

Shielded Tent

The TBST-200/100/100 shielded tent is designed to suppress interference from ambient noise when carrying out EMC pre-compliance measurements. The TBST-200/100/100 has a size of 200 cm x 100 cm x 100 cm. The tent can accommodate any Tekbox pre-compliance test equipment such as LISNs or TEM-cells.

The shielded tent is made of two layers of conductive fabrics. It is supported by rigid aluminium profiles. The filter panel at the side provides a 240V/25A mains AC filter, two general purpose 240V/10A AC/DC filters and four coaxial feed-through adapters with screw caps. The access opening is sealed with conductive Velcro tape.



Picture 1: shielded tent with closed opening



Picture 2: shielded tent with access opening

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Picture 3: side view with filter panel

1 Warning

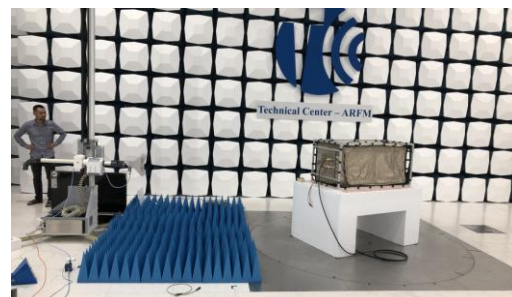
Make sure that your set up prevents main phase getting into contact with the metal parts/fabrics of the tent. Always connect protective earth to avoid any hazard of electrical shock.

2 Specification

Outer dimensions:	204 cm x 104 cm x 100 cm
Opening dimensions:	130 cm x 46 cm
Frame:	20 mm x 20 mm extruded aluminium profiles
Shielding:	two layer of conductive silver fabrics
Suspension:	Velcro tape
Filter panel:	1 x 240V / 10A mains AC filter, C19 socket 2 x 240V / 25A AC/DC filters, attached cables with Banana couplers 3 x N-Female coaxial feed-through connectors with screw caps 1 x BNC-Female coaxial feed-through connector with screw caps
Internal AC-socket:	pigtail cable with detachable female Schuko socket + country specific AC cables with C13 connector
Attenuation:	up to 50 dB in the range 10 MHz to 6 GHz, see chapter 3
Weight:	17kg + 3kg (packaging)

3 Ambient noise attenuation

Up to 10 MHz: up to 30 dB
10 MHz – 6 GHz: up to 50 dB

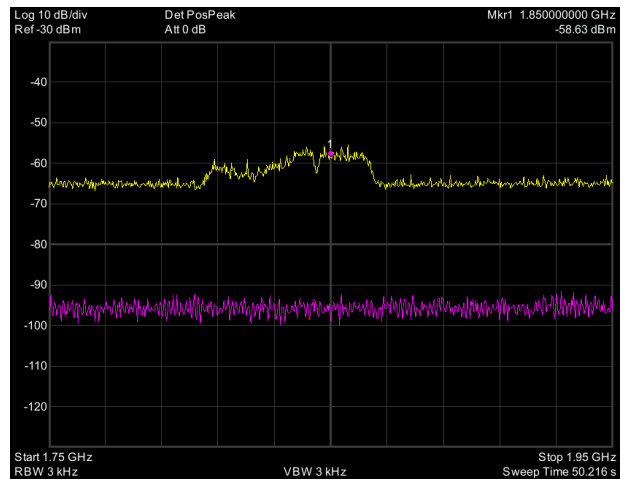
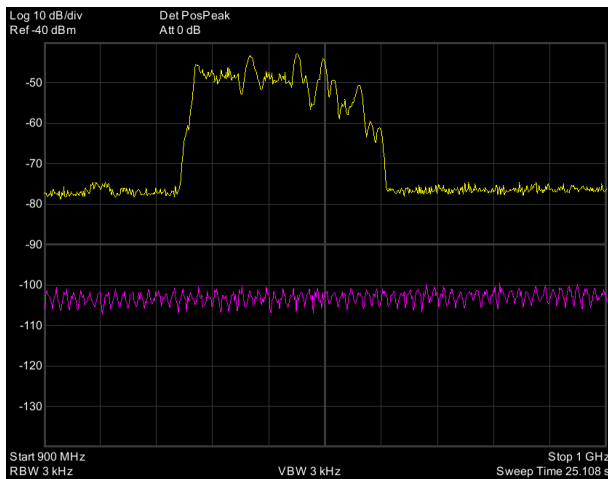
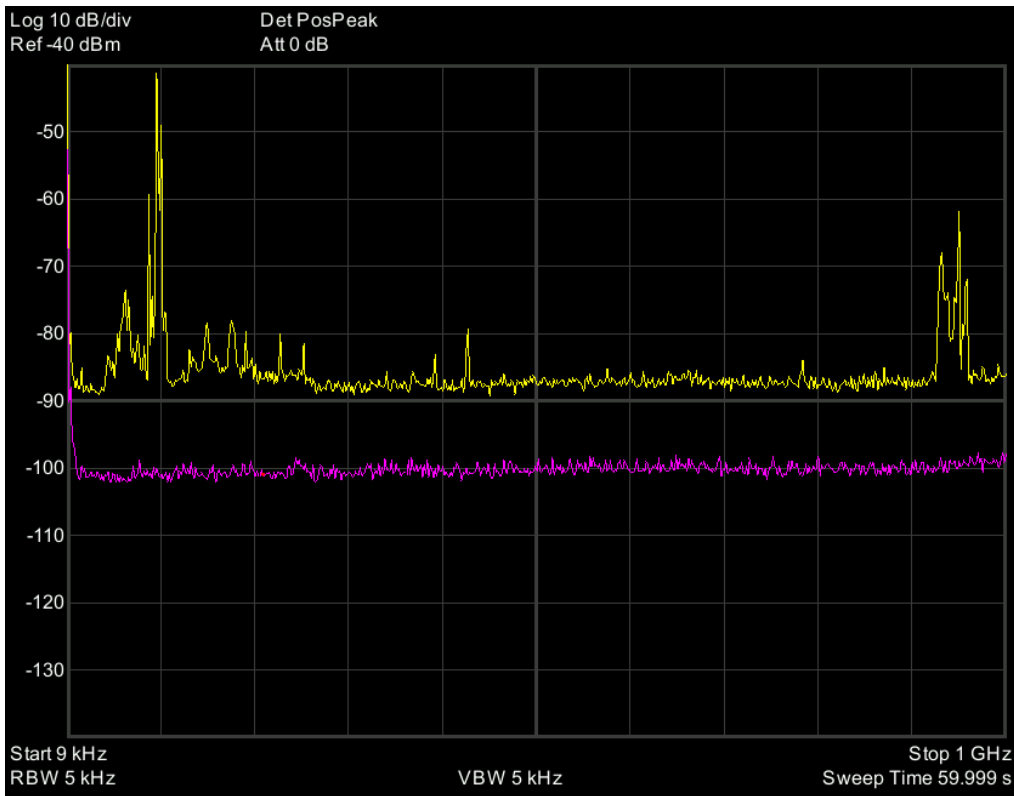


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3.1 Example: Whip antenna

The ambient noise spectrum plot below was taken with a whip antenna outside of the shielded tent (yellow graph) and inside of the shielded tent (pink graph). The pink graph was taken with lower resolution bandwidth to reduce the base noise level of the spectrum analyzer.

The spectrum plots below illustrate the attenuation of the shielded tent in the range 9 kHz – 1 GHz and in the mobile phone bands.



Picture 4: examples, ambient noise outside (yellow) and inside the tent (pink)

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3.2 Example: Conducted noise measurement

The dark green graph below shows the measured spectrum of a non-powered DUT in a CISPR 25 conducted noise measurement setup. The DUT connects to the TBOH01 5μH LISN with a very short supply cable (10cm). The cable between LISN and DUT and the DUT PCB itself already pick up significant ambient noise from AM and FM broadcast stations.

The light green line shows the results of the same arrangement, with the DUT and LISN placed inside the shielded tent.



Picture 5: CISPR 25 conducted noise measurement; DUT not powered

The graphs below show the conducted noise spectrum of the powered DUT. In the unshielded set up, all emissions, except the first harmonic of the DUT and conducted noise between 40MHz and 50MHz, are hidden under the ambient noise level. An accurate measurement would not be possible without a shielded set up.



Picture 6: CISPR 25 conducted noise measurement; DUT powered

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4 Assembly

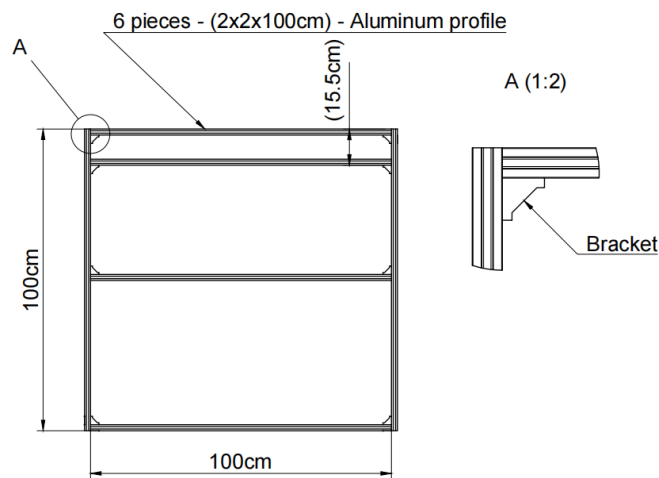
It is not essential to first insert the profile nuts into the profile grooves. The nuts can be inserted and positioned in line with the grooves. When tightened, the nuts spin 90° and lock at a right angle to the direction of the groove.

The tent frame consists of 10 pieces aluminum profiles with 100cm length and 4 pieces aluminum profiles with 200 cm length.

There are two kinds of screws. The shorter version is used to secure the filter plate to the frame.

Step 1:

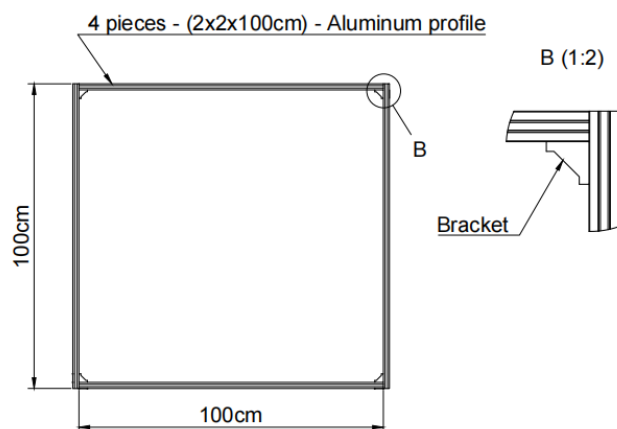
First, put together the left side frame that holds the filter plate. Attach six pieces 100 cm aluminum profiles to each other as shown in the drawing below.



Picture 7: left side frame

Step 2:

Assemble the right-side frame similar as in step 1, using 4 pieces (100 cm) aluminum profiles



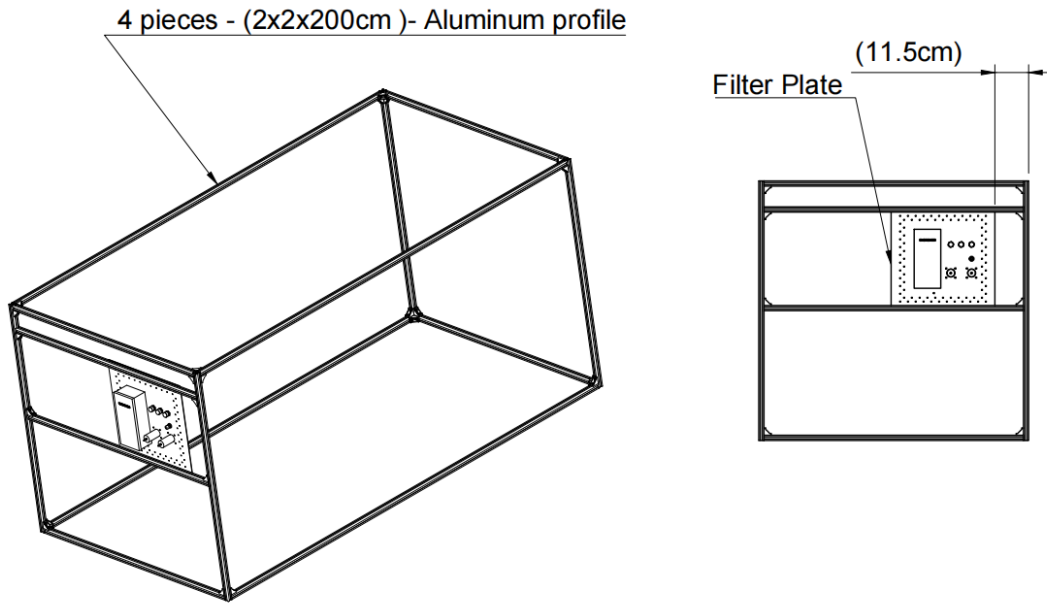
Picture 8: right side frame

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Step 3:

Complete the frame by connecting the two side frames with 4 pieces 120 cm (82 cm) aluminum profiles.

It should be noted that the filter plate is only shown for illustration purposes. The filter plate is pre-assembled with the tent fabrics and is connected after the frame is completed.



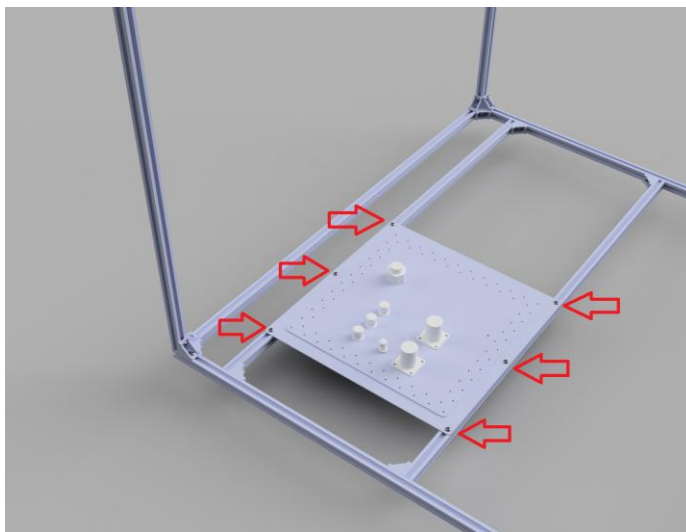
Picture 8: completed frame

Step 4:

Unpack the fabrics and remove the outer foam protection of the filter plate. **To avoid damaging the fabrics, do not open the plastic wrapping with a knife or scissors.**

Place the frame with the left side at the bottom and support the four corners to get clearance for the filters.

Attach the filter plate with six screws to the frame. Note that the attached fabrics is not displayed in the rendering below



Picture 9: location of the filter plate

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Step 5:

Unfold the fabrics and fasten it to the frame with the attached Velcro straps.



Picture 10: fabrics before attaching it to the frame

5 Hints

Minimize residual ambient noise:

When sealing the access opening, make sure there are no gaps between the conductive Velcro hook and loop tapes. Begin closing it at the upper left or right corner and work your way to the diagonally opposite corner. Then begin at the opposite upper corner and see if you can finish without a large wave or gap. If there is a gap, rip the tapes apart at the lowest corner and re-attach them until they fit.

Connect the spectrum analyzer to the tent's connector panel with an RG223 or better cable. RG58 cables should be avoided since they may pick up more ambient noise.

DUT control:

If your DUT requires connectivity to outside control devices or additional multiple voltages, use shielded control cables and feed it through any unused filter or coaxial connector at the filter panel of the shielded tent. You can also use the AC-filter to feed DC supply voltages into the tent. Similarly, the DC filters are capable of carrying AC. Should you need multiple control cables or a USB or HDMI interface, you can feed it sideways through the Velcro tape: use shielded cables and remove a section of the outer jacket to expose the shielding mesh of the respective cable where it would pass the Velcro tape. Then, tightly close the tape, ensuring that the cable shield has good electrical contact with the Velcro. Ensure that the setup is properly grounded, and avoid connecting the mains phase to the sheet metal of the filter panel or the tent's surface.

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Internal AC mains connector:

The output of the AC filter is connected to a pigtail with detachable (non over molded) female Schuko connector. Use the supplied Schuko/C13 cable or a travel adapter or similar, to match it with any other country specific connector. Alternatively detach the Schuko connector from the pigtail cable and mount a connector that fits your specific requirements.

Protection:

The tent is made of two layers of conductive fabrics that can be damaged by sharp instruments or equipment with sharp edges. Handle with caution.

Insert a cardboard, foam, or other suitable material at the bottom for more protection.

You may also attach MDF or plywood panels to the aluminum frame to cover the tent's bottom or stack stuff on top.

Patch any cuts with the included fabric remnants. You can stitch it with any thread as long as it makes a close contact with the overlaying fabric.

6 Ordering Information

Part Number	Description
TBST-200/100/100-EU	Shielded tent 200 cm x 100 cm x 100 cm, RF cable RG223/N-male to N-male/1.5m, repair patch fabrics, C19 Schuko Power cord
TBST-200/100/100-US	Shielded tent 200 cm x 100 cm x 100 cm, RF cable RG223/N-male to N-male/1.5m, repair patch fabrics, C19 US Power cord, C13 Schuko cable
TBST-200/100/100-UK	Shielded tent 200 cm x 100 cm x 100 cm, RF cable RG223/N-male to N-male/1.5m, repair patch fabrics, C19 UK Power cord, C13 Schuko cable
TBST-200/100/100-AU	Shielded tent 200 cm x 100 cm x 100 cm, RF cable RG223/N-male to N-male/1.5m, repair patch fabrics, C19 Australian Power cord, C13 Schuko cable

7 History

Ar	Date	Author	Changes
V 1.0	24.6.2021	Mayerhofer	Creation of the document
V 1.1	6.5.2023	Mayerhofer	updated chapter 2
V 1.2	26.1.2025	Mayerhofer	updated AC/DC filter current rating
V 1.3	16.10.2025	Tauchner	Update chapter 7

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