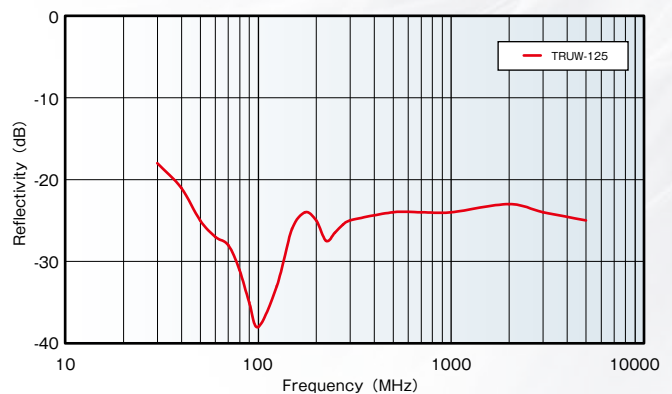
Type	TRUW	TDW		
Features	Power handing capability/ Fire-retardancy/Long-term stability	Power handing capability/ Non-flammability/Long-term stability		
Main uses	EMC/Basic measurement/Each anechoic chamber			
Base material	Hard urethane compound board	Rock wool laminated board		
Basic shape	60cm [□] Wedge-type	30cm [□] Wedge-type		
Operating temperature	-20~+50°C (for a ferrite compound) ^{※1}			
Heat-resistant temperature	+120°C (Hard urethane)	+1,000°C (Base material)		
Frequency range / Absorption performance ^{※2}		TRUW-125		TDW-125
	30MHz	-17dB	30MHz	-17dB
	100MHz	-20dB	100MHz	-20dB
	300MHz	-20dB	300MHz	-20dB
Height	125cm		125cm	
Weight ^{※3}	2.0Kg		2.9Kg	

※1 Based on temperature characteristics of ferrite tile.

※2 Typical characteristics (based on individual specifications).

※3 Excluding ferrite tile (according to individual specifications).

Characteristic example



TSG

A sectional, lattice absorber used in large anechoic chambers for EMC measurement. Uses a lattice structure that renews the conventional form and structure, has ultra broadband characteristics, and is used in high-performance anechoic chambers.



TSG

Specifications

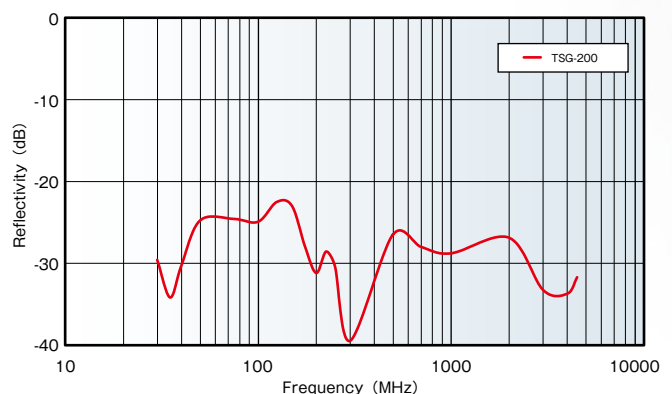
Type	TSG			
Features	PE composite board/ Ultra broadband			
Main uses	EMC/Basic measurement/ Each anechoic chamber			
Base material	Polystyrene foam			
Basic shape	60cm [□] Rectangular parallelepiped			
Operating temperature	-20~+50°C (for a ferrite compound) ^{※1}			
Heat-resistant temperature	-40~+80°C			
Frequency range / Absorption performance ^{※2}		TSG-200	TSG-125	TSG-100
	30MHz	-25dB	-25dB	-18dB
	100MHz	-20dB	-20dB	-18dB
	300MHz	-20dB	-20dB	-18dB
	2000MHz	-25dB	-20dB	-20dB
Height		191cm	126cm	101cm
Weight ^{※3}		5.5kg	4.5kg	3.8kg

※1 Based on temperature characteristics of ferrite tile.

※2 Typical characteristics (based on individual specifications).

※3 Excluding ferrite tile (according to individual specifications).

Characteristic example



TOP

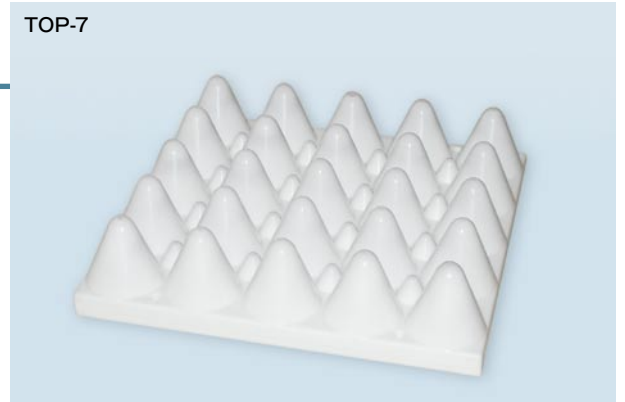
A conical absorber with a short length (7cm) that is used in small anechoic chambers and 3m anechoic chambers for EMC measurement. Ideal for places that have dimensional constraints such as shield doors.

Specifications

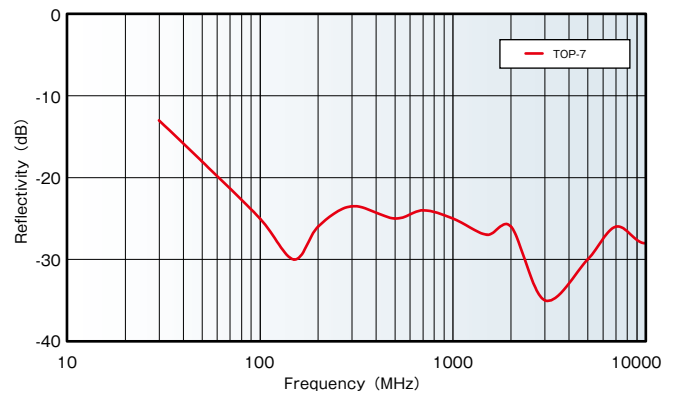
Type	TOP-7		
Features	Conical composite magnetic material / Broadband		
Main uses	EMC / Basic measurement / Each anechoic chamber		
Base material	Sintered ferrite body / PE		
Basic shape	30cm [□]		
Operating temperature	-20~+50°C (for a ferrite compound) ^{*1}		
Heat-resistant temperature	-40~+90°C		
Frequency range / Absorption performance ^{*2}	30MHz	-13dB	
	100MHz	-20dB	
	300MHz	-20dB	
	1000MHz	-20dB	
Height	7cm		
Weight ^{*3}	5.0kg		

^{*1} Based on temperature characteristics of ferrite tile.
^{*2} Typical characteristics (based on individual specifications).
^{*3} Excluding ferrite tile (according to individual specifications).

TOP-7



Characteristic example



TCPF / TCWF

A sectional, pyramid-type/wedge-type absorber used in small anechoic chambers and 3m anechoic chambers for EMC measurement. Uses nonflammable cardboard as the base material, and excels in fire-retardancy (UL94-V0). The super lightweight and knockdown system contributes to reducing storage space and transportation costs. Realizes bright chamber, since the appearance color makes the keynote white.

Specifications

Type	TCPF		TCWF		
Features	Power handling capability / Fire-retardancy (UL94-V0)				
Main uses	EMC / Basic measurement / Each anechoic chamber				
Base material	Non-flammable cardboard				
Basic shape	30 cm [□] Pyramid-type		30 cm [□] Wedge-type		
Operating temperature	-20~+50°C (for a ferrite compound) ^{*1}				
Heat-resistant temperature	Heat-resistant temperature: +800°C / Power handling capability: 0.2W/cm ²				
Frequency range / Absorption performance ^{*2}		TCPF-60	TCPF-125	TCWF-30	TCWF-45
	30MHz	-14dB	-17dB	-14dB	-15dB
	100MHz	-21dB	-23dB	-29dB	-24dB
	300MHz	-20dB	-22dB	-20dB	-28dB
Height	60cm	125cm	30cm	45cm	

^{*1} Based on temperature characteristics of ferrite tile.
^{*2} Typical characteristics (based on individual specifications).

TCPF



TCWF



TFW / TGW

A sheet-shaped, wedge-type absorber used in large anechoic chambers for EMC measurement. The super lightweight and sheet shape contributes to reducing storage space and transportation costs. Realizes a bright chamber, since the appearance color makes the keynote white. Used as a ceiling surface.

TFW / TGW



TFW / TGW

Specifications

Type	TFW/TGW	
Features	Fiber sheet/Broadband	
Main uses	EMC/Basic measurement/Each anechoic chamber	
Base material	Sheet (fire-retardant sheet/TGW)	
Basic shape	60cm ² Wedge-type	
Operating temperature	-20~+50°C (for a ferrite compound) ^{※1}	
Heat-resistant temperature	-40~+80°C	
Frequency range / Absorption performance ^{※2}		TFW-150
	30MHz	-13dB
	100MHz	-20dB
	300MHz	-20dB
	1000MHz	-20dB

※1 Based on temperature characteristics of ferrite tile.

※2 Typical characteristics (based on individual specifications).

TCP-45F

A pyramid-type, nonflammable absorber used for anechoic chambers for high power irradiation tests. Uses a ceramic nonwoven fabric for the base material that passes the fireproof performance test as a noncombustible material based in the Building Standard Law of Japan.

TCP-45F



TCP-45F

Specifications

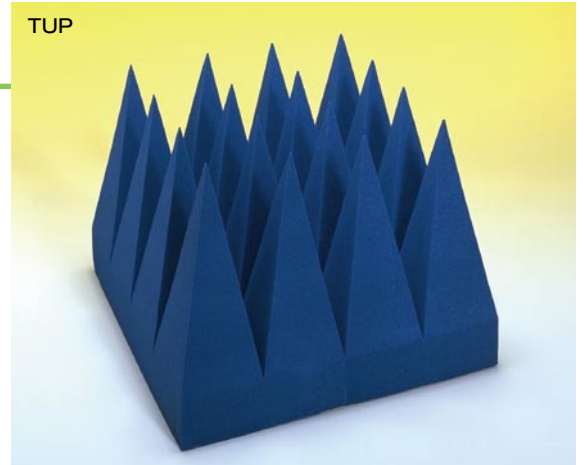
Type	TCP-45F	
Features	Power handing capability/Non-flammability	
Main uses	EMC/Basic measurement/Each anechoic chamber	
Base material	Ceramic nonwoven fabric	
Basic shape	30 cm ² Pyramid-type	
Operating temperature	-20~+50°C (for a ferrite compound) ^{※1}	
Heat-resistant temperature	+1000°C	
Frequency range / Absorption performance ^{※2}	30MHz	-15dB
	100MHz	-20dB
	300MHz	-20dB
	1000MHz	-20dB
Height	125cm	

※1 Based on temperature characteristics of ferrite tile.

※2 Typical characteristics (based on individual specifications).

TUP

A typical radio wave absorber for microwave band. From basic applications such as controlling radiation, conduction, and reflection to advanced applications such as constructing measurement environments. You can use it in a wide range of areas. Also there are various types for walkways of microwave anechoic chambers and fire-retardant (UL94-V0) ones.

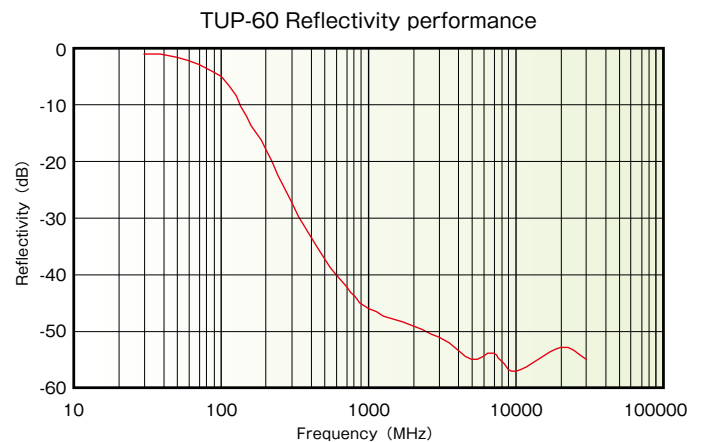
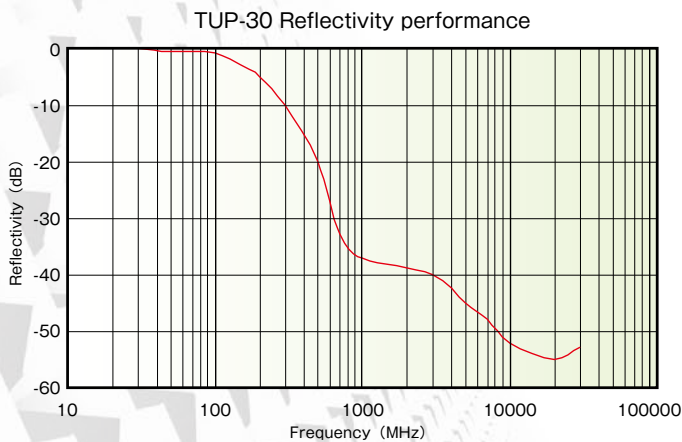


Specifications

Type	TUP							
Features	Broadband/Long-term stability/High absorption performance							
Main uses	Basic measurement/Antenna measurement/Each anechoic chamber							
Base material	Urethane foam							
Basic shape	60 cm ³ Pyramid-type							
Operating temperature	-40~+120°C							
Heat-resistant temperature	+120°C							
Frequency range / Absorption performance ^{※1}		TUP-10	TUP-20	TUP-30	TUP-45	TUP-60	TUP-100	TUP-150
	-20dB	2.0GHz	1.0GHz	700MHz	350MHz	250MHz	150MHz	100MHz
	-30dB	3.0GHz	1.5GHz	1.0GHz	700MHz	500MHz	300MHz	200MHz
	-40dB	4.0GHz	2.0GHz	1.5GHz	1.2GHz	1.0GHz	500MHz	350MHz
Height		10cm	20cm	30cm	45cm	60cm	100cm	150cm
Weight		0.7kg	1.2kg	1.7kg	2.5kg	3.0kg	4.6kg	7.0kg

※1 Typical characteristics (based on individual specifications)

Characteristic example



Radio Wave Absorber

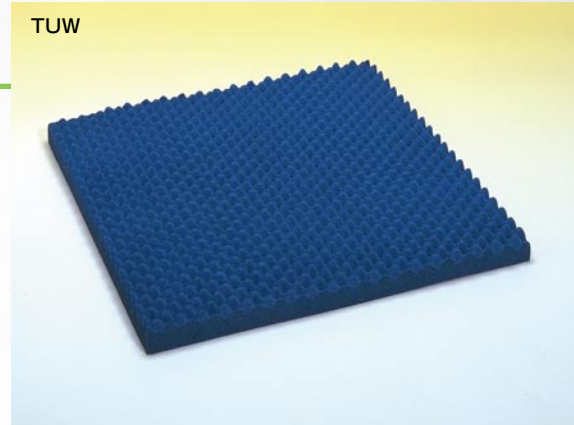
TUW

A radio wave absorber of thin, soft urethane foam in a wavelike surface that is used for microwave band. The main purpose is to improve the measurement environment of a high frequency band. Ready for a microwave band anechoic chamber. You can also use it as a measure against various radio disturbances.

Specifications

Type	TUW		
Features	Undulating urethane / High absorption performance / Broadband		
Main uses	Microwave anechoic chambers / Antenna characteristics improvement / Measure against various radio disturbances		
Base material	Urethane foam		
Basic shape	60cm ² Undulating		
Operating temperature	- 40~+120°C		
Tensile strength	1kg / cm ²		
Frequency range / Absorption performance ^{※1}	TUW-5	TUW-7.5	TUW-10
	4GHz~ / - 20dB	3GHz~ / - 20dB	2.5GHz~ / - 20dB
Thickness	5cm	7.5cm	10cm
Weight	0.6kg	0.9kg	1.2kg

※1 Typical characteristics (based on individual specifications)



TUW

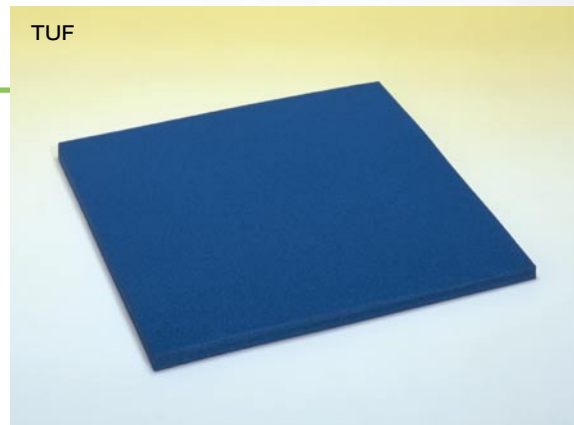
TUF

A ultra thin type radio wave absorber for microwave bands, which has a different dielectric loss material of 3 layers. Changes dielectric loss in each layer and obtains reflection attenuation. You can also use it as a measure against various radio disturbances.

Specifications

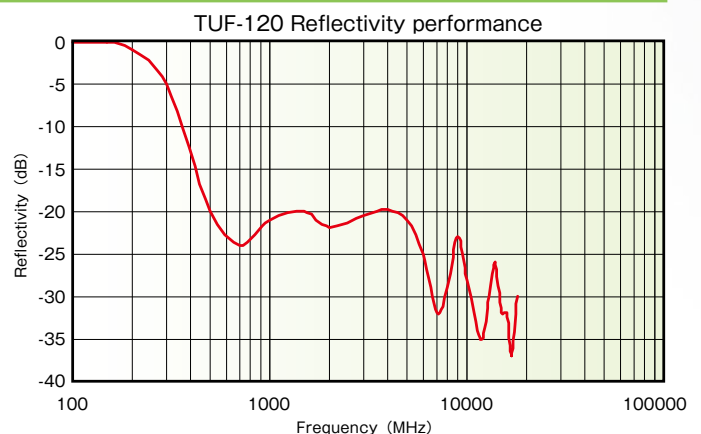
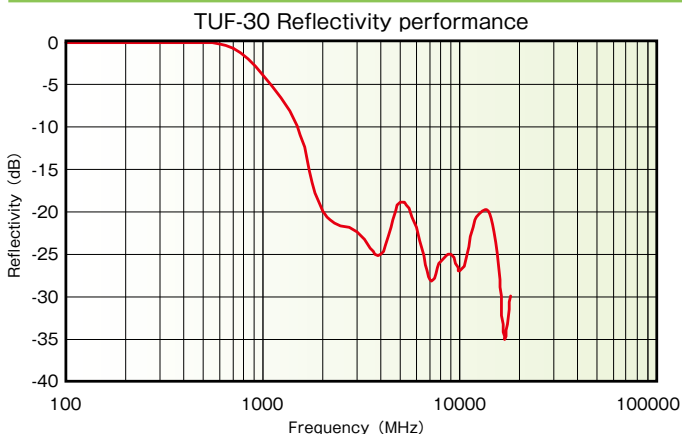
Type	TUF		
Features	Flat urethane / Budget price		
Main uses	Antenna characteristics improvement / Measure against various radio disturbances		
Base material	Urethane foam		
Basic shape	60cm ² Flat sheet		
Operating temperature	- 40~+120°C		
Tensile strength	1kg / cm ²		
Frequency range / Absorption performance ^{※1}	TUF-30	TUF-60	TUF-120
	2GHz~ / - 20dB	1GHz~ / - 20dB	0.5GHz~ / - 20dB
Thickness	3cm	6cm	12cm
Weight	0.3kg	0.7kg	1.3kg

※1 Typical characteristics (based on individual specifications)



TUF

Characteristic example



TGP

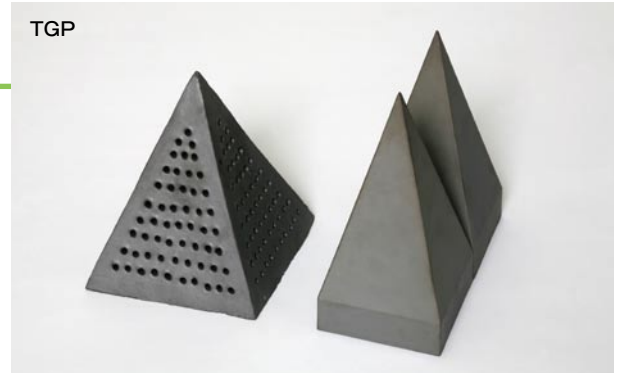
TGP

A radio wave absorber using a carbon dielectric thin film layer that is formed on the surface of a smoked roof tile. This pyramid-type radio wave absorber takes advantage of the excellent durability of a smoked tile, and realizes a pyramid-type radio wave absorber that can withstand very high power irradiation. The special manufacturing process produces outstanding wave absorption performance. Moreover, excels also in weather resistance and heat resistance.

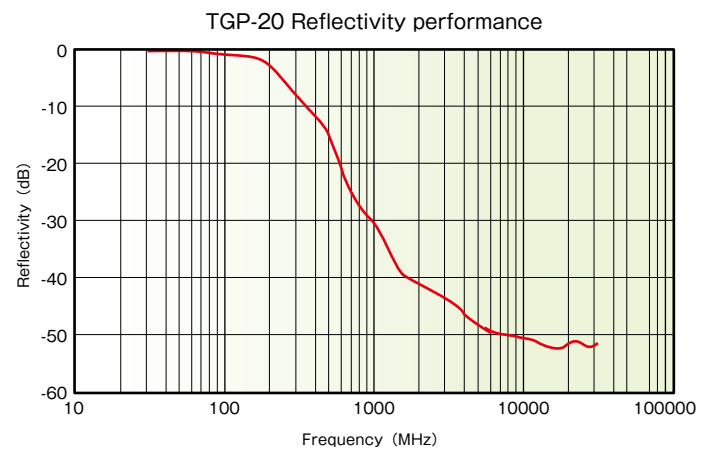
Specifications

Type	TGP	
Features	Hollow pyramid/High power handling capability/Non-flammability/Broadband	
Main uses	Microwave anechoic chamber/High power measurement	
Base material	Smoked roof tile	
Basic shape	15cm [□] Pyramid-type	
Operating temperature	-20~+300°C	
Power handling capability	2W/cm ² (For 12 hours)	
Frequency range / Absorption performance ^{※1}		TGP-20
	3GHz	-18dB
	5GHz	-25dB
	10GHz	-25dB
Height		20cm
Weight		0.9kg

※1 Typical characteristics (based on individual specifications)



Characteristic example



TCC

TCC

Employs a ceramic nonwoven fabric that is superior in power handling capability. Realizes small size and broadband characteristics. Especially superior in heat resistance and power handling capability.

Specifications

Type	TCC	
Features	Power handling capability/Non-flammability	
Main uses	EMC/Basic measurement/Antenna measurement/Each anechoic chamber	
Base material	Ceramic nonwoven fabric	
Basic shape	30cm [□] at base, Pyramid (cone)-type	
Heat-resistant temperature	Heat-resistant temperature:+1000°C Power handling capability:1W/cm ²	
Frequency range / Absorption performance ^{※1}		TCC-10
	1GHz	-15dB
	10GHz	-25dB
	20GHz	-30dB
Height		11cm

※1 Typical characteristics (based on individual specifications)



Radio Wave Absorber

Tokin EMC Engineering supports EMC testing applications for certification in all Asia.

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Location and Number of Chamber

	3m/10m/30m Method Open Site	3m/10m Method Anechoic Chamber	Anechoic Chamber for immunity
Taiwan	5 Chamber	1 Chamber (3)	2 Chamber
Shenzhen	1 Chamber	1 Chamber (3)	1 Chamber
Shanghai	-	1 Chamber (3)	1 Chamber
Thailand	-	1 Chamber (10)	-
South Korea	1 Chamber	1 Chamber (3)	-



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Testing Service Laboratory

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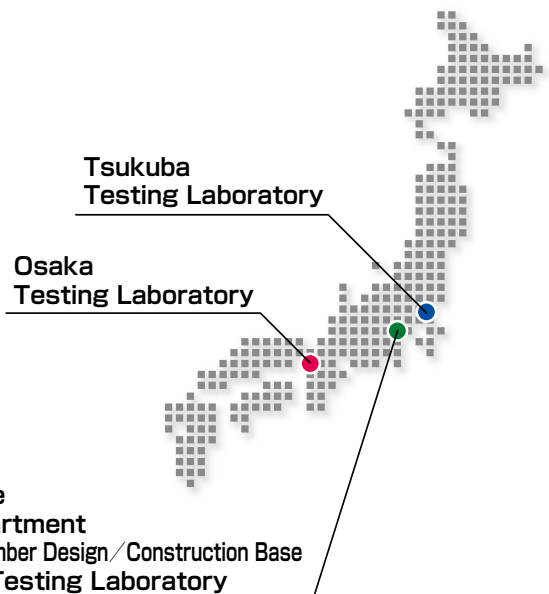
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- Descriptions in this catalog regarding product characteristics and quality are based solely on discrete components. When using these components, be sure to check the specifications with the component in question mounted on the products.
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