



# ELECTRICAL RESEARCH AND DEVELOPMENT ASSOCIATION

(Accredited by the National Accreditation Board for Testing and Calibration Laboratories, Govt. of India)

P. B. 760, ERDA Road, Makarpura Industrial Estate, Vadodara-390 010, India. Gram : ELECSEARCH

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tdc@erda.org, ene@erda.org



## TEST REPORT

SHEET 1 of 7

<b>NAME &amp; ADDRESS OF CUSTOMER</b>  M/s Diamond Cables Limited Essen House, 5/12, BIDD, Gorwa, Baroda-390 016.	<b>REPORT NO.</b> : ICWRWO0052938-4
	<b>DATE</b> : 16-09-2007
	<b>CUSTOMER REF NO</b> : Nil
	<b>DATED</b> : 25-07-2007
	<b>DATE OF SAMPLE RECEIPT</b> : 27-07-2007
<b>DATES OF TESTING</b> : 29-07-07 to 12-09-07	

### SAMPLE DESCRIPTION

3.5 Core x 150 Sq.mm PVC insulated & Yellow coloured PVC outer sheathed unarmoured Cable  
Type of Insulation : A  
Type of outer sheath : ST1  
Class of shaped Aluminium conductor: 2,  
Inner sheath- Black colour.

### SAMPLE IDENTIFICATION

### TEST DETAILS

As per sheet 2 of 7

### TEST SPECIFICATION

IS: 1554 (Part 1)-1988

REMARK : The sample conforms to the requirements for all the mentioned tests.

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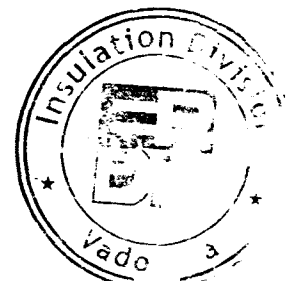
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APPROVED BY

- NOTE:
1. This report relates only to the particular sample received for testing in good condition at ERDA.
  2. This report cannot be reproduced in part under any circumstances.
  3. Publication of this report requires prior permission in writing from Director, ERDA.
  4. Only the tests asked for by the customer have been carried out.

No: 1687878





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SHEET 2 of 7

## TEST DETAILS:

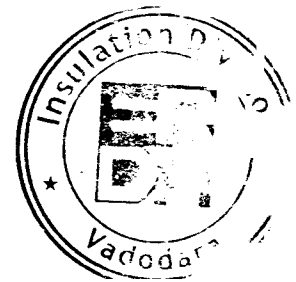
Test Specification: IS:1554 (Pt.1)-1988

Sr. No.	Cl.No.	Test Particulars
1.	15.1.a (1)	Annealing test
	15.1.a (2)	Tensile test
	15.1.a (3)	Wrapping test
	15.1.a (4)	Conductor Resistance test
2.	15.1.b	Tests for Armouring
3.	15.1.c	Test for thickness of Insulation and Sheath
4.	15.1.d	<b>Physical tests for Insulation and Sheath</b>
	(1)	Tensile Strength and Elongation at break
	(2)	Ageing in Air Oven
	(3)	Shrinkage test
	(4)	Hot Deformation test
	(5)	Loss of mass test
	(6)	Heat Shock test
	(7)	Thermal Stability test
5.	15.1.e	Insulation Resistance test
6.	15.1.f	High Voltage test (Water immersion)
7.	15.1.g	High Voltage at Room Temperature
8.	15.1.h	Flammability test

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SHEET 3 of 7

Sr. No.	Cl.No.	Tests	Requirement as per Specification	Obtained Value	Remarks
1.	15.1.a	Tests on conductor			
	1	Annealing test	Not applicable	-	-
	2.	Tensile test	Not applicable	-	-
	3.	Wrapping test	Not applicable	-	-
	4.	Conductor Resistance (Corrected at 20°C), ohm/km			
		- Main Conductor	Max. 0.206	Red 0.198 Yellow 0.193 Blue 0.198	Conforms
		-Neutral Conductor	Max. 0.443	Black 0.413	
2.	15.1.b	Tests for Armouring	Not applicable	-	-
3.	15.1.c	Test for thickness of Insulation and Sheath.			
		-Thickness, mm Insulation			
	A]	-Main Conductor	Nom./Min. 1.8/1.52	Red 2.0/1.74 Yellow 2.0/1.58 Blue 2.0/1.78	Conforms
		-Neutral Conductor	1.4/1.16	Black 1.9/1.69	
	B]	Inner sheath	Min. 0.5	0.6	Conforms
	C]	Outer sheath	Nom./Min. 2.4/1.72	3.8/3.60	Conforms

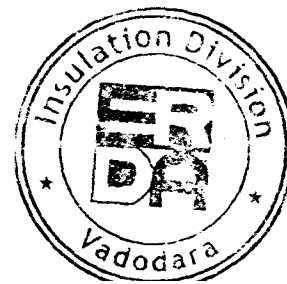
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SHEET 4 of 7

DATE : 16-09-2007

Sr. No.	Cl.No.	Tests	Requirement as per Specification	Obtained Value	Remarks
4.	15.1.d	<b>Physical tests for Insulation and Sheath Insulation</b>			
		1. Tensile Strength and Elongation before ageing			
		- Tensile Strength, N/mm <sup>2</sup>	Min. 12.5	Red 20.4 Yellow 19.6 Blue 19.0 Black 19.3	Conforms
		- Elongation at break, %	Min. 150	Red 305 Yellow 328 Blue 310 Black 313	Conforms
		2. After ageing in Air Oven (at 80 ± 2° C for 168 hrs.)			
		- Tensile Strength, N/mm <sup>2</sup>	Min. 12.5	Red 18.9 Yellow 18.0 Blue 18.9 Black 19.0	Conforms
		- Elongation at break, %	Min. 150	Red 290 Yellow 273 Blue 295 Black 278	Conforms
		- Variation, % Tensile Strength	Max. ± 20	Red -7 Yellow -8 Blue -1 Black -2	Conforms
		- Elongation at break	Max. ± 20	Red -5 Yellow -17 Blue -5 Black -11	Conforms

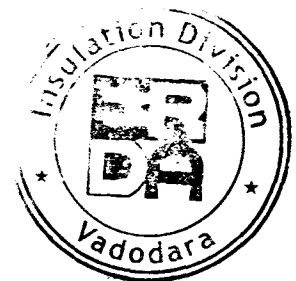
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*M. K. ...*

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DATE : 16-09-2007

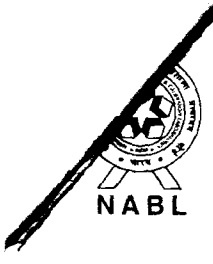
Sr. No.	Cl.No.	Tests	Requirement as per Specification	Obtained Value	Remarks
3.		Shrinkage test (at 150 ± 2° C for 15 min.)			
-		Shrinkage, %	Max. 4	Red <1 Yellow <1 Blue <1 Black <1	Conforms
4.		Hot deformation (at 80 ± 2° C for 6 hrs.)			
-		Depth of indentation, %	Max. 50	Red 31 Yellow 32 Blue 32 Black 32	Conforms
5.		Loss of mass test (at 80 ± 2° C for 168hrs.)			
-		Loss of mass, mg/cm <sup>2</sup>	Max. 2	Red <1 Yellow <1 Blue <1 Black <1	Conforms
6.		Heat shock test (at 150 ± 2° C for 1 hr)			
			No sign of crack or scale shall be observed.	No sign of crack or scale was observed.	All cores Conforms
7.		Thermal Stability test at 200° C, minute	Min. 80	Red 160 Yellow 176 Blue 171 Black 177	Conforms
<b>Outer sheath</b>					
1.		Tensile Strength and Elongation before ageing			
-		Tensile Strength, N/mm <sup>2</sup>	Min. 12.5	14.7	Conforms
-		Elongation at break, %	Min. 150	283	Conforms
2.		After ageing in Air Oven (at 80 ± 2° C for 168 hrs.)			
-		Tensile Strength, N/mm <sup>2</sup>	Min. 12.5	14.4	Conforms
-		Elongation at break, %	Min. 150	288	Conforms
-		Variation, %			
-		Tensile Strength	Max. ± 20	-2	Conforms
-		Elongation at break	Max. ± 20	+2	Conforms

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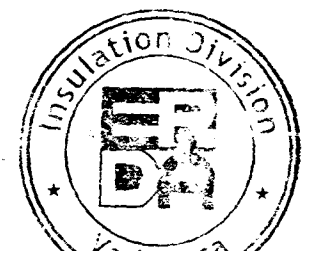


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DATE : 16-09-2007					
Sr. No.	Cl.No.	Tests	Requirement as per Specification	Obtained Value	Remarks
5.	3.	Shrinkage test (at 150 ± 2°C for 15 min.)	Max. 4	1	Conforms
	-	Shrinkage, %			
	4.	Hot deformation (at 80 ± 2°C for 6 hrs.)	Max. 50	38	Conforms
	-	Depth of indentation, %			
	5.	Loss of mass test (at 80 ± 2°C for 168hrs.)	Max. 2	1	Conforms
	-	Loss of mass, mg/cm <sup>2</sup>			
	6.	Heat shock test (at 150 ± 2°C for 1 hr)	No sign of crack or scale shall be observed.	No sign of crack or scale was observed.	Conforms
	-	Visual examination			
	7.	Thermal Stability test at 200°C, minute	Min. 40	98	Conforms
	15.1.e	Insulation resistance	Min. 1 x 10 <sup>13</sup>	Red 1 x 10 <sup>14</sup> Yellow 2 x 10 <sup>14</sup> Blue 2 x 10 <sup>14</sup> Black 2 x 10 <sup>14</sup>	Conforms
A]	Volume resistivity, Ohm-cm				
-	at 27 ± 2 °C				
-	at 70 ± 2 °C				
B]	Insulation Resistance constant, M-ohm km	Min. 36.7	Red 469.7 Yellow 657.6 Blue 563.6 Black 552.7	Conforms	
-	at 27 ± 2 °C				
-	at 70 ± 2 °C				
-	at 70 ± 2 °C				
			Min. 0.037	Red 1.065 Yellow 1.002 Blue 1.002 Black 1.796	Conforms

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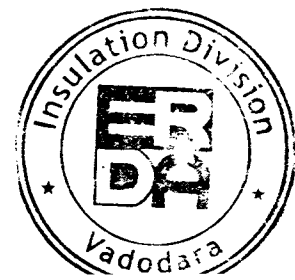
Sr. No.	Cl.No.	Tests	Requirement as per Specification	Obtained Value	Remarks
6.	15.1.f	High Voltage test (Water immersion) - AC test	Insulation shall withstand 3 kV (rms) followed by 6 kV (rms) for 5 min. after 24 hrs water immersion at $60 \pm 3^\circ\text{C}$ .	All cores withstood	Conforms
		- DC test	Insulation shall withstand 1.2 kV DC for 240 hrs. at $60 \pm 3^\circ\text{C}$ .	All cores withstood	Conforms
7.	15.1.g	High Voltage test -at room temperature	To withstand 3 kV rms for 5 minutes for each test connection	All cores withstood	Conforms
8.	15.1.h	Flammability test			
		- Period of burning after removal of flame, seconds	Max. 60	Nil	Conforms
		- Unaffected portion from the lower edge of the top clamp, mm	Min. 50	345	Conforms

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