

SPECIFICATION**For****FD-0.6/1KV-CVV-S**

0.6/1(1.2)kV PVC Insulated PVC Sheathed

Flame Retardant

Shielded Control Cable

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

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Rev.	Date	Description
0	16/11/2020	Issued specification
1	24/11/2020	Add size
2	31/1/2022	Cancel code "0010"

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CUSTOMER

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 polyvinyl chloride (PVC) insulated polyvinyl chloride (PVC) sheathed flame retardant shielded control 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 flexible stranded uncoated annealed copper conductor in accordance with IEC 60228 : 2004, Class 5.

For size 1.5 to 4 mm² : The direction of lay shall be left-hand (S) lay.

For size 6 and 10 mm² : The direction of lay shall be right-hand (Z) lay.

3. Insulation

The insulation shall be polyvinyl chloride (PVC/A) 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

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

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

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

5. Core Identification

The cores shall be identified by colors or by numbers printed on the insulation, as follows :

2-cores : blue, brown

3-cores : brown, black, grey

4-cores : blue, brown, black, grey

For 5-cores to 30-cores :

The cores shall be identified by the arabic numerals printed longitudinally and continuously on the surface of black 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/ST1) compound meet the requirements of IEC 60502-1 : 2004.


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

The minimum thickness shall be not fall below the value in Table 1 by more than 20% plus 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 insulation "PVC"
6. Type of cable " SHIELD CONTROL 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

9. Test and Properties

The cable shall be 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.

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-CVV-S"
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, kV3.5

Sample Tests

- Construction.....specified in Table 1

Type Tests

- Flame retardant tested according to IEC 60332-1 and IEC 60332-3-24; Category C.

Definition concerning the tests

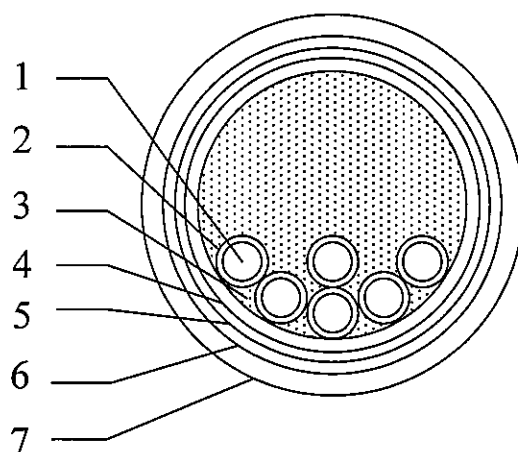
Routine tests: Tests made by the manufacturer on each manufactured length of cable to check that each length meets the specified requirements.

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	Flexible stranded annealed copper
2	Insulation	Polyvinyl chloride (PVC/A)
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/ST1)

Application: For supervisory electrical equipment, station control circuits, outdoor, suitable installation in the dry or wet cable trenches. Maximum conductor temperature of 70°C for normal operation and 160°C for short circuit conditions.

Table 1

No. of cores	Size (mm ²)	Conductor 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	Flexible	1.60	0.8	1.8	12.5	13.3	170	300
2	2.5	Flexible	2.10	0.8	1.8	13.5	7.98	210	300
2	4	Flexible	2.60	1.0	1.8	15.0	4.95	280	300
2	6	Flexible	3.40	1.0	1.8	16.5	3.30	360	300
2	10	Flexible	4.60	1.0	1.8	19.0	1.91	500	300
3	1.5	Flexible	1.60	0.8	1.8	12.5	13.3	190	300
3	2.5	Flexible	2.10	0.8	1.8	14.0	7.98	240	300
3	4	Flexible	2.60	1.0	1.8	15.5	4.95	330	300
3	6	Flexible	3.40	1.0	1.8	17.5	3.30	440	300
3	10	Flexible	4.60	1.0	1.8	20.0	1.91	650	300
4	1.5	Flexible	1.60	0.8	1.8	13.5	13.3	230	300
4	2.5	Flexible	2.10	0.8	1.8	15.0	7.98	290	300
4	4	Flexible	2.60	1.0	1.8	17.0	4.95	400	300
4	6	Flexible	3.40	1.0	1.8	19.0	3.30	550	300
4	10	Flexible	4.60	1.0	1.8	21.5	1.91	800	300

Table 1 (continued)

No. of cores	Size (mm ²)	Conductor 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	Flexible	1.60	0.8	1.8	14.5	13.3	270	300
5	2.5	Flexible	2.10	0.8	1.8	16.0	7.98	350	300
5	4	Flexible	2.60	1.0	1.8	18.5	4.95	480	300
5	6	Flexible	3.40	1.0	1.8	20.5	3.30	650	300
5	10	Flexible	4.60	1.0	1.8	24.0	1.91	950	300
6	1.5	Flexible	1.60	0.8	1.8	15.5	13.3	300	300
6	2.5	Flexible	2.10	0.8	1.8	17.0	7.98	390	300
6	4	Flexible	2.60	1.0	1.8	20.0	4.95	550	300
6	6	Flexible	3.40	1.0	1.8	22.5	3.30	750	300
6	10	Flexible	4.60	1.0	1.8	26.0	1.91	1100	300
7	1.5	Flexible	1.60	0.8	1.8	15.5	13.3	320	300
7	2.5	Flexible	2.10	0.8	1.8	17.0	7.98	420	300
7	4	Flexible	2.60	1.0	1.8	20.0	4.95	600	300
7	6	Flexible	3.40	1.0	1.8	22.5	3.30	800	300
7	10	Flexible	4.60	1.0	1.8	26.0	1.91	1300	300

Table 1 (continued)

No. of cores	Size (mm ²)	Conductor 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)
8	1.5	Flexible	1.60	0.8	1.8	17.0	13.3	370	300
8	2.5	Flexible	2.10	0.8	1.8	18.5	7.98	480	300
8	4	Flexible	2.60	1.0	1.8	21.5	4.95	700	300
8	6	Flexible	3.40	1.0	1.8	24.0	3.30	950	300
8	10	Flexible	4.60	1.0	1.8	28.0	1.91	1400	300
9	1.5	Flexible	1.60	0.8	1.8	18.0	13.3	410	300
9	2.5	Flexible	2.10	0.8	1.8	19.5	7.98	550	300
9	4	Flexible	2.60	1.0	1.8	23.0	4.95	750	300
9	6	Flexible	3.40	1.0	1.8	26.0	3.30	1100	300
9	10	Flexible	4.60	1.0	1.9	30.0	1.91	1600	300
10	1.5	Flexible	1.60	0.8	1.8	19.0	13.3	450	300
10	2.5	Flexible	2.10	0.8	1.8	21.0	7.98	600	300
10	4	Flexible	2.60	1.0	1.8	24.5	4.95	900	300
10	6	Flexible	3.40	1.0	1.8	27.5	3.30	1200	300
10	10	Flexible	4.60	1.0	2.0	33.0	1.91	1800	300

Table 1 (continued)

No. of cores	Size (mm ²)	Conductor 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)
11	1.5	Flexible	1.60	0.8	1.8	19.0	13.3	470	300
11	2.5	Flexible	2.10	0.8	1.8	21.0	7.98	600	300
11	4	Flexible	2.60	1.0	1.8	24.5	4.95	900	300
11	6	Flexible	3.40	1.0	1.8	27.5	3.30	1300	300
11	10	Flexible	4.60	1.0	2.0	33.0	1.91	1900	300
12	1.5	Flexible	1.60	0.8	1.8	19.5	13.3	500	300
12	2.5	Flexible	2.10	0.8	1.8	21.5	7.98	650	300
12	4	Flexible	2.60	1.0	1.8	25.5	4.95	1000	300
12	6	Flexible	3.40	1.0	1.8	28.5	3.30	1400	300
12	10	Flexible	4.60	1.0	2.0	34.0	1.91	2100	300
13	1.5	Flexible	1.60	0.8	1.8	20.5	13.3	550	300
13	2.5	Flexible	2.10	0.8	1.8	22.5	7.98	700	300
13	4	Flexible	2.60	1.0	1.8	26.5	4.95	1100	300
13	6	Flexible	3.40	1.0	1.9	30.5	3.30	1500	300
13	10	Flexible	4.60	1.0	2.1	36.0	1.91	2300	300

Table 1 (continued)

No. of cores	Size (mm ²)	Conductor strands (No./mm)	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)
14	1.5	Flexible	1.60	0.8	1.8	20.5	13.3	550	300
14	2.5	Flexible	2.10	0.8	1.8	25.5	7.98	750	300
14	4	Flexible	2.60	1.0	1.8	26.5	4.95	1100	300
14	6	Flexible	3.40	1.0	1.9	30.5	3.30	1500	300
14	10	Flexible	4.60	1.0	2.1	36.0	1.91	2400	300
15	1.5	Flexible	1.60	0.8	1.8	21.0	13.3	600	300
15	2.5	Flexible	2.10	0.8	1.8	23.5	7.98	800	300
15	4	Flexible	2.60	1.0	1.8	27.5	4.95	1200	300
15	6	Flexible	3.40	1.0	1.9	31.5	3.30	1600	300
15	10	Flexible	4.60	1.0	2.1	37.5	1.91	2500	300
16	1.5	Flexible	1.60	0.8	1.8	21.5	13.3	600	300
16	2.5	Flexible	2.10	0.8	1.8	24.0	7.98	850	300
16	4	Flexible	2.60	1.0	1.8	28.0	4.95	1200	300
16	6	Flexible	3.40	1.0	1.9	31.5	3.30	1600	300
16	10	Flexible	4.60	1.0	2.1	37.5	1.91	2500	300

Table 1 (continued)

No. of cores	Size (mm ²)	Conductor 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)
17	1.5	Flexible	1.60	0.8	1.8	22.5	13.3	650	300
17	2.5	Flexible	2.10	0.8	1.8	25.0	7.98	900	300
17	4	Flexible	2.60	1.0	1.8	29.5	4.95	1300	300
17	6	Flexible	3.40	1.0	2.0	34.0	3.30	1900	300
17	10	Flexible	4.60	1.0	2.2	40.5	1.91	2900	300
18	1.5	Flexible	1.60	0.8	1.8	22.5	13.3	650	300
18	2.5	Flexible	2.10	0.8	1.8	25.0	7.98	900	300
18	4	Flexible	2.60	1.0	1.8	29.5	4.95	1300	300
18	6	Flexible	3.40	1.0	2.0	34.0	3.30	1900	300
18	10	Flexible	4.60	1.0	2.2	40.5	1.91	2900	300
		Flexible							
19	1.5	Flexible	1.60	0.8	1.8	22.5	13.3	700	300
19	2.5	Flexible	2.10	0.8	1.8	25.0	7.98	950	300
19	4	Flexible	2.60	1.0	1.8	29.5	4.95	1400	300
19	6	Flexible	3.40	1.0	2.0	34.0	3.30	2000	300
19	10	Flexible	4.60	1.0	2.2	40.5	1.91	3100	300

Table 1 (continued)

No. of cores	Size (mm ²)	Conductor 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)
20	1.5	Flexible	1.60	0.8	1.8	23.0	13.3	700	300
20	2.5	Flexible	2.10	0.8	1.8	25.5	7.98	1000	300
20	4	Flexible	2.60	1.0	1.9	30.5	4.95	1500	300
20	6	Flexible	3.40	1.0	2.0	35.0	3.30	2100	300
21	1.5	Flexible	1.60	0.8	1.8	23.5	13.3	750	300
21	2.5	Flexible	2.10	0.8	1.8	26.5	7.98	1000	300
21	4	Flexible	2.60	1.0	1.9	31.0	4.95	1500	300
21	6	Flexible	3.40	1.0	2.0	35.5	3.30	2200	300
22	1.5	Flexible	1.60	0.8	1.8	25.0	13.3	800	300
22	2.5	Flexible	2.10	0.8	1.8	27.5	7.98	1100	300
22	4	Flexible	2.60	1.0	1.9	32.5	4.95	1600	300
22	6	Flexible	3.40	1.0	2.1	37.5	3.30	2300	300
23	1.5	Flexible	1.60	0.8	1.8	25.0	13.3	850	300
23	2.5	Flexible	2.10	0.8	1.8	27.5	7.98	1100	300
23	4	Flexible	2.60	1.0	1.9	32.5	4.95	1700	300
23	6	Flexible	3.40	1.0	2.1	37.5	3.30	2400	300

Table 1 (continued)

No. of cores	Size (mm ²)	Conductor 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)
24	1.5	Flexible	1.60	0.8	1.8	26.0	13.3	850	300
24	2.5	Flexible	2.10	0.8	1.8	29.0	7.98	1200	300
24	4	Flexible	2.60	1.0	2.0	34.5	4.95	1800	300
24	6	Flexible	3.40	1.0	2.2	40.0	3.30	2500	300
25	1.5	Flexible	1.60	0.8	1.8	26.0	13.3	900	300
25	2.5	Flexible	2.10	0.8	1.8	29.0	7.98	1200	300
25	4	Flexible	2.60	1.0	2.0	34.5	4.95	1800	300
25	6	Flexible	3.40	1.0	2.2	40.0	3.30	2600	300
26	1.5	Flexible	1.60	0.8	1.8	26.0	13.3	900	300
26	2.5	Flexible	2.10	0.8	1.8	29.0	7.98	1200	300
26	4	Flexible	2.60	1.0	2.0	34.5	4.95	1900	300
26	6	Flexible	3.40	1.0	2.2	40.0	3.30	2700	300
27	1.5	Flexible	1.60	0.8	1.8	26.5	13.3	950	300
27	2.5	Flexible	2.10	0.8	1.8	29.5	7.98	1300	300
27	4	Flexible	2.60	1.0	2.0	35.5	4.95	1900	300
27	6	Flexible	3.40	1.0	2.2	41.0	3.30	2700	300

Table 1 (continued)

No. of cores	Size (mm ²)	Conductor 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)
28	1.5	Flexible	1.60	0.8	1.8	27.5	13.3	1000	300
28	2.5	Flexible	2.10	0.8	1.9	31.0	7.98	1400	300
28	4	Flexible	2.60	1.0	2.1	37.0	4.95	2100	300
29	1.5	Flexible	1.60	0.8	1.8	27.5	13.3	1000	300
29	2.5	Flexible	2.10	0.8	1.9	31.0	7.98	1400	300
29	4	Flexible	2.60	1.0	2.1	37.0	4.95	2100	300
30	1.5	Flexible	1.60	0.8	1.8	27.5	13.3	1000	300
30	2.5	Flexible	2.10	0.8	1.9	31.0	7.98	1400	300
30	4	Flexible	2.60	1.0	2.1	37.0	4.95	2100	300