



Edition 1.2 2019-07 CONSOLIDATED VERSION

TECHNICAL REPORT

Information technology – Generic cabling – Introduction to the MICE environmental classification

INTERNATIONAL ELECTROTECHNICAL COMMISSION

ICS 35.200

ISBN 978-2-8322-7203-9

Warning! Make sure that you obtained this publication from an authorized distributor.

CONTENTS

FOREWORD						
INTRODUCTION to Amendment 1						
1	Scope					
2	Reference documents					
3	Terms, definitions and abbreviations		7			
	3.1	Terms and definitions	7			
	3.2	Abbreviations	7			
4	Appl	pplication of environmental classification				
	4.1	MICE	7			
	4.2	Channel environment	8			
	4.3	Component selection	8			
5	MICE system		10			
	5.1	General	10			
	5.2	Mechanical environment classification	11			
	5.3	Ingress protection and climatic environment classification	12			
	5.4	Chemical environment classification	13			
	5.5	Electromagnetic environment classification				
Bibliography17						
		– Example of variation of the environment along an industrial premises				
cabling channel						
Fig	Figure 2 – The local environment					

Table 1 – Details of environmental classification	9
Table 2 – Derivation of boundaries for mechanical criteria in Table 1	11
Table 3 – Derivation of boundaries for ingress protection criteria in Table 1	12
Table 4 – Derivation of boundaries for climatic criteria in Table 1	12
Table 5 – Derivation of boundaries for chemical criteria in Table 1	13
Table 6 – Derivation of boundaries for electromagnetic criteria in Table 1	16

- 3 -

INFORMATION TECHNOLOGY – GENERIC CABLING – INTRODUCTION TO THE MICE ENVIRONMENTAL CLASSIFICATION

FOREWORD

- ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.
- 2) The formal decisions or agreements of IEC and ISO on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees and ISO member bodies.
- 3) IEC, ISO and ISO/IEC publications have the form of recommendations for international use and are accepted by IEC National Committees and ISO member bodies in that sense. While all reasonable efforts are made to ensure that the technical content of IEC, ISO and ISO/IEC publications is accurate, IEC or ISO cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees and ISO member bodies undertake to apply IEC, ISO and ISO/IEC publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any ISO, IEC or ISO/IEC publication and the corresponding national or regional publication should be clearly indicated in the latter.
- 5) ISO and IEC do not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. ISO or IEC are not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or ISO or its directors, employees, servants or agents including individual experts and members of their technical committees and IEC National Committees or ISO member bodies for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication of, use of, or reliance upon, this ISO/IEC publication or any other IEC, ISO or ISO/IEC publications.
- 8) Attention is drawn to the normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this ISO/IEC publication may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

This consolidated version of the official IEC Standard and its amendments has been prepared for user convenience.

ISO/IEC TR 29106 edition 1.2 contains the first edition (2007-11), its amendment 1 (2012-12) and its amendment 2 (2019-07) [documents JTC1-SC25/2836/DTR and JTC1-SC25/2853/RVDTR].

In this Redline version, a vertical line in the margin shows where the technical content is modified by amendments 1 and 2. Additions are in green text, deletions are in strikethrough red text. A separate Final version with all changes accepted is available in this publication. The main task of IEC and ISO technical committees is to prepare International Standards. In exceptional circumstances, ISO/IEC JTC 1 or a subcommittee may propose the publication of a technical report of one of the following types:

- type 1, when the required support cannot be obtained for the publication of an International Standard, despite repeated efforts;
- type 2, when the subject is still under technical development or where, for any other reason, there is the future but not immediate possibility of an agreement on an International Standard;
- type 3, when the technical committee has collected data of a different kind from that which is normally published as an International Standard, for example 'state of the art'.

ISO/IEC 29106, which is a Technical Report of type 3, has been prepared by subcommittee 25: Interconnection of information technology equipment, of ISO/IEC joint technical committee 1: Information technology.

Technical reports of types 1 and 2 are subject to review within three years of publication to decide whether they can be transformed into International Standards. Technical reports of type 3 do not necessarily have to be reviewed until the data they provide are considered to be no longer valid or useful.

This Technical Report of type 3 has been approved by vote of the member bodies, and the voting results may be obtained from the address given on the second title page.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION to Amendment 1

The Amendment has been developed to correct the misalignment of the MICE table with ISO/IEC 24702.

INFORMATION TECHNOLOGY – GENERIC CABLING – INTRODUCTION TO THE MICE ENVIRONMENTAL CLASSIFICATION

1 Scope

This Technical Report acts as an introduction to the concepts used to develop the MICE environmental classification system used in cabling standards developed by ISO/IEC. It also provides detailed explanation of the sources used to define the boundaries of MICE classifications.

2 Reference documents

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.

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

ISO/IEC 11801-1:2017, Information technology – Generic cabling for customer premises – Part 1: General requirements

ISO/IEC 11801-2, Information technology – Generic cabling for customer premises – Part 2: Office premises

ISO/IEC 11801-3, Information technology – Generic cabling for customer premises – Part 3: Industrial premises

ISO/IEC 11801-4, Information technology – Generic cabling for customer premises – Part 4: Single-tenant homes

ISO/IEC 11801-5, Information technology – Generic cabling for customer premises – Part 5: Data centres

ISO/IEC 11801-6, Information technology – Generic cabling for customer premises – Part 6: Distributed building services

ISO/IEC 15018, Information technology - Generic cabling for homes

ISO/IEC 24702, Information technology – Generic cabling – Industrial premises

IEC 60068-2-5:1975, Environmental testing – Part 2: Tests. Test Sa: Simulated solar radiation at ground level

IEC 60654-4:1987 Operating conditions for industrial-process measurement and control equipment. *Part 4: Corrosive and erosive influences*

IEC 60721-1, Classification of environmental conditions – Part 1: Environmental parameters and their severities

IEC 60721-3-3, Classification of environmental conditions – Part 3-3: Classification of groups of environmental parameters and their severities - Stationary use at weatherprotected locations

IEC 61000-2-5, Electromagnetic compatibility (EMC) – Part 2: Environment – Section 5: Classification of electromagnetic environments. Basic EMC publication

- 7 -

IEC 61000-6-1, *Electromagnetic compatibility (EMC) – Part 6-1: Generic standards – Immunity for residential, commercial and light-industrial environments*

IEC 61000-6-2, *Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity for industrial environments*

IEC 61131-2, Programmable controllers – Part 2: Equipment requirements and tests

IEC 61326:2001, Electrical equipment for measurement, control and laboratory use – EMC requirements

IEC 61918, Industrial communication networks – Installation of communication networks in industrial premises





Edition 1.2 2019-07 CONSOLIDATED VERSION

FINAL VERSION

Information technology – Generic cabling – Introduction to the MICE environmental classification



CONTENTS

- 2 -

FO	REWC	PRD	3			
INT	RODU	JCTION to Amendment 1	5			
1	1 Scope					
2	Reference documents					
3	Term	s, definitions and abbreviations	7			
	3.1	Terms and definitions	7			
	3.2	Abbreviations	7			
4	Application of environmental classification					
	4.1	MICE	7			
	4.2	Channel environment	7			
	4.3	Component selection	8			
5	MICE system					
	5.1	General	. 10			
	5.2	Mechanical environment classification				
	5.3	Ingress protection and climatic environment classification	. 12			
	5.4	Chemical environment classification	. 13			
	5.5	Electromagnetic environment classification	. 15			
Bibliography17						
		- Example of variation of the environment along an industrial premises	8			
	Figure 2 – The local environment					
9						
Tab	Table 1 – Details of environmental classification					
Tab	Table 2 – Derivation of boundaries for mechanical criteria in Table 1					
Tab	le 3 –	Derivation of boundaries for ingress protection criteria in Table 1	.12			

- 3 -

INFORMATION TECHNOLOGY – GENERIC CABLING – INTRODUCTION TO THE MICE ENVIRONMENTAL CLASSIFICATION

FOREWORD

- ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.
- 2) The formal decisions or agreements of IEC and ISO on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees and ISO member bodies.
- 3) IEC, ISO and ISO/IEC publications have the form of recommendations for international use and are accepted by IEC National Committees and ISO member bodies in that sense. While all reasonable efforts are made to ensure that the technical content of IEC, ISO and ISO/IEC publications is accurate, IEC or ISO cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees and ISO member bodies undertake to apply IEC, ISO and ISO/IEC publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any ISO, IEC or ISO/IEC publication and the corresponding national or regional publication should be clearly indicated in the latter.
- 5) ISO and IEC do not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. ISO or IEC are not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or ISO or its directors, employees, servants or agents including individual experts and members of their technical committees and IEC National Committees or ISO member bodies for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication of, use of, or reliance upon, this ISO/IEC publication or any other IEC, ISO or ISO/IEC publications.
- 8) Attention is drawn to the normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this ISO/IEC publication may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

This consolidated version of the official IEC Standard and its amendments has been prepared for user convenience.

ISO/IEC TR 29106 edition 1.2 contains the first edition (2007-11), its amendment 1 (2012-12) and its amendment 2 (2019-07) [documents JTC1-SC25/2836/DTR and JTC1-SC25/2853/RVDTR].

This Final version does not show where the technical content is modified by amendments 1 and 2. A separate Redline version with all changes highlighted is available in this publication.

The main task of IEC and ISO technical committees is to prepare International Standards. In exceptional circumstances, ISO/IEC JTC 1 or a subcommittee may propose the publication of a technical report of one of the following types:

- type 1, when the required support cannot be obtained for the publication of an International Standard, despite repeated efforts;
- type 2, when the subject is still under technical development or where, for any other reason, there is the future but not immediate possibility of an agreement on an International Standard;
- type 3, when the technical committee has collected data of a different kind from that which is normally published as an International Standard, for example 'state of the art'.

ISO/IEC 29106, which is a Technical Report of type 3, has been prepared by subcommittee 25: Interconnection of information technology equipment, of ISO/IEC joint technical committee 1: Information technology.

Technical reports of types 1 and 2 are subject to review within three years of publication to decide whether they can be transformed into International Standards. Technical reports of type 3 do not necessarily have to be reviewed until the data they provide are considered to be no longer valid or useful.

This Technical Report of type 3 has been approved by vote of the member bodies, and the voting results may be obtained from the address given on the second title page.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

INTRODUCTION to Amendment 1

The Amendment has been developed to correct the misalignment of the MICE table with ISO/IEC 24702.

INFORMATION TECHNOLOGY -**GENERIC CABLING -**INTRODUCTION TO THE MICE ENVIRONMENTAL CLASSIFICATION

1 Scope

This Technical Report acts as an introduction to the concepts used to develop the MICE environmental classification system used in cabling standards developed by ISO/IEC. It also provides detailed explanation of the sources used to define the boundaries of MICE classifications.

2 Reference documents

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.

ISO/IEC 11801-1:2017, Information technology – Generic cabling for customer premises – Part 1: General requirements

ISO/IEC 11801-2, Information technology – Generic cabling for customer premises – Part 2: Office premises

ISO/IEC 11801-3, Information technology – Generic cabling for customer premises – Part 3: Industrial premises

ISO/IEC 11801-4, Information technology - Generic cabling for customer premises -Part 4: Single-tenant homes

ISO/IEC 11801-5, Information technology - Generic cabling for customer premises -Part 5: Data centres

ISO/IEC 11801-6, Information technology – Generic cabling for customer premises – Part 6: Distributed building services

IEC 60068-2-5:1975, Environmental testing – Part 2: Tests. Test Sa: Simulated solar radiation at ground level

IEC 60654-4:1987 Operating conditions for industrial-process measurement and control equipment. Part 4: Corrosive and erosive influences

IEC 60721-1, Classification of environmental conditions - Part 1: Environmental parameters and their severities

IEC 60721-3-3, Classification of environmental conditions – Part 3-3: Classification of groups of environmental parameters and their severities - Stationary use at weatherprotected locations

IEC 61000-6-1, Electromagnetic compatibility (EMC) – Part 6-1: Generic standards – Immunity for residential, commercial and light-industrial environments

IEC 61000-6-2, Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity for industrial environments

IEC 61131-2, Programmable controllers – Part 2: Equipment requirements and tests

IEC 61918, Industrial communication networks – Installation of communication networks in industrial premises