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SPECIFICATION

IEC PAS 61935-2-20

Pre-Standard

First edition
2007-05

Generic cabling systems – Specification for the testing of balanced communication cabling in accordance with ISO/IEC 11801 –

Part 2-20: Work area cord for class D applications – Blank detail specification

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GENERIC CABLING SYSTEMS – SPECIFICATION FOR THE TESTING OF BALANCED COMMUNICATION CABLING IN ACCORDANCE WITH ISO/IEC 11801 –

Part 2-20: Work area cord for class D applications – Blank detail specification

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IEC-PAS 61935-2-20 has been processed by IEC technical committee 46: Cables, wires, waveguides, r.f. connectors, r.f. and microwave passive components and accessories.

The text of this PAS is based on the following document:	This PAS was approved for publication by the P-members of the committee concerned as indicated in the following document:
Draft PAS	**Report on voting**
46/180/NP	46/195/RVN

Following publication of this PAS, which is a pre-standard publication, the technical committee or subcommittee concerned will transform it into an International Standard.

This PAS shall remain valid for an initial maximum period of three years starting from 2007-05. The validity may be extended for a single three-year period, following which it shall be revised to become another type of normative document or shall be withdrawn.

GENERIC CABLING SYSTEMS – SPECIFICATION FOR THE TESTING OF BALANCED COMMUNICATION CABLING IN ACCORDANCE WITH ISO/IEC 11801 –

Part 2-20: Work area cord for class D applications – Blank detail specification

1 Scope

This PAS is a blank detail specification describing work area cord for class D applications, as defined in ISO/IEC 11801 as well as in ISO/IEC 24702.

This specification should be used in conjunction with IEC 61156-1 and IEC 61156-6 and IEC 60603-7-2 and IEC 60603-7-3. The blank detail specification determines the layout and style for detail specifications describing symmetrical pair/quad cables with transmission characteristics up to 100 MHz for digital communications. Detail specifications, based on the blank detail specification, may be prepared by a national organization, a manufacturer, or a user.

The designation "Category 5e" is used herein to describe an enhanced Category 5 cable (see Clause 1 of IEC 61156-6).

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60603-7-2, *Connectors for electronic equipment – Part 7-2: Detail specification for 8-way, unshielded, free and fixed connectors, for data transmissions with frequencies up to 100 MHz*

IEC/PAS 60603-7-3, *Connectors for electronic equipment – Part 7-3: Detail specification for 8-way, shielded, free and fixed connectors, for data transmissions with frequencies up to 100 MHz*

IEC 60794-1-1, *Optical fibre cables – Part 1-1: Generic – General*

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

IEC 61156-6, *Multicore and symmetrical pair/quad cables for digital communications – Part 6: Symmetrical pair/quad cables with transmission characteristics up to 600 MHz – Work area wiring – Sectional specification*

IEC 61935-2, *Testing of balance communication cabling in accordance with ISO/IEC 11801 – Part 2: Patch cords and work area cords*

ISO/IEC 11801, *Information technology – Generic cabling for customer premises*

ISO/IEC 24702, *Information technology — Generic cabling — Industrial premises*

EN 50289-1-13, *Communication cables – Specification for test methods – Part 1-13: Electrical test methods – Coupling attenuation or screening attenuation of patch cords/coaxial cable assemblies/pre-connectorised cables*

3 Guidance for preparation of detail specifications

It is necessary to keep the transmission characteristics indicated in the relevant sectional specification for the referenced category number, i.e. 5e, and the characteristic impedance.

The detail specification shall be written in accordance with the layout of the blank detail specification, which forms part of this standard.

NOTE 1 When a characteristic does not apply, then NA (for not applicable) should be entered in the appropriate space.

NOTE 2 When a characteristic applies but a specific value is not considered necessary, then NS (for not specified) should be entered in the appropriate space. When NS is used, the appropriate requirement in the sectional specification should apply.

The numbers shown in brackets in this and the following pages correspond to the following items of required information, which should be entered in the spaces provided.

[1] Name and address of the organization that has prepared the document.

[2] IEC document number, issue number and date of issue.

[3] Address of the organization from which the document is available.

[4] Related documents.

[5] Any other reference to the cable, national reference, trade name, etc.

[6] A complete description of the cable which shall include

a) type and number of elements;
b) nominal impedance;
c) screening;
d) application;
e) category;
f) other distinguishing performance characteristics.

Example: 4-pair, unshielded twisted pair cable for use in work area wiring, having a nominal impedance of 100 Ω, and meeting the transmission requirements of Category 5e and the coupling attenuation requirements of Type III.

[7] Details of the cable material and construction.

[8] Special requirements for bending radius or operating temperatures.

[9] List of cable characteristics. They are separated into electrical, transmission, mechanical and environmental characteristics.

The recommended environmental severities are derived from the MICE table requirements of ISO/IEC 24702. These recommendations were made to better reflect the cable behaviour.

It should be noted that ingress requirements using particles is not applicable to a cable.

The temperature requirements are addressed in [8]. Rapid change of temperature is irrelevant for cables.

Electromagnetic requirements coming from the MICE table of ISO/IEC 24702 have been dealt with by using the requirements that are given for transfer impedance, screening attenuation and coupling attenuation. ESD requirements are considered non-applicable

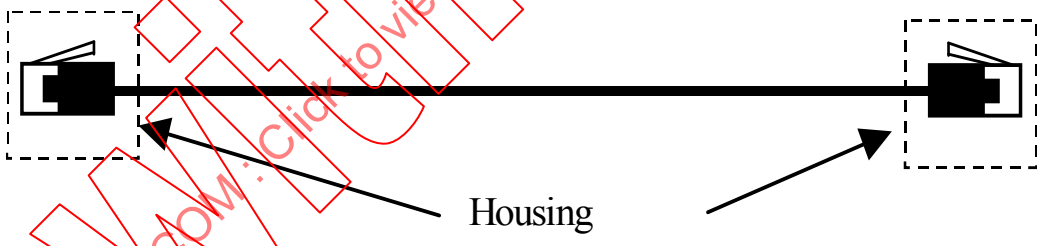
[10] Appropriate subclause references in the generic specification IEC 61156-1 and in IEC 61935-2.

[11] Appropriate subclause references in the sectional specification IEC 61156-6 and in IEC 61935-2.

[12] Requirements applicable to this cable. The values shall meet the requirements of sectional specification IEC 61156-6 for category 5e.

[13] Comments – Relevant remarks.

4 Blank detail specification for work area cord for class D applications

[1] Prepared by:	[2] Document: Issue: Date:
[3] Available from:	[4] Generic specification: IEC Sectional specification: IEC 61935-2 Blank detail specification: IEC 61935-2-20
[5] Additional references: ISO/IEC 11801	
[6] Cord description: a) Category b) Nominal impedance c) Connector type d) Cable e) Screening f) Housing g) MICE	
[7] Cable assembly construction:  	

IEC 61935-2, 4.1	IEC 61156-1	IEC 61156-6		
	2.2.10	2.2.10	Sheath Material Nominal thickness[b]	
	2.2.11	2.2.11	Colour Maximum overall Diameter	
	2.2.12	2.2.12	Marking	
	2.2.13	2.2.13	Packaging:	
Visual inspection	IEC 61935-2,5.1			

[8]

Minimum bending radius for static bending: mm

Minimum bending radius for dynamic bending: mm

Temperature range for installation °C

Operating temperature range under static conditions: -10 °C to +60°C (C1), -25 °C to +70°C (C2), -40 °C to +70°C (C2)[c]

[9] Characteristics	[10] IEC 61156-1 subclause	[11] IEC 61156-6 subclause	[12] Recommended severities/requirements			[13] Comments
Electrical characteristics	**3.2**	**3.2**				
Conductor resistance	3.2.1	3.2.1	Met by design			
Resistance unbalance	3.2.2	3.2.2	Met by design			
Wire map	IEC 61935-2, 5.2					
Transmission characteristics	**3.3**	**3.3**				
Propagation delay	[a]	IEC 61935-2, 5.3	Met by design			
Differential phase delay (skew)	[a]	IEC 61935-2, 5.4	Met by design			
Insertion loss		IEC 61935-2, 5.5	≤ … dB			
Near-end crosstalk (pair to pair)	3.3.4	IEC 61935-2, 5.7	≥ … dB			
Return loss		IEC 61935-2, 5.6	≥ … dB			
Screening attenuation (EN 50289-1-13)	[a]	3.3.9	NA	≥ 40 dB	≥ 60 dB	
Transfer impedance	3.2.7	3.2.7	NA	Grade 2	Grade 1	
Coupling attenuation	IEC 61935-2, 6.8	3.3.10	Type III	Type II	Type I	
Mechanical and dimensional characteristics	**3.4**	**3.4**				
Tensile performance of the cord		IEC 61935-2, 6.2	≥ …N			
Flexure		IEC 61935-2, 5.3				
Bending		IEC 61935-2, 6.4	≥ …			
Twisting		IEC 61935-2, 6.5				
Crushing		IEC 61935-2, 6.6	700 N	1 100 N	2 200 N	[c, d]
Dust test		IEC 61935-2, 6.7	2 cycles	10 cycles	20 cycles	
Impact test of the cable	3.4.7	3.4.7	NA	10 J	20 J	[c]
Shock	IEC 62012	3.4.4	NA	15g / 11ms	50g / 11ms	[c]
Bump	IEC 62012	3.4.3	NA	15g / 11ms	50g / 11ms	[c]
Vibration	IEC 62012	3.4.2	NA	10-500 Hz with 10g	10-2000 Hz with 20g,	[c]
Water immersion	IEC 60794-1-1		NA	1m/12h	1m/12h	[i]
Damp heat steady state	IEC 62012	3.5.2	NA	60/90/10	60/90/56	[C, e, f]
Solar radiation	UC		NA	UC	UC	
Solvents and contaminating fluids	IEC 62012	3.6.1	NA	NA	[a]	[g]
Salt mist and sulphur dioxide tests	IEC 62012	3.6.2	NA	NA	4 days	[h]
Climatic sequence		IEC 61935-2, 6.9	-10 °C to +60°C	-25 °C to +70°C	-40 °C to +70°C	

Environmental characteristics	**3.5**	**3.5**		
Cold bend test of cable	3.5.7	33.5.7		
Heat shock test	3.5.8	3.5.8		
Flame propagation of a single cable	3.5.9	3.5.9		

UC: Under consideration.

NA: Not applicable.

[a] Not specified in IEC 61156-1.

[b] Not specified in IEC 61156-1. Instead, a requirement for tensile strength of insulation is specified.

[c] The proposed severities are taken from the environmental description of ISO/IEC 24702, MICE table. Depending upon the actual need of the end-user, other severities may be agreed between customer and manufacturer.

[d] The lowest severity is expected to be met by design. Testing is not required.

[e] The temperature to be used for this test shall be chosen according to the highest specified [8] operating temperature

[f] This test is assumed to demonstrate the compliance of a cable that meets the humidity requirements of the MICE table of ISO/IEC 24702.

[g] This test is assumed to demonstrate the compliance of a cable that meets the liquid pollution requirements of the MICE table of ISO/IEC 24702.

[h] This test is assumed to demonstrate the compliance of a cable that meets the gazeous pollution requirements of the MICE table of ISO/IEC 24702.

[i] This test is under consideration.