IEC 61386-22

Edition 2.0 2021-04
REDLINE VERSION

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Conduit systems for cable management – Part 22: Particular requirements – Pliable conduit systems

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IEC 61386-22:2021-04 RLV(en)

Full document details: IEC 61386-22 2021 RLV

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Conduit systems for cable management –
Part 22: Particular requirements – Pliable conduit systems

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 29.120.10

ISBN 978-2-8322-9708-7

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CONTENTS

FOREWORD 3
1 Scope 6
2 Normative references 6
3 Terms and definitions 6
4 General requirements 6
5 General conditions for tests 6
6 Classification 6
7 Marking and documentation 7
8 Dimensions 7
9 Construction 9
10 Mechanical properties 9
11 Electrical properties 11
12 Thermal properties 11
13 Fire ~~effects~~ hazard 11
14 External influences 11
15 Electromagnetic compatibility 12
Annex A (normative) Classification coding for conduit systems 16
Annex B (normative) Determination of material thickness 16
Annex C (normative) Additional test requirements for conduit systems already complying with IEC 61386-1:2008 16
Annex AA (informative) Calculation for minimum and maximum rate of increase of force for 10.2.4 17

Figure 101 – Bending test apparatus 13
Figure 102 – Gauge for checking the minimum inside diameter of the conduit system after impact, bending, and resistance to heat tests 14
Figure 103 – Assembly of conduit and terminating conduit fitting for bonding test 14
Figure AA.1 – Graph showing force against time for 750 N force 17

Table 101 – Thread lengths 8
Table 102 – Maximum entry diameter and minimum entry length details 8
Table AA.1 – Minimum and maximum rate of increase of force for 10.2.4 18

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

CONDUIT SYSTEMS FOR CABLE MANAGEMENT –

Part 22: Particular requirements – Pliable conduit systems

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International Standard IEC 61386-22 has been prepared by subcommittee 23A: Cable management systems, of IEC technical committee 23: Electrical accessories:

This second edition cancels and replaces the first edition published in 2002. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) Annex AA has been added to provide guidance on the application of a constantly increasing force.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
23A/951/FDIS	23A/956/RVD

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

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

A list of all the parts in the IEC 61386 series, published under the general title *Conduit systems for cable management*, can be found on the IEC website.

This document is to be used in conjunction with IEC 61386-1:2008 and IEC 61386-1:2008/AMD1:2017.

This document supplements or modifies the corresponding clauses of IEC 61386-1:2008 and IEC 61386-1:2008/AMD1:2017. Where a particular clause or subclause of IEC 61386-1:2008 and IEC 61386-1:2008/AMD1:2017 is not mentioned in this document, that clause or subclause applies as far as is reasonable. Where this document states "addition", "modification" or "replacement", the relevant text of IEC 61386-1:2008 and IEC 61386-1:2008/AMD1:2017 is to be adapted accordingly.

Subclauses, tables and figures which are in addition to those in IEC 61386-1:2008 and IEC 61386-1:2008/AMD1:2017 are numbered starting with 101. Annexes which are additional to those in IEC 61386-1:2008 and IEC 61386-1:2008/AMD1:2017 are lettered AA, BB, etc.

In this document, the following print types are used:

– Requirements proper: in roman type.
– *Test specifications: in italic type.*
– Explanatory matter: in smaller roman type.

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CONDUIT SYSTEMS FOR CABLE MANAGEMENT –

Part 22: Particular requirements – Pliable conduit systems

1 Scope

~~This clause of part 1 is applicable, except as follows:~~

Clause 1 of IEC 61386-1:2008 is applicable, except as follows:

Addition:

This part of IEC 61386 specifies the requirements for pliable conduit systems including self-recovering conduit systems.

2 Normative references

~~This clause of part 1 is applicable.~~

Clause 2 of IEC 61386-1:2008 and of IEC 61386-1:2008/AMD1:2017 are applicable, except as follows:

Addition:

IEC 61386-1:2008, *Conduit systems for cable management – Part 1: General requirements*
IEC 61386-1:2008/AMD1:2017

3 Terms and definitions

~~This clause of part 1 is applicable.~~

Clause 3 of IEC 61386-1:2008 and of IEC 61386-1:2008/AMD1:2017 are applicable.

4 General requirements

~~This clause of part 1 is applicable.~~

Clause 4 of IEC 61386-1:2008 is applicable.

5 General conditions for tests

Clause 5 of IEC 61386-1:2008 and of IEC 61386-1:2008/AMD1:2017 are applicable.

~~This clause of part 1 is applicable.~~

6 Classification

~~This clause of part 1 is applicable, except as follows:~~

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Clause 6 of IEC 61386-1:2008 is applicable, except as follows:

Classifications 6.1.1, 1; 6.1.2, 1; 6.1.3, 1; 6.1.3, 4; 6.1.4, 1 and 6.1.5, 1 are not applicable.

NOTE Pliable conduit systems according to 6.1.1, 2 and 6.1.2, 2 and classification ~~1X~~ 1 from 6.2.1, Table 1 are not allowed in France.

7 Marking and documentation

~~This clause of part 1 is applicable, except as follows:~~

Clause 7 of IEC 61386-1:2008 and of IEC 61386-1:2008/AMD1:2017 are applicable, except as follows:

Addition:

7.1.101 The conduit shall be marked in accordance with 7.1 along its entire length at regular intervals of preferably 1 m but not longer than 3 m. Where this is technically impractical, the mark shall be on a label attached to the product at each end or on the packaging.

Compliance is checked by inspection.

7.1.102 The manufacturer shall document, for the conduit system, the minimum inside diameter and the classification in accordance with Clause 6.

Compliance is checked by inspection of the manufacturer's documentation.

8 Dimensions

Replacement:

8.1 Threads shall comply with IEC 60423.

Outside diameters of non-metallic conduit shall comply with IEC 60423.

Outside diameters of metallic and composite conduits need not comply with IEC 60423, provided that they are designed to be installed only with terminating conduit fittings having threads complying with IEC 60423.

Compliance is checked by means of the gauges specified in IEC 60423.

8.2 Threadable conduits and threadable conduit fittings, except terminating conduit fittings, shall comply with Table 101. Non-threadable conduit fittings, except fittings which are part of a conduit system declaring tensile strength, shall comply with Table 102. The minimum inside diameter of the conduit system shall be as declared by the manufacturer.

Compliance is checked by measurement.

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Table 101 – Thread lengths

Size	External thread	Internal thread
	Minimum length	Minimum length
mm	mm	mm
6	05,5	06,5
8	06,5	07,5
10	08,5	09,5
12	10,5	11,5
16	12,5	13,5
20	14,0	15,0
25	17,0	18,0
32	19,0	20,0
40	19,0	20,0
50	19,0	20,0
63	19,0	20,0
75	19,0	20,0

Table 102 – Maximum entry diameter and minimum entry length details

~~Size~~	~~External thread~~	~~Internal thread~~
	~~Maximum entry diameter~~ ~~mm~~	~~Minimum entry length~~ ~~mm~~
~~6~~	~~06,5~~	~~06,0~~
~~8~~	~~08,5~~	~~08,0~~
~~10~~	~~10,5~~	~~10,0~~
~~12~~	~~12,5~~	~~12,0~~
~~16~~	~~16,5~~	~~16,0~~
~~20~~	~~20,5~~	~~20,0~~
~~25~~	~~25,5~~	~~25,0~~
~~32~~	~~32,6~~	~~30,0~~
~~40~~	~~40,7~~	~~32,0~~
~~50~~	~~50,8~~	~~42,0~~
~~63~~	~~63,9~~	~~50,0~~
~~75~~	~~75,9~~	~~50,0~~

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Size mm	Maximum entry diameter mm	Minimum entry length mm
6	06,5	06,0
8	08,5	08,0
10	10,5	10,0
12	12,5	12,0
16	16,5	16,0
20	20,5	20,0
25	25,5	25,0
32	32,6	30,0
40	40,7	32,0
50	50,8	42,0
63	63,9	50,0
75	75,9	50,0

9 Construction

~~This clause of part 1 is applicable.~~

Clause 9 of IEC 61386-1:2008 is applicable.

10 Mechanical properties

~~This clause of part 1 is applicable, except as follows:~~

Clause 10 of IEC 61386-1:2008 and of IEC 61386-1:2008/AMD1:2017 are applicable, except as follows:

10.2 Compression test

Subclause 10.2 is applicable with the following addition:

10.2.4 *Add the following note at the end of Subclause 10.2.4:*

NOTE In order to achieve a uniformly increasing compression force, the force indicated in Table 4 is divided by time; this value is the required rate per second to fulfil the requirement.

Example: For a test force of 750 N an increase of the test force of 25 N/s is required (750 divided by 30 equals 25). Informative Annex AA gives detailed calculations including tolerances for time and force.

For self-recovering conduits, replace Subclauses 10.2.4, 10.2.5, 10.2.6, 10.2.7 and 10.2.8, with the following:

10.2.101 The intermediate steel piece shall be subjected to a uniformly increasing compression force (*N*) reaching the force indicated in Table 4 after (30 ± 3) s. The sample shall flatten by between 25 % and 50 % of its initial outside diameter.

If the sample flattens by less than 25 %, an additional test is carried out whereby the intermediate steel piece is lowered onto the sample at constant speed until the sample is flattened by (30 ± 3) % after (30 ± 3) s and the resultant force is measured.

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A new sample is subjected to the uniformly increasing force (*N*) reaching the force measured above after (30 ± 3) s. The sample shall flatten by between 25 % and 50 % of its initial outside diameter.

The force and the intermediate steel piece shall then be removed. Fifteen minutes after removal, the outside diameter of the sample, where it has flattened, shall be measured again.

After the test, the difference between the initial outside diameter and the outside diameter of the flattened sample shall not exceed 10 % of the outside diameter, as measured before the test, and the sample shall show no cracks visible to normal or corrected vision without magnification.

10.4 Bending test

Replacement:

10.4.101 Conduits shall be subjected to a bending test by means of the apparatus as shown in Figure 101.

10.4.102 The test shall be made on six samples of conduit, the length of each sample being at least:

a) 30 times the nominal outside diameter for plain conduits;

b) 12 times the nominal outside diameter for corrugated conduits.

Three of the samples shall be tested at ambient temperature; the other three shall be tested at the minimum declared temperature for transport, application and installation ~~temperature~~ according to Table 1, with a tolerance of ±2 °C.

10.4.103 For the test at ambient temperature, the sample shall be clamped vertically in the bending apparatus as shown in Figure 101. The sample shall be slowly bent by hand to the left through an angle of (90 ± 5)°, then back to the vertical position, then to the right through an angle of (90 ± 5)°, and then back to the vertical position. This sequence of operations shall be repeated three more times but at the end the sample shall not be bent back to the vertical position. The sample shall be maintained in the bent position for 5 min, after which it shall be placed in such a position that the straight portions are at an angle of (45 ± 5)° to the vertical, one end of the sample pointing upwards and the other downwards.

For the test at the minimum declared temperature for transport, application and installation ~~temperature~~ according to Table 1, the sample clamped in the bending apparatus as shown in Figure 101 shall be conditioned before the test for 2 h in a cold chamber at ~~this~~ the aforementioned minimum declared temperature with a tolerance of ±2 °C.

After the test, the sample shall show no cracks visible to normal or corrected vision without magnification and it shall be possible to pass the appropriate gauge, as shown in Figure 102, through the sample under its own weight and without any initial speed.

10.5 Flexing test

~~This subclause of part 1 is not applicable.~~

Subclause 10.5 of IEC 61386-1:2008 is not applicable.

10.6 Collapse test

~~This subclause of part 1 is not applicable.~~

Subclause 10.6 of IEC 61386-1:2008 is not applicable.

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