

# INTRODUCTION TO SHIELDING TENTS



**TEMAS**

SHIELDING SOLUTIONS

# MAIN FEATURES

- ✓ .....  
Easy to install and unpack
- ✓ .....  
Light weight, available to move after installation
- ✓ .....  
Possible to use when shielding room is not arranged or installation space is not ready
- ✓ .....  
Low price compared to shield room
- ✓ .....  
Good EMI Shielding Effectiveness
- ✓ .....  
Useful for Wi-Fi, Wireless LAN, Communication equipments, Broadcasting equipments, Medical equipments, Measuring equipments, Ordinary electronic equipments, etc.

# ROOM TYPE SHIELDED TENT



## ■ Characteristic

- Operator can perform tests inside the tent because it is well ventilated and possible to install a light
- It is suitable for operating with large instruments or inside if shielding space is enough

## ■ Size ( W=Width, L=Length, H=Height )

P/N	W (mm)	L (mm)	H (mm)	P/N	W (mm)	L (mm)	H (mm)
TENT-1515-1	1.500	1.500	2.000	TENT-2030-1	2.000	3.000	2.000
TENT-1520-1	1.500	2.000	2.000	TENT-3030-1	3.000	3.000	2.000
TENT-1530-1	1.500	3.000	2.000	TENT-2448-1	2.400	4.800	2.000
TENT-2020-1	2.000	2.000	2.000	* These sizes are based on tent covers. Frames are larger than tent sizes (about 100mm)			

## ■ Features and specifications per each part

### one-touch Method



- Possible to install easily the tent with One-couch method

### Frame Connection



- In the coupling rods, user can insert aluminum pipes and assemble easily with a standard screwdriver

### Doors and Handles



- Easy to open or close door with a conductive fastener and middle holder

Fastener - Starting point



Fastener - Ending point



Fastener Replacement



- If fastener is broken due to long-term use, user can remove Velcro in both sides

Power-tube Connection



Power-tube / EMI filter box Connection



- Power and signal lines
- Standard Size:  $\varnothing 100\text{mm} \times L1000\text{mm}$
- It restrains electromagnetic waves flowed into the tent
- Signal and power are supplied through an EMI filter

Inside of Air-Filing hole/honeycomb



Air-blower Connection



- Air-Filing hole to supply air inside the tent
- Size of Air-Filing hole:  $\varnothing 50\text{mm} \times 300\text{mm(L)}$
- Air-blower specification recommended for a tent size of  $1500 \times 1500 \times 2000\text{(mm)}$ :  
Air volume of  $300\text{m}^3/\text{h}$

Shielding Monitor Window



- Conductive mesh layer is placed between transparent plastic layers so electromagnetic waves are blocked and inside monitoring is available
- Material of conductive mesh layer: plating fabrics or stainless steel
- If conductive mesh consists of dual-layers, shielding effectiveness is improved

Air-blower Window



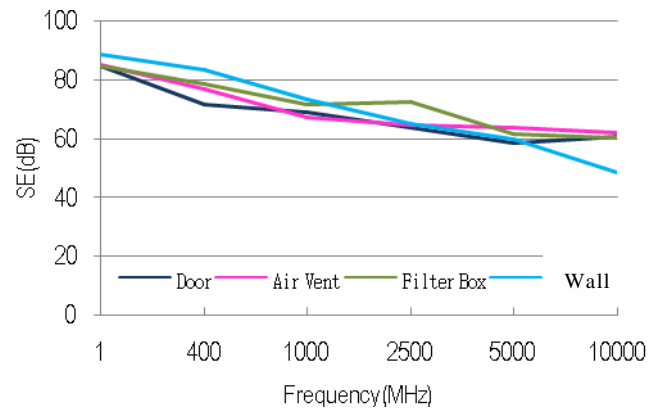
- It let out the air from inside of the tent. It consists of conductive mesh or honeycomb so electromagnetic waves are blocked and air can pass through the air-blower window

■ Shielding effectiveness per signals and components

Field	(MHz)	(dB)			
		door	Air Vent	Filter Box	Wall
Electric field	1	85.0	85.4	85.0	88.8
	400	71.8	76.8	78.7	83.4
Plane wave	1.000	69.2	67.2	71.9	73.6
	2.500	63.8	64.9	72.7	65.2
	5.000	58.8	63.9	61.8	59.7
	10.000	60.7	62.1	60.5	48.6

\*Size: 1500x1500x2000(mm)

\* Test Method: based on IEEE-STD-299



“Users can pack a tent and move it easily”

## TABLE TYPE SHIELDED TENT



■ Characteristic

- It is possible to install on the table, so suitable for test to small instrument
- It is low cost effective and possible to install/uninstall in a short time

■ Size ( W=Width, D=Depth, H=Height )

P/N	W (mm)	D (mm)	H (mm)
TENT-0505-1	500	500	500
TENT-0606-1	600	600	600
TENT-0707-1	700	700	700
TENT-0808-1	800	800	800
TENT-0909-1	900	900	900
TENT-1010-1	1.000	1.000	1.000

\* These sizes are based on tent covers. Frames are larger than tent sizes (about 50mm)

■ Shielding effectiveness per signal frequency

Frequency	900 MHz	2.4 GHz	5.9 GHz
Shielding effectiveness(dB)	61	47	41

Size: 500X500X500(mm)

\*Test Method: based on IEEE-STD-299

# DOUBLE-LAYER SHIELDED TENT



## ■ Characteristics

- Tent's cover consists of two layers, so it has very good shielding effectiveness
- Inside layer and outside layer are separated electronically
- Room type shielded tent is possible to be produced with two layer structure

## ■ Size ( W=Width, D=Depth, H=Height )

P/N	interior tent			exterior tent
	W (mm)	D (mm)	H (mm)	
TENT-0505-2	500	500	500	Bigger than interior tent about 200mm
TENT-0606--2	600	600	600	
TENT-0707-2	700	700	700	
TENT-0808-2	800	800	800	
TENT-0909-2	900	900	900	
TENT-1010-2	1.000	1.000	1.000	

\* These sizes are based on tent covers. Frames are larger than tent sizes. (about 50mm)

## ■ Shielding effectiveness per signal

Signal	900 MHz	2.4 GHz	5.9 GHz
shielding effectiveness(dB)	74	71	54

Size: 700X700X700(mm)

\* Test Method: based on IEEE-STD-299

## ■ Features and specifications per each part

### Interior Installation



- It is easy to install interior tent inside of exterior tent by using one-touch method

### base plate



- A base plate is placed between interior and exterior tent so shielding effectiveness is not reduced and short is not occurred between test equipment and interior tent

### Power-tube



- To prevent short, insulation sheet is inserted between interior and exterior tent.



# OPTIONAL PARTS SPECIFICATIONS

## ■ EMI Filter Box



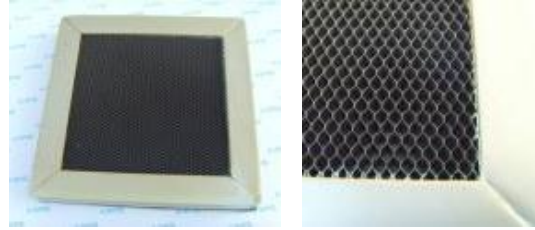
- Connector: AC power supply, DC power supply, LAN, USB2.0, SMA, BNC-N, RJ45, 9pin, 15pin, D-SUB, etc. - It's available to produce according to customer's request
- Shielding effectiveness: 40-60dB @ 300MHz to 1GHz

## ■ LED Light



- LED light(ropo-type): 3W/1m. DC power-supply 24V/110~220V
- Color: white
- Ref.: In case of tent of 1.5X1.5X2(m), 2m length of LED light is suitable

## ■ Honeycomb panels



- Material: Aluminum 0.06mm(T)
- Cell size: 12.7mm(T) / Cell size: 3.2mm
- Outer size of air-blower: Ø120mm
- Outer size of ventilating window: 200x300mm

## ■ Shielded Gloves (for special tents with "hands-inside" option)



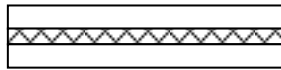
- Material: Conductive polyester fabric (Surface: Ni + Cu + Ni + Urethane coating)
- Shielding effectiveness: 70dB @ 100MHz to 1GHz [ASTM D4935]



## ■ Shielded Window



High shielding type / Sample size 340x240x3(T) (mm)

Ordinary type (Conductive Mesh - Single layer)





 polycarbonate  
 mesh

- Material: Conductive black mesh fabric(130mesh), Polycarbonate sheet
- Size: 200 x 300 x 2(T) mm
- Shielding effectiveness: 40dB @ 100MHz to 1GHz
- Light transmission 60%

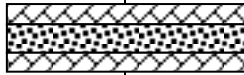

High shielding type (Conductive Mesh - Double layer)



 polycarbonate  
 mesh

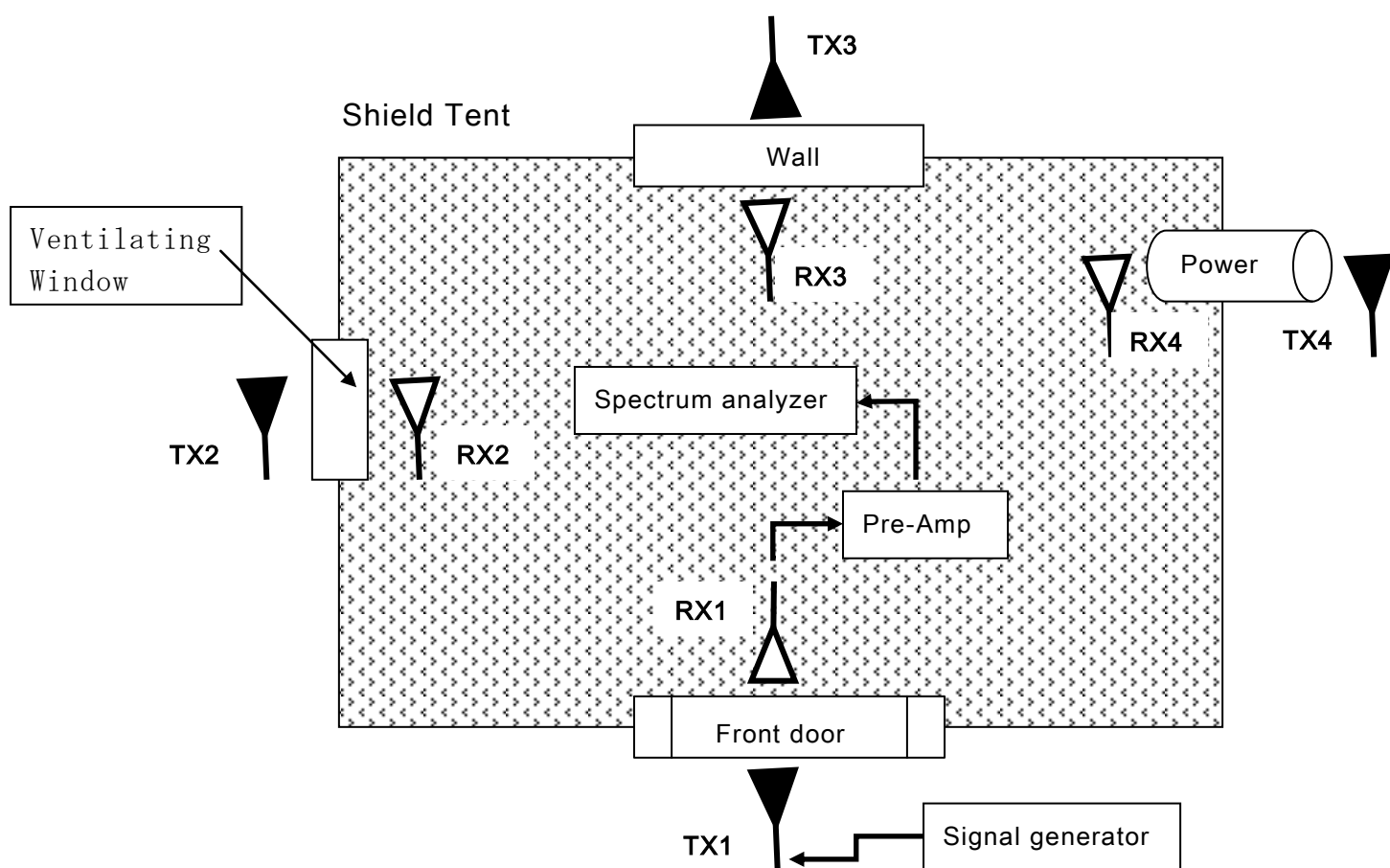
- Material: Conductive black mesh fabric(130mesh), polycarbonate sheet
- Size: 200 x 300 x 3(T) mm
- Shielding effectiveness: 60dB @ 100MHz to 1GHz
- Penetration ratio: Light transmission 40%

■ Standard Material Specifications

Material	Specification	Material	Specification
Tent	Material :Polyester Conductive Fabric dual-layer (Plated layer: Ni/Cu/Ni) Thickness :0.1mm Surface resistance :0.05/ $\Omega$ -cm (Test standard MIL-DTL-83528C) Heat resistance :-15°C to +100°C	Ventilating window (mesh type)	Size: 300 x 200 x 3(T) mm Shielding effectiveness: -80dB @ 20MHz to 1GHz [ASTM D4935]  Stainless steel mesh Conductive filter 3mm Stainless steel mesh
Frame	Material :Aluminum Pipe(No.6063) Size : OD.30mm T 2mm (Room-type) OD.25mm T 2mm (Table-type)	Aluminum board	Aluminum foil → Material: A1235 / Thickness: 0.1mm Plastic box → Material: polypropylene / Thickness: 5mm 
Frame connection socket	Material :Aluminum AC2B. Thickness 5mm		
Door fastener	Material :Brass / Size-type10		
Mesh Fabric	Material :Polyester Conductive Fabric layer (Plated layer: Ni/Cu/Ni) Thickness :0.07mm. 200mesh/inch2 Surface resistance :0.09/ $\Omega$ -cm (MIL-DTL-83528C) Heat resistance :-15°C to +100°C		



# HOW TO MEASURE SHIELDING EFFECTIVENESS OF SHIELDED TENT



## ■ Test Method

- Measurement of shielding effectiveness in accordance with IEEE-STD-299
- Available measurement size is 1.5(W) X 1.5(D) X 2.0(H) (length in m). In case of smaller sized tent, shielding effectiveness is measured by setting RX ANT inside of shielding tent