CB TEST CERTIFICATE

Ref. Certificate No.

IT-6513

IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST CERTIFICATES FOR ELECTRICAL EQUIPMENT (IECEE) CB SCHEME

Issued by:	IMQ SpA		
Product:	Pliable conduits		
Applicant:	P.M. PLASTIC MATERIALS SRL	Via Garibaldi 44 24031 ALMENNO S. SALVATORE (BG)	Italy
Manufacturer:	P.M. PLASTIC MATERIALS SRL	Via Garibaldi 44 24031 ALMENNO S. SALVATORE (BG)	Italy
Factory:	P.M. PLASTIC MATERIALS SRL	Via Garibaldi 44 24030 ALMENNO S. BARTOLOMEO (BG)	Italy
Rating and principal characteristics:	16,20,25,32,40,50mm		
Trade mark (if any):	PM		
Model/Type reference:	IPS		
Additional information:			
Sample of product tested to be in conformity with IEC:	61386-1(ed.1);am1 61386-22(ed.1)		
Test Report Ref. No:	02SH00069		

This CB Test Certificate is issued by the National Certification Body:

IMQ SpA
Via Quintiliano 43 I-20138 Milano, Italy

Signed by: Roberta Pelosi

Date of issue: 2007-11-22

IMQ

Test Report issued under the responsibility of:

IMQ

TEST REPORT

IEC 61386-22

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

Report Reference No. ..... :	02SH00069
Date of issue ..... :	2007/10/10
Total number of pages ..... :	30
CB Testing Laboratory ..... :	IMQ S.p.A.
Address ..... :	I – 20138 Milano (MI) - Via Quintiliano, 43
Applicant's name ..... :	P.M. PLASTIC MATERIALS Srl
Address ..... :	I – 24031 Almenno S. Salvatore (BG) - Via Garibaldi, 44
Test specification:	
Standard ..... :	IEC 61386-22:2002 (1st Edition) used in conjunction with IEC 61386-1:1996 + A1:2000 (1st Edition)
Test procedure ..... :	CB
Non-standard test method ..... :	N/A
Test Report Form No. ..... :	IEC61386-22A
Test Report Form(s) Originator ..... :	IMQ
Master TRF ..... :	Dated 2007-09

Test item description ..... :	Pliable conduits
Trade Mark ..... :	PM
Manufacturer ..... :	P.M. PLASTIC MATERIALS Srl I – 24031 Almenno S. Salvatore (BG) - Via Garibaldi, 44
Model/Type reference ..... :	IPS
Ratings ..... :	16,20,25,32,40,50mm

Testing procedure and testing location:		
☒ **CB Testing Laboratory**:	IMQ S.p.A.	
Testing location/ address.....:	I – 20138 Milano (MI) - Via Quintiliano, 43	
☐ **Associated CB Laboratory:**	--	
Testing location/ address.....:		
Tested by (name + signature).....:	MONGELLI TOMMASO	
Approved by (name + signature)..:	VISENTAINER IVANO	
☐ Testing procedure: TMP	--	
Tested by (name + signature).....:		
Approved by (name + signature)..:		
Testing location/ address.....:		
☐ Testing procedure: WMT	--	
Tested by (name + signature).....:		
Witnessed by (name + signature).:		
Approved by (name + signature)..:		
Testing location/ address.....:		
☐ Testing procedure: SMT	--	
Tested by (name + signature).....:		
Approved by (name + signature)..:		
Supervised by (name + signature):		
Testing location/ address.....:		
☐ Testing procedure: RMT	--	
Tested by (name + signature).....:		
Approved by (name + signature)..:		
Supervised by (name + signature):		
Testing location/ address.....:		

Summary of testing:

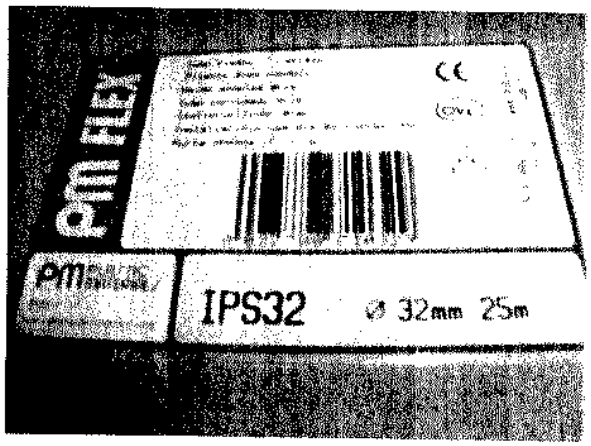
Tests performed (name of test and test clause):	**Testing location:**
7 – Marking and documentation **8** – Dimensions **10.2** – Compression test **10.3** – Impact test **10.4** – Bending test **11.3.1** – Electrical insulating strenght and resistance **12** – Thermal properties **13.1.3** – Spread of fire	IMQ S.p.A. I – 20138 Milano (MI) - Via Quintiliano, 43

Summary of compliance with National Differences:

Copy of marking plate:

For example:

on the conduit: **PM IPS 2221 OVE VDE ∅ xx CE EN 61386**



on the label of the conduit (see photo)

Test item particulars:	
Conduit system classification coding	**2 2 2 1 2 2 – 0 – 0 1 0**
Type of conduit	☐ Metallic ☒ Non-metallic ☐ Composite
Type of conduit	☐ Plain ☒ Corrugated
Type of conduit fitting	☐ Metallic ☐ Non-metallic ☐ Composite
Conduit fitting – quantity	--
Conduit fitting – type(s)	--
Conduit fitting – colour(s)	--
Method for connection	☐ Threadable ☒ Non-threadable
Resistance to compression	☒ Light ☐ Medium ☐ Heavy ☐ Very heavy
Resistance to impact	☒ Light ☐ Medium ☐ Heavy ☐ Very heavy
Tensile strength	☐ Light ☐ Medium ☐ Heavy ☐ Very heavy
Suspended load capacity	☐ Light ☐ Medium ☐ Heavy ☐ Very heavy
Lower / Upper temperature range	-5°C / +60°C
Electrical characteristics	☐ With electrical continuity ☒ With electrical insulating
Resistance to external influences	IP
Resistance against corrosion	☒ Without protection ☐ With protection:
Resistance to flame propagation	☒ Non-flame propagating ☐ Flame propagating

Possible test case verdicts:	
- test case does not apply to the test object	N/A
- test object does meet the requirement	Pass (P)
- test object does not meet the requirement	Fail (F)

Testing:	
Date of receipt of test item	2007/07/24
Date(s) of performance of tests	2007/09/04

General remarks:

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.
"(See Enclosure #)" refers to additional information appended to the report.
"(See appended table)" refers to a table appended to the report.
Throughout this report a comma (point) is used as the decimal separator.

General product information:

IEC 61386-22			
Clause	Requirement + Test	Result - Remark	Verdict
7	**MARKING AND DOCUMENTATION**		
7.1	Conduit (conduit fitting) is marked on the product with a trade mark or a name identifying the manufacturer or responsible vendor ..... :		P
	Conduit (conduit fitting) is marked in addition in such a way that it can be identified in the manufacturer's, or responsible vendor's, literature ..... :		P
7.1.1	Conduit is also marked with the classification code, in accordance with annex A, and includes at least the first four digits (optional) ..... :		P
7.1.2	Manufacturer indicates the compatibility of parts within a conduit system		—
7.1.101	Conduit is marked in accordance with 7.1 along its entire length at regular intervals of preferably 1 m but not longer than 3 m (m) ..... :		P
	The mark is on a label attached to the product at each end or on the packaging (if the marking in accordance with 7.1 along its entire length is technically impractical) ..... :		P
7.1.102	Minimum inside diameter and the classification for the system in accordance with clause 6 are documented by the manufacturer ..... :	See appended table 7.1.102	P
7.2	Conduit fitting is marked in accordance with 7.1, on		N/A
	- the product ..... :		N/A
	- a label attached to the product, or on the box or carton containing the fittings (if the marking on the product is impractical) ..... :		N/A
7.3	Flame propagating material is orange in colour		--
	Flame propagating material is not coloured orange by painting or other superficial means		–
	Non-flame propagating material is of any colour except yellow, orange or red, unless is clearly marked on the product to be of non-flame propagating material ..... :	grey	P
7.4	Earthing facilities are indicated by the symbol for protective earth in accordance with IEC 60417, symbol 60417-IEC-5019-a ..... :		N/A
	This marking is not placed on easily removable parts, for example screws		N/A
7.5	Compliance with 7.1 to 7.4 checked by inspection		N/A
7.6	Marking is durable and clearly legible		P
	Compliance checked by inspection and by rubbing the marking by hand for 15 s with a piece of cloth soaked with water, and again for 15 s with a piece of cloth soaked with petroleum spirit		P

IEC 61386-22			
Clause	Requirement + Test	Result - Remark	Verdict

8	**DIMENSIONS**		
8.1	Outside diameters of non-metallic conduits comply with IEC 60423 ..... :	See appended table 8.1A	P
	Threads comply with IEC 60423 ..... :	See appended table 8.1B	N/A
	Outside diameters of metallic and composite conduits designed to be installed only with terminating conduit fittings having threads complying with IEC 60423: need not to comply with IEC 60423	See appended table 8.1A	N/A
8.2	Threadable conduits and threadable conduit fittings comply with table 101 (except terminating conduit fittings) ..... :	See appended table 8.2A	N/A
	Non-threadable conduit fittings comply with table 102 (except fittings which are part of a conduit system declaring tensile strength) ..... :	See appended table 8.2B	N/A
	Minimum inside diameter of the conduit system is as declared by the manufacturer	See appended table 8.2C	P

9	**CONSTRUCTION**		
9.1	There are no sharp edges, burrs or surface projections within the conduit system		P
	The manufacturer provides guidelines to assist the safe installation of the conduit system		P
9.2	Screws, if any, used for attaching components or covers to conduit fittings, or in joints to conduits, do not cause damage to cable insulation when correctly inserted		N/A
	Screws have ISO metric threads		N/A
	Thread-cutting screws are not used		N/A
	Fixing screws and small clips for use with non-metallic or composite conduit fittings, of non-metallic material, are isolated from insulated conductors or cables		N/A
9.3	Test for screw fixing using preformed threads	See appended table 9.3	N/A
	After the test: no damage sustained by the screw or nut, such as breakage of the screw or damage to the head or thread		N/A
9.4	Test for screw fixing using thread-forming screws	See appended table 9.4	N/A
	After the test: no damage, such as breakage of the screw or damage to the head or thread		N/A
9.5	Any material within the joint have at least the same level of resistance to the external influence as either the conduit or the conduit fitting ..... :		N/A

IEC 61386-22			
Clause	Requirement + Test	Result - Remark	Verdict
9.6	Indications whether the conduit system that are assembled by means other than threads can be disassembled and if so, how this can be achieved, are provided by the manufacturer		N/A
10	**MECHANICAL PROPERTIES**		
10.1	**Mechanical strength**		
10.1.1	Conduit systems have adequate mechanical strength		P
10.1.2	Conduits do not crack and are not deformed when bent or compressed, or exposed to impact or extreme temperature, according to their classification		P
10.1.3	Conduit systems intended as a mounting for other equipment have adequate mechanical strength		N/A
10.1.4	Compliance of 10.1.1 to 10.1.3 checked by the tests specified in 10.2 to 10.8		P
10.2	**Compression test**		
	3 samples of conduit, each (200 ± 5) mm long, subjected to a compression test at (23 ± 2) °C, using the apparatus shown in figure 1		
	Test for pliable conduits	See appended table 10.2	P
10.2.101	Test for pliable/self-recovering conduits	See appended table 10.2.101	N/A
10.3	**Impact test**		
	12 samples of conduit, each (200 ± 5) mm in length, or 12 samples of conduit fittings subjected to an impact test using the apparatus shown in figure 2	See appended table 10.3	P
10.3.3	At least 9 of the 12 samples passed the test		P
10.4	**Bending test**		
	6 samples of conduits subjected to a bending test by means of the apparatus as shown in figure 101	See appended table 10.4	P
10.5	**Flexing test**		
	Sub-clause of part 1 not applicable		—
10.6	**Collapse test**		
	Sub-clause of part 1 not applicable		—
10.7	**Tensile test**		
	Conduit systems declaring tensile strength: test carried out on an assembly prepared in accordance with the manufacturer's instructions so that the overall length is approximately 300 mm	See appended table 10.7	N/A

IEC 61386-22			
Clause	Requirement + Test	Result - Remark	Verdict
10.8	**Suspended load test**		
	Conduit fitting declared by the manufacturer to be suitable for suspended loads: test carried out with a load suspended by the means provided and installed in accordance with the manufacturer's instructions for a time duration given in table 7	See appended table 10.8	N/A
11	**ELECTRICAL PROPERTIES**		
11.1	**Electrical requirements**		
11.1.1	Conduit systems declaring electrical continuity characteristics are checked by the tests in 11.2 immediately after the tests in 14.2		N/A
11.1.2	Conduit systems of metal or composite materials are so constructed that accessible metal parts can be bonded to earth		N/A
11.1.3	Accessible conductive parts of the metal or composite conduit system, which may become live in the event of a fault, are be effectively earthed		N/A
11.1.4	Conduit systems of non-metallic or composite materials, where declared, have an adequate electrical insulating strength and insulating resistance		N/A
11.2	**Bonding test**		
	Test carried out on a sample of a conduit and terminating conduit fittings assembled in accordance with the manufacturer's instructions and mounted as shown in figure 103: resistance not exceed 0,1 Ω	See appended table 11.2	N/A
11.3	**Electrical insulating strength and resistance**		
11.3.1	Conduits		
	3 samples of conduit tested in a salt water solution at (23 ± 2) °C, in accordance with figure 5, and submitted after 24 h ± 15 min to a voltage of 2000 V maintained for a period of 15 min +5/0 s: trip device incorporated into the circuit not trip during the test	See appended table 11.3.1	P
	Same samples then subjected to an electrical insulation resistance test with a direct voltage of 500 V applied for (60 ± 2)s: measured insulation resistance greater than 100 MΩ	See appended table 11.3.1	P
11.3.2	Conduit fittings		
	3 samples of conduit fittings immersed for 24 h ± 15 min in water at (23 ± 2) °C and then submitted by means of lead spheres to a voltage of 2000 V maintained for a period of 15 min +5/0 s: trip device incorporated into the circuit not trip during the test	See appended table 11.3.2	N/A

IEC 61386-22			
Clause	Requirement + Test	Result - Remark	Verdict
	Same samples then subjected to an electrical insulation resistance test with a direct voltage of 500 V applied for (60 ± 2)s: measured insulation resistance greater than 100 MΩ	See appended table 11.3.2	N/A
12	**THERMAL PROPERTIES**		
12.1	Non-metallic and composite conduits have adequate resistance to heat		P
12.2	Samples of conduit, each (100 ± 5) mm long, together with the test apparatus as shown in figure 8, kept for 4 h ± 5 min in a heating cabinet at the declared temperature given in table 2, with a tolerance of ±2 °C	See appended table 12	P
	Each sample then loaded for 24 h ± 15 min in the apparatus of figure 8 with a total mass as shown in table 9	See appended table 12	P
12.3	It is possible to pass the appropiate gauge of figure 102 immediately after the removal of the load	See appended table 12	P
13	**FIRE HAZARD**		
13.1	Reaction to fire		N/A
13.1.1	Initiation of fire (not applicable)		—
13.1.2	Contribution to fire (under consideration)		—
13.1.3	Spread of fire		P
	Non-flame propagating conduit systems have adequate resistance to flame propagation		P
13.1.3.1	Non-metallic and composite conduit fittings subjected to glow-wire test of IEC 60695-2-1/1 (IEC 60695-2-11) at 750 °C		N/A
	No visible flame or sustained glowing,	See appended table 13.1.3.1	N/A
	Flames and glowing extinguished within 30 s of the removal of the glow-wire (s) ..... :	See appended table 13.1.3.1	N/A
13.1.3.2	Non-metallic and composite conduits subjected to 1 kW flame of IEC 60695-2-4/1 (IEC 60695-11-2), according to the arrangement of figure 7, applied for the period given in table 11		P
	▪ Sample does not ignite, or	See appended table 13.1.3.2	P
	▪ In case of ignition:		P
	a) Flame extinguishes within 30 s..... :	See appended table 13.1.3.2	P
	b) No ignition of the tissue paper	See appended table 13.1.3.2	P
	c) No evidence of burning or charring within 50 mm of the lower extremity of the upper clamp	See appended table 13.1.3.2	P

IEC 61386-22			
Clause	Requirement + Test	Result - Remark	Verdict

14	**EXTERNAL INFLUENCES**	
14.1	Degree of protection provided by enclosure	N/A
14.2	Resistance against corrosion	N/A

15	**ELECTROMAGNETIC COMPATIBILITY**		
	Products covered by this standards are, in normal use, passive in respect of electromagnetic influences (emission and immunity)		P

7.1.102	**TABLE: Minimum inside diameter declared by manufacturer for the system**	
Size	Minimum inside diameter declared by manufacturer for the system (mm)	Verdict
6	--	--
8	--	--
10	--	--
12	--	--
16	10,7	P
20	13,8	P
25	18,0	P
32	23,9	P
40	32,0	P
50	40,0	P
63	--	--
75	--	--
Supplementary information:----------		

IEC 61386-22			
Clause	Requirement + Test	Result - Remark	Verdict

8.1A	**TABLE: Checking of dimensions of conduits**						
Size		Maximum outside diameter (all type of conduits)		Minimum outside diameter (metallic conduits)		Minimum outside diameter (non-metallic conduits)	
Outside diameters (mm)	Metric threads	Gauge fig.2 d_g (mm)	Comply (P-F-N/A)	Gauge fig.3A c (mm)	Comply (P-F-N/A)	Gauge fig.3b d_g (mm)	Comply (P-F-N/A)
6 +0/-0,1	M6	6,04	N/A	5,900	N/A	5,90	N/A
8 +0/-0,2	M8	8,04	N/A	7,800	N/A	7,80	N/A
10 +0/-0,2	M10	10,04	N/A	9,800	N/A	9,80	N/A
12 +0/-0,2	M12	12,04	N/A	11,800	N/A	11,70	N/A
16 +0/-0,3	M16	16,04	P	15,700	N/A	15,70	N/A
20 +0/-0,3	M20	20,04	P	19,700	N/A	19,70	N/A
25 +0/-0,4	M25	25,04	P	24,600	N/A	24,60	N/A
32 +0/-0,4	M32	32,04	P	31,600	N/A	31,60	N/A
40 +0/-0,4	M40	40,04	P	39,600	N/A	39,60	N/A
50 +0/-0,5	M50	50,04	P	49,500	N/A	49,50	N/A
63 +0/-0,6	M63	63,04	N/A	62,400	N/A	62,40	N/A
75 +0/-0,6	M75	75,04	N/A	74,400	N/A	74,40	N/A
Supplementary information:----------							

8.1B	**TABLE: Checking of dimensions of threads**				
Size		External threads of conduits and fittings		Internal threads of fittings	
Outside diameters (mm)	Metric threads	Go gauge fig. 4 (threaded) Comply (P-F-N/A)	No go gauge fig. 4 (plain) Comply (P-F-N/A)	Go gauge fig. 5 (threaded) Comply (P-F-N/A)	No go gauge fig. 5 (plain) Comply (P-F-N/A)
6 +0/-0,1	M6	N/A	N/A	N/A	N/A
8 +0/-0,2	M8	N/A	N/A	N/A	N/A
10 +0/-0,2	M10	N/A	N/A	N/A	N/A
12 +0/-0,2	M12	N/A	N/A	N/A	N/A
16 +0/-0,3	M16	N/A	N/A	N/A	N/A
20 +0/-0,3	M20	N/A	N/A	N/A	N/A
25 +0/-0,4	M25	N/A	N/A	N/A	N/A
32 +0/-0,4	M32	N/A	N/A	N/A	N/A
40 +0/-0,4	M40	N/A	N/A	N/A	N/A
50 +0/-0,5	M50	N/A	N/A	N/A	N/A
63 +0/-0,6	M63	N/A	N/A	N/A	N/A
75 +0/-0,6	M75	N/A	N/A	N/A	N/A
Supplementary information:----------					

IEC 61386-22			
Clause	Requirement + Test	Result - Remark	Verdict

8.2A	**TABLE: Checking of thread lengths according to table 101 (threadable conduits and threadable conduit fittings)**						
Size	External thread			Internal thread			
	Minimum length allowed (mm)	Length measured (mm)	Comply (P-F-N/A)	Minimum length allowed (mm)	Length measured (mm)	Comply (P-F-N/A)	
6	5,5	--	N/A	6,5	--	N/A	
8	6,5	--	N/A	7,5	--	N/A	
10	8,5	--	N/A	9,5	--	N/A	
12	10,5	--	N/A	11,5	--	N/A	
16	12,5	--	N/A	13,5	--	N/A	
20	14,0	--	N/A	15,0	--	N/A	
25	17,0	--	N/A	18,0	--	N/A	
32	19,0	--	N/A	20,0	--	N/A	
40	19,0	--	N/A	20,0	--	N/A	
50	19,0	--	N/A	20,0	--	N/A	
63	19,0	--	N/A	20,0	--	N/A	
75	19,0	--	N/A	20,0	--	N/A	
Supplementary information:----------							

8.2B	**TABLE: Checking of maximum entry diameter and minimum entry length details according to table 102 (non-threadable conduits and non-threadable conduit fittings)**					
Size	Maximum entry diameter allowed (mm)	Entry diameter measured (mm)	Comply (P-F-N/A)	Minimum entry length allowed (mm)	Entry length measured (mm)	Comply (P-F-N/A)
6	6,5	--	N/A	6,0	--	N/A
8	8,5	--	N/A	8,0	--	N/A
10	10,5	--	N/A	10,0	--	N/A
12	12,5	--	N/A	12,0	--	N/A
16	16,5	--	N/A	16,0	--	N/A
20	20,5	--	N/A	20,0	--	N/A
25	25,5	--	N/A	25,0	--	N/A
32	32,6	--	N/A	30,0	--	N/A
40	40,7	--	N/A	32,0	--	N/A
50	50,8	--	N/A	42,0	--	N/A
63	63,9	--	N/A	50,0	--	N/A
75	75,9	--	N/A	50,0	--	N/A
Supplementary information:-------						

IEC 61386-22			
Clause	Requirement + Test	Result - Remark	Verdict

8.2C	**TABLE: Checking of minimum inside diameter of the conduit system**		
Size	Minimum inside diameter of the conduit system declared by manufacturer (mm)	Inside diameter of the conduit system measured (mm)	Comply (P-F-N/A)
6	--	--	--
8	--	--	--
10	--	--	--
12	--	--	--
16	10,7	10,8	P
20	13,8	14,0	P
25	18,0	18,2	P
32	23,9	24,1	P
40	32,0	32,4	P
50	40,0	40,8	P
63	--	--	--
75	--	--	--
Supplementary information:----------			

9.3	**TABLE: Screw test (screw fixing using preformed threads)**				
Threaded part identification	Nominal diameter of thread (mm)	Column number of table 3 (I or II)	Applied torque (Nm)	Times (5/10)	Verdict
--	--	--	--	--	--
Supplementary information:----------					

9.4	**TABLE: Screw test (screw fixing using thread-forming screws)**				
Threaded part identification	Nominal diameter of thread (mm)	Column number of table 3 (I or II)	Applied torque (Nm)	Times (5/10)	Verdict
--	--	--	--	--	--
Supplementary information:----------					

IEC 61386-22			
Clause	Requirement + Test	Result - Remark	Verdict

10.2	**TABLE: Compression test (pliable conduits)**								
	Classification (first digit) ..... :					**2**/3/4/5			—
Size	N° of sample	$Ø_{bt}$ (mm)	F (N)	$Ø_{a1}$ (mm)	$[Ø_{bt} - Ø_{at1}/Ø_{bt}]100 \leq 25$ % (%)	$Ø_{at2}$ (mm)	$[Ø_{bt} - Ø_{at2}/Ø_{bt}]100 \leq 10$ % (%)	No visible cracks (P/F)	Verdict
16	1	16,0	320	15,5	3	15,8	1	P	P
16	2	16,0	320	15,5	4	15,8	1	P	P
16	3	16,0	320	15,5	3	15,8	2	P	P

Supplementary information:

F = Compression force, reaching the value shown in table 4 within (30 ± 3) s

$Ø_{bt}$ = Outside diameter measured before the test

$Ø_{at1}$ = Outside diameter measured after the force given in table 4 has been applied for (60 ± 2) s where flattening has taken place, without removing the force

$Ø_{at2}$ = Outside diameter measured after the test where flattening has taken place, (60 ± 2) s after removal of the force given in table 4 and the intermediate piece

10.2	**TABLE: Compression test (pliable conduits)**								
	Classification (first digit) ..... :					**2**/3/4/5			—
Size	N° of sample	$Ø_{bt}$ (mm)	F (N)	$Ø_{a1}$ (mm)	$[Ø_{bt} - Ø_{at1}/Ø_{bt}]100 \leq 25$ % (%)	$Ø_{at2}$ (mm)	$[Ø_{bt} - Ø_{at2}/Ø_{bt}]100 \leq 10$ % (%)	No visible cracks (P/F)	Verdict
20	1	19,8	320	18,7	6	19,4	2	P	P
20	2	19,8	320	18,6	6	19,4	2	P	P
20	3	19,8	320	18,7	6	19,4	2	P	P

Supplementary information:

F = Compression force, reaching the value shown in table 4 within (30 ± 3) s

$Ø_{bt}$ = Outside diameter measured before the test

$Ø_{at1}$ = Outside diameter measured after the force given in table 4 has been applied for (60 ± 2) s where flattening has taken place, without removing the force

$Ø_{at2}$ = Outside diameter measured after the test where flattening has taken place, (60 ± 2) s after removal of the force given in table 4 and the intermediate piece

IEC 61386-22			
Clause	Requirement + Test	Result - Remark	Verdict

10.2	**TABLE: Compression test (pliable conduits)**								
	Classification (first digit) ..... :					**2**/3/4/5			—
Size	N° of sample	$Ø_{bt}$ (mm)	F (N)	$Ø_{at1}$ (mm)	$[Ø_{bt} - Ø_{at1}/Ø_{bt}]100 \leq$ 25 % (%)	$Ø_{at2}$ (mm)	$[Ø_{bt} - Ø_{at2}/Ø_{bt}]100 \leq$ 10 % (%)	No visible cracks (P/F)	Verdict
25	1	24,9	320	23,7	5	24,5	1	P	P
25	2	24,9	320	23,7	5	24,5	1	P	P
25	3	24,9	320	23,7	5	24,5	1	P	P

Supplementary information:

F = Compression force, reaching the value shown in table 4 within (30 ± 3) s

$Ø_{bt}$ = Outside diameter measured before the test

$Ø_{at1}$ = Outside diameter measured after the force given in table 4 has been applied for (60 ± 2) s where flattening has taken place, without removing the force

$Ø_{at2}$ = Outside diameter measured after the test where flattening has taken place, (60 ± 2) s after removal of the force given in table 4 and the intermediate piece

10.2	**TABLE: Compression test (pliable conduits)**								
	Classification (first digit) ..... :					**2**/3/4/5			—
Size	N° of sample	$Ø_{bt}$ (mm)	F (N)	$Ø_{at1}$ (mm)	$[Ø_{bt} - Ø_{at1}/Ø_{bt}]100 \leq$ 25 % (%)	$Ø_{at2}$ (mm)	$[Ø_{bt} - Ø_{at2}/Ø_{bt}]100 \leq$ 10 % (%)	No visible cracks (P/F)	Verdict
32	1	31,8	320	30,8	3	31,5	1	P	P
32	2	31,8	320	30,8	3	31,5	1	P	P
32	3	31,8	320	30,8	3	31,5	1	P	P

Supplementary information:

F = Compression force, reaching the value shown in table 4 within (30 ± 3) s

$Ø_{bt}$ = Outside diameter measured before the test

$Ø_{at1}$ = Outside diameter measured after the force given in table 4 has been applied for (60 ± 2) s where flattening has taken place, without removing the force

$Ø_{at2}$ = Outside diameter measured after the test where flattening has taken place, (60 ± 2) s after removal of the force given in table 4 and the intermediate piece

IEC 61386-22			
Clause	Requirement + Test	Result - Remark	Verdict

10.2	**TABLE: Compression test (pliable conduits)**								
	Classification (first digit) ..... :				**2**/3/4/5				—
Size	N° of sample	$Ø_{bt}$ (mm)	F (N)	$Ø_{at1}$ (mm)	$[Ø_{bt} - Ø_{at1}/Ø_{bt}]100 \leq 25$ % (%)	$Ø_{at2}$ (mm)	$[Ø_{bt} - Ø_{at2}/Ø_{bt}]100 \leq 10$ % (%)	No visible cracks (P/F)	Verdict
40	1	39,6	320	38,5	3	39,4	1	P	P
40	2	39,6	320	38,5	3	39,4	1	P	P
40	3	39,6	320	38,5	3	39,4	1	P	P

Supplementary information:

F = Compression force, reaching the value shown in table 4 within (30 ± 3) s

$Ø_{bt}$ = Outside diameter measured before the test

$Ø_{at1}$ = Outside diameter measured after the force given in table 4 has been applied for (60 ± 2) s where flattening has taken place, without removing the force

$Ø_{at2}$ = Outside diameter measured after the test where flattening has taken place, (60 ± 2) s after removal of the force given in table 4 and the intermediate piece

10.2	**TABLE: Compression test (pliable conduits)**								
	Classification (first digit) ..... :				**2**/3/4/5				—
Size	N° of sample	$Ø_{bt}$ (mm)	F (N)	$Ø_{at1}$ (mm)	$[Ø_{bt} - Ø_{at1}/Ø_{bt}]100 \leq 25$ % (%)	$Ø_{at2}$ (mm)	$[Ø_{bt} - Ø_{at2}/Ø_{bt}]100 \leq 10$ % (%)	No visible cracks (P/F)	Verdict
50	1	49,6	320	48,1	3	49,3	1	P	P
50	2	49,6	320	48,1	3	49,3	1	P	P
50	3	49,6	320	48,0	3	49,2	1	P	P

Supplementary information:

F = Compression force, reaching the value shown in table 4 within (30 ± 3) s

$Ø_{bt}$ = Outside diameter measured before the test

$Ø_{at1}$ = Outside diameter measured after the force given in table 4 has been applied for (60 ± 2) s where flattening has taken place, without removing the force

$Ø_{at2}$ = Outside diameter measured after the test where flattening has taken place, (60 ± 2) s after removal of the force given in table 4 and the intermediate piece

IEC 61386-22			
Clause	Requirement + Test	Result - Remark	Verdict

10.2.101	**TABLE: Compression test (pliable/self-recovering conduits)**								
	Classification (first digit) ..... :					2/3/4/5			—
Size	N° of sample	$Ø_{bt}$ (mm)	F (N)	F_r (N)	Flattening limits allowed (25 % $Ø_{bt}$ / 50 % $Ø_{bt}$) (mm / mm)	Flattening measured (mm)	[$Ø_{bt}$ - $Ø_{at}$/ $Ø_{bt}$]100 ≤ 10 % (%)	No visible cracks (P/F)	Verdict
--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--

Supplementary information:

F = Compression force, reaching the value shown in table 4 within (30 ± 3) s

Fr = Resultant force measured until the sample is flattened by (30 ± 3) % after (30 ± 3) s (additional test carried out in case of the sample flattens by less than 25 %)

$Ø_{bt}$ = Outside diameter measured before the test

$Ø_{at}$ = Outside diameter measured after the test where flattening has taken place, fifteen minutes after removal of the force F or Fr and the intermediate piece

10.3	**TABLE: Impact test**						
	Classification (second digit) ..... :				**2**/3/4/5		—
	Test temperature (table 1) (°C) ..... :				-5		—
	Mass of hammer (table 5) (kg) ..... :				1		—
	Fall height (table 5) (mm) ..... :				100		—
Size	N° of sample	Check of possibility to pass the gauge of figure 102 through the sample		No sign of disintegration / No visible cracks		Total n° of samples which passed the test	Verdict
		N° of samples which passed the test	N° of samples which failed the test	N° of samples which passed the test	N° of samples which failed the test		
16	12	12	0	12	0	0	P
20	12	12	0	12	0	0	P
25	12	12	0	12	0	0	P
32	12	12	0	12	0	0	P
40	12	12	0	12	0	0	P
50	12	12	0	12	0	0	P

Supplementary information:----------

IEC 61386-22			
Clause	Requirement + Test	Result - Remark	Verdict

10.4	**TABLE: Bending test (plain or corrugated conduits)**				
	Plain conduits: length of each sample at least 30 times the nominal outside diameter (mm) .....:	--			—
	Corrugated conduits: length of each sample at least 12 times the nominal outside diameter (mm) .....:	Pass			—
Size	N° of sample	Test at ambient temperature (°C)	No visible cracks (P/F)	Possibility to pass the gauge of figure 102 (P/F)	Verdict
16	1	+25	P	P	P
16	2	+25	P	P	P
16	3	+25	P	P	P
Size	N° of sample	Test after conditioning of 2 h at lower temperature range (table 1) (°C)	No visible cracks (P/F)	Possibility to pass the gauge of figure 102 (P/F)	Verdict
16	4	-5	P	P	P
16	5	-5	P	P	P
16	6	-5	P	P	P
Supplementary information:----------					

IEC 61386-22			
Clause	Requirement + Test	Result - Remark	Verdict

10.4	**TABLE: Bending test (plain or corrugated conduits)**				
	Plain conduits: length of each sample at least 30 times the nominal outside diameter (mm) ..... :	--			—
	Corrugated conduits: length of each sample at least 12 times the nominal outside diameter (mm) ..... :	Pass			—
Size	N° of sample	Test at ambient temperature (°C)	No visible cracks (P/F)	Possibility to pass the gauge of figure 102 (P/F)	Verdict
20	1	+25	P	P	P
20	2	+25	P	P	P
20	3	+25	P	P	P
Size	N° of sample	Test after conditioning of 2 h at lower temperature range (table 1) (°C)	No visible cracks (P/F)	Possibility to pass the gauge of figure 102 (P/F)	Verdict
20	4	-5	P	P	P
20	5	-5	P	P	P
20	6	-5	P	P	P
Supplementary information:----------					

IEC 61386-22			
Clause	Requirement + Test	Result - Remark	Verdict

10.4	**TABLE: Bending test (plain or corrugated conduits)**				
	Plain conduits: length of each sample at least 30 times the nominal outside diameter (mm) .....:	--			-
	Corrugated conduits: length of each sample at least 12 times the nominal outside diameter (mm) .....:	Pass			-
Size	N° of sample	Test at ambient temperature (°C)	No visible cracks (P/F)	Possibility to pass the gauge of figure 102 (P/F)	Verdict
25	1	+25	P	P	P
25	2	+25	P	P	P
25	3	+25	P	P	P
Size	N° of sample	Test after conditioning of 2 h at lower temperature range (table 1) (°C)	No visible cracks (P/F)	Possibility to pass the gauge of figure 102 (P/F)	Verdict
25	4	-5	P	P	P
25	5	-5	P	P	P
25	6	-5	P	P	P
Supplementary information:----------					

IEC 61386-22			
Clause	Requirement + Test	Result - Remark	Verdict

10.4	**TABLE: Bending test (plain or corrugated conduits)**				
	Plain conduits: length of each sample at least 30 times the nominal outside diameter (mm) .....:	--			—
	Corrugated conduits: length of each sample at least 12 times the nominal outside diameter (mm) .....:	Pass			—
Size	N° of sample	Test at ambient temperature (°C)	No visible cracks (P/F)	Possibility to pass the gauge of figure 102 (P/F)	Verdict
32	1	+25	P	P	P
32	2	+25	P	P	P
32	3	+25	P	P	P
Size	N° of sample	Test after conditioning of 2 h at lower temperature range (table 1) (°C)	No visible cracks (P/F)	Possibility to pass the gauge of figure 102 (P/F)	Verdict
32	4	-5	P	P	P
32	5	-5	P	P	P
32	6	-5	P	P	P
Supplementary information:----------					

IEC 61386-22			
Clause	Requirement + Test	Result - Remark	Verdict

10.4	**TABLE: Bending test (plain or corrugated conduits)**				
	Plain conduits: length of each sample at least 30 times the nominal outside diameter (mm) .....:	--			—
	Corrugated conduits: length of each sample at least 12 times the nominal outside diameter (mm) .....:	Pass			—
Size	N° of sample	Test at ambient temperature (°C)	No visible cracks (P/F)	Possibility to pass the gauge of figure 102 (P/F)	Verdict
40	1	+25	P	P	P
40	2	+25	P	P	P
40	3	+25	P	P	P
Size	N° of sample	Test after conditioning of 2 h at lower temperature range (table 1) (°C)	No visible cracks (P/F)	Possibility to pass the gauge of figure 102 (P/F)	Verdict
40	4	-5	P	P	P
40	5	-5	P	P	P
40	6	-5	P	P	P
Supplementary information:----------					

IEC 61386-22			
Clause	Requirement + Test	Result - Remark	Verdict

10.4	**TABLE: Bending test (plain or corrugated conduits)**				
	Plain conduits: length of each sample at least 30 times the nominal outside diameter (mm) ..... :	--			—
	Corrugated conduits: length of each sample at least 12 times the nominal outside diameter (mm) ..... :	Pass			—
Size	N° of sample	Test at ambient temperature (°C)	No visible cracks (P/F)	Possibility to pass the gauge of figure 102 (P/F)	Verdict
50	1	+25	P	P	P
50	2	+25	P	P	P
50	3	+25	P	P	P
Size	N° of sample	Test after conditioning of 2 h at lower temperature range (table 1) (°C)	No visible cracks (P/F)	Possibility to pass the gauge of figure 102 (P/F)	Verdict
50	4	-5	P	P	P
50	5	-5	P	P	P
50	6	-5	P	P	P
Supplementary information:----------					

IEC 61386-22			
Clause	Requirement + Test	Result - Remark	Verdict

10.7	**TABLE: Tensile test**						
	Classification (tenth digit) ..... :			2/3/4/5			—
	Increasing tensile force value reached in (30 ± 3)s and then applied for (120 ± 10)s (table 6) (N) ..... :			--			—
Size	N° of assembly sample	Art./Type Ref. of the two conduit fittings assembled to the conduit	Elongation occurred (Y/N)	After the test the conduit fittings or terminating conduit fittings remained properly assembled (P/F)	No visible cracks (P/F)	Verdict	
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Supplementary information:----------							

10.8	**TABLE: Suspended load test (conduit fittings)**						
	Classification (twelfth digit) ..... :			2/3/4/5			—
	Test temperature of the heating cabinet at which the non-metallic and composite conduit fitting was kept during the test (table 2) (°C) ..... :			--			—
Size	N° of sample	Art./Type Ref. of the conduit fitting	Load (N)	Duration (h)	No visible cracks (P/F)	No deformation (P/F)	Verdict
----	1	-------	------	------	-----	-----	---
----	2	-------	------	------	-----	-----	---
----	3	-------	------	------	-----	-----	---
Supplementary information:----------							

11.2	**TABLE: Bonding test**				
	Classification (sixth digit) ..... :		1/3		—
Size	N° of assembly sample	Art./Type Ref. of the terminating conduit fitting assembled to the conduit	Voltage drop measured (V)	Resistance (Ω)	Verdict
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Supplementary information:----------					

IEC 61386-22			
Clause	Requirement + Test	Result - Remark	Verdict

11.3.1	**TABLE: Electrical insulating strength and resistance test (conduits)**			
Size	N° of sample	Device incorporated into the circuit not trip during the insulating strength test (P/F)	Insulation resistance measured (MΩ)	Verdict
16	1	P	>100 MΩ	P
16	2	P	>100 MΩ	P
16	3	P	>100 MΩ	P
20	1	P	>100 MΩ	P
20	2	P	>100 MΩ	P
20	3	P	>100 MΩ	P
25	1	P	>100 MΩ	P
25	2	P	>100 MΩ	P
25	3	P	>100 MΩ	P
32	1	P	>100 MΩ	P
32	2	P	>100 MΩ	P
32	3	P	>100 MΩ	P
40	1	P	>100 MΩ	P
40	2	P	>100 MΩ	P
40	3	P	>100 MΩ	P
50	1	P	>100 MΩ	P
50	2	P	>100 MΩ	P
50	3	P	>100 MΩ	P
Supplementary information:----------				

11.3.2	**TABLE: Electrical insulating strength and resistance test (conduit fittings)**				
Size	N° of sample	Art./Type Ref. of the conduit fitting	Device incorporated into the circuit not trip during the insulating strength test (P/F)	Insulation resistance measured (MΩ)	Verdict
---	1	---	---	---	---
---	2	---	---	---	---
---	3	---	---	---	---
Supplementary information:					

12	**TABLE: Heating test (conduits)**	

IEC 61386-22			
Clause	Requirement + Test	Result - Remark	Verdict

	Classification (fourth digit) ..... :		**1**/2/3/4/5/6/7	—
	Test temperature of the heating cabinet at which the non-metallic and composite conduit fitting was kept for 4 h ± 5 min (table 2) (°C) ..... :		+60	—
	Classification (first digit) ..... :		**2**/3/4/5	—
	Total mass applied for 24 h ± 5 min in an apparatus as shown in figure 8 (table 9) (kg) ..... :		1	—
Size	N° of sample	Sample after the period of 24 h ± 5 min and then cool to room temperature under load: no visible cracks (P/F)	Possibility to pass the gauge of figure 102 immediately after the removal of the load (P/F)	Verdict
16	1	P	P	P
16	2	P	P	P
16	3	P	P	P
20	1	P	P	P
20	2	P	P	P
20	3	P	P	P
25	1	P	P	P
25	2	P	P	P
25	3	P	P	P
32	1	P	P	P
32	2	P	P	P
32	3	P	P	P
40	1	P	P	P
40	2	P	P	P
40	3	P	P	P
50	1	P	P	P
50	2	P	P	P
50	3	P	P	P
Supplementary information:----------				

13.1.3.1	**TABLE: Glow-wire test (non-metallic and composite conduit fittings)**	

IEC 61386-22			
Clause	Requirement + Test	Result - Remark	Verdict

	Material designation ..... :			--	--
	Test temperature (°C) ..... :			--	--
Size	N° of sample	Art./Type Ref. of the conduit fitting	Visible flame or sustained glowing (Y/N)	Time of extinguishment of flames and glowing, if any, after removal of the glow-wire (s)	Verdict
--	1	--	--	--	--
--	2	--	--	--	--
--	3	--	--	--	--
Supplementary information:----------					

13.1.3.2	**TABLE: Flame-propagation resistance test (non-metallic and composite conduits)**	

IEC 61386-22			
Clause	Requirement + Test	Result - Remark	Verdict

	Material designation ..... :	Non flame propagation	—

Size	N° of sample	Highest mean material thickness (mm)	Flame application time (+1/0) (s)	Sample did not ignite (P/F)	Time of extinguishment of flaming or glowing, if any, after removal of the test flame (s)	No ignition of the tissue paper (P/F)	No evidence of burning or charring (P/F)	Verdict
16	1	0,5	15	P	0	P	P	P
16	2	0,5	15	P	0	P	P	P
16	3	0,5	15	P	0	P	P	P
20	1	0,5	15	P	0	P	P	P
20	2	0,5	15	P	0	P	P	P
20	3	0,5	15	P	0	P	P	P
25	1	0,5	15	P	0	P	P	P
25	2	0,5	15	P	0	P	P	P
25	3	0,5	15	P	0	P	P	P
32	1	0,7	20	P	0	P	P	P
32	2	0,7	20	P	0	P	P	P
32	3	0,7	20	P	0	P	P	P
40	1	0,7	20	P	0	P	P	P
40	2	0,7	20	P	0	P	P	P
40	3	0,7	20	P	0	P	P	P
50	1	0,7	20	P	0	P	P	P
50	2	0,7	20	P	0	P	P	P
50	3	0,7	20	P	0	P	P	P

Supplementary information:----------

List of test equipment used at the Manufacturer's Testing Laboratory:

Clause	Measurement / testing	Testing / measuring equipment / material used	Range used	Last Calibration date	Calibration due date