

TÜV SOLAR CABLE (H1Z2Z2-K)

CAVO UNIPOLARE FLESSIBILE HALOGEN FREE PER APPLICAZIONI FOTOVOLTAICHE
FLEXIBLE SINGLE CORE CABLE HALOGEN FREE FOR PHOTOVOLTAIC SYSTEMS

CE **Reach** **compliant** **TÜV Rheinland**
APPROVAZIONI / APPROVALS:
Certificate Nr R60113052



COLORI 1° e 2° ISOLAMENTO/
1st and 2nd INSULATION COLOUR



Conduttore trefolo flessibile in rame stagnato
Twisted flexible tinned copper conductor

- 1 – 1° isolamento:
copolimero speciale halogen free
1st insulation:
halogen free special copolymer
- 2 – 2° isolamento:
copolimero speciale halogen free
2nd insulation:
halogen free special copolymer
- 3 – Conduttore in rame
Copper conductor

MARCATURA / MARKING :

CET SOLAR CABLE 1Xn,00 mm2 1.0/1.0 kV H1Z2Z2-K TÜV Rheinland Type Approved R60113052 IEC 60332-1 CE

APPLICAZIONI /
APPLICATIONS



CONFEZIONI /
PACKAGING



Dati Tecnici	
Tensione Nominale Uo/U	1.0/1.0 kV AC – 1.5/1.5 kV DC
Tensione max.consentita	1,8 kV DC
Tensione di Prova	6.5 kV AC
Temperatura di Esercizio	- 40 ÷ +90°C
Max. temp. conduttore	+120°C (for 20.000 hrs.)
Raggio minimo di curvatura	5 x D cavo (installazione fissa)
Omologazione	TÜV Rheinland
Norme di Riferimento :	EN 50618: 2014 IEC 60228 – EN 50395 – EN 50396 EN 60332-1-2 – EN 61034-1; -2 EN 50525-1 – EN 60216-1; -2

Technical Data	
Nominal Voltage Uo/U	1.0/1.0 kV AC – 1.5/1.5 kV DC
Maximum permitted voltage	1,8 kV DC
Test Voltage	6.5 kV AC
Operating Temperature	- 40 ÷ +90°C
Max. core temperature	+120°C (for 20.000 hrs.)
Min. bending radius	5 x D cable (fixed installation)
Approved	TÜV Rheinland
References:	EN 50618: 2014 IEC 60228 – EN 50395 – EN 50396 EN 60332-1-2 – EN 61034-1; -2 EN 50525-1 – EN 60216-1; -2

TIPO	SEZIONE	DIAMETRO MAX FILI CONDUTTORE	SPESSORE ISOLANTE 1° / 2°	DIAMETRO ESTERNO	RESISTENZA ELETTRICA MAX A 20°C MAX ELECTRIC RESISTANCE AT 20°C	REATTANZA (a 50 Hz)
TYPE	SECTION	MAX WIRE DIAMETER OF CONDUCTOR	INSULATION THICKNESS 1 ST / 2 ND	OVERALL DIAMETER	WIRE STAGNATO TINNED COPPER	REACTANCE (at 50 Hz)
	mm ²	mm	mm	mm	Ω/Km	Ω/Km
TÜV SOLAR CABLE	1x2.50	0.26	0.70 / 0.80	5.00	8.21	/
	1x4.00	0.31	0.70 / 0.80	5.40	5.09	0.143
	1x6.00	0.31	0.70 / 0.80	6.20	3.39	0.135
	1x10.0	0.41	0.70 / 0.80	7.40	1.95	0.119

Tolleranza sui diametri: in accordo con le norme di riferimento TÜV
Diameters tolerances: according with TÜV standards

SEZIONE	Portata amperometrica dei cavi PV in funzione del tipo d'installazione (T=60°C) Current carrying capacity of PV cables in accordance to the installation (T=60°C)		
SECTION	Cavo singolo – posa in aria Single cable free in air	Cavo singolo – posa su superficie Single cables on surfaces	Cavi in fascio – posa su superficie To cables adjacent on surfaces
mm ²	(A)	(A)	(A)
1 x 2.5	41	39	33
1 x 4.0	55	52	44
1 x 6.0	70	67	57
1 x 10	98	93	79

Proprietà

La speciale costruzione e i materiali impiegati, consentono al cavo di soddisfare i requisiti più recenti previsti per i sistemi fotovoltaici in accordo alle normative: EN50618 – EN 60216-1-2 – EN 61034. L'isolamento garantisce un elevato potere isolante e notevole resistenza all'invecchiamento termico, nonché proprietà di resistenza all'abrasione ed alla fiamma, resistenza all'ozono, resistenza ai raggi UV ed è facilmente rimovibile dall'isolamento interno per facilitare operazioni di connessione.

Properties

The cable is able to satisfy the latest requirements fixed for PV systems in accordance to the following Reference Standards: EN50618 – EN 60216-1-2 – EN 61034. The special insulation has qualities of high abrasion resistance to high temperature. Moreover the insulation has property of flame retardant and ozone resistance. The cable is UV-resistant and the external sheath can be removed from the inner layer of extruded insulation.

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APPENDIX



The H1Z2Z2-K is to be considered Harmonized because has been tested and certified in accordance with the requirements of the harmonized standard EN 50618: 2014 (quoted in the official document of the European Union that lists the harmonized standards to the LVD Directive 2006/95/EC (Low voltage Directive)).

Use and type of installation for applications in photovoltaic (HD 60364-7-712). For fixed installation indoors and outdoors. Installation of walls, walkways, pipes, conduits, and similar systems. The cables are suitable for use with Class II.

They are inherently short-circuit and earth fault proof acc.to HD 60364-5-52.

Chemical properties

Halogen-free	acc. to EN 50525-1 Annex B (EN 50267-2-1, EN 50267-2-2, IEC 60754-1, IEC 60754-2)
Low Smoke Emission	acc. to IEC 61034, EN 61034 (Light Transmittance > 60%)
Weather resistance	<i>Ozone resistance:</i> acc. to EN 60811-403 Test Method A, EN 50396 clause 8.1.3 Test Method B <i>Weathering/UV resistance:</i> acc. to EN 50618 Annex E, EN 50289-4-17 (Method A), EN ISO 4892-1 /-2 tensile strength and elongation at break after 720h (360 Cycles) of exposure to UV lights
Acid and alkaline resistance	acc. to EN 50618:2014 Annex B: 7 days, 23° C (N-Oxalic Acid, N-Sodium Hydroxide) as for EN 60811-404
Resistance to fire	Flame propagation acc. to EN 60332-1-2 (Single Cable Flame Test) Tested according to CPR: EN 50399 Common test methods for cables under fire conditions Heat release and smoke production measurement on cables during flame spread test, UNI EN 13501-6 Flammability class: D_{ca} Smoke emission class: s2 Drip particle class: d2 Fume acidity: a1

Mechanical properties

	for insulation and sheath before ageing acc. to EN 50618 Annex B (test acc. To EN 60811-501). tensile strength $\geq 8 \text{ N/mm}^2$ elongation at break for insulation and sheath $\geq 125 \%$
Shrinkage test on sheath	acc. to EN 50618, Table 2: <2% (test acc. to EN 60811-503).
Dynamic Penetration Test	acc. to EN 50618
Durability of Print	acc. to EN 50618 (test acc. to EN 50396)
Direct Burial	Impact test resistance of single conductor type USE and USE-2 cables (tested acc. to UL854)
Rodent resistance (optional)	Rodent resistance safety can be optimized by utilizing a special compound <i>alternative:</i> braid metallic coatings
Water resistance	AD8 category Tested with successful acc. to EN 50525-2-21 "Annex E" (after immersion for 100 days / 2.400 h to 50°C): • Voltage at 1 kV AC on cable in water at 50°C during 100 days without any breakdown • Mechanical properties on sheath after immersion 100 days at 50°C • Minimum tensile strength after immersion 100 days at 50°C > 7 MPa • Minimum elongation at break after immersion 100 days at 50°C > 200% • Water absorption on sheath after immersion 100 days at 50°C less than 40% • Insulation resistance tests with a minimum resistivity of $10^{11} \Omega \cdot \text{cm}$ measured after 14 days in water at 50°C
Long term resistance of insulation to d.c	acc. to EN 50618, Table 2 test acc. to EN 50395 clause 9: Cable immersed in water containing 1% NaCl for 240h ; water temperature: $85^\circ\text{C} \pm 5$; Voltage applied: 1.8 kV D.C.

Thermal properties

Lifetime	acc. to EN 50618 : 25 years the cables are designed to operate at a normal max 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. (test according to EN 60216-1 and EN 60216-2)
Max.short circuit temperature	250°C (for 5 sec.)
Resistance to cold	EN 50618, Table 2: Cold Bending Test at -40°C acc. to EN 60811-504; Cold Elongation Test at -40°C acc. to EN 60811-505; Cold Impact Test at -40°C acc. to EN 50618 Annex C and EN 60811-506. Damp-Heat Test Acc. to EN 50618, Table 2 (test acc. to EN 60068-2-78) : 90°C for 1.000h and min. 85% humidity