

**SPECIFICATION****For****60227 IEC 10**

300/500V 70 °C Copper Conductor PVC Insulated PVC Inner Sheathed

PVC Outer Sheathed with Grounded Power Cable Power Cable

(300/500V, Cu/PVC/PVC/PVC)

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Rev.	Date	Description
0	25/5/2022	Issued specification
1	29/1/2024	Update Table 1

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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 300/500V copper conductor polyvinyl chloride (PVC) insulated polyvinyl chloride (PVC) inner sheathed polyvinyl chloride (PVC) outer sheathed with grounded power cable.

Maximum conductor temperature shall be 70°C.

The wire shall be in accordance with TIS 11 Part 4-2553, Table 1  
(Same IEC 60227-4 : 1997, Table 1 ).

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 4-2553. (Same IEC 60227-4 : 1997).

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 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 :

2-cores + G : blue, brown + green/yellow

3-cores + G : brown, black, grey + green/yellow

4-cores + G : blue, brown, black, grey + green/yellow

## **6. Inner Sheath**

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 4-2553. (Same IEC 60227-4 : 1997).


The average thickness shall be not less than the value 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 "60227 IEC 10"
3. Rated voltage "300/500V"
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 shall be made on the outer sheath at every 1 meter

## **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 4-2553 (Same IEC 60227-4 : 1997), TIS 2427-2552 (Same IEC 60228 : 2004) and TIS 11 Part 2-2553 (Same IEC 60332-1 : 2015).

## 10. Packing

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

The reels shall be lagged to provide the cable with physical protection during transportation and during ordinary storage and handling operation.

Each package shall be clearly marked as follows.

1. Rated voltage "300/500V "
2. Max. operating rated temperature at conductor "70°C"
3. Designation "60227 IEC 10"
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** "
10. TIS logo and standard number

### **Test and Inspection**

#### **Sample Tests**

- Maximum conductor resistance, Ohm/km ..... specified in Table 1
- AC test voltage for 5 minutes, kV .....2.0
- 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 concerning the tests**

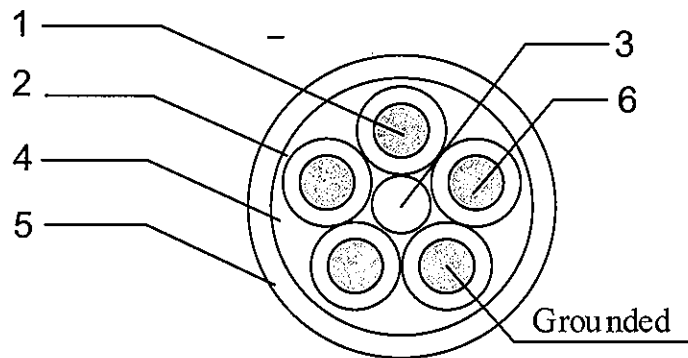
**Routine tests:** Tests made by the manufacturer on each manufactured length of cable to check that each length meets the specified requirements.

**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	Solid and 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, Maximum conductor temperature of 70°C for normal operation and 160°C for short circuit conditions.

**Table 1**

No. of core and size (core x mm <sup>2</sup> )	Conductor			Insulation thickness nominal (mm)	Inner sheath thickness approx. (mm)	Outer sheath thickness nominal (mm)	Overall diameter average (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)				Minimum	Maximum				
2+G x 1.5/1.5	1	Solid	1.38	0.7	0.4	1.2	8.0	10.5	12.1	0.011	150	100/coil
2+G x 1.5/1.5 (st)	7	Non-compacted	1.59	0.7	0.4	1.2	8.2	11.0	12.1	0.010	160	100/coil
2+G x 2.5/2.5	1	Solid	1.78	0.8	0.4	1.2	9.2	12.0	7.41	0.010	200	100/coil
2+G x 2.5/2.5 (st)	7	Non-compacted	2.01	0.8	0.4	1.2	9.4	12.5	7.41	0.009	220	100/coil
2+G x 4/4	1	Solid	2.25	0.8	0.4	1.2	10.0	13.0	4.61	0.0085	260	100/coil
2+G x 4/4 (st)	7	Non-compacted	2.55	0.8	0.4	1.2	10.5	13.5	4.61	0.0077	280	100/coil
2+G x 6/6	7	Non-compacted	3.12	0.8	0.4	1.4	12.0	15.5	3.08	0.0065	380	100/coil
2+G x 10/10	7	Non-compacted	4.10	1.0	0.6	1.4	14.5	19.0	1.83	0.0065	590	500
2+G x 16/16	7	Non-compacted	5.10	1.0	0.8	1.4	16.5	21.5	1.15	0.0052	830	500

**Table 1 (continued)**

No. of core and size  (core x mm <sup>2</sup> )	Conductor			Insulation thickness nominal (mm)	Inner sheath thickness approx. (mm)	Outer sheath thickness nominal (mm)	Overall diameter average (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)				Minimum	Maximum				
3+G x 1.5/1.5	1	Solid	1.38	0.7	0.4	1.2	8.6	11.5	12.1	0.011	170	100/coil
3+G x 1.5/1.5 (st)	7	Non-compacted	1.59	0.7	0.4	1.2	9.0	12.0	12.1	0.010	190	100/coil
3+G x 2.5/2.5	1	Solid	1.78	0.8	0.4	1.2	10.0	13.0	7.41	0.010	240	100/coil
3+G x 2.5/2.5 (st)	7	Non-compacted	2.01	0.8	0.4	1.2	10.0	13.5	7.41	0.009	260	100/coil
3+G x 4/4	1	Solid	2.25	0.8	0.4	1.4	11.5	14.5	4.61	0.0085	330	100/coil
3+G x 4/4 (st)	7	Non-compacted	2.55	0.8	0.4	1.4	12.0	15.0	4.61	0.0077	350	100/coil
3+G x 6/6	7	Non-compacted	3.12	0.8	0.6	1.4	13.0	17.0	3.08	0.0065	480	500
3+G x 10/10	7	Non-compacted	4.10	1.0	0.6	1.4	16.0	20.5	1.83	0.0065	730	500
3+G x 16/16	7	Non-compacted	5.10	1.0	0.8	1.4	18.0	23.5	1.15	0.0052	1040	500



**Table 1 (continued)**

No. of core and size (core x mm <sup>2</sup> )	Conductor		Insulation thickness nominal (mm)	Inner sheath thickness approx. (mm)	Outer sheath thickness nominal (mm)	Overall diameter average (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)			Minimum	Maximum				
4+G x 1.5/1.5	1	Solid	1.38	0.4	1.2	9.4	12.0	12.1	0.011	210	100/coil
4+G x 1.5/1.5 (st)	7	Non-compacted	1.59	0.4	1.2	9.8	12.5	12.1	0.010	230	100/coil
4+G x 2.5/2.5	1	Solid	1.78	0.4	1.2	11.0	14.0	7.41	0.010	290	100/coil
4+G x 2.5/2.5 (st)	7	Non-compacted	2.01	0.4	1.2	11.0	14.5	7.41	0.009	310	100/coil
4+G x 4/4	1	Solid	2.25	0.6	1.4	12.5	16.0	4.61	0.0085	410	100/coil
4+G x 4/4 (st)	7	Non-compacted	2.55	0.6	1.4	13.0	17.0	4.61	0.0077	440	100/coil
4+G x 6/6	7	Non-compacted	3.12	0.6	1.4	14.5	18.5	3.08	0.0065	580	500
4+G x 10/10	7	Non-compacted	4.10	0.6	1.4	17.5	22.0	1.83	0.0065	880	500
4+G x 16/16	7	Non-compacted	5.10	0.8	1.6	20.5	26.0	1.15	0.0052	1300	500

**Table 1 (continued)**

**FOR GROUNDED CONDUCTOR**

Size (mm <sup>2</sup> )	Conductor		Insulation thickness nominal (mm)	Conductor resistance at 20 °C maximum (Ohm/km)
	No. of wires (wires)	Type Diameter approx. (mm)		
1.5	1	Solid	0.7	12.1
1.5 (st)	7	Non-compacted	0.7	12.1
2.5	1	Solid	0.8	7.41
2.5 (st)	7	Non-compacted	0.8	7.41
4	1	Solid	0.8	4.61
4 (st)	7	Non-compacted	0.8	4.61
6	7	Non-compacted	0.8	3.08
10	7	Non-compacted	1.0	1.83
16	7	Non-compacted	1.0	1.15