

TEST REPORT

Report reference No .	TR_2023342_1
Tested by (printed name and signature)	Hakan Aydın 
Approved by (printed name and signature)	
Date of issue	25.01.2023

Testing Laboratory	SGS Supervise Gözetme Etüd Kontrol Servisleri A.Ş.
Address	Bağlar Mah. Osmanpaşa Caddesi No. 95 İş İstanbul Plaza, Güneşli İstanbul, 34209 Türkiye
Procedure	Test Report ☒ TMP ☐ WMT ☐ SMT ☐
Applicant's Name	YUSUF KABUKÇU NAK KABLO ELEKTRİK MAL. İNŞ. İTH. İHR. SAN. TİC. LTD. ŞTİ.
Address	Bozburun Mah. 7067 Sokak No:1 Gümüşler / DENİZLİ - TURKEY
Manufacturer	YUSUF KABUKÇU NAK KABLO ELEKTRİK MAL. İNŞ. İTH. İHR. SAN. TİC. LTD. ŞTİ.
Address (if difefrent from applicant)	

Test specification	
Standard	Gen. to EN 50525-2-21, EN 50618, IEC 62930
Test procedure	Special Test
Procedure deviation	N/A
Non-standard test method	N/A

Test Report Form	
Test Report Form No	EN 50525-2-21/ iss.01 – rev. 00
TRF originator	-
Master TRF	-

Item tested	Electric cables for photovoltaic systems
Code designation/number of cores and cross section/colour/length:	Within the scope of H1Z2Z2-K / 62930 IEC 1x1,5 - 1x6mm ² sections H1Z2Z2-K / 62930 IEC 131 1x1,5 mm ² RED, 50mt
Trade mark	NAK SOLAR CABLE
Rating(s) U ₀ /U	1,5 kV D.C

Tests and test case verdicts	☐ complete tests ☒ partial tests (see notes page 2)
Test item does meet the requirement s	: P(ass)
Test item does not meet the requirement s	: F(ail)
Test does not apply to test item	N/A
Not tested (see notes on page 2)	N/T
Date of receipt of test item	15.08.2022
Date(s) of performance of tests	From 22.08.2022 to 24.01.2023
Summary of test results:	☒ POSITIVE ☐ NEGATIVE NOTES: YES ☐ NO ☐ (see notes page 2)

General remarks:

- Observations, notes and remarks of test results:

H1Z2Z2-K / 62930 IEC 131 1x1,5 mm²

* The sample described above has passed the water resistance tests. Samples has been found to be in compliance with referens to EN 50525-2-21 (2011- 05).

The test results are given on the following pages.

Summary of tests carried out (*in case of partial test*):

AD8 Water resistance tests;

- Electrical test
 - Mechanical test on sheath
-
- The complete markings on cable (or on tape, etc)
NAK SOLAR CABLE TUV NORD EN 50618:2014 H1Z2Z2-K 1x1,50 mm² 1,5 kV DC / 62930 IEC 131 –
HALOGEN FREE LOW SMOKE - Dca CPR – Dop No 0001 30.05.2022 OP.1



Based to EN 50525-2-21				
Ref No.	Tests	Prescribed	Observed <i>(uncertainty issues are marked with (*))</i>	Verdict

	Water resistance tests			
	Electrical test			
	Voltage pre-test on completed cable 6,5 kV AC	No breakdown	No breakdown	P
	Voltage test on completed cable at 50°C 1kV AC	No breakdown	No breakdown	P
	Insulation resistance test after pre-voltage test			
	Voltage test on cores 5mins 2,5kV AC	No breakdown	No breakdown	P
	Volume resistivity $\Omega \cdot \text{cm}$	$\geq 10^{12}$	$3,2 \times 10^{13}$	P
	Voltage test on cores at 50°C 14 days 1kV AC	No breakdown	No breakdown	P
	Volume resistivity $\Omega \cdot \text{cm}$	$\geq 10^{11}$	$4,7 \times 10^{12}$	P

	Mechanical test on sheath			
	Increase in mass after immersion for 100 days %	≤ 40	29	P
	Tensile strength and elongation at break	Inner layer	Single/outer layer	
	Tensile strength without immersion N/mm^2	≥ 5	≥ 7	11,6
	Elongation at break without immersion %	≥ 175	≥ 200	235
	Tensile strength after 28 days N/mm^2	≥ 5	≥ 7	12,8
	Elongation at break after 28 days %	≥ 175	≥ 200	210
	Tensile strength after 100 days N/mm^2	≥ 5	≥ 7	14,0
	Elongation at break after 100 days %	≥ 175	≥ 200	190
	Tensile strength variation	$-0,15 \leq \frac{\text{TS}_{28} - \text{TS}_{100}}{\text{TS}_{28}} \leq + 0,15$		-0,09
	Elongation at break variation	$-0,2 \leq \frac{\text{EB}_{28} - \text{EB}_{100}}{\text{EB}_{28}} \leq + 0,2$		0,09
				P

TEST REPORT

Report reference No	:	
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Approved by (printed name and signature)	:	
Date of issue	:	25.01.2023
Testing Laboratory	:	SGS Supervise Gözetme Etüd Kontrol Servisleri A.Ş.
Address	:	Bağlar Mah. Osmanpaşa Caddesi No. 95 İş İstanbul Plaza, Güneşli İstanbul, 34209 Türkiye
Procedure	:	Test Report ☒ TMP ☐ WMT ☐ SMT ☐
Applicant's Name	:	YUSUF KABUKÇU NAK KABLO ELEKTRİK MAL. İNŞ. İTH. İHR. SAN. TİC. LTD. ŞTİ.
Address	:	Bozburun Mah. 7067 Sokak No:1 Gümüşler / DENİZLİ - TURKEY
Manufacturer	:	YUSUF KABUKÇU NAK KABLO ELEKTRİK MAL. İNŞ. İTH. İHR. SAN. TİC. LTD. ŞTİ.
Address (if difefrent from applicant).....	:	
Test specification	:	
Standard.....	:	Gen. to EN 50525-2-21, EN 50618, IEC 62930
Test procedure	:	Special Test
Procedure deviation	:	N/A
Non-standard test method	:	N/A
Test Report Form	:	
Test Report Form No.....	:	EN 50525-2-21/ iss.01 – rev. 00
TRF originator	:	-
Master TRF	:	-
Item tested	:	Electric cables for photovoltaic systems
Code designation/number of cores and cross section/colour/length:	:	Within the scope of H1Z2Z2-K / 62930 IEC 1x1,5 - 1x6mm ² sections H1Z2Z2-K / 62930 IEC 131 1x4 mm ² BLACK, 50mt
Trade mark	:	NAK SOLAR CABLE
Rating(s) U ₀ /U	:	1,5 kV D.C
Tests and test case verdicts	:	☐ complete tests ☒ partial tests (see notes page 2)
Test item does meet the requirement s	:	P(ass)
Test item does not meet the requirement s	:	F(ail)
Test does not apply to test item	:	N/A
Not tested (see notes on page 2)	:	N/T
Date of receipt of test item	:	15.08.2022
Date(s) of performance of tests	:	From 22.08.2022 to 24.01.2023
Summary of test results: ☒ POSITIVE	:	☐ NEGATIVE NOTES: YES ☐ NO ☐ (see notes page 2)

General remarks:

- Observations, notes and remarks of test results:

H1Z2Z2-K / 62930 IEC 131 1x4 mm²

* The sample described above has passed the water resistance tests. Samples has been found to be in compliance with referens to EN 50525-2-21 (2011- 05).

The test results are given on the following pages.

Summary of tests carried out (*in case of partial test*):

AD8 Water resistance tests;

- Electrical test
- Mechanical test on sheath

- The complete markings on cable (or on tape, etc)

NAK SOLAR CABLE TUV NORD EN 50618:2014 H1Z2Z2-K 1x4 mm² 1,5 kV DC / 62930 IEC 131 – HALOGEN FREE LOW SMOKE - Dca CPR – Dop No 0001 30.05.2022 OP.1

Based to EN 50525-2-21				
Ref No.	Tests	Prescribed	Observed <i>(uncertainty issues are marked with (*))</i>	Verdict

	Water resistance tests			
	Electrical test			
	Voltage pre-test on completed cable 6,5 kV AC	No breakdown	No breakdown	P
	Voltage test on completed cable at 50°C 1kV AC	No breakdown	No breakdown	P
	Insulation resistance test after pre-voltage test			
	Voltage test on cores 5mins 2,5kV AC	No breakdown	No breakdown	P
	Volume resistivity $\Omega \cdot \text{cm}$	$\geq 10^{12}$	$2,6 \times 10^{13}$	P
	Voltage test on cores at 50°C 14 days 1kV AC	No breakdown	No breakdown	P
	Volume resistivity $\Omega \cdot \text{cm}$	$\geq 10^{11}$	$4,2 \times 10^{12}$	P

	Mechanical test on sheath			
	Increase in mass after immersion for 100 days %	≤ 40		24
	Tensile strength and elongation at break	Inner layer	Single/outer layer	
	Tensile strength without immersion N/mm^2	≥ 5	≥ 7	12,4
	Elongation at break without immersion %	≥ 175	≥ 200	245
	Tensile strength after 28 days N/mm^2	≥ 5	≥ 7	12,7
	Elongation at break after 28 days %	≥ 175	≥ 200	225
	Tensile strength after 100 days N/mm^2	≥ 5	≥ 7	13,4
	Elongation at break after 100 days %	≥ 175	≥ 200	202
	Tensile strength variation	$-0,15 \leq \frac{\text{TS}_{28} - \text{TS}_{100}}{\text{TS}_{28}} \leq +0,15$		-0,055
	Elongation at break variation	$-0,2 \leq \frac{\text{EB}_{28} - \text{EB}_{100}}{\text{EB}_{28}} \leq +0,2$		0,102

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Procedure	:	Test Report ☒ TMP ☐ WMT ☐ SMT ☐
Applicant's Name	:	YUSUF KABUKÇU NAK KABLO ELEKTRİK MAL. İNŞ. İTH. İHR. SAN. TİC. LTD. ŞTİ.
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Address (if difefrent from applicant).....	:	
Test specification	:	
Standard.....	:	Gen. to EN 50525-2-21, EN 50618, IEC 62930
Test procedure	:	Special Test
Procedure deviation	:	N/A
Non-standard test method	:	N/A
Test Report Form	:	
Test Report Form No.....	:	EN 50525-2-21/ iss.01 – rev. 00
TRF originator	:	-
Master TRF	:	-
Item tested	:	Electric cables for photovoltaic systems
Code designation/number of cores and cross section/colour/length:	:	Within the scope of H1Z2Z2-K / 62930 IEC 1x1,5 - 1x6mm ² sections H1Z2Z2-K / 62930 IEC 131 1x6 mm ² BLACK, 50mt
Trade mark	:	NAK SOLAR CABLE
Rating(s) U ₀ /U	:	1,5 kV D.C
Tests and test case verdicts	:	☐ complete tests ☒ partial tests (see notes page 2)
Test item does meet the requirement s	:	P(ass)
Test item does not meet the requirement s	:	F(ail)
Test does not apply to test item	:	N/A
Not tested (see notes on page 2)	:	N/T
Date of receipt of test item	:	15.08.2022
Date(s) of performance of tests	:	From 22.08.2022 to 24.01.2023
Summary of test results: ☒ POSITIVE	:	☐ NEGATIVE NOTES: YES ☐ NO ☐ (see notes page 2)

General remarks:

- Observations, notes and remarks of test results:

H1Z2Z2-K / 62930 IEC 131 1x6 mm²

* The sample described above has passed the water resistance tests. Samples has been found to be in compliance with referens to EN 50525-2-21 (2011- 05).

The test results are given on the following pages.

Summary of tests carried out (*in case of partial test*):

AD8 Water resistance tests;

- Electrical test
- Mechanical test on sheath

- The complete markings on cable (or on tape, etc)

NAK SOLAR CABLE TUV NORD EN 50618:2014 H1Z2Z2-K 1x6 mm² 1,5 kV DC / 62930 IEC 131 – HALOGEN FREE LOW SMOKE - Dca CPR – Dop No 0001 30.05.2022 OP.1

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	Water resistance tests			
	Electrical test			
	Voltage pre-test on completed cable 6,5 kV AC	No breakdown	No breakdown	P
	Voltage test on completed cable at 50°C 1kV AC	No breakdown	No breakdown	P
	Insulation resistance test after pre-voltage test			
	Voltage test on cores 5mins 2,5kV AC	No breakdown	No breakdown	P
	Volume resistivity $\Omega \cdot \text{cm}$	$\geq 10^{12}$	$2,4 \times 10^{13}$	P
	Voltage test on cores at 50°C 14 days 1kV AC	No breakdown	No breakdown	P
	Volume resistivity $\Omega \cdot \text{cm}$	$\geq 10^{11}$	$2,7 \times 10^{12}$	P

	Mechanical test on sheath			
	Increase in mass after immersion for 100 days %	≤ 40		31
	Tensile strength and elongation at break	Inner layer	Single/outer layer	
	Tensile strength without immersion N/mm^2	≥ 5	≥ 7	11,9
	Elongation at break without immersion %	≥ 175	≥ 200	237
	Tensile strength after 28 days N/mm^2	≥ 5	≥ 7	12,6
	Elongation at break after 28 days %	≥ 175	≥ 200	215
	Tensile strength after 100 days N/mm^2	≥ 5	≥ 7	13,9
	Elongation at break after 100 days %	≥ 175	≥ 200	195
	Tensile strength variation	$-0,15 \leq \frac{TS_{28} - TS_{100}}{TS_{28}} \leq + 0,15$		-0,103
	Elongation at break variation	$-0,2 \leq \frac{EB_{28} - EB_{100}}{EB_{28}} \leq + 0,2$		0,093

END OF TEST REPORT