

Camignone di Passirano, 06/06/19

## Manufacturer Declaration

**Product:** Solar Cable Elettro Brescia H1Z2Z2-K

**TÜV cert.:** R 60108022, R 60109330

### Main normative reference:

- EN 50618

### General

The cable type H1Z2Z2-K is considered harmonized because it has been tested and certified in accordance with the requirements of the harmonized standard EN 50618: 2014 which covers the Principle Elements of the Safety Objectives for Electrical Equipment Design for Use within Certain Voltage Limits (LVD – 2006/95/EC).

It is intended for use in PV installations e.g. acc. To HD 60364-7-712, for free movable, free hanging and fixed installation indoors and outdoors. Installation in conduits and trunkings on, in or under plaster as well as in appliances. The cables are suitable for the application in/at equipment with protective insulation (protection 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 pH and conductivity, EN 50267-2-2 Chlorine and bromine content, EN 50525-1 Annex C fluorine, EN 60684-2 fluorine content).

*Low Smoke Emission* acc. to EN 61034-2 (Light Transmittance > 60%)

*Ozone resistance* acc. to EN 60811-403 Test Method A or EN 50396 clause 8.1.3 Test Method B.

*Weathering/UV resistance* acc. to EN 50618 Annex E, EN 60811-501, EN 50289-4-17 (Method A), EN ISO 4892-1 and EN ISO 4892-2; tensile strength and elongation at break after 720h (360 Cycles) of exposure to UV lights is at least 70% of the values measured on not exposed specimens.

*Resistance against acid and alkaline solution* acc. to EN 50618:2014 Annex B: 7 days, 23° C (N-Oxalic Acid, N-Sodium Hydroxide) as determined by EN 60811-404. Maximum variation of tensile strength  $\pm 30\%$ .

*Resistance to fire and flame propagation* acc. to EN 60332-1-2 (single cable vertical flame test).

*Tested according to EN 50575 – EN 13501-6 (CPR):* common test methods for cables under fire conditions EN 60332-1-2, EN 50399, EN 60754-2:

Fire behaviour class: Dca

Smoke production class: s2

Flaming droplets/particles class: d2

Acidity class: a1

### **Mechanical and physical properties**

*Insulation and sheath before ageing* acc. to EN 50618 Annex B (test acc. To EN 60811-501), tensile strength  $\geq 8$  N/mm<sup>2</sup>, elongation at break for insulation and sheath  $\geq 125$  %.

*Shrinkage test on sheath* acc. to EN 50618, Table 2: 120° C, 1 h, length 300 mm; maximum shrinkage accepted 2% (test acc. to EN 60811-503).

*Dynamic Penetration Test* acc. to EN 50618 Annex D.

*Durability of Print* acc. to EN 50618 (test acc. to EN 50396 5.1).

*Presence of water:* AD8 category acc. to EN 50525-2-21 Annex D & Annex E (in house test only for H1Z2Z2-K I): 100 days at 2,5 kV in water at 50±2° C.

*Corrosive or polluting substances:* AF3 acc. to EN 50618.

*Impact:* AG2 acc. to EN 50618.

*Vibration:* AH3 acc. to EN 50618.

*Outdoor use:* AN3 (permanent) acc. to EN 50618.

*Direct burial:* acc. to Impact-Resistance Test UL 854.23 and Crushing-Resistance Test UL 854.24.

### **Electrical properties**

*Voltage test on complete cable with a.c. or d.c.* acc. to EN 50395 clause 6 (6.5 kV in a.c. or 15 kV in d.c. in water at 20° C ±5 for 1 h). No breakdown expected.

*Absence of faults on insulation or on complete cable* acc. to EN 62230 Annex A. No fault shall be detected.

*Insulation resistance* acc. to EN 50395 clause 8.1 (sample in water at 20° C for 2 h and sample in water at 90° C for 2 h). MΩ.km as stated in Table 1 of EN 50618.

*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 for 240h at 85°C ± 5; voltage applied: 1.8 kV D.C. No breakdown expected.

*Surface resistance of sheath* acc. to EN 50395 clause 11 (voltage applied d.c. 10 to 500 for 1 min). Result to be obtained ohm  $\geq 10^9$ .

### **Thermal properties**

Expected period of use under normal usage conditions as specified in EN 50618: at least 25 years.

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 (test acc. to EN 60216-1 and EN 60216-2).

*Hot set test* acc. to EN 60811-507 (250° C ±3, 15 min, mechanical stress 20 N/cm<sup>2</sup>). Result to be obtained: max elongation under load 100%, permanent elongation after cooling 25%.

*Max. short circuit temperature* 250°C (for 5 sec.)

*Resistance to cold* acc. to EN 50618:

Cold Bending Test at -40°C ±2 acc. to EN 60811-504;

Cold Elongation Test at -40°C ±2 acc. to EN 60811-505;

Cold Impact Test at -40°C ±2 acc. to EN 50618 Annex C and EN 60811-506.

*Damp-Heat Test* acc. to EN 50618; test acc. to EN 60068-2-78: 90°C for 1.000h and min. 85% humidity. Result to be obtained: max variation -30% for tensile strength and elongation at break.

*Elettro Brescia S.p.A.*