

**SPECIFICATION****For****6/10KV-AL-CV**

6/10(12)kV Aluminium Conductor

XLPE Insulated PVC Sheathed

Power Cable

(6/10(12)kV, Al/XLPE/CTS/PVC)

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CUSTOMER

Rev.	Date	Description
0	10/3/2023	Issued specification

Customer Document	Rev.

**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 11000V aluminium conductor cross-linked polyethylene (XLPE) insulated polyvinyl chloride (PVC) sheathed power cable.

The cable shall be in accordance with IEC 60502-2 : 2014.

The finished cables shall meet the flame test requirements per IEC 60332-1.

## **2. Conductor**

The conductor shall be compacted concentric stranded uncoated hard-drawn aluminium conductor in accordance with IEC 60228 : 2004, Class 2.

The direction of lay shall be right-hand (Z) lay in the outermost layer.

## **3. Conductor Shield**

The conductor shield shall be a layer of 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 IEC 60502-2 : 2014.

The average thickness of the insulation shall be not less than that given in Table 1.

The minimum thickness shall not fall below the value in Table 1 by more than 10% plus 0.1 mm.

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. Metallic Shield**

The metallic shield shall be an uncoated annealed copper tape and shall be applied helically with a lap over the insulation shield.

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

A suitable separator tape shall be applied helically over the shielded core for single-core only.

## **7. Cabling (For multi-cores only)**

The individual shielded cores shall be cabled together with non-hygroscopic filler to give the completed cable a substantially circular cross section.

The direction of lay shall be left-hand (S) lay.

A suitable binder tape shall be applied helically over the cabled core.

## **8. Core Identification**

The cores shall be identified by colors of identification tape, placed longitudinally under the metallic shield, as follow :

Single-core : Not inserted color of identification tape

3-cores : white, red, blue

## **9. Sheath**

The sheath shall be sunlight resistant polyvinyl chloride (PVC/ST2) compound meet the requirements of IEC 60502-2 : 2014.


The average thickness of the sheath shall be not less than that given in Table 1.

The minimum thickness shall not fall below the value in Table 1 by more than 20% plus 0.2 mm.

The color of the sheath shall be black.

## **10. 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 "6/10(12)KV"

4. Type of insulation "XLPE"

5. Type of cable "POWER CABLE"

6. Number of cores and size of conductor

7. The continuous reel length marking (in figure) shall be made on the sheath at every 1 meter

## **11. Test and Properties**

The cable shall meet the requirements in Test and Inspection and Table 1 , when tested in accordance with IEC 60502-2 : 2014, IEC 60228 : 2004 and IEC 60332-1.


Remark: Sunlight resistant test meet the requirement of TIS 293-2541.

## 12. 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 "6/10KV-AL-CV"
2. Number of cores and size of conductor
3. Cable length
4. Net and gross weight
5. Manufacturer's name and/or trade mark "  **YAZAKI** "
6. Rolling direction of reel

## Test and Inspection

### Routine Tests

- Maximum conductor resistance, Ohm/km.....specified in Table 1
- AC test voltage for 5 minutes, kV.....21
- Maximum partial discharge level\*.....10 pC or better, at 10.38 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.....24
- 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

### Type Tests

- Flame retardant tested according to IEC 60332-1

### Definition concerning the tests

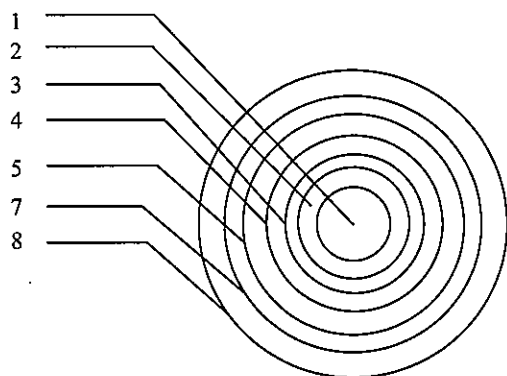
**Routine tests:** Tests made by the manufacturer on each manufactured length of cable to check that each length meets the specified requirements.

**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.

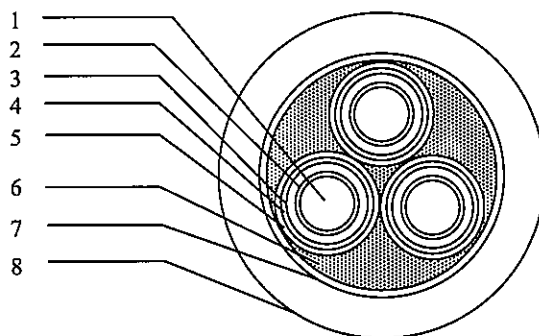
**Type tests:** Tests made before supplying, on a general commercial basis, a type of cable covered by this standard, in order to demonstrate satisfactory performance characteristics to meet the intended application.

### Cable structure

Cross-sectional (Not scale)



Single-core



Multi-cores

No.	Structure	Material
1	Conductor	Stranded uncoated hard-drawn aluminium
2	Conductor shield	Semi-conducting compound
3	Insulation	Cross-Linked Polyethylene (XLPE)
4	Insulation shield	Semi-conducting compound
5	Metallic shield	Copper tape
6	Filler	Non-hygroscopic
7	Binder tape or separator tape	Spun bond tape or suitable tape
8	Sheath	Polyvinyl chloride (PVC/ST2)

**Application:** Use for installation exposed, or in raceway, wet or dry location, or direct burial in ground.

Maximum conductor temperature of 90°C for normal operation and 250°C for short circuit conditions

**Table 1**

No. of core	Size (mm <sup>2</sup> )	Conductor (wires/type)	Conductor diameter approx. (mm)	Insulation thickness nominal (mm)	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	16	7/Compacted	4.80	3.4	1.5	19.0	1.91	340	500
1	25	7/Compacted	6.00	3.4	1.6	20.5	1.20	400	500
1	35	7/Compacted	7.10	3.4	1.6	21.5	0.868	460	500
1	50	7/Compacted	8.10	3.4	1.7	22.5	0.641	550	500
1	70	19/Compacted	9.90	3.4	1.7	24.5	0.443	650	500
1	95	19/Compacted	11.50	3.4	1.8	26.0	0.320	750	500
1	120	19/Compacted	13.10	3.4	1.8	28.0	0.253	850	500
1	150	19/Compacted	14.40	3.4	1.9	29.5	0.206	1000	500
1	185	34/Compacted	16.10	3.4	1.9	31.0	0.164	1100	500
1	240	34/Compacted	18.60	3.4	2.0	34.0	0.125	1400	500
1	300	34/Compacted	20.80	3.4	2.1	36.0	0.100	1600	500
1	400	55/Compacted	23.50	3.4	2.2	39.0	0.0778	2000	500
1	500	55/Compacted	26.80	3.4	2.3	43.0	0.0605	2400	500

**Table 1 (continued)**

No. of cores	Size  (mm <sup>2</sup> )	Conductor  (wires/type)	Conductor diameter approx.  (mm)	Insulation thickness nominal  (mm)	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)
3	16	7/Compacted	4.80	3.4	2.2	38.0	1.91	1100	500
3	25	7/Compacted	6.00	3.4	2.2	40.5	1.20	1300	500
3	35	7/Compacted	7.10	3.4	2.3	43.0	0.868	1500	500
3	50	7/Compacted	8.10	3.4	2.4	45.5	0.641	1700	500
3	70	19/Compacted	9.90	3.4	2.6	49.5	0.443	2100	500
3	95	19/Compacted	11.50	3.4	2.7	53.5	0.320	2500	500
3	120	19/Compacted	13.10	3.4	2.8	57.0	0.253	2900	500
3	150	19/Compacted	14.40	3.4	2.9	60.0	0.206	3300	500
3	185	34/Compacted	16.10	3.4	3.0	64.0	0.164	3800	500
3	240	34/Compacted	18.60	3.4	3.2	70.0	0.125	4700	500
3	300	34/Compacted	20.80	3.4	3.3	75.0	0.100	5500	500
3	400	55/Compacted	23.50	3.4	3.6	81.5	0.0778	6500	300