

SPECIFICATION**For****NYY**

450/750V 70 °C Copper Conductor PVC Insulated PVC Inner Sheathed

PVC Outer Sheathed Power Cable

(450/750V, Cu /PVC/PVC/PVC)

BY



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CUSTOMER

Rev.	Date	Description
0	10/11/2020	Issued specification
1	30/6/2021	Add size 2C, 3C, 4C x 6, 10 mm ²

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 450/750V copper conductor polyvinyl chloride (PVC) insulated polyvinyl chloride (PVC) inner sheathed polyvinyl chloride (PVC) outer sheathed power cable. Maximum conductor temperature shall be 70°C.

The cable shall be in accordance with TIS 11 Part 101-2559, Table 3 and Table 4.

Flame retardant test TIS 11 Part 2-2553 (Same IEC 60332-1 : 2015).

2. Conductor

The conductor shall be solid and non-compacted concentric stranded uncoated annealed copper conductor in accordance with TIS 2427-2552, Class 1 and Class 2.

(Same IEC 60228 : 2004, Class 1 and Class 2).

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

3. Insulation

The insulation shall be polyvinyl chloride (PVC/C) compound meet the requirements of TIS 11 Part 101-2559.

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-core only)

The individual insulated cores shall be cabled together with suitable length of lay or PVC rod to give the completed cable a circular cross section.

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

5. Core Identification

The cores shall be identified by colors, as follows :

Single-core : black

2-cores : blue, brown

3-cores : brown, black, grey

4-cores : blue, brown, black, grey

6. Inner Sheath (For multi-core only)

The inner sheath shall be polyvinyl chloride (PVC) compound applied over the cable core.

The approximate thickness given in Table 1.

The color of the inner sheath shall be black.

7. Outer Sheath

The outer sheath shall be polyvinyl chloride (PVC/ST4) compound meet the requirements of TIS 11 Part 101-2559.


The average thickness of the outer 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 15% plus 0.1 mm.

The color of the outer sheath shall be black.

8. Marking on Cable

The marking items shall be marked with suitable mean throughout the length of cable.

1. Manufacturer's name and/or trade mark "  YAZAKI..... : TYE"
2. Designation "NYY"
3. Rated voltage "450/750V "
4. Insulation and sheath material "PVC/PVC"
5. Max. operating rated temperature at conductor "70°C"
6. Number of cores and size of conductor
7. TIS logo and standard number
8. The continuous reel length marking (in figure) shall be made on the outer sheath at every 1 meter (Except single core cable the length mark on size $\geq 300 \text{ mm}^2$)

9. Test and Properties


The cable shall be meet the requirement in test and inspection and Table 1, when tested in accordance with TIS 11 Part 101-2559 and TIS 2427-2552 and TIS 11 Part 2-2553 (Same IEC 60332-1 : 2015).

10. Packing

The cable shall be placed on non-returnable wooden reels or shall be coiled and wrapped with plastic which shall be overlapped and secured.

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. Rated voltage "450/750V "
2. Max. operating rated temperature at conductor "70°C"
3. Designation "NYY"
4. Number of cores and size of conductor
5. Cable length
6. Net and gross weight
7. Month and year of manufacture
8. Rolling direction of reel (only for reel package)
9. Manufacturer's name and/or trade mark "  YAZAKI "

Test and Inspection

Sample Tests

- Maximum conductor resistance, Ohm/km specified in Table 1
- AC test voltage for 5 minutes, kV2.5
- Construction.....specified in Table 1

Type Tests

This cable shall be tested as followed :

- Minimum insulation resistance at 70 °C, MOhm-km specified in Table 1
- Flame retardant tested according to TIS 11 Part 2-2553 (Same IEC 60332-1)

Definition

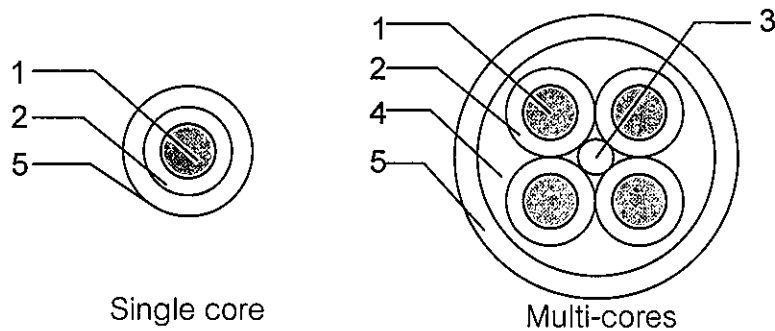
Routine tests: Tests made by the manufacturer on each manufactured length of cable to check that each length meets the specified requirements.

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	Solid and Non-compacted concentric stranded annealed copper
2	Insulation	Polyvinyl chloride (PVC/C)
3	Filler	PVC Rod
4	Inner Sheath	Polyvinyl chloride (PVC)
5	Outer Sheath	Polyvinyl chloride (PVC/ST4)

Application: For installation exposed, or in raceway, wet or dry location, or direct burial in ground, Maximum conductor temperature of 70°C for normal operation and 160°C for short circuit condition.

Table 1

No. of core	Size (mm ²)	Conductor			Insulation thickness nominal (mm)	Sheath thickness nominal (mm)	Overall diameter maximum (mm)	Conductor resistance at 20 °C maximum (Ohm/km)	Insulation resistance at 70 °C minimum (MOhm-km)	Weight of cable approx. (kg/km)	Standard packing length (m)
		No. of wires (wires)	Type	Diameter approx. (mm)							
1	1	1	Solid	1.13	1.5	1.8	8.6	18.1	0.0207	85	100/Coil
1	1 (st)	7	Non-compacted	1.29	1.5	1.8	8.8	18.1	0.0200	90	100/Coil
1	1.5	1	Solid	1.38	1.5	1.8	9.0	12.1	0.0184	95	100/Coil
1	1.5 (st)	7	Non-compacted	1.59	1.5	1.8	9.2	12.1	0.0175	100	100/Coil
1	2.5	1	Solid	1.78	1.5	1.8	9.4	7.41	0.0157	110	100/Coil
1	2.5 (st)	7	Non-compacted	2.01	1.5	1.8	9.8	7.41	0.0146	110	100/Coil
1	4	1	Solid	2.25	1.5	1.8	10.0	4.61	0.0135	130	100/Coil
1	4 (st)	7	Non-compacted	2.55	1.5	1.8	10.5	4.61	0.0124	140	100/Coil
1	300	61	Non-compacted	22.68	2.5	2.2	35.0	0.0601	0.0032	3400	500
1	400	61	Non-compacted	25.65	2.7	2.2	38.5	0.0470	0.0030	4300	500
1	500	61	Non-compacted	28.80	3.1	2.4	43.0	0.0366	0.0031	5500	500

Table 1 (continued)

No. of cores	Size (mm ²)	Conductor		Insulation thickness nominal (mm)	Inner sheath thickness approx. (mm)	Outer sheath thickness nominal (mm)	Overall diameter maximum (mm)	Conductor resistance at 20 °C maximum (Ohm/km)	Insulation resistance at 70 °C minimum (MΩm-km)	Weight of cable approx. (kg/km)	Standard packing length (m)
		No. of wires	Type								
2	1	1	Solid	0.8	0.8	1.8	12.0	18.1	0.0141	170	100/Coil
2	1 (st)	7	Non-compacted	0.8	0.8	1.8	12.5	18.1	0.0135	170	100/Coil
2	1.5	1	Solid	0.8	0.8	1.8	12.5	12.1	0.0123	180	100/Coil
2	1.5 (st)	7	Non-compacted	0.8	0.8	1.8	13.0	12.1	0.0116	200	100/Coil
2	2.5	1	Solid	0.8	0.8	1.8	13.5	7.41	0.0102	220	100/Coil
2	2.5 (st)	7	Non-compacted	0.8	0.8	1.8	14.0	7.41	0.0093	240	100/Coil
2	4	1	Solid	0.9	0.8	1.8	15.0	4.61	0.0094	290	100/Coil
2	4 (st)	7	Non-compacted	0.9	0.8	1.8	15.5	4.61	0.0085	310	100/Coil
2	6	7	Non-compacted	0.9	0.8	1.8	17.0	3.08	0.0073	380	100/Coil
2	10	7	Non-compacted	1.1	0.8	1.8	19.5	1.83	0.0069	550	500
2	95	19	Non-compacted	1.7	1.5	2.2	42.5	0.193	0.0038	3300	500
2	120	37	Non-compacted	1.7	1.5	2.4	46.5	0.153	0.0034	4000	500
2	150	37	Non-compacted	1.9	1.8	2.6	52.0	0.124	0.0034	4900	500
2	185	37	Non-compacted	2.1	1.8	2.8	57.0	0.0991	0.0034	6000	500
2	240	61	Non-compacted	2.3	2.0	3.0	64.0	0.0754	0.0033	8000	300
2	300	61	Non-compacted	2.5	2.0	3.2	70.5	0.0601	0.0032	9500	300

Table 1 (continued)

No. of cores	Size (mm ²)	Conductor		Insulation thickness nominal (mm)	Inner sheath thickness approx. (mm)	Outer sheath thickness nominal (mm)	Overall diameter maximum (mm)	Conductor resistance at 20 °C maximum (Ohm/km)	Insulation resistance at 70 °C minimum (MΩm-km)	Weight of cable approx. (kg/km)	Standard packing length (m)
		No. of wires	Type								
3	1	1	Solid	0.8	0.8	1.8	12.5	18.1	0.0141	180	100/Coil
3	1 (st)	7	Non-compacted	0.8	0.8	1.8	13.0	18.1	0.0135	190	100/Coil
3	1.5	1	Solid	0.8	0.8	1.8	13.0	12.1	0.0123	210	100/Coil
3	1.5 (st)	7	Non-compacted	0.8	0.8	1.8	13.5	12.1	0.0116	220	100/Coil
3	2.5	1	Solid	0.8	0.8	1.8	14.0	7.41	0.0102	260	100/Coil
3	2.5 (st)	7	Non-compacted	0.8	0.8	1.8	15.0	7.41	0.0093	270	100/Coil
3	4	1	Solid	0.9	0.8	1.8	15.5	4.61	0.0094	340	100/Coil
3	4 (st)	7	Non-compacted	0.9	0.8	1.8	16.5	4.61	0.0085	360	100/Coil
3	6	7	Non-compacted	0.9	0.8	1.8	18.0	3.08	0.0073	450	100/Coil
3	10	7	Non-compacted	1.1	0.8	1.8	20.5	1.83	0.0069	650	500
3	95	19	Non-compacted	1.7	1.5	2.4	46.0	0.193	0.0038	4200	500
3	120	37	Non-compacted	1.7	1.8	2.6	50.5	0.153	0.0034	5000	500
3	150	37	Non-compacted	1.9	1.8	2.8	56.0	0.124	0.0034	6500	500
3	185	37	Non-compacted	2.1	2.0	3.0	61.5	0.0991	0.0034	8000	300
3	240	61	Non-compacted	2.3	2.0	3.2	69.0	0.0754	0.0033	10000	300
3	300	61	Non-compacted	2.5	2.2	3.4	76.0	0.0601	0.0032	12500	200

Table 1 (continued)

No. of cores	Size (mm ²)	Conductor			Insulation thickness nominal (mm)	Inner sheath thickness approx. (mm)	Outer sheath thickness nominal (mm)	Overall diameter maximum (mm)	Conductor resistance at 20 °C maximum (Ohm/km)	Insulation resistance at 70 °C minimum (MOhm-km)	Weight of cable approx. (kg/km)	Standard packing length (m)
		No. of wires	Type	Diameter approx. (mm)								
4	1	1	Solid	1.13	0.8	0.8	1.8	13.5	18.1	0.0141	210	100/Coil
4	1 (st)	7	Non-compacted	1.29	0.8	0.8	1.8	14.0	18.1	0.0135	220	100/Coil
4	1.5	1	Solid	1.38	0.8	0.8	1.8	14.0	12.1	0.0123	240	100/Coil
4	1.5 (st)	7	Non-compacted	1.59	0.8	0.8	1.8	14.5	12.1	0.0116	260	100/Coil
4	2.5	1	Solid	1.78	0.8	0.8	1.8	15.0	7.41	0.0102	300	100/Coil
4	2.5 (st)	7	Non-compacted	2.01	0.8	0.8	1.8	16.0	7.41	0.0093	320	100/Coil
4	4	1	Solid	2.25	0.9	0.8	1.8	17.0	4.61	0.0094	400	100/Coil
4	4 (st)	7	Non-compacted	2.55	0.9	0.8	1.8	17.5	4.61	0.0085	430	100/Coil
4	6	7	Non-compacted	3.12	0.9	0.8	1.8	19.0	3.08	0.0073	550	500
4	10	7	Non-compacted	4.10	1.1	0.8	2.0	23.0	1.83	0.0069	850	500
4	95	19	Non-compacted	12.60	1.7	1.8	2.6	51.5	0.193	0.0038	5500	500
4	120	37	Non-compacted	14.21	1.7	1.8	2.8	56.0	0.153	0.0034	6500	500
4	150	37	Non-compacted	15.75	1.9	2.0	3.0	62.0	0.124	0.0034	8000	300
4	185	37	Non-compacted	17.64	2.1	2.0	3.2	68.0	0.0991	0.0034	10000	300
4	240	61	Non-compacted	20.25	2.3	2.2	3.4	76.5	0.0754	0.0033	13000	200
4	300	61	Non-compacted	22.68	2.5	2.2	3.8	85.0	0.0601	0.0032	16000	200