

Technical Note 005

Testing Guidelines for Class D (Cat 5) to Class II (Cat 8.2) Twisted Pair Copper Cabling

1. Applicability

The following applies to balanced twisted pair copper permanent link and channel testing of Class D to Class II cabling installations seeking performance conformance to AS/NZS 11801.1, AS 11801.x, ISO/IEC 11801-x and/or AS/NZS IEC 61935.1.

2. Background

AS/NZS 11801.1 and ISO/IEC 11801-1 specify the performance parameters and minimum values for conforming balanced cabling installations for Class D (Cat 5) to Class II (Cat 8.2).

AS/NZS IEC 61935-1 specifies accuracy levels for hand-held testers and test methods to measure cabling parameters identified in AS/NZS 11801.1, AS 11801.x, and ISO/IEC 11801-x. Customer requirements that exceed the performance conformance requirements of the above standards may also exist within the project documentation.

This Technical Note provides guidance for conducting the testing of balanced copper cabling for establishing installation performance conformance by VTI Services to meet its NATA reporting obligations against AS/NZS 11801.1, AS 11801.x, and/or ISO/IEC 11801-x.

3. Testers

Testers must be fully calibrated within the period recommended by the manufacturer for all test results submitted.

Tester performance levels must be suitable for the test undertaken and support the test undertaken to the latest Standard. The standard for testers in Australia and New Zealand is AS/NZS IEC 61935-1.

4. Current approved testers for compliance testing.

- Fluke DSX 5000 is approved for Class F_A (Cat 7_A) and below, including E_A (Cat 6_A)
- Lantek III (1000 MHz) is approved for Class F_A (Cat 7_A) and below, including E_A (Cat 6_A)
- WireXpert 4500 is approved for Class F_A (Cat 7_A) and below, including E_A (Cat 6_A)
- Fluke DSX 8000 is approved for Class II (Cat 8.2) and below, incl. Class I (Cat 8.1), C7_A C6_A.

Note: While other testers may be available, the compliance status of those testers would need to be established before testing.



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5. Firmware

The tester Firmware must be the latest published version.

- Viewing software normally contains links for upgrades of tester firmware
- Current Firmware is freely available from manufacturer's web sites, for example:-

<http://www.idealnetworks.net> (Lantek testers)

<http://www.flukenetworks.com> (Fluke testers)

<https://itnetworks.softing.com/us/copper/> (WireXpert tester)

6. Applicable Standards

Sites shall be tested to the requirements of a current published standard and any additional customer or contract requirements using an appropriate tester.

The published balanced cabling standards for performance values include;

- ISO/IEC 11801-x
- AS/NZS 11801.x
- ANSI/TIA 568.1-D

The published standards for balanced cabling test equipment include;

- AS/NZS IEC 61935.1
- IEC 61935-1
- ANSI/TIA 1152-A

7. Test Configuration

All tests shall be either Link, Permanent Link, Modular Plug Terminated Link (MPTL) or Channel tests.

- Permanent Link Testing is preferred by most vendors and end users.
- A large number of customers insist on Permanent Link testing. Check before testing.
- If a warranty is to be issued, check with the cabling vendor as to which tests and tester settings are acceptable for their warranty.

8. Adaptors

Approved test equipment adaptors/heads and test cables shall be used for all tests. Permanent Link Adaptors used for permanent link or link testing must be those approved by the tester vendor or the warranty cable vendor.

- Permanent Link Adaptors shall be used for link or permanent link testing.
- Channel Adaptors shall be used for channel testing.
- A permanent link and a patch cord test adaptor shall be used for MPTL testing.
- Performance Level of the tester adaptor shall equal or be greater than the performance level of the cabling system under test for Links, Permanent Links, MPTL or Channels.



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9. Test Results

DOs

- Test Results shall be provided for analysis in the tester's database format.
- Text, CSV and PDF test results are not acceptable.
- Plot data is highly regarded to aid result analysis and as visual evidence for customers.
- Test results containing Marginal/Conditional passes are considered by the standard to be a pass. VTI Services reports these as a conditional pass.

DON'Ts

- Failed or manipulated test results are deemed to be noncompliant and/or fraudulent.
- Test results not containing all the required tests are deemed to be noncompliant.
- All test results shall be free of accidental or malicious manipulation.
- Test results shall not be duplicated.
- Test data shall not be altered.

10. General Information

The term Category 5 has been adopted by Australian and New Zealand Standards as well as by the International Standard ISO/IEC 11801, instead of the American term Category 5e.

- The ANSI/TIA have retained Category 5 for performance level prior to 2003. In addition, America has adopted Category 5e for post-2003 cabling performance.
- To avoid confusion about which performance level is required in Australia and New Zealand, Category 5 post-2003 cable is sometimes referred to as Cat 5/5e cable.
- Cat 5 (AS/NZS and ISO/IEC) is the same as C5e (ANSI/TIA) in performance conformance.

Category 5 components form Class D links and channels.

Category 6 components form Class E links and channels.

Category 6_A components form Class E_A links and channels.

Category 7 components form Class F links and channels.

Category 7_A components form Class F_A links and channels.

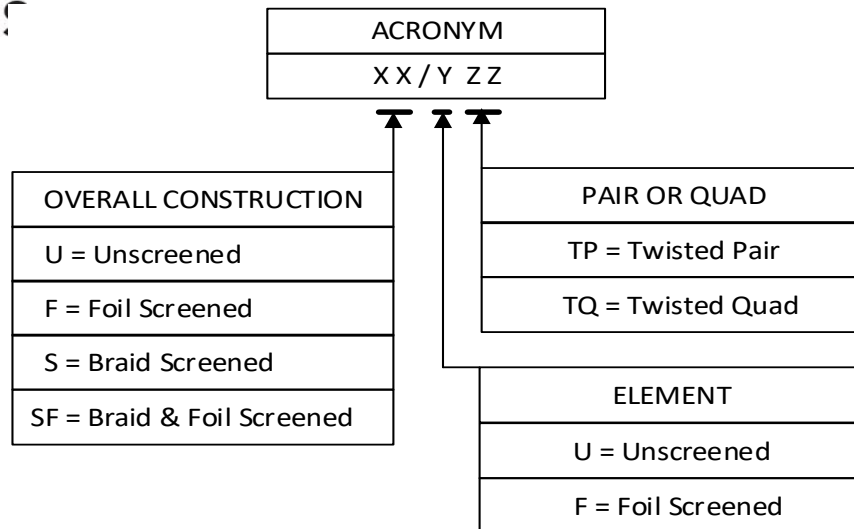
Category 8.1 components form Class I links and channels.

Category 8.2 components form Class II links and channels.

VTI Services provides professional Independent Verification, Testing and Inspection of Communication Infrastructures through innovation in research, development, design and delivery of unique services and assists our clients in the protection of their investment in the Communication Infrastructure and provides credible independent expertise in Verification, Testing and Inspections.

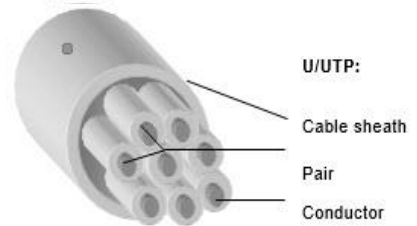


11. General Cable Types

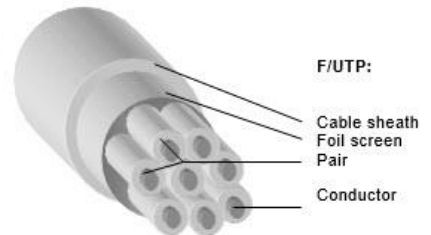


The Acronyms above define the type of cable construction.

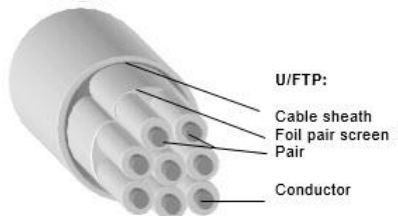
U/UTP No screen over unscreened twisted pairs
 Unscreened outer layer over UTP
 Commonly called just UTP cable



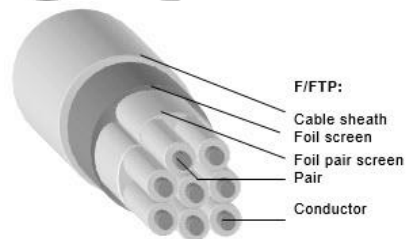
F/UTP Foil over unscreened twisted pairs
 Foil outer screen layer over UTP



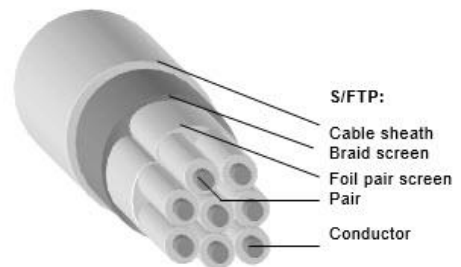
U/FTP No Screen over foil twisted pair
 Each pair has a foil screen but no screen overall



F/FTP Foil Screen over foil twisted pair
 Each pair has a foil screen and a foil screen overall



S/FTP Braid Screen over foil twisted pair
 Each pair has a foil screen and all pairs have a braid screen overall
 (aka PiMF – pairs in metal foil)



There is no such cable or acronym as “shielded cable” or STP.