

SPECIFICATION**For****FD-0.6/1KV-AL-CV**

0.6/1(1.2)kV Aluminium Conductor

XLPE Insulated PVC Sheathed

Flame Retardant Power Cable

(0.6/1kV, Al/XLPE/FR-PVC)

BY



(Wachara Sangsomritphon)

MANAGER, Cable Design Section

APP.



(Winai Ariyasakulsap)

MANAGER, Development Department

APP.

()

CUSTOMER

Rev.	Date	Description
0	29/4/2020	Issued specification
1	16/2/2021	Cancel cable code "0010"

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 1000V aluminium conductor cross-linked polyethylene (XLPE) insulated polyvinyl chloride (PVC) sheathed flame retardant power cable.

The cable shall be in accordance with IEC 60502-1 : 2004 and Amend.1 : 2009.

The finished cables shall meet the vertical tray flame test requirements per IEC 60332-1 and IEC 60332-3-24 ; Category C.

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. Insulation

The insulation shall be cross-linked polyethylene (XLPE) compound meet the requirements of IEC 60502-1 : 2004.

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.

4. Cabling (For multi-cores only)

The individual insulated 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.

5. Core Identification

The cores shall be identified by color, as follows :

Single-core : white

2-cores : blue, brown

3-cores : brown, black, grey

4-cores : blue, brown, black, grey

(White color is natural color of XLPE insulation)

6. Sheath

The sheath shall be sunlight resistant and flame retardant polyvinyl chloride (PVC/ST2) compound meet the requirements of IEC 60502-1 : 2004.


The average thickness of the sheath shall not be 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.

7. 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. Flame retardant "FD"
4. Rated circuit voltage "0.6/1KV"
5. Type of insulation "XLPE"
6. Type of cable "POWER CABLE"
7. Number of cores and size of conductor
8. The continuous reel length marking (in figure) shall be made on the sheath at every 1 meter

8. Test and Properties

The cable shall meet the requirements in Test and Inspection and Table 1, when tested in accordance with IEC 60502-1 : 2004 and Amend.1 : 2009, IEC 60228 : 2004, IEC 60332-1 and IEC 60332-3-24 ; Category C.


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

9. 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 "FD-0.6/1KV-AL-CV"
2. Number of cores and size of cable
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..... 3.5

Sample Tests

- Construction specified in Table 1
- 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 and IEC 60332-3-24 ; Category C.

Definition concerning the tests

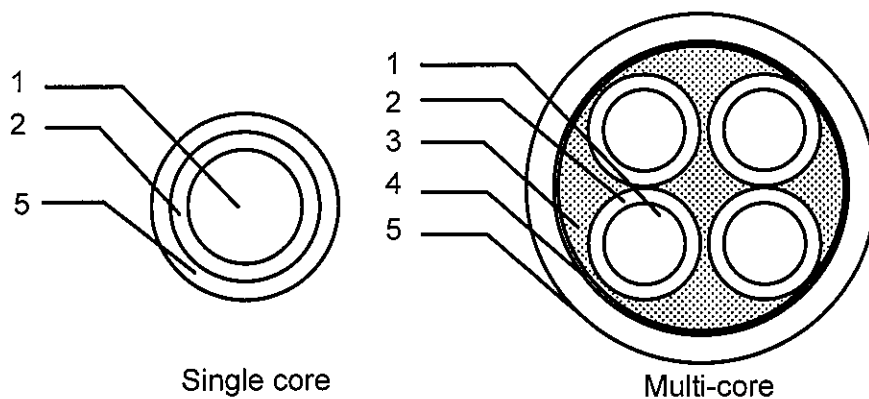
Routine tests: Tests made by the manufacturer on each manufactured length of cable to check that each length meets the specified requirements.

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)



No.	Structure	Material
1	Conductor	Compacted concentric stranded uncoated hard-drawn aluminium
2	Insulation	Cross-Linked Polyethylene (XLPE)
3	Filler	PP Calcium Yarn (Non-hygroscopic)
4	Binder Tape	Spun bond tape or suitable tape
5	Sheath	Flame retardant polyvinyl chloride (PVC/ST2)

Application: Use for installation in open tray, conduit, underground duct trench or direct burial in ground, at wet or dry location. Maximum conductor temperature of 90°C for normal operation and 250°C for short circuit conditions.

Table 1

No. of core	Size (mm ²)	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	10	7/Compacted	3.90	0.7	1.4	8.5	3.08	85	500
1	16	7/Compacted	4.80	0.7	1.4	9.5	1.91	110	500
1	25	7/Compacted	6.00	0.9	1.4	11.5	1.20	160	500
1	35	7/Compacted	7.10	0.9	1.4	12.5	0.868	190	500
1	50	7/Compacted	8.10	1.0	1.4	13.5	0.641	240	500
1	70	19/Compacted	9.90	1.1	1.4	14.5	0.443	320	500
1	95	19/Compacted	11.50	1.1	1.5	17.5	0.320	420	500
1	120	19/Compacted	13.10	1.2	1.5	19.5	0.253	500	500
1	150	19/Compacted	14.40	1.4	1.6	21.5	0.206	650	500
1	185	34/Compacted	16.10	1.6	1.6	23.5	0.164	750	500
1	240	34/Compacted	18.60	1.7	1.7	26.5	0.125	1000	500
1	300	34/Compacted	20.80	1.8	1.8	29.0	0.100	1200	500
1	400	55/Compacted	23.50	2.0	1.9	32.5	0.0778	1500	500
1	500	55/Compacted	26.80	2.2	2.0	36.0	0.0605	1900	500

Table 1 (Continued)

No. of cores	Size (mm ²)	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)
2	10	7/Compacted	3.90	0.7	1.8	15.5	3.08	220	500
2	16	7/Compacted	4.80	0.7	1.8	17.5	1.91	290	500
2	25	7/Compacted	6.00	0.9	1.8	21.0	1.20	400	500
2	35	7/Compacted	7.10	0.9	1.8	23.0	0.868	490	500
2	50	7/Compacted	8.10	1.0	1.8	26.0	0.641	600	500
2	70	19/Compacted	9.90	1.1	1.8	29.5	0.443	800	500
2	95	19/Compacted	11.50	1.1	2.0	33.5	0.320	1100	500
2	120	19/Compacted	13.10	1.2	2.1	37.5	0.253	1300	500
2	150	19/Compacted	14.40	1.4	2.2	41.0	0.206	1600	500
2	185	34/Compacted	16.10	1.6	2.3	45.5	0.164	1900	500
2	240	34/Compacted	18.60	1.7	2.5	51.5	0.125	2500	500
2	300	34/Compacted	20.80	1.8	2.7	57.0	0.100	3000	500
2	400	55/Compacted	23.50	2.0	2.9	63.5	0.0778	3800	500

Table 1 (Continued)

No. of cores	Size (mm ²)	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	10	7/Compacted	3.90	0.7	1.8	16.5	3.08	260	500
3	16	7/Compacted	4.80	0.7	1.8	18.5	1.91	350	500
3	25	7/Compacted	6.00	0.9	1.8	21.5	1.20	490	500
3	35	7/Compacted	7.10	0.9	1.8	24.5	0.868	650	500
3	50	7/Compacted	8.10	1.0	1.8	27.5	0.641	800	500
3	70	19/Compacted	9.90	1.1	1.9	32.0	0.443	1100	500
3	95	19/Compacted	11.50	1.1	2.0	35.5	0.320	1400	500
3	120	19/Compacted	13.10	1.2	2.1	40.0	0.253	1700	500
3	150	19/Compacted	14.40	1.4	2.3	44.0	0.206	2100	500
3	185	34/Compacted	16.10	1.6	2.4	49.0	0.164	2600	500
3	240	34/Compacted	18.60	1.7	2.6	55.5	0.125	3300	500
3	300	34/Compacted	20.80	1.8	2.8	61.0	0.100	4100	500
3	400	55/Compacted	23.50	2.0	3.1	69.0	0.0778	5000	500

Table 1 (Continued)

No. of cores	Size (mm ²)	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)
4	10	7/Compacted	3.90	0.7	1.8	18.0	3.08	310	500
4	16	7/Compacted	4.80	0.7	1.8	20.0	1.91	420	500
4	25	7/Compacted	6.00	0.9	1.8	24.5	1.20	600	500
4	35	7/Compacted	7.10	0.9	1.8	27.0	0.868	750	500
4	50	7/Compacted	8.10	1.0	1.9	30.5	0.641	1000	500
4	70	19/Compacted	9.90	1.1	2.0	35.5	0.443	1400	500
4	95	19/Compacted	11.50	1.1	2.1	39.5	0.320	1700	500
4	120	19/Compacted	13.10	1.2	2.3	44.0	0.253	2200	500
4	150	19/Compacted	14.40	1.4	2.4	48.5	0.206	2600	500
4	185	34/Compacted	16.10	1.6	2.6	54.5	0.164	3300	500
4	240	34/Compacted	18.60	1.7	2.8	61.5	0.125	4200	500
4	300	34/Compacted	20.80	1.8	3.0	68.0	0.100	5000	500
4	400	55/Compacted	23.50	2.0	3.3	76.5	0.0778	6500	300