

# SPECIFICATION

## For

## NYCY

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

Concentric Conductor PVC Outer Sheathed Power Cable

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

BY 

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CUSTOMER

Rev.	Date	Description
0	2/7/2020	Issued specification
1	24/2/2021	Add size 3 x 70/16 mm <sup>2</sup> and delete cable code "0010"
2	24/3/2021	Add size 4 x 2.5/2.5 mm <sup>2</sup>
3	8/7/2021	Add size 4 x 4/4 mm <sup>2</sup>
4	6/9/2021	Add size 3 x 4/4, 10/10 mm <sup>2</sup>
5	16/8/2022	Add size 3 x 16/16 mm <sup>2</sup>
6	9/8/2023	Add size 3 x 150/150 mm <sup>2</sup>
7	5/2/2025	Update Table 1

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 concentric conductor polyvinyl chloride (PVC) outer sheathed power cable.

Maximum conductor temperature shall be 70°C.

The cable shall be based on TIS 11 Part 101-2559, Table 3 and Table 4.

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

## 2. Conductor

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

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

## 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-cores 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

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

The average thickness given in Table 1.

The color of the inner sheath shall be black.

## 7. Concentric Conductor

The concentric conductor shall consist of plain annealed round copper wires applied helically over the inner sheathed.

The contact tape shall be an uncoated annealed copper tape and shall be applied helically with a gap over the concentric conductor.

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

A suitable separator tape shall be applied helically over the contact tape.

## 8. 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.

## 9. 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. Designation "NYCY "
4. Rated voltage "450/750V "
5. Type of conductor "CU"
6. Insulation and sheath material "PVC/PVC"
7. Max. operating rated temperature at conductor "70°C"
8. Number of cores and size of conductor
9. The continuous reel length marking (in figure) shall be made on the outer sheath at every 1 meter

## 10. 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, TIS 2427-2552 and IEC 60332-1 : 2015 and TIS 11 Part 2-2553 (Comply with IEC 60332-1 : 2015).

## 11. 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. Rated voltage "450/750V "
2. Max. operating rated temperature at conductor "70°C"
3. Designation "NYCY"
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
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, kV .....2.5
- Construction.....specified in Table 1

### Type Tests

- Flame retardant tested according to TIS 11 Part 2-2553 (Comply with IEC 60332-1 : 2015)

### Definition concerning the tests

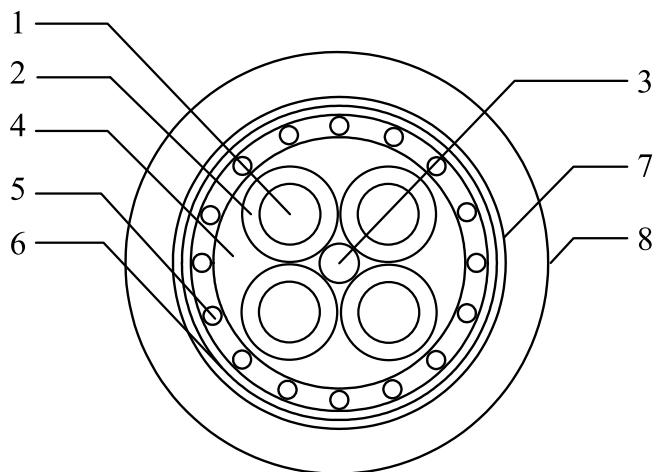
**Routine tests:** Tests made by the manufacturer on each manufactured length of cable to check that each length meets the specified requirements.

**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	Solided and Stranded annealed copper
2	Insulation	Polyvinyl chloride (PVC/C) compound
3	Filler	PVC Rod (For 4-cores size $\geq 6/6 \text{ mm}^2$ only)
4	Inner sheath	Polyvinyl chloride (PVC) compound
5	Concentric conductor	Plain annealed round copper wires
6	Contact tape	Copper contact tape
7	Separator tape	Spun bond tape or suitable tape
8	Outer Sheath	Polyvinyl chloride (PVC/ST4) compound

**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 and size (core x mm <sup>2</sup> )	Conductor (wires/type)	Conductor diameter approx. (mm)	Insulation thickness nominal (mm)	Inner sheath thickness nominal (mm)	Dia. of inner sheath approx. (mm)	Concentric conductor area (mm <sup>2</sup> )	Outer 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 x 1.5/1.5	Solid	1.38	1.5	1.2	8.0	1.5	1.8	13.5	12.1	218	500
1 x 2.5/2.5	Solid	1.78	1.5	1.2	8.0	2.5	1.8	14.0	7.41	236	500
1 x 4/4	Solid	2.25	1.5	1.2	8.5	4	1.8	14.5	4.61	266	500
1 x 6/6	7/Non-compacted	3.12	1.5	1.2	9.5	6	1.8	16.0	3.08	333	500
1 x 10/10	7/Non-compacted	4.10	1.5	1.2	10.5	10	1.8	17.0	1.83	429	500
1 x 16/16	7/Non-compacted	5.10	1.5	1.2	11.5	16	1.8	18.5	1.15	570	500
1 x 25/16	7/Non-compacted	6.26	1.5	1.2	12.5	16	1.8	19.5	0.727	673	500
1 x 35/16	19/Non-compacted	7.65	1.5	1.2	14.0	16	1.8	21.0	0.524	803	500
1 x 50/25	19/Non-compacted	8.73	1.5	1.2	15.0	25	1.8	22.0	0.387	1011	500
1 x 70/35	19/Non-compacted	10.70	1.5	1.2	17.0	35	1.8	25.0	0.268	1373	500
1 x 95/50	19/Non-compacted	12.60	1.7	1.2	19.5	50	1.8	28.0	0.193	1850	500
1 x 120/70	37/Non-compacted	14.21	1.7	1.2	21.0	70	1.8	30.5	0.153	2317	500
1 x 150/95	37/Non-compacted	15.75	1.9	1.2	23.0	95	2.0	33.0	0.124	2889	500
1 x 185/95	37/Non-compacted	17.64	2.1	1.2	25.5	95	2.0	35.0	0.0991	3308	500
1 x 240/120	61/Non-compacted	20.25	2.3	1.2	28.5	120	2.2	37.5	0.0754	4200	300
1 x 300/150	61/Non-compacted	22.68	2.5	1.2	31.0	150	2.2	41.0	0.0601	5174	300

**Table 1 (continued)**

No. of core and size  (core x mm <sup>2</sup> )	Conductor  (wires/type)	Conductor diameter approx.  (mm)	Insulation thickness nominal  (mm)	Inner sheath thickness nominal (mm)	Dia. of inner sheath approx. (mm)	Concentric conductor area  (mm <sup>2</sup> )	Outer 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 x 1.5/1.5	Solid	1.38	0.8	0.8	9.0	1.5	1.8	14.5	12.1	252	500
2 x 2.5/2.5	Solid	1.78	0.8	0.8	9.5	2.5	1.8	15.5	7.41	290	500
2 x 4/4	Solid	2.25	0.9	0.8	11.0	4	1.8	17.0	4.61	362	500
2 x 6/6	7/Non-compacted	3.12	0.9	0.8	13.0	6	1.8	19.0	3.08	481	500
2 x 10/10	7/Non-compacted	4.10	1.1	0.8	15.5	10	1.8	22.0	1.83	687	500
2 x 16/16	7/Non-compacted	5.10	1.1	0.8	17.5	16	2.0	25.0	1.15	953	500
2 x 25/16	7/Non-compacted	6.26	1.3	1.2	21.5	16	2.0	29.0	0.727	1289	500
2 x 35/16	19/Non-compacted	7.65	1.3	1.2	24.5	16	2.0	32.0	0.524	1613	500
2 x 50/25	19/Non-compacted	8.73	1.5	1.2	28.0	25	2.2	35.5	0.387	2109	500
2 x 70/35	19/Non-compacted	10.70	1.5	1.5	32.5	35	2.2	40.5	0.268	2899	500
2 x 95/50	19/Non-compacted	12.60	1.7	1.5	37.0	50	2.2	45.0	0.193	3847	500
2 x 120/70	37/Non-compacted	14.21	1.7	1.5	40.5	70	2.4	49.0	0.153	4782	500
2 x 150/95	37/Non-compacted	15.75	1.9	1.8	45.0	95	2.6	55.0	0.124	5969	500
2 x 185/95	37/Non-compacted	17.64	2.1	1.8	50.0	95	2.8	60.0	0.0991	7129	500
2 x 240/120	61/Non-compacted	20.25	2.3	2.0	56.5	120	3.0	67.5	0.0754	9143	300
2 x 300/150	61/Non-compacted	22.68	2.5	2.0	62.0	150	3.2	74.0	0.0601	11266	300



**Table 1 (continued)**

No. of core and size  (core x mm <sup>2</sup> )	Conductor  (wires/type)	Conductor diameter approx.  (mm)	Insulation thickness nominal  (mm)	Inner sheath thickness nominal (mm)	Dia. of inner sheath approx. (mm)	Concentric conductor area  (mm <sup>2</sup> )	Outer 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 x 1.5/1.5	Solid	1.38	0.8	0.8	9.5	1.5	1.8	15.0	12.1	275	500
3 x 2.5/2.5	Solid	1.78	0.8	0.8	10.0	2.5	1.8	16.0	7.41	323	500
3 x 4/4	Solid	2.25	0.9	0.8	11.5	4	1.8	17.5	4.61	411	500
3 x 6/6	7/Non-compacted	3.12	0.9	0.8	13.5	6	1.8	20.0	3.08	551	500
3 x 10/10	7/Non-compacted	4.10	1.1	0.8	16.5	10	1.8	23.0	1.83	797	500
3 x 16/16	7/Non-compacted	5.10	1.1	1.2	19.5	16	2.0	26.5	1.15	1163	500
3 x 25/16	7/Non-compacted	6.26	1.3	1.2	23.0	16	2.0	30.0	0.727	1538	500
3 x 35/16	19/Non-compacted	7.65	1.3	1.2	26.0	16	2.0	33.0	0.524	1962	500
3 x 50/25	19/Non-compacted	8.73	1.5	1.5	30.0	25	2.2	38.0	0.387	2613	500
3 x 70/35	19/Non-compacted	10.70	1.5	1.5	34.5	35	2.2	42.5	0.268	3556	500
3 x 95/50	19/Non-compacted	12.60	1.7	1.5	39.5	50	2.4	47.5	0.193	4788	500
3 x 120/70	37/Non-compacted	14.21	1.7	1.8	43.5	70	2.6	52.5	0.153	6015	500
3 x 150/95	37/Non-compacted	15.75	1.9	1.8	47.5	95	2.8	58.0	0.124	7398	500
3 x 185/95	37/Non-compacted	17.64	2.1	2.0	53.5	95	3.0	64.0	0.0991	8974	500
3 x 240/120	61/Non-compacted	20.25	2.3	2.0	60.0	120	3.2	71.0	0.0754	11448	300
3 x 300/150	61/Non-compacted	22.68	2.5	2.2	66.0	150	3.4	79.0	0.0601	14200	300

**Table 1 (continued)**

No. of core and size (core x mm <sup>2</sup> )	Conductor (wires/type)	Conductor diameter approx. (mm)	Insulation thickness nominal (mm)	Inner sheath thickness nominal (mm)	Dia. of inner sheath approx. (mm)	Concentric conductor area (mm <sup>2</sup> )	Outer 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 x 1.5/1.5	Solid	1.38	0.8	0.8	10.0	1.5	1.8	16.0	12.1	307	500
4 x 2.5/2.5	Solid	1.78	0.8	0.8	11.0	2.5	1.8	17.0	7.41	368	500
4 x 4/4	Solid	2.25	0.9	0.8	13.0	4	1.8	18.5	4.61	476	500
4 x 6/6	7/Non-compacted	3.12	0.9	0.8	15.0	6	1.8	21.0	3.08	652	500
4 x 10/10	7/Non-compacted	4.10	1.1	0.8	18.0	10	2.0	25.0	1.83	975	500
4 x 16/16	7/Non-compacted	5.10	1.1	1.2	21.5	16	2.0	28.5	1.15	1386	500
4 x 25/16	7/Non-compacted	6.26	1.3	1.2	25.0	16	2.0	32.5	0.727	1867	500
4 x 35/16	19/Non-compacted	7.65	1.3	1.5	29.5	16	2.2	37.0	0.524	2521	500
4 x 50/25	19/Non-compacted	8.73	1.5	1.5	33.5	25	2.2	41.0	0.387	3195	500
4 x 70/35	19/Non-compacted	10.70	1.5	1.5	38.0	35	2.4	46.5	0.268	4429	500
4 x 95/50	19/Non-compacted	12.60	1.7	1.8	44.0	50	2.6	53.0	0.193	6017	500
4 x 120/70	37/Non-compacted	14.21	1.7	1.8	48.5	70	2.8	57.5	0.153	7481	500
4 x 150/95	37/Non-compacted	15.75	1.9	2.0	53.5	95	3.0	64.5	0.124	9230	300
4 x 185/95	37/Non-compacted	17.64	2.1	2.0	59.0	95	3.2	70.5	0.0991	11191	300
4 x 240/120	61/Non-compacted	20.25	2.3	2.2	67.0	120	3.4	78.5	0.0754	14345	300
4 x 300/150	61/Non-compacted	22.68	2.5	2.2	73.5	150	3.8	87.0	0.0601	17827	200