

SLOVENSKI STANDARD SIST EN 50441-4:2012

01-maj-2012

Kabli za notranjo stanovanjsko telekomunikacijsko montažo - 4. del: Kabli za frekvence do 1200 MHz - 4. stopnja

Cables for indoor residential telecommunication installations - Part 4: Cables up to 1 200 MHz - Grade 4

Innenkabel für Telekommunikationseinrichtungen im Wohnbereich - Teil 4: Kabel bis 1 200 MHz - Klasse 4 **iTeh STANDARD PREVIEW**

Câbles pour les installations résidentielles de télécommunications en intérieur - Partie 4: Câbles jusqu'à 1 200 MHz - Classe 4_{SIST EN 50441-4:2012}

https://standards.iteh.ai/catalog/standards/sist/b117e277-0a51-4654-af10-

Ta slovenski standard je istoveten z: EN 50441-4-2012

ICS:

33.120.10 Koaksialni kabli. Valovodi Coaxial cables. Waveguides

SIST EN 50441-4:2012 en

SIST EN 50441-4:2012

iTeh STANDARD PREVIEW (standards.iteh.ai)

<u>SIST EN 50441-4:2012</u> https://standards.iteh.ai/catalog/standards/sist/b117e277-0a51-4654-af10-f23c2d036d8c/sist-en-50441-4-2012 **EUROPEAN STANDARD**

EN 50441-4

NORME EUROPÉENNE EUROPÄISCHE NORM

March 2012

ICS 33.120.10

English version

Cables for indoor residential telecommunication installations Part 4: Cables up to 1 200 MHz Grade 3

Câbles pour les installations résidentielles de télécommunications en intérieur - Partie 4: Câbles jusqu'à 1 200 MHz - Classe 3

Innenkabel für Telekommunikationseinrichtungen im Wohnbereich -Teil 4: Kabel bis 1 200 MHz -Klasse 3

iTeh STANDARD PREVIEW (standards.iteh.ai)

This European Standard was approved by CENELEC on 2012-01-23. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. 50441-4-2012

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization Comité Européen de Normalisation Electrotechnique Europäisches Komitee für Elektrotechnische Normung

Management Centre: Avenue Marnix 17, B - 1000 Brussels

Contents

1 Scope
3 Quality control
3 Quality control
4 Cable construction 5 4.1 Conductors 5 4.2 Insulation 5 4.3 Cable element 6 4.4 Screening of the cable element 6 4.5 Cabling 6 4.6 Spare pairs 6 4.7 Colour code 6 4.8 Screening and wrapping of the core 6 4.9 Sheath 6 4.10 Ripcord 6 4.11 Overall diameter 7 4.12 Identification 7 4.13 Delivery length 7 5 Mechanical requirements 8 5.1 Conductor 8 5.2 Insulation 10 5.2 Insulation 10 5.3 Sheath 8 5.4 Finished cable (standards.itch.add.ta/2012 6 Environmental and climatic requirements 10 6.1 Insulation SISTEN.50441.4.2012 6.2 Sheath Jupings/standards/standards/standards/standards/standards/standards/standards/standards/standards/standards/standards/standards/standards/standards/standards/standards/standards/standards/standards/standards/standards/standards/standards/standards/standards/standards/standards/standards/standards/standards/standards/standards/standards/standards/standards/standards/standards/standards/s
4.1 Conductors 5 4.2 Insulation 5 4.3 Cable element 6 4.4 Screening of the cable element 6 4.5 Cabling 6 4.6 Spare pairs 6 4.7 Colour code 6 4.8 Screening and wrapping of the core 6 4.9 Sheath 6 4.10 Ripcord 6 4.11 Overall diameter 7 4.12 Identification 7 4.13 Delivery length 7 5 Mechanical requirements 8 5.1 Conductor 8 5.2 Insulation Insulation 8 5.3 Sheath 8 5.4 Finished cable (standards,itch,ablicate,ablicate,ablicate,ablicate,ablicate,ablicate,ablicate,ablicate,ablicate,ablicate,ablicate,ablicate,ablicate,ablicate,ablicate,ablicate,ablicate,ablicate,ablicate,ablicate,ablicate,ablicate,ablicate,ablicate,ablicate,ablicate,ablicate,ablicate,ablicate,ablicate,ablicate,ablicate,ablicate,ablicate,ablicate,ablicate,ablicate,ablicate,ablicate,ablicate,ablicate,ablicate,ablicate,ablicate,ablicate,ablicate,ablicate,ablicate,ablicate,ablicate,ablicate,ablicate,ablicate,ablica
4.2 Insulation 5 4.3 Cable element 6 4.4 Screening of the cable element 6 4.5 Cabling 6 4.6 Spare pairs 6 4.7 Colour code 6 4.8 Screening and wrapping of the core 6 4.9 Sheath 6 4.10 Ripcord 6 4.11 Overall diameter 7 4.12 Identification 7 4.13 Delivery length 7 5 Mechanical requirements 8 5.1 Conductor 8 5.2 Insulation Insulation 8 5.3 Sheath 8 5.4 Finished cable (standards.iteh.air.air.air.air.air.air.air.air.air.air
4.3 Cable element 6 4.4 Screening of the cable element 6 4.5 Cabling 6 4.6 Spare pairs 6 4.7 Colour code 6 4.8 Screening and wrapping of the core 6 4.9 Sheath 6 4.10 Ripcord 6 4.11 Overall diameter 7 4.12 Identification 7 4.13 Delivery length 7 5 Mechanical requirements 8 5.1 Conductor 8 5.2 Insulation Insulation 8 5.3 Sheath 8 5.4 Finished cable (\$tandards.iteh.a/catalog/standards/stahl.1/2012 10 6.1 Insulation SISTEN 50441.4.2012 10 6.2 Sheath .bttps://standards.iteh.a/catalog/standards/stahl.1/2017.0.51.4654.af00 10 6.3 Fire behaviour 03c2d03dds/standards/stahl.1/2017.0.51.4654.af00 11 7.1 General 11 7.2 Conductor resistance 11
4.4 Screening of the cable element 6 4.5 Cabling 6 4.6 Spare pairs 6 4.7 Colour code 6 4.8 Screening and wrapping of the core 6 4.9 Sheath 6 4.10 Ripcord 6 4.11 Overall diameter 7 4.12 Identification 7 4.13 Delivery length 7 5 Mechanical requirements 8 5.1 Conductor 8 5.2 Insulation Insulation Insulation 5.3 Sheath 8 5.4 Finished cable (standards/iteh/a) 8 5.3 Sheath 8 5.4 Finished cable (standards/iteh/a) 10 6.1 Insulation SISTEN SO44LA2012 10 6.2 Sheath Litps://standards/iteh/a/2012 10 6.2 Sheath Litps://standards/iteh/a/2012 11 7 Electrical requirements 11 7.1
4.5 Cabling
4.6 Spare pairs 6 4.7 Colour code 6 4.8 Screening and wrapping of the core 6 4.9 Sheath 6 4.10 Ripcord 6 4.11 Overall diameter 7 4.12 Identification 7 4.13 Delivery length 7 5 Mechanical requirements 8 5.1 Conductor 8 5.2 Insulation Insulation 8 5.3 Sheath 8 5.4 Finished cable (standards.itch.arctistich.late.late.late.late.late.late.late.late
4.7 Colour code 6 4.8 Screening and wrapping of the core 6 4.9 Sheath 6 4.10 Ripcord 6 4.11 Overall diameter .7 4.12 Identification .7 4.13 Delivery length .7 5 Mechanical requirements .8 5.1 Conductor .8 5.2 Insulation Feb. STANDARD PREVIEW .8 5.3 Sheath 8 5.4 Finished cable (standards.iteha.cate) 1 6.1 Insulation SISTEN.50441.4.2012 10 6.2 Sheath bitps://standards.iteha/catalog/standards/sist/h117e277.0a51.4654.afi0. 10 6.3 Fire behaviour 23c2d03d38c/sist.os.50441.4.2012 11 7 Electrical requirements 11 7.1 General 11 7.2 Conductor resistance 11 7.3 Dielectric strength and capacitance 11 7.5 High frequency characteristics 11
4.9 Sheath 6 4.10 Ripcord 6 4.11 Overall diameter 7 4.12 Identification 7 4.13 Delivery length 7 5 Mechanical requirements 8 5.1 Conductor 8 5.2 Insulation ITCH STANDARD PREVIEW 8 5.3 Sheath 8 5.4 Finished cable (standards.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.itch.aics.i
4.10 Ripcord 6 4.11 Overall diameter 7 4.12 Identification 7 4.13 Delivery length 7 5 Mechanical requirements 8 5.1 Conductor 8 5.2 Insulation i.Teh STANDARD PREVIEW 8 5.3 Sheath 8 5.4 Finished cable (standards.iteh.ai) 8 6 Environmental and climatic requirements 10 6.1 Insulation SISTEN 50441.4:2012 10 6.2 Sheath 10 6.3 Fire behaviour 03c2d036d8e/stat on 50441.4:2012 11 7 Electrical requirements 11 7.1 General 11 7.2 Conductor resistance 11 7.3 Dielectric strength and capacitance 11 7.4 Insulation resistance 11 7.5 High frequency characteristics 11 7.6 Electromagnetic behaviour 14 7.7 Unbalance attenuation 14 7.8 Environmental and safety aspects 14 Bibliography 15
4.11 Overall diameter 7 4.12 Identification 7 4.13 Delivery length 7 5 Mechanical requirements 8 5.1 Conductor 8 5.2 Insulation 8 5.3 Sheath 8 5.4 Finished cable (standards,iteh,ai) 6 Environmental and climatic requirements 10 6.1 Insulation SISTEN 50441,4:2012 6.2 Sheath 10 6.3 Fire behaviour 03c2d036d8e/sist on 50441,4:2012 7 Electrical requirements 10 7.1 General 11 7.2 Conductor resistance 11 7.3 Dielectric strength and capacitance 11 7.4 Insulation resistance 11 7.5 High frequency characteristics 11 7.6 Electromagnetic behaviour 14 7.7 Unbalance attenuation 14 7.8 Environmental and safety aspects 14 Bibliography 15
4.12 Identification 7 4.13 Delivery length 7 5 Mechanical requirements 8 5.1 Conductor 8 5.2 Insulation 3. Teh. STANDARD PREVIEW 8 5.3 Sheath 8 5.4 Finished cable (standards iteh.aic 6 Environmental and climatic requirements 10 6.1 Insulation SISTEN 50441.4.2012 10 6.2 Sheath latips://standards.idehai/catalog/standards/sist/b1.17e277.0a51.4654.aft.0 10 6.3 Fire behaviour 23c2d036d8c/sist on 50441.4.2012 11 7 Electrical requirements 11 7.1 General 11 7.2 Conductor resistance 11 7.3 Dielectric strength and capacitance 11 7.4 Insulation resistance 11 7.5 High frequency characteristics 11 7.6 Electromagnetic behaviour 14 7.7 Unbalance attenuation 14 7.8 Environmental and safety aspects 14 Bibliography 15
4.13 Delivery length 7 Mechanical requirements 8 5.1 Conductor 8 5.2 Insulation iTch STANDARD PREVIEW 8 5.3 Sheath 8 5.4 Finished cable (standards.itch.ai) 8 6 Environmental and climatic requirements 10 6.1 Insulation SISTEN 50441.4.2012 10 6.2 Sheath Littps://standards.itch.ai/catalog/standards/sist/b117e277-0a51.4654-af10 10 6.3 Fire behaviour 23e2d036d8c/sist-ep 50441.4.2012 11 7 Electrical requirements 11 7.1 General 11 7.2 Conductor resistance 11 7.3 Dielectric strength and capacitance 11 7.4 Insulation resistance 11 7.5 High frequency characteristics 11 7.6 Electromagnetic behaviour 14 7.7 Unbalance attenuation 14 7.8 Environmental and safety aspects 14 Bibliography 15
5 Mechanical requirements 8 5.1 Conductor 8 5.2 Insulation IFCH STANDARD PREVIEW 8 5.3 Sheath 8 5.4 Finished cable (standardsitehai) 8 6 Environmental and climatic requirements 10 6.1 Insulation SISTEN 50441.4.2012 10 6.2 Sheath bitps://standards.ich.ai/catalog/standards/sist/b117c277.0a51.4654.aft0 10 6.3 Fire behaviour £3c2d036d8c/sist.en.50441.4.2012 11 7 Electrical requirements 11 7.1 General 11 7.2 Conductor resistance 11 7.3 Dielectric strength and capacitance 11 7.4 Insulation resistance 11 7.5 High frequency characteristics 11 7.6 Electromagnetic behaviour 14 7.7 Unbalance attenuation 14 7.8 Environmental and safety aspects 14 Bibliography 15
5.1 Conductor 8 5.2 Insulation iTeh STANDARD PREVIEW 8 5.3 Sheath 8 5.4 Finished cable (standards.iteh.al/catalog/standards/sixteh.al/. 8 6 Environmental and climatic requirements 10 6.1 Insulation SISTEN 50441-4:2012 10 6.2 Sheath https://standards.iteh.al/catalog/standards/sixteh117e277.0a51-4654-af10 10 6.3 Fire behaviour 23c2d036d8c/sixten-50441-4-2012 11 7 Electrical requirements 11 7.1 General 11 11 7.2 Conductor resistance 11 11 7.3 Dielectric strength and capacitance 11 11 7.4 Insulation resistance 11 11 7.5 High frequency characteristics 11 11 7.6 Electromagnetic behaviour 14 14 7.7 Unbalance attenuation 14 14 7.8 Environmental and safety aspects 14 Bibliography 15
5.3 Sheath 8 5.4 Finished cable (standards.iteh.ai) 6 Environmental and climatic requirements 10 6.1 Insulation SISTEN 50441-4-2012 10 6.2 Sheathbrtps://standards.iteh.ai/catalog/standards/sist/b117e277-0a51-4654-af10. 10 6.3 Fire behaviour £23c2d036d8c/sist.en-50441-4-2012 11 7 General 11 7.1 General 11 7.2 Conductor resistance. 11 7.3 Dielectric strength and capacitance 11 7.4 Insulation resistance. 11 7.5 High frequency characteristics 11 7.6 Electromagnetic behaviour 14 7.7 Unbalance attenuation 14 7.8 Environmental and safety aspects 14 Bibliography 15
5.3 Sheath 8 5.4 Finished cable (standards.iteh.ai) 6 Environmental and climatic requirements 10 6.1 Insulation SISTEN 50441-4-2012 10 6.2 Sheathbrtps://standards.iteh.ai/catalog/standards/sist/b117e277-0a51-4654-af10. 10 6.3 Fire behaviour £23c2d036d8c/sist.en-50441-4-2012 11 7 General 11 7.1 General 11 7.2 Conductor resistance. 11 7.3 Dielectric strength and capacitance 11 7.4 Insulation resistance. 11 7.5 High frequency characteristics 11 7.6 Electromagnetic behaviour 14 7.7 Unbalance attenuation 14 7.8 Environmental and safety aspects 14 Bibliography 15
5.3 Sheath 8 5.4 Finished cable (standards.iteh.ai) 6 Environmental and climatic requirements 10 6.1 Insulation SISTEN 50441-4-2012 10 6.2 Sheathbrtps://standards.iteh.ai/catalog/standards/sist/b117e277-0a51-4654-af10. 10 6.3 Fire behaviour £23c2d036d8c/sist.en-50441-4-2012 11 7 General 11 7.1 General 11 7.2 Conductor resistance. 11 7.3 Dielectric strength and capacitance 11 7.4 Insulation resistance. 11 7.5 High frequency characteristics 11 7.6 Electromagnetic behaviour 14 7.7 Unbalance attenuation 14 7.8 Environmental and safety aspects 14 Bibliography 15
6 Environmental and climatic requirements 10 6.1 Insulation SISTEN 50441-4:2012 10 6.2 Sheathbitps://standards.itch.ai/catalog/standards/sist/b117e277-0a51-4654-af10 10 6.3 Fire behaviour 23e2d036d8c/sist-en-50441-4-2012 11 7 Electrical requirements 11 7.1 General 11 7.2 Conductor resistance 11 7.3 Dielectric strength and capacitance 11 7.4 Insulation resistance 11 7.5 High frequency characteristics 11 7.6 Electromagnetic behaviour 14 7.7 Unbalance attenuation 14 7.8 Environmental and safety aspects 14 Bibliography 15
6.1 Insulation SIST.FN 50441.4:2012 10 6.2 Sheath https://standards.itch.ai/catalog/standards/sist/b117e277.0a51.4654-af10. 10 6.3 Fire behaviour £23c2d036d8c/sist.en.50441.4-2012 11 7 Electrical requirements 11 7.1 General 11 7.2 Conductor resistance 11 7.3 Dielectric strength and capacitance 11 7.4 Insulation resistance 11 7.5 High frequency characteristics 11 7.6 Electromagnetic behaviour 14 7.7 Unbalance attenuation 14 7.8 Environmental and safety aspects 14 Bibliography 15
6.2 Sheath
6.3 Fire behaviour £3c2d036d8c/sist-en-50441-4-2012 11 7 Electrical requirements 11 7.1 General 11 7.2 Conductor resistance 11 7.3 Dielectric strength and capacitance 11 7.4 Insulation resistance 11 7.5 High frequency characteristics 11 7.6 Electromagnetic behaviour 14 7.7 Unbalance attenuation 14 7.8 Environmental and safety aspects 14 Bibliography 15
7 Electrical requirements 11 7.1 General 11 7.2 Conductor resistance 11 7.3 Dielectric strength and capacitance 11 7.4 Insulation resistance 11 7.5 High frequency characteristics 11 7.6 Electromagnetic behaviour 14 7.7 Unbalance attenuation 14 7.8 Environmental and safety aspects 14 Bibliography 15
7.1General117.2Conductor resistance117.3Dielectric strength and capacitance117.4Insulation resistance117.5High frequency characteristics117.6Electromagnetic behaviour147.7Unbalance attenuation147.8Environmental and safety aspects14Bibliography15
7.2Conductor resistance117.3Dielectric strength and capacitance117.4Insulation resistance117.5High frequency characteristics117.6Electromagnetic behaviour147.7Unbalance attenuation147.8Environmental and safety aspects14Bibliography15
7.3Dielectric strength and capacitance117.4Insulation resistance117.5High frequency characteristics117.6Electromagnetic behaviour147.7Unbalance attenuation147.8Environmental and safety aspects14Bibliography15
7.4Insulation resistance117.5High frequency characteristics117.6Electromagnetic behaviour147.7Unbalance attenuation147.8Environmental and safety aspects14Bibliography15
7.5 High frequency characteristics
7.6 Electromagnetic behaviour
7.7 Unbalance attenuation
7.8 Environmental and safety aspects
Bibliography15
Figures
Figure 1 – Test fixture9
Figure 2 – Installation test system
Tables
Table 1 – Recommended outer diameter of the sheath
Table 2 – Cable impedance
Table 2 – Cable Impedance
Table 4 – Maximum cable attenuation
Table 5 – Minimum PSNEXT
Table 6 – Minimum PSFI FFXT

Foreword

This document (EN 50441-4:2012) has been prepared by SC 46XC, "Multicore, multipair and quad data communication cables", of CLC/ TC 46X, "Communication cables".

The following dates are fixed:

•	latest date by which this document has to be implemented at national level by publication of an identical national	(dop)	2013-01-23
•	standard or by endorsement latest date by which the national standards conflicting with this document have to be withdrawn	(dow)	2015-01-23

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

This standard covers the Principle Elements of the Safety Objectives for Electrical Equipment Designed for Use within Certain Voltage Limits (LVD - 2006/95/EC).

iTeh STANDARD PREVIEW (standards.iteh.ai)

<u>SIST EN 50441-4:2012</u> https://standards.iteh.ai/catalog/standards/sist/b117e277-0a51-4654-afl0-f23c2d036d8c/sist-en-50441-4-2012

1 Scope

This European Standard specifies the constructional details and performance requirements for cables for installation in indoor residential cabling systems characterized up to 1 200 MHz. Cables in this European Standard are based on the common design rules specified in EN 50290-2-1 and are specifically intended for supporting ICT and BCT applications (telephone, computer and TV services) as specified in EN 50173-4.

The cables covered in this European Standard are intended to operate with voltages and currents normally encountered in communication systems. These cables are not intended to be used in conjunction with low impedance sources, for example, the electrical power supply of public utility mains.

Cables covered in this European Standard may however be subjected to voltages of not more than 300 V a.c or 450 V d.c and comply with the requirements of the Low Voltage Directive.

The maximum current rating per conductor is 3 A/mm² unless otherwise specified in the relevant detail specification.

2 Normative references

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

EN 50173-1	Information technology – Generic cabling systems - Part 1: General requirements
EN 50289-1-2	Communication cables – Specifications for test methods - Part 1-2: Electrical test methods – DC resistance
EN 50289-1-3	https://sCommunication.cablesderSpecifications for test methods – Part 1-3: Electrical test methods – Dielectric strength
EN 50289-1-4	Communication cables – Specifications for test methods – Part 1-4: Electrical test methods – Insulation resistance
EN 50289-1-6	Communication cables – Specifications for test methods – Part 1-6: Electrical test methods – Electromagnetic performance
EN 50289-1-7	Communication cables – Specifications for test methods – Part 1-7: Electrical test methods – Velocity of propagation
EN 50289-1-8	Communication cables – Specifications for test methods – Part 1-8: Electrical test methods – Attenuation
EN 50289-1-9	Communication cables – Specifications for test methods – Part 1-9: Electrical test methods – Unbalance attenuation (longitudinal conversion loss, longitudinal conversion transfer loss)
EN 50289-1-10	Communication cables – Specifications for test methods – Part 1-10: Electrical test methods – Crosstalk
EN 50289-1-11	Communication cables – Specifications for test methods – Part 1-11: Electrical test methods – Characteristic impedance, input impedance, return loss
EN 50289-3-7	Communication cables – Specifications for test methods – Part 3-7: Mechanical test methods – Abrasion resistance of the cable sheath
EN 50289-3-9	Communication cables – Specifications for test methods – Part 3-9: Mechanical test methods – Bending tests
EN 50289-3-17	Communication cables – Specifications for test methods – Part 3-17: Mechanical test methods – Adhesion of dielectric and sheath

EN 50290-2-1:2005	Communication cables – Part 2-1: Common design rules and construction
EN 50290-2-22	Communication cables – Part 2-22: Common design rules and construction – PVC sheathing compounds
EN 50290-2-23	Communication cables – Part 2-23: Common design rules and construction – PE insulation
EN 50290-2-27	Communication cables – Part 2-27: Common design rules and construction – Halogen free flame retardant thermoplastic sheathing compounds
EN 60332-1-2	Tests on electric and optical fibre cables under fire conditions – Part 1-2: Test for vertical flame propagation for a single insulated wire or cable – Procedure for 1 kW pre-mixed flame (IEC 60332-1-2)
EN 60794-1-2	Optical fibre cables – Part 1-2: Generic specification – Basic optical cable test procedures (IEC 60794-1-2)
EN 60811-1-1	Insulating and sheathing materials of electric and optical cables – Common test methods – Part 1-1: General application – Measurement of thickness and overall dimensions – Tests for determining the mechanical properties (IEC 60811-1-1)
HD 402 S2:1984	Standard colours for insulation for low-frequency cables and wires (IEC 60304:1982)

iTeh STANDARD PREVIEW (standards.iteh.ai)

3 Quality control

Not applicable. SIST EN 50441-4:2012

https://standards.iteh.ai/catalog/standards/sist/b117e277-0a51-4654-af10-

f23c2d036d8c/sist-en-50441-4-2012

4 Cable construction

4.1 Conductors

4.1.1 Conductor construction

Conductor construction shall be in accordance with EN 50290-2-1:2005, 4.1.

NOTE Constructions with "Copper Clad" conductors do not meet the requirements.

4.1.2 Conductor type

The conductor shall be a solid wire of annealed copper with a minimum diameter of 0,5 mm in accordance with EN 50290-2-1.

NOTE Diameters < 0,5 mm and > 0,65 mm may cause problems with connecting hardware. Diameters larger than 0,8 mm could cause connectorisation problems.

4.2 Insulation

4.2.1 Insulation material

The insulation shall be polyethylene in accordance with EN 50290-2-23. Other materials may be used providing that they do not affect compliance with this European Standard and any local regulations (e.g. Environmental Directives).

4.2.2 Thickness of the insulation

The thickness of the insulation shall be compatible with the electrical requirements as defined in Clause 7.

4.2.3 Colour of the insulated conductor

The colour of insulation shall be a reasonable match to HD 402 S2:1984.

4.3 Cable element

The cable element shall be a pair or a guad.

The lay length shall be in accordance with EN 50290-2-1.

4.4 Screening of the cable element

Not specified but might be required to meet local regulation for EMC performance.

4.5 Cabling

The cables shall have at least 4 pairs or 2 quads. The core of the cable shall comply with the requirements specified in 7.4 and 7.5.

4.6 Spare pairs

Not applicable.

4.7 Colour code

The colour code shall be given in the detail specification; it should take into account the local practices as well as international recognised codes.

The colours shall be easily identifiable.

ileh STANDARD PREVIEW

4.8 Screening and wrapping of the core (standards.iteh.ai)

4.8.1 Core wrapping

The cable core shall be wrapped with one or more non-hydroscopic synthetic tapes. The synthetic tape shall be applied helically or longitudinally with an overlap of a minimum of 10 %.

123c2d036d8c/sist-en-50441-4-2012

4.8.2 Screen

The cable core may be screened, when screened in accordance with EN 50290-2-1.

Where a braid is applied, the minimum coverage (mainly for mechanical reasons) shall be 60 %. Where the screen is a metallised foil and a braid, this minimum coverage shall be 30 %. The method of calculating the coverage is described in EN 50290-2-1.

4.9 Sheath

4.9.1 Sheath material

The sheath shall be of a thermoplastic compound according to EN 50290-2-27 or EN 50290-2-22.

4.9.2 Sheath construction

Unless otherwise specified the colour of the sheath shall be cream. The sheath shall be applied to fit closely to the core of the cable but it shall be possible to strip the cable over 20 cm without removing foils or damaging conductors.

The sheath shall be cylindrical and its external aspect shall not reveal the core profile.

The ovality of the finished cable shall be not greater than 0,16.

4.9.3 Thickness of the sheath

The minimum thickness of the sheath shall be equal to or greater than 0,5 mm when measured in accordance with EN 60811-1-1.

4.10 Ripcord

A ripcord shall be laid under the sheath.

4.11 Overall diameter

For installation practices and connectorisation the recommended outer diameter is given in Table 1.

Table 1 - Recommended outer diameter of the sheath

Number of pairs	Maximal outer diameter	Minimum thickness of the sheath
	mm	mm
4	8,0	0,50

In case of installation by stapling other diameters may be required (see 5.4.7.3).

4.12 Identification

4.12.1 General

Identification shall be provided either by sheath marking or by identification thread.

4.12.2 Sheath marking

Unless otherwise specified by the customer the cable may be marked as follows.

Sheath marking shall be either by a non-degradable print or embossing and shall contain the following minimum information:

- designation of cable including the numbering of the relevant standard;
- reaction to fire classification (ffs): (Standards.iteh.ai)
- name of supplier;
- SIST EN 50441-4:2012 metric marking. https://standards.iteh.ai/catalog/standards/sist/b117e277-0a51-4654-af10-

f23c2d036d8c/sist-en-50441-4-2012 4.12.3 Identification thread

Where a cable is not identified by sheath marking there shall be an alternative means of identification (e.g. identification thread laid under the sheath, identification tape, printing on the core wrapping, etc.).

Identification shall contain the following minimum information:

- designation of cable including the numbering of the relevant standard;
- reaction to fire classification;
- name of supplier.

4.13 Delivery length

4.13.1 Labelling

Unless otherwise specified in the detail specification drums or coils shall be provided with a label with a non-degradable print containing the following minimum information:

- designation of cable including the numbering of the relevant standard;
- reaction to fire classification;
- name of supplier;
- batch part number;
- length of cable.

EXAMPLE EN $50XXX - \pounds\pounds\pounds - 03/00 - 543$ m.