

SPEC. NO. PV-17R1

DATE : August 6, 2019

SPECIFICATION
FOR
ELECTRICAL CABLE FOR PHOTOVOLTAIC SYSTEMS

H1Z2Z2-K
(PV CABLE)

REV.	DATE	SHEET	DESCRIPTION
00	4-Oct-17	1-5	Issued Specification
01	6-Aug-19	4 OF 5	- Revised Overall diameter - Revised Cable weight

DESIGNED BY 

DESIGN ENGINEER

CHECKED BY 

DESIGN SECTION MANAGER

APPROVED BY 

QUALITY ASSURANCE MANAGER



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FMQADN 18 REV : 03

Specification
for
Electric cables for Photovoltaic Systems

1. Scope

This specification covers the requirements of low smoke halogen-free, flexible, single-core power cables with cross-linked insulation and sheath for use at the direct current side of photovoltaic systems. The cables are designed to operate at a normal maximum conductor temperature of 90°C, but for a maximum of 20,000 hours, a max. conductor temperature of 120°C at a max. ambient temperature of 90°C is permitted.

This cable is designed, manufactured and tested in accordance with EN 50618:2014.

The IEC of the corresponding EN standards may be applied.

2. Rate Voltage

- Direct Current (D.C.) : nominal voltage rating of cable is 1.5 kV both between conductors as well as between conductors and earth (shall not exceed 1.8 kV).
- Alternating current (A.C) : voltage rating is 1.0/1.0 kV (U_0/U)

3. Conductor

The conductor shall be circular stranded tinned annealed copper wires in accordance with EN 60228: class 5.

4. Insulation

The insulation shall be colored natural, cross-linked polyolefin-copolymer compound meeting the requirements of EN 50618:2014.

The average thickness of insulation shall be not less than the specified value given in the attached table.

The minimum thickness shall not fall below 90% of the specified value by more than 0.1 mm.

5. Sheath

The sheath shall be extruded with cross-linked polyolefin-copolymer compound meeting the requirements of EN 50618:2014.

The average thickness of sheath shall be not less than the specified value given in the attached table.

The minimum thickness shall not fall below 85% of the specified value by more than 0.1 mm.

The color of sheath shall be black or other color, as customer's specified.



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6. Marking

The sheath of the cable shall be marked by printing throughout the length of the cable by suitable means as the following items.

- a. TÜV SÜD Certificated
- b. Standard reference “EN 50618:2014”
- c. Cable type. “H1Z2Z2-K”
- d. Size of conductor.
- e. Manufacturer’s name and/or trade mark.
- f. Rated voltage. “AC 1.0/1.0 kV DC 1.5 kV(MAX. 1.8)”

Example:

TÜV SÜD EN 50618:2014 H1Z2Z2-K 1.5 SQ.MM BANGKOK CABLE AC 1.0/1.0 KV DC 1.5 KV (MAX. 1.8)

7. Test

The following tests on the cable shall be performed in accordance with EN 50618:2014.

7.1 Routine test

- a. Check for absence of fault on the insulation.

7.2 Sample test

- a. Resistance of conductor
- b. Voltage test on completed cable.
- c. Insulation resistance.
- d. Insulation and sheath thickness
- e. Check overall diameter and ovality
- f. Check sheath colour by visual examination
- g. Check sheath marking by visual examination and measurement
- h. Test for vertical flame propagation on complete cable.

8. Packing

A length of the cable shall be wound onto a non-returnable wooden drum lagged with wooden battens. Each drum shall be clearly marked as follows:

- a. Manufacturer’s name and/or trade mark.
- b. Rated voltage.
- c. Cable type.
- d. Number of core and size of conductor.
- e. Cable length.
- f. Net and gross weight.
- g. Rolling direction of drum.
- h. Drum number.
- i. Year of manufacture.
- j. Other according to customer’s specification.



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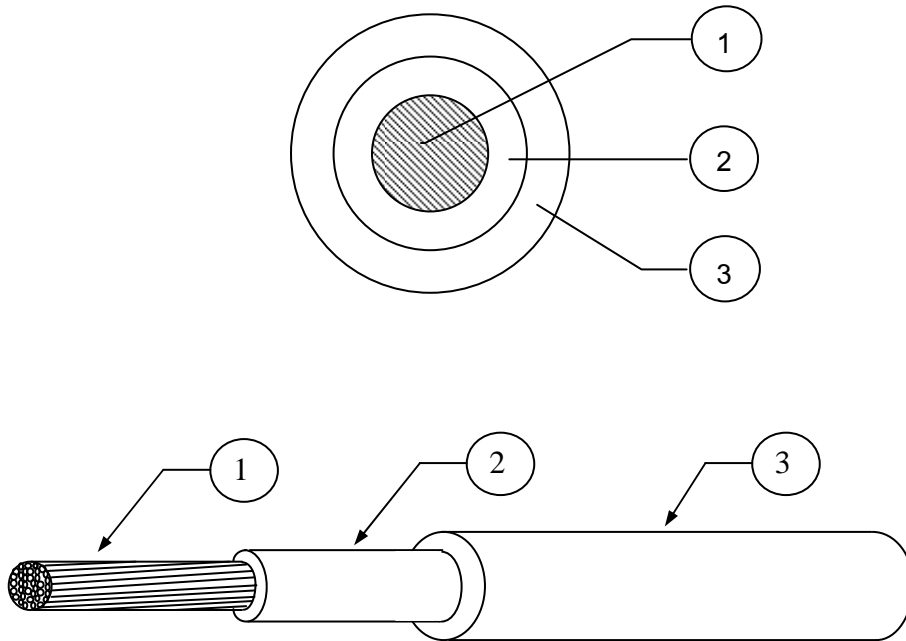
ATTACHED TABLE

No. core	Conductor		Thickness of insulation (mm.)	Thickness of sheath (mm.)	Overall diameter		Maximum DC conductor resistance at 20°C (Ω/km)	Minimum Insulation resistance		Current rating			Cable weight (Approx.) kg/km	Standard length m
	Cross-section area of conductor mm ²	Maximum diameter of wire in conductor (mm.)			Approx.	Upper limit (mm.)		at 20°C	at 90°C	Single cable in free air (A)	Single Cable on a surface (A)	Two loaded touching on a surface (A)		
1	1.5	0.26	0.7	0.8	4.8	5.4	13.7	860	0.86	30	29	24	33	200
1	2.5	0.26	0.7	0.8	5.2	5.9	8.21	690	0.69	41	39	33	43	200
1	4	0.31	0.7	0.8	5.6	6.6	5.09	580	0.58	55	52	44	54	200
1	6	0.31	0.7	0.8	6.7	7.4	3.39	500	0.50	70	67	57	80	100
1	10	0.41	0.7	0.8	8.0	8.8	1.95	420	0.42	98	93	79	130	100
1	16	0.41	0.7	0.9	9.3	10.1	1.24	340	0.34	132	125	107	190	100
1	25	0.41	0.9	1.0	11.5	12.5	0.795	340	0.34	176	167	142	300	100
1	35	0.41	0.9	1.1	13.3	14.0	0.565	290	0.29	218	207	176	420	100
1	50	0.41	1.0	1.2	15.1	16.3	0.393	270	0.27	276	262	221	550	100
1	70	0.51	1.1	1.2	17.5	18.7	0.277	250	0.25	347	330	278	790	500
1	95	0.51	1.1	1.3	19.0	20.8	0.210	220	0.22	416	395	333	950	500
1	120	0.51	1.2	1.3	21.5	22.8	0.164	210	0.21	488	464	390	1,370	500
1	150	0.51	1.4	1.4	24.0	25.5	0.132	210	0.21	566	538	453	1,625	500
1	185	0.51	1.6	1.6	27.0	28.5	0.108	200	0.20	644	612	515	2,030	500
1	240	0.51	1.7	1.7	30.4	32.1	0.0817	200	0.20	775	736	620	2,670	500



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Item No.	Description	Material
1	Conductor	Stranded tinned annealed copper wires
2	Insulation	Cross-linked polyolefin-copolymer
3	Sheath	Cross-linked polyolefin-copolymer

**PHOTOVOLTAIC CABLE (H1Z2Z2-K)
CROSS-SECTION (NOT SCALE)**



DRAWN BY : S. Chanvith
 CHECKED BY : *[Signature]*
 APPROVED BY : *[Signature]*
 DATE : 6-Aug-19

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