First Group Lab

CE LVD
TEST REPORT

For

Aldo Bernardi srl

Model No.:	Brass Conduit system
Applicant:	Aldo Bernardi srl via Vittorio Veneto, 7 31017 Pieve del Grappa - TV - Italy
Manufacturer:	Aldo Bernardi srl via Vittorio Veneto, 7 31017 Pieve del Grappa - TV - Italy
Issued by:	First Group sas via Tiepolo, 18 31021 Mogliano V.to, Treviso, Italy tel.: +39 041 5951122 mail: info@firstgroup.it
Report number:	02306353LN-00
Issued Date:	10/07/2023
Start of tests:	15/04/2023
End of tests:	10/07/2023
Date of sample receipt:	18/01/2023

Note

The results reported in this test report relate the tested item only.

The laboratory is not responsable of the sampling.

TEST REPORT
EN IEC 61386-21
Conduit systems for cable management
Part 21: Particular requirements - Rigid conduit system

Report number:	02306353LN-00
Date of issue:	10/07/2023
total number of pages:	11
Name of Testing Laboratory preparing the Report:	First Group sas - via Tiepolo, 18 - Mogliano V.to - Treviso - Italy
Applicant's name:	Aldo Bernardi srl
Address:	via Vittorio Veneto, 7 31017 Pieve del Grappa - TV - Italy
Test specification Standard:	IEC 61386-21: 2021 used in conjunction with IEC 61386-1: 2008 + A1: 2017
Non standard test method:	N/A
Trade Mark:	Aldo Bernardi srl
Model/Type designation:	Brass Conduit system
Test Item Description:	Metallic conduit system
Ratings:	1000V a.c. / 1500V d.c.

Possible test verdict

N/A	test case does not apply to the test object
P (pass)	test object does meet the requirement
F (fail)	test object does not meet the requirement
Decisional rule	The judgment / declaration of conformity is assigned taking into account only the numerical values of the measurands reported in this document or the data obtained in the visual inspection.

Tested by :	laboratory technician	Valter Benetton	Valter Benetton
Approved by:	laboratory manager	Giorgio Lovisetto	

General remarks:

This report includes the following parts:
_ Applied clauses of IEC 61386-21.
_ Annex 1: Tables
_ Annex 2: Photo Documentation.
_ Annex 3: Laboratory Equipments.

Unless otherwise specified, test are made under normal conditions at an ambient temperature within the range of 18°C to 28°C, RH 45% to 75%.

Throughout this report a comma is used as the decimal separator.

Test item particulars:

Conduit system classification coding:

Type of conduit ……..:	☒ metallic ☐ non metallic ☐ composite
Type of conduit ……..:	☒ plane ☐ corrugated
Type of conduit fitting ……..:	☒ metallic ☐ non metallic ☐ composite
Conduit fitting – quantity ……..:	N/A
Conduit fitting – type(s) ……..:	☒ metallic ☐ non metallic ☐ composite
Conduit fitting – colour(s) ……..:	N/A
Method for connection ……..:	☐ threadable ☒ non-threadable
Resistance to compression ……..:	☐ light ☐ medium ☒ heavy ☐ very heavy
Resistance to impact ……..:	☐ light ☐ medium ☒ heavy ☐ very heavy
Resistance to bending ……..:	☒ rigid
Electrical characteristics ……..:	☒ electrical continuity ☐ electrical insulating
Resistance to external influences ……..:	☐ without protection ☒ with protection IP40
Resistance against corrosion ……..:	☐ without protection ☒ with protection
Resistance to flame propagation ……..:	☒ no propagation ☐ flame propagation

Classification code of brass conduit system according with Annex A of IEC 61386

4 Heavy compression strenght
4 Heavy impact strenght
5 -45°C lower temperature range
7 +400°C upper temperature range
1 Rigid (no bending)
1 With electrical continuity
4 Protect against solid foreign objects of 1 mm diameter and greater
0 No protection aginst ingress of water
2 Medium resistance to corrosion inside and outside
1 Very light tensile strenght

The system cover by this test report is composed by the follow elements:

LIN.1.0	brass tube Ø20 mm
LIN.2.0	brass tube Ø16 mm
LIN.3.0	brass tube Ø10 mm
CUR.1	bent brass tube Ø20 mm
CUR.2	bent brass tube Ø16 mm
CUR.3	bent brass tube Ø10 mm
SUP.1	wall support in brass cast for tube Ø20 mm
SUP.2	wall support in brass cast for tube Ø16 mm
SUP.3	wall support in brass cast for tube Ø10 mm
RAC.1	wall connection in brass cast for tube Ø20 mm
RAC.2	wall connection in brass cast for tube Ø16 mm
RAC.3	wall connection in brass cast for tube Ø10 mm
VOL.1	brass head to head connection for tube Ø20 mm
VOL.2	brass head to head connection for tube Ø16 mm
VOL.3	brass head to head connection for tube Ø10 mm

IEC 61386-21			
Clause	Requirement + Test	Result - Remark	Verdict

7	**MARKING AND DOCUMENTATION**		P
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	Classification code accordance Annex A, least first four digits		P
7.1.2	Manufacturer indicates the compatibility of parts within a conduit system	on instruction sheet	P
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)	one for item (2 m lenght)	P
7.2	Conduit fitting is marked in accordance with 7.1		P
7.6	Marking is durable and clearly legible		P

8	**DIMENSIONS**		**P**
8.1	Threads and external diameter comply with IEC 60423	see Tab 8.1 on Annex 1	P

9	**CONTRUCTION**		**P**
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
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		P
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		P

10	**MECHANICAL PROPERTIES**		**P**
10.1	**Mechanical Strenght**		-
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
10.2	**Compression test**		P
	sample lenght (200 ± 5mm)	200	-
	compression force (ref table 4) (N)	1250	-
	force applied fo 60 ± 2 sec		-
	Difference between initial outside diameter and the diameter of the flattened sample not exceed 25%	see Tab 10.2 on Annex 1	P
10.3	**Impact test**		P
	12 samples of conduit, each (200 ± 5) mm in length, or 12 samples of conduit fittings subjected to an impact test	see Tab 10.3 on Annex 1	-
10.3.3	At least 9 of the 12 samples passed the test	12	P

11	**ELECTRICAL PROPERTIES**		**P**
11.1	**Electrical requirements**		-
11.1.2	Conduit systems of a metal or composite materials shall be so constructed that accessible metal parts can be bonded to earth		P
11.1.3	Accessible conductive parts shall be effectively earthed		P
11.2	**Bonding test**		-
	Resistance < 0,1 Ω (Ω)		P

14	**EXTERNAL INFLUENCES**		**P**
14.1	**Degree of protection provided by enclosure**		-
14.1.1	Conduit systems have adequate resistance to external influences according to the classification declared by the manufacturer, with a minimum requirement of IP30	IP40	P
14.2	**Resistance against corrosion**		-
	Resistance to corrosion classification for painted and zinc coated steel and steel composite conduits and conduit fittings (table 10)	resistance 2	P
	For non-ferrous metallic and composite conduit systems, the manufacturer provided information about its protection against corrosion		P
14.2.2	Tests for resistance to corrosion for painted and zinc coated steel and steel composite conduits systems		-
14.2.2.1	Low protection conduit and conduit fittings inspected for completeness of covering by the protective coating, both inside and outside		N/A

14.2.2.2	Test for medium protection conduit and conduit fittings: after completion of the test, the samples showed no more than two blue coloured spots on each square centimetre of the surface, and no blue spot had a dimension larger than 1,5 mm		P
14.2.2.3	Test for high protection conduit and conduit fittings: after the test, the sample showed no precipitation of copper which cannot be scrubbed off in running water, if necessary after immersion for 15 s in a 10% solution of hydrochloric acid in water		N/A

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

ANNEX 1	TABLES						
8.1	**TABLE: dimension**						**P**
	Reference Table 2 IEC 60423 - Outside diameters for non-threadable conduit		Reference table 102 IEC 61386-21				
Outside diameters (mm)	Tolerance (mm)	Measured (mm)	Maximum entrance diameter (mm)	Measured (mm)	Minimum junction lenght (mm)	Measured (mm)	Verdict
6	+0,0 -0,1		6,5		6		-
8	+0,0 -0,2		8,5		8		-
10	+0,0 -0,2	9,93	10,5	10,1	10	12,0	P
12	+0,0 -0,3		12,5		12		-
16	+0,0 -0,3	15,98	16,5	16,1	16	20,0	P
20	+0,0 -0,3	19,95	20,5	20,2	20	22,0	P
25	+0,0 -0,4		25,5		25		-
32	+0,0 -0,4		32,6		30		-
40	+0,0 -0,4		40,7		32		-
50	+0,0 -0,5		50,8		42		-
63	+0,0 -0,6		63,9		50		-
75	+0,0 -0,7		75,9		50		-

10.2	**TABLE: compression test**						**P**
	compression force (N)		**1250**				-
	tolerance 0, +4%		max force admitted (N)		**1300**		-
size	n° of sample	**Øi**	**Ød**	**Øi - Ød**	**Øi - Ød <25%**	no visible cracks	Verdict
10	1	9,95	10,99	1,04	P	no	P
10	2	9,95	10,97	1,02	P	no	P
10	3	9,97	11	1,03	P	no	P
16	1	15,98	17,23	1,25	P	no	P
16	2	15,99	17,31	1,32	P	no	P
16	3	15,98	17,29	1,31	P	no	P
20	1	19,96	20,51	0,55	P	no	P
20	2	19,95	20,48	0,53	P	no	P
20	3	19,95	20,55	0,6	P	no	P

Supplementary information
Øi outside diameter mesured before test
Ød outside diameter mesured during the application of the force

10.3	TABLE: impact test						P
	Test temperature (°C)	-45					-
	Mass of hammer (kg)	2					-
	tolerance 0, +1%	max mass admitted (kg)		2,02			-
	Fall height (mm)	300					-
	tolerance ±1%	mix height	297	max height	303		-

size	n° of sample	check with gauge		No sign of disintegration / no visible crack		Total n° of sample passed the test	Verdict
		n° of sample pass	n° of sample fail	n° of sample pass	n° of sample fail		
10	1-12	12	0	12	0	12	P
16	1-12	12	0	12	0	12	P
20	1-12	12	0	12	0	12	P

ANNEX 2	PHOTO DOCUMENTATION






earth continuity system

end of photo

ANNEX 3	LABORATORY EQUIPMENTS

code	type	manufacturer	model	serial	certificate of calibration	calibration due date
LAB008	electrical safety tester	Schleich	GLP2-i	2347	LAT 238 0714CT-22	22/09/2023
LAB021	torque srewdriver	Fervi	0806/020	Q70600255	T2i 2690/22-2805/22-2806/22	28/10/2023
LAB022	dynamometer	Sauter	FH2K	5B15L01144	T2i 2689/22	27/10/2023
LAB025	vernier caliper	Metrica	vernier caliper	SC 2927	LAT 137 S1474/22	27/10/2023
LAB058	ambient datalogger	Testo	Saveris 2 H1	0054737942	LAT 238 0537-22	15/02/2024
LAB064+ LAB065	dynamometer	AEP	TCE-TM25kN + DFI2	164162 + 6962	03214 23 I + 03216 23 I	16/01/2025
	Petrolium spirit (n-Hexane)	Merck	1.04374.1000	K54108474	coa K54108474	2027

END OF REPORT