

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

0.6/1(1.2)kV Aluminium Conductor

XLPE Insulated PVC Sheathed

Flame Retardant Power Cable

(0.6/1(1.2)kV, Al/XLPE/FR-PVC)

BY



(Wachara Sangsomritphon)

MANAGER, Cable Design Section

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CUSTOMER

Rev.	Date	Description
0	29/4/2020	Issued specification
1	16/2/2021	Cancel cable code "0010"
2	16/6/2023	Add 5-cores and correct the Table 1
3	7/5/2024	Update specification
4	2/9/2024	Update Table 1
5	10/9/2024	Change thickness sheath for 1-core
6	27/1/2025	Update 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 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 : 2021.

- Flame retardant test requirements per IEC 60332-1.
- Flame propagation test requirements per 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 : 2021.

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

The minimum thickness shall not fall below 90% of the nominal value in Table 1 by more than 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

5-cores : blue, brown, black, grey, green/yellow

(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 : 2021.


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

The minimum thickness shall not fall below 80% of the nominal value in Table 1 by more than 0.2 mm.

The color of the sheath shall be black.

7. Marking on Cable

The marking items shall be marked by printed at intervals not exceeding 1 meter 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 conductor "AL"
6. Type of insulation and sheath "XLPE/PVC"
7. Type of cable "POWER CABLE"
8. Number of cores and size of conductor
9. 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 : 2021, 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.
- Flame propagation test according to IEC 60332-3-24; Category C.

Definition concerning the tests

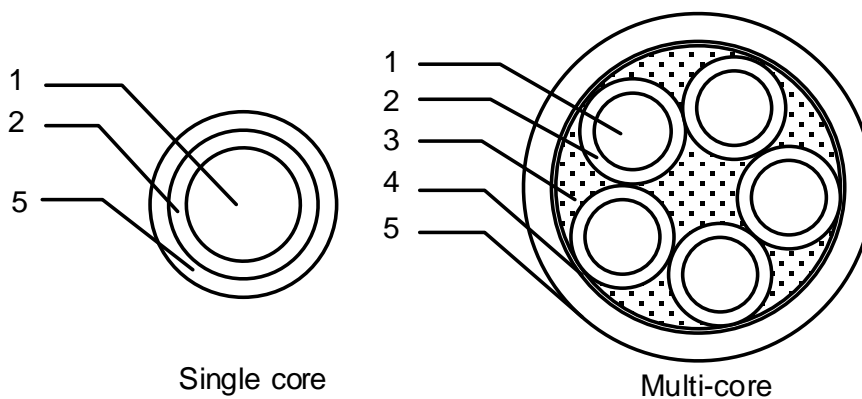
Routine tests: Tests made by the manufacturer on each manufactured length of cable to check that each length meets the specified requirements.

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	Stranded uncoated hard-drawn aluminium
2	Insulation	Cross-linked polyethylene (XLPE) compound
3	Filler	Non-hygroscopic
4	Binder Tape	Spun bond tape or suitable tape
5	Sheath	Flame retardant polyvinyl chloride (PVC/ST2) compound

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	3.72	0.7	1.4	8.5	3.08	83	500
1	16	7/Compacted	4.69	0.7	1.4	9.5	1.91	109	500
1	25	7/Compacted	5.90	0.9	1.4	11.5	1.20	153	500
1	35	7/Compacted	6.95	0.9	1.4	12.5	0.868	191	500
1	50	7/Compacted	8.01	1.0	1.4	13.5	0.641	240	500
1	70	19/Compacted	9.73	1.1	1.4	15.5	0.443	318	500
1	95	19/Compacted	11.40	1.1	1.5	17.5	0.320	417	500
1	120	19/Compacted	12.95	1.2	1.6	19.5	0.253	521	500
1	150	19/Compacted	14.27	1.4	1.8	21.5	0.206	643	500
1	185	34/Compacted	15.98	1.6	2.1	24.5	0.164	824	500
1	240	34/Compacted	18.47	1.7	2.3	28.0	0.125	1058	500
1	300	34/Compacted	20.68	1.8	2.4	30.5	0.100	1285	500
1	400	55/Compacted	23.39	2.0	2.7	34.0	0.0778	1644	500
1	500	55/Compacted	26.67	2.2	3.0	38.5	0.0605	2107	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	3.72	0.7	1.9	16.0	3.08	222	500
2	16	7/Compacted	4.69	0.7	2.1	18.5	1.91	308	500
2	25	7/Compacted	5.90	0.9	2.9	23.5	1.20	522	500
2	35	7/Compacted	6.95	0.9	3.0	26.0	0.868	643	500
2	50	7/Compacted	8.01	1.0	3.2	29.0	0.641	820	500
2	70	19/Compacted	9.73	1.1	3.6	33.5	0.443	1117	500
2	95	19/Compacted	11.40	1.1	4.0	38.0	0.320	1446	500
2	120	19/Compacted	12.95	1.2	4.0	41.5	0.253	1735	500
2	150	19/Compacted	14.27	1.4	4.0	45.0	0.206	2042	500
2	185	34/Compacted	15.98	1.6	4.0	49.5	0.164	2468	500
2	240	34/Compacted	18.47	1.7	4.0	55.0	0.125	3053	500
2	300	34/Compacted	20.68	1.8	4.0	60.0	0.100	3635	500
2	400	55/Compacted	23.39	2.0	4.0	66.5	0.0778	4476	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	3.72	0.7	2.0	17.0	3.08	271	500
3	16	7/Compacted	4.69	0.7	2.2	19.5	1.91	378	500
3	25	7/Compacted	5.90	0.9	2.6	24.0	1.20	566	500
3	35	7/Compacted	6.95	0.9	2.7	26.5	0.868	701	500
3	50	7/Compacted	8.01	1.0	2.8	29.5	0.641	891	500
3	70	19/Compacted	9.73	1.1	3.0	34.5	0.443	1203	500
3	95	19/Compacted	11.40	1.1	3.3	38.5	0.320	1569	500
3	120	19/Compacted	12.95	1.2	3.8	43.5	0.253	2010	500
3	150	19/Compacted	14.27	1.4	4.0	47.5	0.206	2435	500
3	185	34/Compacted	15.98	1.6	4.0	52.5	0.164	2948	500
3	240	34/Compacted	18.47	1.7	4.0	58.5	0.125	3673	500
3	300	34/Compacted	20.68	1.8	4.0	64.0	0.100	4407	500
3	400	55/Compacted	23.39	2.0	4.0	71.0	0.0778	5446	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	3.72	0.7	2.3	19.0	3.08	352	500
4	16	7/Compacted	4.69	0.7	2.5	21.5	1.91	486	500
4	25	7/Compacted	5.90	0.9	3.0	27.0	1.20	750	500
4	35	7/Compacted	6.95	0.9	3.2	30.0	0.868	948	500
4	50	7/Compacted	8.01	1.0	3.4	33.5	0.641	1211	500
4	70	19/Compacted	9.73	1.1	3.7	39.0	0.443	1636	500
4	95	19/Compacted	11.40	1.1	4.0	43.5	0.320	2128	500
4	120	19/Compacted	12.95	1.2	4.0	48.0	0.253	2589	500
4	150	19/Compacted	14.27	1.4	4.0	52.0	0.206	3080	500
4	185	34/Compacted	15.98	1.6	4.0	58.0	0.164	3751	500
4	240	34/Compacted	18.47	1.7	4.0	64.5	0.125	4700	500
4	300	34/Compacted	20.68	1.8	4.0	70.5	0.100	5662	500
4	400	55/Compacted	23.39	2.0	4.0	78.0	0.0778	7041	300

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)
5	10	7/Compacted	3.72	0.7	2.5	21.0	3.08	429	500
5	16	7/Compacted	4.69	0.7	2.8	24.0	1.91	606	500
5	25	7/Compacted	5.90	0.9	3.4	30.0	1.20	941	500
5	35	7/Compacted	6.95	0.9	3.8	34.0	0.868	1228	500
5	50	7/Compacted	8.01	1.0	3.7	37.5	0.641	1486	500
5	70	19/Compacted	9.73	1.1	4.0	43.5	0.443	2044	500
5	95	19/Compacted	11.40	1.1	4.0	47.5	0.320	2552	500
5	120	19/Compacted	12.95	1.2	4.0	52.5	0.253	3102	500
5	150	19/Compacted	14.27	1.4	4.0	57.0	0.206	3711	500
5	185	34/Compacted	15.98	1.6	4.0	63.5	0.164	4544	500
5	240	34/Compacted	18.47	1.7	4.0	71.0	0.125	5711	500
5	300	34/Compacted	20.68	1.8	4.0	77.5	0.100	6890	300
5	400	55/Compacted	23.39	2.0	4.0	86.0	0.0778	8620	300