

Halogen Free Cables for Solar Photovoltaic Power Supply Systems

Single-core cables with tinned copper flexible conductor, halogen free insulation, halogen free oversheath

General Description:

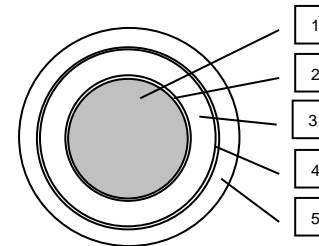
Standard specification:	EN 50618:2014
Cable code designation:	H1Z2Z2-K
Rated voltage AC U ₀ /U (U _{max}):	1.0/1.0 (1.2) kV
Rated voltage DC U _{nom} /(U _{max}):	1.5 kV (conductor - conductor and conductor - earth) /1.8 kV
Nominal cross-section range:	4 to 240 mm ²
Ambient temperature range:	-40 °C to +90 °C
Maximum conductor temperature:	120 °C ⁽¹⁾

Outersheath marking by ink as follows:

- CABLEL 2018* H1Z2Z2-K 1x4** EN 50618
- * Year of manufacture, ** Conductor cross-section

Cable structure:

- 1 - Conductor:
Annealed tinned copper round flexible class 5 according to EN 60228
- 2 - Separator tape:
Polyester tape (optional)
- 3 - Insulation:
Halogen free cross-linked compound according to EN 50618:2014
Core identification: BLACK
- 4 - Separator tape:
Synthetic tape (PES, optional)
- 5 - Sheath:
Halogen free cross-linked compound according to EN 50618:2014
Sheath colour: BLACK or RED



Tests:

- **Routine:**

1. Check for absence of faults on the insulation (or on completed cable) – No faults (EN 62230 Annex A)

- **Sample:**

1. Conductor resistance (EN 50395 §5)
2. AC voltage test: 6.5 kV – No faults (EN 50618:2014 and EN 50395 §6)
3. Insulation resistance at 20°C and 90°C (EN 50618:2014 and EN 50395 §8.1)
4. Measurement of insulation thickness (EN 50396 §4.1)
5. Measurement of sheath thickness (EN 50396 §4.2)
6. Measurement of mean value of overall diameter (EN 50396 §4.4)
7. Measurement of ovality: ≤15% (EN 50396 §4.4.2 and EN 50618:2014 §7.3.3)
8. Sheath colour (EN 50618:2014 §7.3.1)
9. Sheath marking (EN 50618:2014 §7.3.2)
10. Vertical flame propagation: EN 60332-1-2

- **Type:**

1. Conductor resistance (EN 50395 §5)
2. AC voltage test: 6.5 kV – No faults (EN 50618:2014 and EN 50395 §6)
3. Surface resistance of sheath: min 10⁹ Ω (EN 50618:2014 and EN 50395 §11)
4. Insulation resistance at 20°C and 90°C (EN 50618:2014 and EN 50395 §8.1)
5. Long term resistance to DC (EN 50618:2014 and EN 50395 §9)
6. Checking of compliance with constructional provisions
7. Measurement of wire diameter in conductor (EN 60228 §6.1)
8. Checking continuity of tin (EN 50618:2014 §5.1.1)
9. Checking insulation material (EN 50618:2014 Table B.1)
10. Checking sheath material (EN 50618:2014 Table B.1)
11. Compatibility test (EN 50618:2014 and EN 60811-401:2012, 4.2.3.4)
12. Cold impact test (EN 50618:2014 and EN 60811-506)
13. Cold bending test (EN 50618:2014 and EN 60811-504, for cable diameter ≤12.5 mm)
14. Cold elongation test (EN 50618:2014 and EN 60811-505, for cable diameter >12.5 mm)
15. Ozone resistance (EN 50618:2014 and Method B EN 50396 §8.1.3 or Method A EN 60811-403)
16. Weathering/UV resistance test (EN 50618:2014 Annex E)
17. Dynamic penetration test (EN 50618:2014 Annex D)
18. Damp heat test (EN 50618:2014 and EN 60068-2-78)
19. Shrinkage test on sheath (EN 50618:2014 and EN 60811-503)
20. Vertical flame propagation: EN 60332-1-2
21. Smoke emission (EN 50618:2014 and EN 61034-1 & EN 61034-2)
22. Assessment of halogens (EN 50618:2014 and EN 50525-1:2011, Annex B)

Mechanical characteristics of insulation and sheath acc. to EN 50618:2014:

1. Properties before ageing (EN 60811-501 §9.2)
2. Properties after ageing (EN 60811-401 §8.1)
3. Hot set test (EN 60811-507 §9)
4. Thermal endurance properties (EN 60216-1, EN 60216-2)
5. Cold elongation test (EN 60811-505 §8.4)
6. Sheath resistance against acid and alkaline solution (EN 60811-404)
7. Compatibility test (EN 50618:2014 and EN 60811-401:2012, 4.2.3.4)

(1): According to EN 50618:2014 standard the expected period of use is 25 years (Suitable to operate at constant temperature of max. 120°C for max. 20.000 h).

Dimensional data and current carrying capacities:

1	2	3	4	5	6	7
Number and nominal cross sectional area of conductors	Thickness of insulation Specified value	Thickness of sheath Specified value	Mean overall diameter Upper limit Informative value	Current carrying capacities according method of installation [*]		
				Single cable free in air	Single cable on a surface	Two loaded cables touching, on a surface
mm ²	mm	mm	mm	A	A	A
1 x 4	0.7	0.8	6.6	55	52	44
1 x 6	0.7	0.8	7.4	70	67	57
1 x 10	0.7	0.8	8.8	98	93	79
1 x 16	0.7	0.9	10.1	132	125	107
1 x 25	0.9	1.0	12.5	176	167	142
1 x 35	0.9	1.1	14.0	218	207	176
1 x 50	1.0	1.2	16.3	276	262	221
1 x 70	1.1	1.2	18.7	347	330	278
1 x 95	1.1	1.3	20.8	416	395	333
1 x 120	1.2	1.3	22.8	488	464	390
1 x 150	1.4	1.4	25.5	566	538	453
1 x 185	1.6	1.6	28.5	644	612	515
1 x 240	1.7	1.7	32.1	775	736	620

 Note^{*} : Ambient temperature: 60 °C, max. conductor temperature: 120 °C.

___END OF SPECIFICATION___

No.:	TS 3448	Cable Engineering Department	
Date - Revision:	05/10/2018 - 0	Detailed by:	Francesco Nicolae
Client - Destination country:	EU	Approved by:	O. Avramescu