



FORM NO : NTH/CHN/F5



NABL
T-0183, 0184
T-0185, 0189

भारत सरकार Government of India
राष्ट्रीय परीक्षण शाला (द.क्षे.)
NATIONAL TEST HOUSE (SR)
तरमणी, चेन्नई - 600 113 Taramani, Chennai - 600 113.
Phone : 22432374, 22431157 Fax : 22433158 email : nthsr@tn.nic.in

TEST CERTIFICATE**344775**

Test Certificate No.	Date of Issue	Code No.	Page	No. of Pages
NTH(SR)/EL(C)/2011/445B	09.12.2011	1319697781112	01	06

Issued in two copies

Issued to & address	: M/s. Wiremann Industries Pvt. Ltd., #74, 3 rd floor, Sri Plaza, A.M. Lane, Chickpet, Bangalore – 560 053.
Customer's Ref. No.	: WIPL/NTH/Type Test/694/11-12, Date: 20.10.2011
Register No. & Date	: NTH(SR)/EL(C)/2011/445, Dated: 25.10.2011.
Description of Test Item	: Type A PVC insulated and Type ST1 PVC sheathed circular 3 core cable with bunched copper conductor, (Class 5)1100V Grade cable. Suitable for outdoor and low temperature application. Cable code YYOUSZ.
Identification of Test Item	: i) 3 Core X 0.75mm ² , PVC insulated and sheathed circular cable with bunched copper conductor ii) Plain annealed copper wire (Before stranding) of diameter 0.2mm
Date of Receipt of Sample	: 25.10.2011
Method used for test/Specification	: As per IS: 694 – 1990, (Reaffirmed 2005 up to amendment No.5)
Sampling Procedure	: Not applicable
Remarks	: The sample meets the requirements of the specification IS: 694 - 1990, reaffirmed 2005 (with amend. no.5) for Type tests, Additional Ageing and Optional Test.
Tested by	Checked & Approved by
 V. Sivaguru Scientific Assistant (Elect.)	 P. Somu Scientist.SC (Elect.)

Note: 1. This Test Certificate or report may not be published for commercial purpose except in full, unless permission for the publication of an approved abstract has been obtained from the Director, National Test House, Taramani, Chennai.
Note: 2. This certificate applies only to sample tested.



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1. Description of the sample :

- a. Nomenclature : PVC insulated and Sheathed circular cable with bunched Copper conductor. Suitable for outdoor and low temperature application. Cable code YYOUSZ.
- b. Size : 3 Core X 0.75 mm².
- c. Quantity : 1 Number of cut length coil of cable approximately 25 meter and Plain annealed copper wire (Before stranding) of diameter 0.2mm length 2m
- d. Packing : Packed in a carton box.
- e. Markings : Markings found printed on the cable at regular interval "WALNA 1100 V 3C x 0.75 SQMM"

As requested the sample has been subjected to the Type tests as per IS: 694 -1990, reaffirmed 2005(up to amendment no. 5) with the results noted below.

2. Material (Section 2 of the specification)	Specified	Observed
a. Conductor (Cl. 4)	Plain copper	Plain Copper
b. Insulation (Cl. 5)	Shall be Type 'A' PVC Compound	PVC Compound Type 'A'
c. Fillers (Cl.6)	Shall be fillers shall be vulcanized rubber, unvulcanized rubber, thermoplastic compound or textile materials.	Not applicable
d. Binder tape (Cl.7)	Binder tape shall consists of plastic or proofed textile material.	Not applicable
e. Sheathing (Cl.8)	Type 'ST1' PVC Compound	PVC Compound Type 'ST1'

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3. Construction (Section 2 of the specification)	Specified	Observed
a. Number of cores	Single, Twin, Three or multi cores	Three cores
b. Number of wires (Cl.9)	Diameter of the wires 0.21mm(Max) for class 5 conductor Table 3 of IS:8130 –1984	24 strands 0.2mm dia. each Conductor class 5
c. Area of the conductor (Cl. 9)	0.75 sq.mm. (Nominal)	0.75 sqmm (Calculated)
d. Insulation (Cl.10)	Insulation shall be applied by extrusion by PVC compound. It shall fit closely to the conductor and shall be possible to remove the insulation without damage to the conductor.	PVC Insulation applied over the conductor by extrusion and found fit closely to the conductor. It is possible to remove it without damage to the conductor.
e. Core identification (Cl. 11)	For three core cable: Red, Black & Green (or) Red, Yellow & Blue	Red, Black & Green
f. Laying up of cores (Cl. 12)	Circular multi core cable: Laid together with suitable right hand lay.	Laid together with suitable right hand lay.
g. Sheathing (Cl.13)	Shall be applied with black colour PVC compound by extrusion over the laid up cores. It shall fit closely and shall be possible to remove without damage to the cores.	Applied above the laid up cores using Black colour PVC compound by extrusion and found fit closely to the laid up cores. It is possible to remove it without damage to the cores.
h. Ovality (Cl.14)	Values of overall diameter of circular cables shall not exceed 15 percent of maximum measured value at the same cross section.	Satisfactory 3%

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4. Tests (Table 8, Cl.15.1 of the specification)

a. Test on Conductor	Specified values		Observed Values			
	Red	Black	Green			
i. Annealing Test (Before stranding) (as per Cl. 6.1.2.1 of IS: 8130 - 1984 & IS: 10810 (Part-1) - 1984) Elongation percent	9.0 (Min)		17			
ii. Conductor resistance test (as per Cl. 6.3 & Table 3 of IS: 8130 - 1984 & IS: 10810 (Part-5) - 1984) Calculated resistance corrected to 20 °C in Ohm/km	Class 5 conductor 26.0 (Max)		25.3	25.2	25.1	
b. Test for overall dimensions and thickness of insulation & sheath. (as per Cl. 14.1, 10, 13 and table 6 of IS: 694-1990 & IS:10810(Part-6)-1984)	Insulation	Sheath	Insulation			Outer Sheath
			Red	Black	Green	
i. Overall dimension in mm	8.2 (Max)		Not applicable			7.7
ii. Average thickness of insulation & sheath in mm	0.6 (Nominal)	0.9 (Nominal)	0.7	0.8	0.7	1.1
iii. Minimum thickness of insulation & sheath in mm	0.44(Min)	0.71(Min)	0.66	0.67	0.65	0.91
c. Physical Test on Insulation & Outer Sheath (as per Table 1 & table 2 of IS: 5831 - 1984)						
i. Tensile strength & elongation at break (as per IS: 10810 (Part - 7) - 1984)						
Tensile strength in N/mm ²	12.5 (Min)		14.7	14.9	15.1	15.3
Elongation at break in percent	150 (Min)		200	200	190	200
ii. Ageing test (Sample kept at 80±2°C for 7 days) (as per IS: 10810 (Part - 11) - 1984)						
Loss of mass in mg/cm ² (as per IS: 10810 (Part - 10) - 1984)	2 (Max)		<1	1	1	<1
Tensile strength in N/mm ²	12.5 (Min)		15.9	16.2	16.3	16.4
Elongation at break in percent	150 (Min)		190	190	180	190
Tensile strength variation in percent	±20 (Max)		(-)8	(-)9	(-)8	(-)7
Elongation variation in percent	±20 (Max)		(+)5	(+)5	(+)5	(+)5

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	Specified	Observed			
		Insulation			Outer Sheath
	Insulation & Outer Sheath	Red	Black	Green	
iii. Shrinkage in % (as per IS: 10810(Part - 12) - 1984) (150±2°C for 15minutes)	4 (Max)	1	2	2	1
iv. Hot deformation test (80±2°C for 4 hours) (as per IS: 10810 (Part - 15) - 1984)					
Depth of indentation in percent	50 (Max)	26	25	26	26
v. Heat shock test (150±2°C for 1 hour) (as per IS: 10810 (Part - 14) - 1984)	Shall not show scales or cracks	Satisfactory as no signs of Scales or cracks observed			
d. Insulation resistance test (as per Cl. 15.1 of IS: 694 - 1990 & IS: 10810 (part - 43) - 1984)		Cores			
		Red	Black	Green	
i. Volume resistivity in Ω Cm					
At Room temperature	1 X 10 ¹³ (Min)	9 x 10 ¹³	8 x 10 ¹³	8 x 10 ¹³	
At 70°C	1 X 10 ¹⁰ (Min)	7 x 10 ¹⁰	5 x 10 ¹⁰	6 x 10 ¹⁰	
ii. Insulation Resistance Constant in MΩ km					
At Room temperature	36.7 (Min)	342.8	290.9	301.3	
At 70°C	0.037 (Min)	0.249	0.197	0.208	
e. High voltage test (at room temperature) (as per Cl. 16.3 of IS: 694 - 1990 & IS: 10810 (part - 45) - 1984)					
An ac voltage of 3kV(rms) 50Hz was applied between each conductor of the cores and kept for 5 minutes.	Shall withstand without breakdown or flash over	The cable with stood the test satisfactorily, as no breakdown or flash over observed.			
f. High voltage test (Water immersion test) (as per Cl. 16.2 of IS:694-1990 & IS:10810(part-45)-1984)					
i. ac test (as per Cl. 16.2.1 of IS: 694 - 1990 & IS: 10810 (part - 45) - 1984)					
The cores were kept in water at 60±3°C for 24 hrs. after that an ac voltage of 3kV(rms) at 50Hz was applied and raised to 6kV(rms) 50 Hz within 10seconds and kept for 5minutes.	Each core shall withstand without breakdown or flash over	Each core with stood the test satisfactorily as no breakdown or flash over observed.			

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