



# 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  
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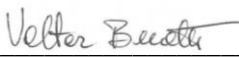
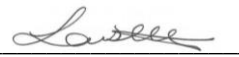
**Report number:** 02306353LN-00  
**Issued Date:** 10/07/2023  
**Start of tests:** 15/04/2023  
**End of tests:** 10/07/2023  
**Date of sample receipt:** 18/01/2023

### Note

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

The laboratory is not responsible of the sampling.

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TEST REPORT EN IEC 61386-21 Conduit systems for cable management Part 21: Particular requirements - Rigid conduit system	
<b>Report number:</b>	02306353LN-00
<b>Date of issue:</b>	10/07/2023
<b>total number of pages:</b>	11
<b>Name of Testing Laboratory preparing the Report:</b>	First Group sas - via Tiepolo, 18 - Mogliano V.to - Treviso - Italy
<b>Applicant's name:</b>	Aldo Bernardi srl
<b>Address:</b>	via Vittorio Veneto, 7 31017 Pieve del Grappa - TV - Italy
<b>Test specification Standard:</b>	IEC 61386-21: 2021 used in conjunction with IEC 61386-1: 2008 + A1: 2017
<b>Non standard test method:</b>	N/A
<b>Trade Mark:</b>	Aldo Bernardi srl
<b>Model/Type designation:</b>	Brass Conduit system
<b>Test Item Description:</b>	Metallic conduit system
<b>Ratings:</b>	1000V a.c. / 1500V d.c.
<b>Possible test verdict</b>	
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.
<b>Tested by :</b>	laboratory technician Valter Benetton 
<b>Approved by:</b>	laboratory manager Giorgio Lovisetto 
<b>General remarks:</b>	
<p>This report includes the following parts:</p> <ul style="list-style-type: none"> <li>_ Applied clauses of IEC 61386-21.</li> <li>_ Annex 1: Tables</li> <li>_ Annex 2: Photo Documentation.</li> <li>_ Annex 3: Laboratory Equipments.</li> </ul> <p>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%.</p> <p>Throughout this report a comma is used as the decimal separator.</p>	

Test item particulars:

Conduit system classification coding:

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

<b>IEC 61386-21</b>			
Clause	Requirement + Test	Result - Remark	Verdict
<b>7</b>	<b>MARKING AND DOCUMENTATION</b>		<b>P</b>
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
<b>8</b>	<b>DIMENSIONS</b>		<b>P</b>
8.1	Threads and external diameter comply with IEC 60423	see Tab 8.1 on Annex 1	P
<b>9</b>	<b>CONTRUCTION</b>		<b>P</b>
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
<b>10</b>	<b>MECHANICAL PROPERTIES</b>		<b>P</b>
<b>10.1</b>	<b>Mechanical Strenght</b>		-
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
<b>10.2</b>	<b>Compression test</b>		P
	sample length (200 ± 5mm)	200	-
	compression force (ref table 4 ) (N)	1250	-
	force applied for 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
<b>10.3</b>	<b>Impact test</b>		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

<b>11</b>	<b>ELECTRICAL PROPERTIES</b>		<b>P</b>
<b>11.1</b>	<b>Electrical requirements</b>		-
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
<b>11.2</b>	<b>Bonding test</b>		-
	Resistance < 0,1 Ω (Ω)		P

<b>14</b>	<b>EXTERNAL INFLUENCES</b>		<b>P</b>
<b>14.1</b>	<b>Degree of protection provided by enclosure</b>		-
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
<b>14.2</b>	<b>Resistance against corrosion</b>		-
	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
<b>15</b>	<b>ELECTROMAGNETIC COMPATIBILITY</b>		<b>P</b>
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					
<b>8.1</b>		<b>TABLE: dimension</b>					<b>P</b>
		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 length (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		-
<b>10.2</b>		<b>TABLE: compression test</b>					<b>P</b>
		compression force (N)	<b>1250</b>				-
		tolerance 0, +4%	max force admitted (N)		<b>1300</b>		-
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 measured before test							
Ød outside diameter measured during the application of the force							

10.3		TABLE: impact test				P	
	Test temperature (°C)	<b>-45</b>				-	
	Mass of hammer (kg)	<b>2</b>				-	
	tolerance 0, +1%	max mass admitted (kg)		<b>2,02</b>		-	
	Fall height (mm)	300				-	
	tolerance ±1%	mix height		<b>297</b>		max height <b>303</b>	
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 + DF12	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**