

To: 3P Customers and Business Partners

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3P Newsletter No. 4/2008

Category 6A

The first Category 6A standard has now been agreed for publication !!!

Traditionally it is again TIA/EIA that is out first with the new generation cabling specification containing requirements for both channels, permanent links, cables, connecting hardware and patch cords. The new standard is published as ANSI/TIA/EIA-568-B.2-10.

Category 6A cabling and components have been out in the market for some time, but until now the performance of these components and cabling have been based on draft standard requirements. For the first time final and published requirements will exist. This will most probably give a boost to Category 6A, which I expect will take over a major market share from Category 6 within a 5 year time frame. A step from Category 5e might in the future be directly to Category 6A.

The arrival of Category 6A has been delayed due to technical challenges of which alien crosstalk of unshielded cables and test methods for connecting hardware have caused special concerns.

1. Technical Challenge - Connecting Hardware Test Method

The biggest problem has turned up to be the test method for connecting hardware. I estimate that this problem alone has delayed the publication of the TIA standard by almost a year. It turned out that increase of the frequency to 500 MHz increased the uncertainty of the pyramide Category 6 test method to an unacceptably high level. In connection with critical NEXT requirements it made it necessary to develop a completely new test method. This was done as the last step of the Category 6A specification and does revolutionise the connecting hardware testing.

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The new test method uses a re-embedding technology, which has both benefits and draw backs. A major simplification is that only one single plug and no pyramide is needed to carry out the measurements. Instead of actually inserting the many different high, low and medium level test plugs in the connector under test, one just calculates performance using the vectors of these plugs by software calculations (re-embedding).

The draw back is the complexity of the test method. 3P believes that understanding the details of the testing is quite difficult and first time testing will require engineering skills. However, it will probably be a fast and easy connecting hardware testing once the understanding is there and the first testing has been sucessfully concluded.

3P also believes that **future Category 6 connecting hardware testing** will also be conducted according to the "re-embedding" method. This is actually also recommended by TIA.

The present 3P Newsletter does not intend to discuss the details of the testing because this would not be possible in a reasonable number of pages. Instead the annexes G and H of ANSI/TIA/EIA-568-B.2-10 should be studied in detail.

Only a couple of points should be mentioned and are based on 3P's present experience:

1. The Salsa plug test solution is recommended by 3P (alternative to conventional, wired plug test solution - see ANSI/TIA/EIA-568-B.2-10). 3P believes that this type of test plug will become de-facto industry standard as it will give more consistent connecting hardware results which may be 2 - 3 times better uncertainty of the measurements (which may be crucial as limits will often only be passed by a very small margin due to the demanding limits).
2. The Salsa plug solution can be purchased from SMP together with the plug vectors on a CD. This should make testing very much easier as measurement of the plug vectors is then not necessary.
3. 3P strongly recommends that comparative testing of a certain connector with other testing laboratories is conducted and successfully concluded before your testing results are trusted.

It can be informed that 3P has selected the Salsa plug solution to get the low uncertainty of our measurements. We also intend to apply the re-embedding test method for Category 6 connecting hardware measurements to have the low state of the art measurement precision. However, the old pyramide type of testing will be maintained until our comparative study of the re-embedding and pyramide test methods has been concluded.

2. Technical Challenge - Alien Crosstalk of Unscreened Cables

Alien crosstalk is only a problem for unscreened cables as screened cables are protected from outside noise by the screen. Normally alien crosstalk is less of a problem for connecting hardware, but has of course to be verified for each individual combination of connector and panel/face plate. Alien crosstalk of patch cords is related to the cable used for the patch cord. This means that when this cable passes alien crosstalk requirements then the patch cord will pass requirements.

The technical challenge with respect to alien crosstalk concerns both the development at the cable producer to reduce alien crosstalk of the unscreened cable and the standardisation of the test method.

In ANSI/TIA/EIA-568-B.2-10 the test method has been specified as packing six disturbing cables around the victim cable and with strapping of the cable bundle every 20 cm to hold the cables together. This "6-around-1" test method may not always secure that the cables are held closely together throughout the entire length of the cable bundle. Therefore 3P has some concern that this test method may give too varying results depending on the arrangement of the cable bundle and actual tensions in the cable. A wrapping of the cable with a binder will secure that the cables are always held together and will provide more consistent results.

International standardisation also considers this and similar solutions to the problem of holding cables together.

3. Status of International Standardisation

As stated in the first lines of this 3P Newsletter, ANSI/TIA/EIA-568-B.2-10 is the first finished Category 6A standard. However, activities are in rapid progress in all relevant international committees as described below.

Names:

TIA/EIA identifies both cabling and components by "Category 6A", while a different identification is used by international committees. Both ISO/IEC, IEC and CENELEC use the name Class E_A for permanent links and channels and Category 6_A for components.

International activities:

ISO/IEC has decided to issue two different Class E_A/Category 6_A specifications, i.e. one for channels and one for permanent links and components. The channel specification has been agreed and will soon be published as Amendment 1 to 2ND edition ISO/IEC 11801, while the permanent link and component standard is still in discussion and I believe that it might not be published before 2010.

The ISO/IEC channel requirements for NEXT are significantly more demanding than the TIA/EIA limit.

The last meeting was in Spain in February and the next meeting will be in France in October, where I hope we can gain more progress with the permanent link and component requirements. (3P actively participates in this standardisation committee).

CENELEC cabling standard activities have wisely awaited the ISO/IEC developments and are now in progress. These will also be split in a channel and a permanent link & component document. Their publications will depend on the progress of the ISO/IEC standardisation.

The last meeting was in Germany in January and the next meeting will be in Belgium in April. (3P actively participates in this standardisation committee).

IEC cable standard activities are in progress with published and draft standards containing mature requirements (except for impedance which is unfortunately also wrongly specified in the published standard). These specifications are draft 2ND edition IEC 61156-5 (solid Cat. 5e, Cat. 6, Cat. 6_A, Cat. 7 and Cat. 7_A cables) and 2ND edition IEC 61156-6 (stranded Cat. 5e, Cat. 6, Cat. 6_A, Cat. 7 and Cat. 7_A cables).

The last meeting was in Italy in December and the next meeting will be in USA in May. (3P actively participates in this standardisation committee).

IEC connector standard activities are in progress and I expect that a standard containing requirements corresponding with the TIA/EIA specification will be published in approx. one year.

The last meeting was in the Czech Republic in October and the next meeting will be in Belgium in April. (3P actively participates in this standardisation committee).

IEC patch cord and field testing activities are in their final stage with expected publication of standards later this year. I will especially point out the coming field test standard which contains useful information about field testing of alien crosstalk of installations. Here it is 3P's experience that the selection of ports/outlets for alien crosstalk testing is the biggest problem, not the testing itself. The coming document, 3RD edition IEC 61935-1, contains very practical directions on how to make this selection.

The last meeting was in USA in July (sub-meeting in Barcelona in February). (3P actively participates in this standardisation committee).

CENELEC cable standard activities are in progress with discussion of alternative alien crosstalk test methods and the last details of the standards.

The last meeting was in Germany in March and the next meeting will be in Belgium in April. (3P actively participates in this standardisation committee).

Yours sincerely,
3P Third Party Testing

A handwritten signature in blue ink, appearing to read "Poul Villien".

Poul Villien