

# TÜV SOLAR CABLE (H1Z2Z2-K)

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

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



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



Conduttore trefolo flessibile in rame stagnato  
Twisted flexible tinned copper conductor

- 1 – 1° isolamento:  
copolimero speciale halogen free  
1<sup>st</sup> insulation:  
halogen free special copolymer
- 2 – 2° isolamento:  
copolimero speciale halogen free  
2<sup>nd</sup> 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		Technical Data	
Tensione Nominale Uo/U	1.0/1.0 kV AC – 1.5/1.5 kV DC	Nominal Voltage Uo/U	1.0/1.0 kV AC – 1.5/1.5 kV DC
Tensione max. consentita	1,8 kV DC	Maximum permitted voltage	1,8 kV DC
Tensione di Prova	6.5 kV AC	Test Voltage	6.5 kV AC
Temperatura di Esercizio	- 40 ÷ +90°C	Operating Temperature	- 40 ÷ +90°C
Max. temp. conduttore	+120°C (for 20.000 hrs.)	Max. core temperature	+120°C (for 20.000 hrs.)
Raggio minimo di curvatura	5 x D cavo (installazione fissa)	Min. bending radius	5 x D cable (fixed installation)
<b>Omologazione</b>	<b>TÜV Rheinland</b>	<b>Approved</b>	<b>TÜV Rheinland</b>
Norme di Riferimento :	EN 50618: 2014	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		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 <sup>ST</sup> / 2 <sup>ND</sup>	OVERALL DIAMETER	RAMME STAGNATO TINNED COPPER	REACTANCE (at 50 Hz)
	mm <sup>2</sup>	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)		
	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 <sup>2</sup>	(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

<b>Halogen-free</b>	acc. to EN 50525-1 Annex B (EN 50267-2-1, EN 50267-2-2, IEC 60754-1, IEC 60754-2)
<b>Low Smoke Emission</b>	acc. to IEC 61034, EN 61034 (Light Transmittance > 60%)
<b>Weather resistance</b>	<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
<b>Acid and alkaline resistance</b>	acc. to EN 50618:2014 Annex B: 7 days, 23° C (N-Oxalic Acid, N-Sodium Hydroxide) as for EN 60811-404
<b>Resistance to fire</b>	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: <b>D<sub>ca</sub></b> Smoke emission class: <b>s2</b> Drip particle class: <b>d2</b> Fume acidity: <b>a1</b>

### Mechanical properties

	for insulation and sheath before ageing acc. to EN 50618 Annex B (test acc. To EN 60811-501). tensile strength ≥ 8 N/mm <sup>2</sup> elongation at break for insulation and sheath ≥ 125 %
<b>Shrinkage test on sheath</b>	acc. to EN 50618, Table 2: <2% (test acc. to EN 60811-503).
<b>Dynamic Penetration Test</b>	acc. to EN 50618
<b>Durability of Print</b>	acc. to EN 50618 (test acc. to EN 50396)
<b>Direct Burial</b>	Impact test resistance of single conductor type USE and USE-2 cables (tested acc. to UL854)
<b>Rodent resistance (optional)</b>	Rodent resistance safety can be optimized by utilizing a special compound <i>alternative:</i> braid metallic coatings
<b>Water resistance</b>	AD8 category Tested with successful acc. to EN 50525-2-21 "Annex E" (after immersion for 100 days / 2.400 h to 50°C): <ul style="list-style-type: none"> <li>• Voltage at 1 kV AC on cable in water at 50°C during 100 days without any breakdown</li> <li>• Mechanical properties on sheath after immersion 100 days at 50°C</li> <li>• Minimum tensile strength after immersion 100 days at 50°C &gt; 7 MPa</li> <li>• Minimum elongation at break after immersion 100 days at 50°C &gt; 200%</li> <li>• Water absorption on sheath after immersion 100 days at 50°C less than 40%</li> <li>• Insulation resistance tests with a minimum resistivity of 10<sup>11</sup> Ω.cm measured after 14 days in water at 50°C</li> </ul>
<b>Long term resistance of insulation to d.c</b>	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°C ± 5; Voltage applied: 1.8 kV D.C.

### Thermal properties

<b>Lifetime</b>	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)
<b>Max.short circuit temperature</b>	250°C (for 5 sec.)
<b>Resistance to cold</b>	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