

STP Grounding & Bonding Frequently Asked Questions

All grounding and bonding should be completed per your local authority having jurisdiction (AHJ). The AHJ may have more stringent requirements than the information presented in this document.

1. Do I ground both ends of a shielded system using shielded patch cables?

Yes. In the TR, shielded patch cords continue the ground path from the shielded patch panel to the active equipment. The patch panels and equipment are bonded to the rack, which is bonded to the TGB. At the work area, the use of a shielded patch cable continues the ground path from the shield of the cable to the equipment located in the work area.

2. Does the shield have to maintain continuity through the entire permanent link or channel?

Yes. The shield should completely surround the cable along its entire length and remain continuous along the entire length of the permanent link or channel. This is accomplished by using *only* shielded products, from cable to plug to jack to patch panel.

3. I've heard that equipment in shielded systems requires shielded jacks and interface cards. Is this true?

No. Computers and networking equipment all include shielded jacks, which are bonded to the ground conductor of the electrical cord. Absolutely no special jacks or interface cards are required in an STP system.

4. If the work area equipment is not grounded through the electrical receptacle, is my system grounded?

Yes. Even if a shielded patch cord is not used, or the work area equipment is not grounded through the electrical receptacle, the channel is tied to ground in the TR, which prevents risk of electrical shock.

5. Do I have to ground my UTP system?

Yes. Due to the effects of unwanted noise signals, proper bonding and grounding of metallic components is necessary to assure that unwanted signals do not effect the operation of the telecommunications infrastructure. Grounding and bonding may also be a safety issue since metallic parts may become accidentally energized causing an electrical hazard.

6. What is a ground loop, and how can I test for it?

A ground loop refers to an unwanted current that flows in a conductor connecting two points that are at different voltages. A ground loop can only occur when a system has more than one ground and the voltage difference between the two points is more than 1 Volt. If the components of a telecommunications system are properly bonded, and the system is bonded to the building's grounding electrode system, there is virtually no condition where a ground loop is possible.

ANSI/TIA-568-C.0 states in clause 5.3.5 that, "Voltage of greater than 1.0 V_{rms} between the screen of Cabling Subsystem 1 at the EO and the ground wire of the corresponding electrical outlet expected to provide power to the equipment indicates improper grounding and is not recommended. The bonding and grounding infrastructure should be modified so that this voltage is less than 1.0 V_{rms} ."

7. How do I test my system to ensure it is grounded properly?

It is imperative to test the ground resistance between the TMGB and the nearest grounding electrode and between each TGB and grounding electrode. Within the telecommunications space, testing should also be done between the TGB and all racks, cable tray, and electronic equipment. The ground resistance should not exceed 0.1 Ohm. Testing for ground resistance can be done using an Earth Ground Resistance Tester with the entire building in operation.

8. How can I get my grounding and bonding installations independently tested or certified?

A grounding and bonding system can be independently tested or certified by a qualified electrical contractor or engineer.

9. What is an antenna effect, and how do I avoid this?

The antenna effect is unwanted noise signals on telecommunications cables that can interfere with the overall network performance. Whether UTP or Shielded, a properly grounded system helps to nullify receiving antenna effects.

10. What are the potential differentials for the power system versus the communications system?

Within a building, there is one common ground for all electrical systems, which the NEC refers to as the grounding electrode system. The potential difference between the power system and the communications system should not exceed 1 Volt.

11. Is shielded cable more sensitive?

While it is necessary that the shield is not deformed or damaged, if any cable – UTP or STP – is deformed during installation, the geometry will change. This will cause the performance parameters to change also.

12. I also hear about EMC and EMI. What are they all about?

EMC stands for electromagnetic compatibility, which is the ability of a device or system to function without error in its intended electromagnetic environment. EMI stands for electromagnetic interference, which is caused when emissions from a device or system interfere with the normal operation of another device or system. STP systems enable proper EMC by eliminating EMI.

13. Should I scrape the paint on the rack and patch panel?

Yes. When bonding patch panels, racks, and other painted equipment or components, a low resistance path is achieved by scraping the paint or other means that will assure a good ground. At Tyco Electronics, we provide a star washer with all AMP NETCONNECT STP and UTP patch panels to avoid having to scrape paint and to ensure a proper bonding connection.