

SPECIFICATION

For

FD-0.6/1KV-CV-S

0.6/1(1.2)kV

XLPE Insulated PVC Sheathed

Flame Retardant Shielded Power Cable

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

BY



(Wachara Sangsomritphon)

MANAGER, Cable Design Section

APP. _____

()

CUSTOMER

Rev.	Date	Description
0	13/11/2019	Issued specification
1	14/01/2020	Adjust thickness sheath for single core
2	25/3/2021	Add length mark
3	30/5/2024	Update specification
4	10/4/2025	Update conductor diameter

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 copper conductor cross-linked polyethylene (XLPE) insulated polyvinyl chloride (PVC) sheathed flame retardant shielded 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

For size $\leq 6 \text{ mm}^2$:

The conductor shall be non-compacted concentric stranded uncoated annealed copper conductor in accordance with IEC 60228 : 2004, Class 2.

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

For size $\geq 10 \text{ mm}^2$:

The conductor shall be compacted concentric stranded uncoated annealed copper conductor in accordance with IEC 60228 : 2004, Class 2.

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

A suitable binder tape shall be applied helically over the insulation for single-core only.

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 of, 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. Metallic Shield

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

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

A suitable separator tape shall be applied helically over the metallic shield.

7. 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.

8. 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 conductor "CU"
6. Type of insulation and sheath "XLPE/PVC"
7. Type of cable "SHIELD 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

9. 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.

10. 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-CV-S"
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

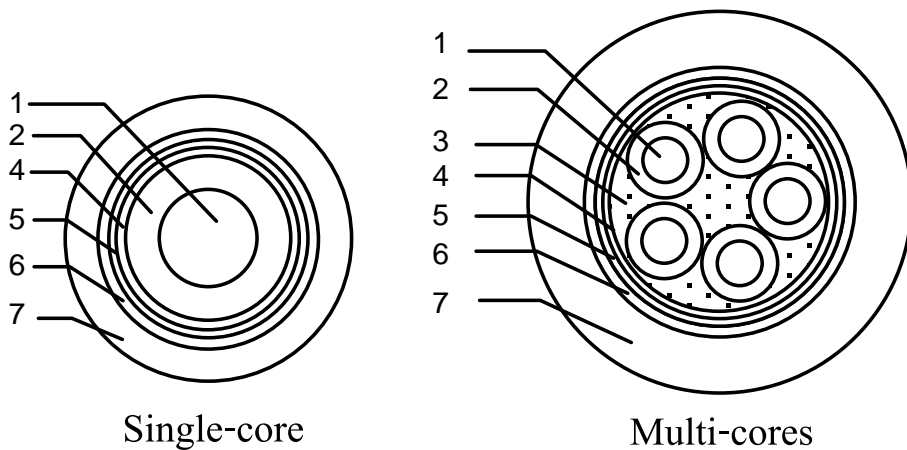
Routine tests: Tests made by the manufacturer on each manufactured length of cable to check that each length meets the specified requirements.

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 annealed copper
2	Insulation	Cross-linked polyethylene (XLPE) compound
3	Filler	Non-hygroscopic
4	Binder Tape	Spun bond tape or suitable tape
5	Metallic shield	Copper tape
6	Separator tape	Spun bond tape or suitable tape
7	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	1.5	7/Non-compacted	1.59	0.7	1.8	8.5	12.1	94	500
1	2.5	7/Non-compacted	2.01	0.7	1.8	9.0	7.41	128	500
1	4	7/Non-compacted	2.55	0.7	1.8	9.5	4.61	131	500
1	6	7/Non-compacted	3.12	0.7	1.8	10.5	3.08	151	500
1	10	7/Compacted	3.70	0.7	1.8	11.0	1.83	192	500
1	16	7/Compacted	4.70	0.7	1.8	12.0	1.15	259	500
1	25	7/Compacted	5.90	0.9	1.8	13.5	0.727	367	500
1	35	7/Compacted	6.90	0.9	1.8	14.5	0.524	468	500
1	50	19/Compacted	8.20	1.0	1.8	16.0	0.387	602	500
1	70	19/Compacted	9.80	1.1	1.8	18.0	0.268	817	500
1	95	19/Compacted	11.60	1.1	1.9	20.0	0.193	1087	500
1	120	37/Compacted	13.10	1.2	2.1	22.0	0.153	1371	500
1	150	37/Compacted	14.50	1.4	2.3	24.0	0.124	1682	500
1	185	37/Compacted	16.10	1.6	2.6	27.0	0.0991	2068	500
1	240	61/Compacted	18.60	1.7	2.8	30.0	0.0754	2682	500
1	300	61/Compacted	20.80	1.8	3.0	33.0	0.0601	3333	500
1	400	61/Compacted	23.40	2.0	3.2	36.5	0.0470	4230	500
1	500	61/Compacted	26.60	2.2	3.5	41.0	0.0366	5386	500
1	630	61/Compacted	30.20	2.4	3.8	45.5	0.0283	6864	500
1	800	61/Compacted	34.00	2.6	4.0	50.0	0.0221	8554	500
1	1000	127/Compacted	39.40	2.8	4.0	56.0	0.0176	11095	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)
2	1.5	7/Non-compacted	1.59	0.7	1.8	12.0	12.1	156	500
2	2.5	7/Non-compacted	2.01	0.7	1.8	13.0	7.41	187	500
2	4	7/Non-compacted	2.55	0.7	1.8	14.0	4.61	233	500
2	6	7/Non-compacted	3.12	0.7	2.0	15.5	3.08	305	500
2	10	7/Compacted	3.70	0.7	2.0	16.5	1.83	392	500
2	16	7/Compacted	4.70	0.7	2.3	19.5	1.15	566	500
2	25	7/Compacted	5.90	0.9	3.0	24.5	0.727	903	500
2	35	7/Compacted	6.90	0.9	3.2	27.0	0.524	1163	500
2	50	19/Compacted	8.20	1.0	3.4	30.5	0.387	1514	500
2	70	19/Compacted	9.80	1.1	3.9	35.0	0.268	2099	500
2	95	19/Compacted	11.60	1.1	4.0	39.0	0.193	2741	500
2	120	37/Compacted	13.10	1.2	4.0	42.5	0.153	3362	500
2	150	37/Compacted	14.50	1.4	4.0	46.0	0.124	4029	500
2	185	37/Compacted	16.10	1.6	4.0	50.5	0.0991	4911	500
2	240	61/Compacted	18.60	1.7	4.0	56.0	0.0754	6242	500
2	300	61/Compacted	20.80	1.8	4.0	60.5	0.0601	7612	500
2	400	61/Compacted	23.40	2.0	4.0	67.0	0.0470	9491	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)
3	1.5	7/Non-compacted	1.59	0.7	1.8	12.5	12.1	179	500
3	2.5	7/Non-compacted	2.01	0.7	1.8	13.5	7.41	219	500
3	4	7/Non-compacted	2.55	0.7	1.9	15.0	4.61	287	500
3	6	7/Non-compacted	3.12	0.7	2.1	16.5	3.08	381	500
3	10	7/Compacted	3.70	0.7	2.2	18.0	1.83	514	500
3	16	7/Compacted	4.70	0.7	2.4	20.5	1.15	737	500
3	25	7/Compacted	5.90	0.9	2.9	25.5	0.727	1119	500
3	35	7/Compacted	6.90	0.9	3.2	28.5	0.524	1497	500
3	50	19/Compacted	8.20	1.0	3.2	31.5	0.387	1928	500
3	70	19/Compacted	9.80	1.1	3.7	36.5	0.268	2701	500
3	95	19/Compacted	11.60	1.1	4.0	41.0	0.193	3622	500
3	120	37/Compacted	13.10	1.2	4.0	45.0	0.153	4471	500
3	150	37/Compacted	14.50	1.4	4.0	49.0	0.124	5408	500
3	185	37/Compacted	16.10	1.6	4.0	53.5	0.0991	6616	500
3	240	61/Compacted	18.60	1.7	4.0	59.5	0.0754	8480	500
3	300	61/Compacted	20.80	1.8	4.0	64.5	0.0601	10403	300
3	400	61/Compacted	23.40	2.0	4.0	71.5	0.0470	13021	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)
4	1.5	7/Non-compacted	1.59	0.7	1.8	13.5	12.1	208	500
4	2.5	7/Non-compacted	2.01	0.7	1.9	15.0	7.41	265	500
4	4	7/Non-compacted	2.55	0.7	2.1	16.5	4.61	358	500
4	6	7/Non-compacted	3.12	0.7	2.3	18.5	3.08	480	500
4	10	7/Compacted	3.70	0.7	2.5	20.0	1.83	662	500
4	16	7/Compacted	4.70	0.7	2.7	23.0	1.15	949	500
4	25	7/Compacted	5.90	0.9	3.3	28.5	0.727	1482	500
4	35	7/Compacted	6.90	0.9	3.5	31.0	0.524	1919	500
4	50	19/Compacted	8.20	1.0	3.5	35.0	0.387	2485	500
4	70	19/Compacted	9.80	1.1	3.9	40.0	0.268	3454	500
4	95	19/Compacted	11.60	1.1	4.0	45.0	0.193	4595	500
4	120	37/Compacted	13.10	1.2	4.0	49.0	0.153	5711	500
4	150	37/Compacted	14.50	1.4	4.0	53.5	0.124	6927	500
4	185	37/Compacted	16.10	1.6	4.0	59.0	0.0991	8502	500
4	240	61/Compacted	18.60	1.7	4.0	65.5	0.0754	10929	300
4	300	61/Compacted	20.80	1.8	4.0	71.0	0.0601	13456	300
4	400	61/Compacted	23.40	2.0	4.0	79.0	0.0470	16896	200

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	1.5	7/Non-compacted	1.59	0.7	2.0	15.0	12.1	254	500
5	2.5	7/Non-compacted	2.01	0.7	2.1	16.5	7.41	324	500
5	4	7/Non-compacted	2.55	0.7	2.4	18.5	4.61	449	500
5	6	7/Non-compacted	3.12	0.7	2.5	20.0	3.08	583	500
5	10	7/Compacted	3.70	0.7	2.7	22.0	1.83	807	500
5	16	7/Compacted	4.70	0.7	3.0	25.5	1.15	1181	500
5	25	7/Compacted	5.90	0.9	3.6	31.5	0.727	1825	500
5	35	7/Compacted	6.90	0.9	4.0	35.0	0.524	2415	500
5	50	19/Compacted	8.20	1.0	4.0	39.0	0.387	3106	500
5	70	19/Compacted	9.80	1.1	4.0	44.0	0.268	4254	500
5	95	19/Compacted	11.60	1.1	4.0	49.0	0.193	5615	500
5	120	37/Compacted	13.10	1.2	4.0	53.5	0.153	6983	500
5	150	37/Compacted	14.50	1.4	4.0	58.5	0.124	8497	500
5	185	37/Compacted	16.10	1.6	4.0	64.5	0.0991	10466	300
5	240	61/Compacted	18.60	1.7	4.0	72.0	0.0754	13477	300
5	300	61/Compacted	20.80	1.8	4.0	78.5	0.0601	16605	200
5	400	61/Compacted	23.40	2.0	4.0	87.0	0.0470	20912	200