

SPECIFICATION

For

12/20KV-CE-CWS (0300)

12/20(24)kV XLPE Insulated

Copper Wire Screened

With Synthetic Water Blocking and Cushioning Tape

PE Sheathed Power Cable

(12/20(24)kV, Cu/XLPE/CWS/PE)

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Rev.	Date	Description
0	31/7/2020	Issued specification
1	17/02/2021	Change cable code "0310" to "0300"
2	1/8/2022	Add size 1 x 800/25 mm ²

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CUSTOMER

Customer Document	Rev.
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Remark:

This document is based on the Customer Document for the structure and properties of electric wire and cable only. If there are different points, will be shown in deviation table.

1. Scope

This specification covers 22000V copper conductor cross-linked polyethylene (XLPE) insulated copper wire screened with synthetic water blocking and cushioning tape polyethylene (PE) sheathed power cable.

The cable shall be in accordance with TIS 2143-2546. (Same IEC 60502-2 : 2014).
(Reference PEA's specification No. RCBL-035/2554 Rev.No.1).

2. Conductor

The conductor shall be compacted concentric stranded uncoated annealed copper conductor in accordance with TIS 2427-2552, Class 2 (Same IEC 60228 : 2004, Class 2).

The direction of lay shall be left-hand (S) lay in the outermost layer.

3. Conductor Shield

The conductor shield shall be a semi-conducting nylon tape and shall be applied helically with a wrap over the conductor and a layer of extruded semi-conducting compound.

Size $\leq 150 \text{ mm}^2$: Applied extruded semi-conducting compound

Size $\geq 185 \text{ mm}^2$: Applied semi-conducting nylon tape and extruded semi-conducting compound

The thickness of the conductor shield shall be approximate 0.5 mm.

4. Insulation

The insulation shall be cross-linked polyethylene (XLPE) compound meet the requirements of TIS 2143-2546. (Same IEC 60502-2 : 2014).

The average thickness of the insulation shall be not less than the nominal value specified in Table 1.

The minimum thickness of the insulation shall be not less than 90% of the nominal value.

The thickness of insulation shall not be included that of conductor shield.

5. Insulation Shield

The insulation shield shall be a layer of extruded semi-conducting compound and shall be free stripping.

The thickness of the insulation shield shall be approximate 0.5 mm.

6. Copper Wire Screen

The copper wire screen shall consist of plain annealed round copper wires applied helically over the insulation shield.

The contact tape shall be an uncoated annealed copper tape and shall be applied helically with a gap over the copper wire screen.

The thickness of the copper tape shall be approximate 0.1 mm.

7. Synthetic Water Blocking and Cushioning Tape

A non-conductive non-biodegradable water blocking tape shall be applied over the contact tape to provided a continuous longitudinal watertight throughout the cable length.

8. Sheath

The sheath shall be polyethylene (PE/ST7) compound meet the requirements of TIS 2143-2546. (Same IEC 60502-2 : 2014).


The average thickness of the sheath shall be not less than the nominal value specified in Table 1.

The minimum thickness of the sheath shall be not less than 80% of the nominal value.

The color of the sheath shall be black.

9. Marking on Cable

The marking items shall be marked with suitable means throughout the length of cable.

1. Manufacturer's name and/or trade mark "  YAZAKI.....TYE"
2. Year of manufacture
3. Rated circuit voltage "12/20(24)KV"
4. Type of conductor "CU"
5. Type of insulation and sheath "XLPE/PE"
6. Type of cable "POWER CABLE"
7. Number of core and size of conductor
8. TIS logo and standard number
9. The continuous reel length marking (in figure) shall be made on the sheath at every 1 meter

10. Test and Properties


The cable shall meet the requirements in Test and Inspection and Table 1, when tested in accordance with TIS 2143-2546, TIS 2427-2552 (Same IEC 60502-2 : 2014 and IEC 60228 : 2004) and PEA's specification No. RCBL-035/2554 Rev.No.1.

11. Packing

The cable shall be placed on non-returnable wooden reels.

The reels shall be covered with suitable covering to provide the cable with physical protection during transportation and during ordinary storage and handling operations.

Each reel shall be clearly marked as follows.

1. Designation "12/20KV-CE-CWS (0300)"
2. Type of insulation and sheath "XLPE/PE"
3. Number of core and size of conductor
4. Cable length
5. Net and gross weight
6. Year of manufacture
7. Manufacturer's name and trade mark "  **YAZAKI** "
8. Rolling direction of reel and cable end position

Test and Inspection

Routine Tests

- Maximum conductor resistance, Ohm/km..... specified in Table 1
- AC test voltage for 5 minutes, kV..... 42
- Maximum partial discharge level*..... 10 pC or better, at 20.76 kV
- Electrical test on over sheath No breakdown

*The partial discharge level shall be no detectable discharge exceeding the declared sensitivity

Sample Tests

- Construction..... specified in Table 1
- AC test voltage for 4 hours, kV..... 48
- Hot set test at $200\text{ }^{\circ}\text{C} \pm 3\text{ }^{\circ}\text{C}$ for XLPE
 - Maximum elongation under load (%) 175
 - Maximum permanent elongation after cooling (%)..... 15

Definition concerning the tests

Routine tests: Tests made by the manufacturer on each manufactured length of cable to check that each length meets the specified requirements.

Sample tests: Tests made by the manufacturer on samples of completed cable or components taken from a completed cable, at a specified frequency, so as to verify that the finished product meets the specified requirements.

Type tests: Tests made before supplying, on a general commercial basis, a type of cable covered by this standard, in order to demonstrate satisfactory performance characteristics to meet the intended application

Table 1

No. of core	Size (mm ²)	Conductor (wires/type)	Conductor diameter (mm)	Insulation thickness nominal (mm)	Copper wire area (mm ²)	Sheath thickness nominal (mm)	Overall diameter approx. (mm)	Conductor resistance at 20 °C maximum (Ohm/km)	Weight of cable approx. (kg/km)	Standard packing length (m)
1	35/10	7/Compacted	6.95±1%	5.5	10	1.8	27.5	0.524	850	500
1	50/10	19/Compacted	8.33±1%	5.5	10	1.8	29.0	0.387	1000	500
1	70/10	19/Compacted	9.80±1%	5.5	10	1.9	30.5	0.268	1200	500
1	95/10	19/Compacted	11.45±1%	5.5	10	1.9	33.0	0.193	1600	500
1	120/10	37/Compacted	12.95±1%	5.5	10	2.0	34.5	0.153	1800	500
1	150/25	37/Compacted	14.50±1%	5.5	25	2.1	36.0	0.124	2200	500
1	185/25	37/Compacted	15.98±1%	5.5	25	2.1	38.0	0.0991	2600	500
1	240/25	61/Compacted	18.47±1%	5.5	25	2.2	40.5	0.0754	3200	500
1	300/25	61/Compacted	20.80±1%	5.5	25	2.3	43.0	0.0601	3800	500
1	400/25	61/Compacted	23.39±1%	5.5	25	2.4	46.0	0.0470	4700	500
1	500/25	61/Compacted	26.67±1%	5.5	25	2.6	50.0	0.0366	6000	500
1	800/25	61/Compacted	34.00±1%	5.5	25	2.8	58.0	0.0221	9000	500

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