

EMM. KOUVIDIS SA
Manufacture of Electrical
Mr. Nektarios Droulos
Materials
Viopa Tylissos
71500 HERAKLIO, CRETE
GRIECHENLAND



Offenbach, 2011-01-13

Your ref.

Your letter
2010-10-05

Our ref. - please indicate
5001979-5410-0022/141270
FG41/hue

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**PRÜFBERICHT
zur Information des Auftraggebers**

Test Report for the Information of the applicant

dieser Prüfbericht enthält das Ergebnis einer einmaligen Untersuchung an dem zur Prüfung vorgelegten Erzeugnis. Ein Muster dieses Erzeugnisses wurde geprüft, um die Übereinstimmung mit den nachfolgend aufgeführten Normen bzw. Abschnitten von Normen festzustellen. Die Prüfung wurde durchgeführt von 2010-11-25 bis 2011-01-13.

This test report contains the result of a singular investigation carried out on the product submitted. A sample of this product was tested to found the accordance with the thereafter listed standards or clauses of standards resp. The testing was carried out from 2010-11-25 to 2011-01-13.

Der Prüfbericht berechtigt Sie nicht zur Benutzung eines Zertifizierungszeichens des VDE und berücksichtigt ausschließlich die Anforderungen der unten genannten Regelwerke.

The test report does not entitle for the use of a VDE Certification Mark and considers solely the requirements of the specifications mentioned below.

Wenn gegenüber Dritten auf diesen Prüfbericht Bezug genommen wird, muss dieser Prüfbericht in voller Länge an gleicher Stelle verfügbar gemacht werden.

Whenever reference is made to this test report towards third party, this test report shall be made available on the very spot in full length.



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Date of receipt of test samples: 2010-10-22
Date of performance of tests: 2010-11-25 – 2011-01-13
Testing Laboratory: VDE Testing and Certification Institute

Description of test samples

The applicant supplied following conduit systems for the test

Type	Size	Description	Declared by manufacturer	
			Outside diameter	Inside diameter
Hydroflex	23 mm	Pliable, corrugated, non-metallic conduit	28,0 mm	23,2 mm
Hydroflex coupler	23 mm	Conduit fitting	---	---
Hydroflex	29 mm	Pliable, corrugated, non-metallic conduit	33,4 mm	28,5 mm
Hydroflex coupler	29 mm	Conduit fitting	---	---

Test procedure

On the request of the applicant following tests have been performed

- Compression test with reference to DIN EN 61386-1:2004 / DIN EN 61386-22:2004, clause 10.2
- Impact test with reference to DIN EN 61386-1:2004 / DIN EN 61386-22:2004, clause 10.3
- Bending test with reference to DIN EN 61386-1:2004 / DIN EN 61386-22:2004, clause 10.4
- Heating test with reference to DIN EN 61386-1:2004 / DIN EN 61386-22:2004, clause 12
- External influences according to DIN EN 61386-1:2004 / DIN EN 61386-22:2004, clause 14.1
- Ageing test with reference to DIN EN 60670-1:2005, clause 13.1
- Smoke density with reference to DIN EN 61034-1:2006 / DIN EN 61034-2:2006



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Compression test

Conduit size	N° of sample	$\varnothing_{bt}$ (mm)	F (N)	$\varnothing_{at1}$ (mm)	$\frac{[\varnothing_{bt} - \varnothing_{at1}]}{\varnothing_{bt}} 100$ $\leq 25\%$ (%)	$\varnothing_{at2}$ (mm)	$\frac{[\varnothing_{bt} - \varnothing_{at2}]}{\varnothing_{bt}} 100$ $\leq 10\%$ (%)	No visible cracks (P/F)	Final result
23 mm	1	28,0	220	23,7	15,4	27,1	3,2	P	passed
	2	28,1	220	23,4	16,7	26,7	5,0	P	passed
	3	28,0	220	23,3	16,8	26,9	3,9	P	passed
29 mm	1	33,9	220	28,7	15,3	32,6	3,8	P	passed
	2	33,8	220	28,6	15,4	33,0	2,4	P	passed
	3	33,9	220	28,8	15,0	33,0	2,7	P	passed

Supplementary information:

F = Compression force, reaching the value within (30 ± 3) s

$\varnothing_{bt}$ = Outside diameter measured before the test

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

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



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Impact test

At least 9 of the 12 samples shall pass the test

	Test temperature:	-25 °C				
	Energy:	7 J				
	Mass of hammer:	2,0 kg				
	Fall height:	350 mm				
Conduit size	N° of sample	Check of minimum inside diameter with gauge according to EN 61386-22		No sign of disintegration / No visible cracks		Final result
		N° of samples which <u>passed</u> the test	N° of samples which <u>failed</u> the test	N° of samples which <u>passed</u> the test	N° of samples which <u>failed</u> the test	
23 mm	1-12	12	0	12	0	passed
29 mm	1-12	12	0	12	0	passed

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Bending test

Conduit size	N° of sample	Test at ambient temperature (°C)	Bending radius (mm)	No visible cracks (P/F)	Check of minimum inside diameter with gauge according to EN 61386-22 (P/F)	Final result
23 mm	1-3	+23°C	60 mm	P	P	passed
29 mm	1-3	+23°C	160 mm	P	P	passed
Conduit size	N° of sample	Test after conditioning of 2 h at lower temperature range (°C)	Bending radius (mm)	No visible cracks (P/F)	Check of minimum inside diameter with gauge according to EN 61386-22 (P/F)	Final result
23 mm	4-6	-25°C	60 mm	P	P	passed
29 mm	4-6	-25°C	160 mm	P	P	passed



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Heating test

		Test temperature of the heating cabinet at which the conduit was kept for 4 h $\pm$ 5 min ($^{\circ}$ C)	+105 $^{\circ}$ C	
		Total mass applied for 24 h $\pm$ 5 min (kg)	0,5 kg	
Conduit size	N° of sample	Sample after the period of 24 h $\pm$ 5 min and then cool to room temperature under load: no visible cracks (P/F)	Check of minimum inside diameter with gauge according to EN 61386-22 (P/F)	Final result
23 mm	1-3	P	P	passed

		Test temperature of the heating cabinet at which the conduit was kept for 4 h $\pm$ 5 min ($^{\circ}$ C)	+105 $^{\circ}$ C	
		Total mass applied for 24 h $\pm$ 5 min (kg)	1,0 kg	
Conduit size	N° of sample	Sample after the period of 24 h $\pm$ 5 min and then cool to room temperature under load: no visible cracks (P/F)	Check of minimum inside diameter with gauge according to EN 61386-22 (P/F)	Final result
29 mm	1-3	P	P	passed

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External influences

Protection against ingress of solid objects.....:					IP6X
Conduit size	N° of assembly sample	Type of the conduit fitting with a short length of conduit assembled in each conduit entry	Assembly tested in accordance with the appropriate test of IEC 60529 (P/F)	No ingress of dust visible to normal or corrected vision without magnification in the assembly tested for IP5X or IP6X (P/F)	Final result
23 mm	1	Hydroflex coupler	P	P	passed
29 mm	1	Hydroflex coupler	P	P	passed

Protection against ingress of water.....:					IPX6
Conduit size	N° of assembly sample	Type of the conduit fitting with a short length of conduit assembled in each conduit entry	Assembly tested in accordance with the appropriate test of IEC 60529 (P/F)	No sufficient ingress of water to form a drop visible to normal or corrected vision without magnification in the assembly tested for IPX1 and above (P/F)	Final result
23 mm	1	Hydroflex coupler	P	P	passed
29 mm	1	Hydroflex coupler	P	P	passed

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Ageing test

		Test temperature of the heating cabinet at which the conduit was kept for 168 h (°C)	+70°C	
		Sample after the period of 168 h and then cool to room temperature for 96 h (°C).....	+23°C	
Conduit size	N° of sample	Type of the conduit fitting	No visible cracks (P/F)	Final result
23 mm	1	Hydroflex coupler	P	passed
29 mm	1	Hydroflex coupler	P	passed

Smoke density

		Test after conditioning of 16 h at ambient temperature.....	+23°C	
Conduit size	N° of test pieces	Temperature of test chamber (°C)	Measured light transmittance ≤ 60% (%)	Final result
23 mm	2	20°C	93%	passed
29 mm	2	21°C	91%	passed

VDE Testing and Certification Institute
Section F4


Dietmar Banowski

i. A. 
Reiner Lehrer



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