AS/NZS 3087:2000
IEC 61935-1:2000

Australian/New Zealand Standard™

Telecommunications installations—Generic cabling systems—Specification for the testing of balanced communication cabling in accordance with values set out in AS/NZS 3080:2000

[IEC title: Generic cabling systems—Specification for the testing of balanced communication cabling in accordance with ISO/IEC 11801, Part 1: Installed cabling]

Standards Australia
STANDARDS NEW ZEALAND

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee CT-001, Communications Cabling. It was approved on behalf of the Council of Standards Australia on 5 December 2000 and on behalf of the Council of Standards New Zealand on 17 November 2000. It was published on 20 December 2000.

The following interests are represented on Committee CT-001:

Australian Chamber of Commerce and Industry
Australian Communications Authority
Australian Communications Industry Forum
Australian Electrical and Electronic Manufacturers Association
Australian Information Industry Association
Australian Telecommunications Users Group
BICSI Australia
Cable & Wireless Optus
Electrical Compliance Testing Association
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Australian/New Zealand Standard™

Telecommunications installations—Generic cabling systems—Specification for the testing of balanced communication cabling in accordance with values set out in AS/NZS 3080:2000

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PREFACE

This Australian/New Zealand Standard AS/NZS 3087 was prepared by the Joint Standards Australia/Standards New Zealand Committee CT-001, Communications Cabling.

This Standard is identical with and has been reproduced from IEC 61935-1:2000, *Generic cabling systems—Specification for the testing of balanced communication cabling in accordance with ISO/IEC 11801*, Part 1: *Installed cabling*.

The objective of the Standard is to reference measurement procedures for cabling parameters and the requirements for field tester accuracy to measure cabling parameters identified in AS/NZS 3080:2000.

This Standard is essentially split up into five sections or ‘Clauses’. It was developed to be read and used in conjunction with AS/NZS 3080:2000 (ISO/IEC 11801 Ed. 1.2).

The Foreword and Preface together with Chapters 1 through 3, provide a broad overview of the origins, content, scope and definitions contained within the document.

Clause 4 on reference measurements and properties sets out what tests should be carried out and describes the laboratory equipment and techniques required to conduct same, along with references to the relevant required parameter values as contained in AS/NZS 3080:2000 (ISO/IEC 11801 Ed. 1.2).

These ‘laboratory’ test arrangements however, are impractical to carry out in an actual cabling plant installation, located in say a high rise building or sprawling campus area. These test sites often effectively encompass many hectares in anything but laboratory-like conditions.

Clause 5 on Field Testing then, will be the focus of most users of this document. It sets out the cabling configurations and parameters to be tested using ‘field testers’. It specifies the tests, both simple and complex, which are required to obtain go/no go measurements based on the values for these parameters set out in AS/NZS 3080:2000.

Clause 5 also sets out test result reporting requirements and techniques which can be used with ‘Field’ (usually hand-held) Testers to ensure consistency and repeatability of the tests being undertaken, and their subsequent traceability back to the measurements obtained in the laboratory if required.

Clause 6 completes the document with specifications of the required performance of these field testers to meet the specified levels of accuracy up to and including Level IIe.

Level IIe is where the uncertainty area of the test results is small enough to enable the performance of revised Class D (or Cat 5e) links to be confidently gauged.

Chapter 6 also sets out ways to go about measuring the testers and their associated test adapters own error contributions to the values as measured.

It concludes by specifying models of these errors and shows how the same laboratory equipment/ techniques described in Clause 4 can be used to gauge the absolute amounts of these errors.

Test personnel should acquaint themselves with the relative age/level of accuracy of the tester being used. This current edition of the Standard specifies tests to Level IIe.

Tests to Level IIe permit accurate predictions of the degree of success of an installation to the new Class D as described in AS/NZS 3080:2000 using so-called Cat 5e components in most cases. They DO NOT enable accurate predictions to be made as to the relative degree of success which can be expected from Class E links (often wrongly called Cat 6).

Level III testing for Class E links will be described in the next edition of IEC 61935-1 due to be published early in 2001 in conjunction with ISO/IEC 11801:2001.

Companion AS/NZS 308x (IEC Standard 61935-2), on patch cords and their performance will also be available in 2001. It must be used where testing of manufactured patch cords in isolation is required (i.e. where they do not yet form part of an overall cabling installation).

These tests will ensure, in most cases, their suitability for connection as patch cords at the patch panel or fly leads at the workstation ends of a CHANNEL.

As this Standard is reproduced from an International Standard, the following applies:

(a) Its number does not appear on each page of text and its identity is shown only on the cover and title page.

(b) In the source text ‘this standard’ should read ‘this Australian/New Zealand Standard’.

(c) A full point should be substituted for a comma when referring to a decimal marker.

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FOREWORD

This Standard addresses post-installation performance measurements of balanced cabling plant designed in accordance with AS/NZS 3080.

Telecommunications cabling, once specified uniquely for each telecommunications application, has evolved into a generic cabling system. Telecommunications applications now use the AS/NZS 3080 cabling Standard to specify their cabling requirements.

Formerly, connectivity tests and visual inspection were deemed sufficient to verify a cabling installation. Today, users demand more comprehensive verification testing to validate that the link will support high-speed telecommunications applications that are designed to operate on the generic cabling system.

This Standard addresses user needs by providing a consistent solution targeted toward field tester vendors, system integrators and field test organizations involved in telecommunications cabling.

Transmission performance depends on cable characteristics, connecting hardware, patch cords and cross-connect wiring, the total number of connections, and the care with which they are installed and maintained.

The information contained in this Standard is related to the Channel and to the Permanent link as described in AS/NZS 3080.

Classes of copper cabling links described herein correspond exactly with link classifications found in AS/NZS 3080.

This Standard is an adoption, in its entirety, of an International Electrotechnical Commission (IEC) Standard.

The IEC is a world-wide organization for standardization comprising representatives from all national electrotechnical committees (IEC national Committees) including Australia.

IEC committees create International Standards on a diversity of subjects, including such things as electronic components and electrical test procedures.

As a signatory to the GATT International Trade Agreement, Australia is obliged to adopt such International Standards wherever possible and appropriate, providing no threat to security or safety would ensue.

In 1996, the International Organization for Standardisation (ISO), and the IEC, whilst completing work on the first edition of an international cabling Standard ISO/IEC 11801 requested that the IEC create a complementary testing Standard to be published in synchronism with ISO/IEC 11801.

IEC Sub-Committee 46A on Coaxial Cables (SC46A) was charged with the task of describing procedures and testing equipment attributes required to test generic cabling systems against the parameter values specified in ISO 11801 Edition 1 (and more recently against Edition 1.2, published February 2000).

An Australian representative contributed to the majority of the committee meetings in which this Standard was produced.

Other national test Standards, **similarly** based on this International Standard, have subsequently been produced, by other countries whose representatives also took part in the formulation of IEC 61935-1.

Adoption of AS/NZS 3080:2000 and now AS/NZS 3087 will give Australian and New Zealand installers and users of generic cabling systems a clear set of guidelines as to the nature and performance required of components which go to make up a generic cabling system and the subsequent testing and certification of such a system.

Previously, AS/NZS Handbook 27 (HB 27) *Handbook for field testing of balanced cable installations* (based on the ANSI TIA/EIA TSB 67) was issued on an interim basis to cover the testing of these systems whilst 61935-1 was being completed. With the publication of the AS/NZS 308X series, HB 27 is no longer current and should NO LONGER be used.

The tables/diagrams/values referred to in this test Standard are those contained in companion document ISO/IEC 11801 Edition 1.2 and thus AS/NZS 3080:2000 should be read in conjunction with this Standard.

INTRODUCTION

Telecommunication cabling, once specified uniquely by each telecommunications application, has evolved into a generic cabling system. Telecommunications applications now use the ISO/IEC 11801 cabling Standard to meet their cabling requirements. Formerly, connectivity tests and visual inspection were deemed sufficient to verify a cabling installation. Now, users need more comprehensive testing in order to ensure that the link will support telecommunications applications that are designed to operate on the generic cabling system. This part of IEC 61935 addresses reference laboratory and field test methods, and provides a comparison of these methods.

Transmission performance depends on cable characteristics, connecting hardware, patch cords and cross-connect cabling, on the total number of connections and the care with which they are installed and maintained. This Standard provides test methods for installed cabling and pre-fabricated cable assemblies. These test methods, where appropriate, are based on those used for components of the cable assembly.

This part 1 contains the test methods required for installed cabling. Part 2 contains the test methods required for patch cords and work area cables.

This Standard is organized as follows:

– reference laboratory measurement procedures are specified in Clause 4. In some cases, these procedures may be used in the field;

– descriptions and requirements for measurements in the field are specified in Clause 5;

– performance requirements for field testers and procedures to verify performance are specified in Clause 6.

NOTE 1 This Standard does not include tests that are normally performed on the cables and connectors separately. These tests are described in IEC 61156-1 and IEC 60603-7 respectively.

NOTE 2 Wherever possible, cables and connectors used in cable assemblies, even if they are not described in the series IEC 61156 or in IEC 60603-7 are tested separately according to the tests given in the relevant generic specification. In this case, most of the environmental and mechanical tests described in this Standard may be omitted.

NOTE 3 Users of this Standard are advised to consult with applications standards, equipment manufacturers and system integrators to determine the suitability of these requirements for specific networking applications.

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Any IEC table, figure or passage of text that is struck-through is not part of this Standard. Any Australian/New Zealand table, figure or passage of text that is added (and identified by shading) is part of this Standard.

1 Scope

This part of IEC 61935 specifies reference measurement procedures for cabling parameters and the requirements for field tester accuracy to measure cabling parameters identified in ISO/IEC 11801. References in this Standard to ISO/IEC 11801 mean ISO/IEC 11801 or equivalent cabling Standards.

This Standard applies when the cable assemblies are constructed of cables complying with IEC 61156-1, IEC 61156-2, IEC 61156-3 or IEC 61156-4, and of connecting hardware as specified in IEC 60603-7 or IEC 60807-8. In the case where cables and/or connectors do not comply with these standards, then additional tests may be required.

This Standard relates to performance with respect to 100 Ω, 120 Ω or 150 Ω cabling.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 61935. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of IEC 61935 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 60169-16*, Radio-frequency connectors – Part 16: R.F. coaxial connectors with inner diameter of outer conductor 7 mm (0,276 in) with screw coupling – Characteristic impedance 50 ohms (75 ohms) (type N)*

IEC 60169-22*, Radio-frequency connectors – Part 22: RF two-pole bayonet coupled connectors for use with shielded balanced cables having twin inner conductors (type BNO)*

IEC 60603-7:1996*, Connectors for frequencies below 3 MHz for use with printed boards – Part 7: Detail specification for connectors, 8-way, including fixed and free connectors with common mating features, with assessed quality*

IEC 60807-8:1992*, Rectangular connectors for frequencies below 3 MHz – Part 8: Detail specification for connectors, four-signal contacts and earthing contacts for cable screen*

IEC 61156-1:1994*, Multicore and symmetrical pair/quad cables for digital communications – Part 1: Generic specification*