
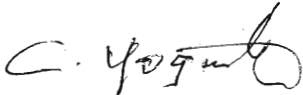


Test Report



Product Services

Report No	243/4443363	This Report consists of 10 pages
Client	National Cables Industry P.O.Box 27472 Sharjah U.A.E	
Authority & date	Clients order dated 14 November 2002	
Items tested	2 samples of Electric Cable	
Specification	CEI IEC 60502-1:1997 Including AMD 1	
Results	The samples submitted complied with the requirements of the Specification For the tests which were requested	
Prepared by	C R Mead 	Technician
Authorized by	C Yogaratnam 	Technical Engineer
Issue Date	31 March 2003	
Conditions of issue	This Test Report is issued subject to the conditions stated in current issue of <i>PS082</i> 'General conditions relating to acceptance of testing'. The results contained herein apply only to the particular sample/s tested and to the specific tests carried out, as detailed in this Test Report. The issuing of this Test Report does not indicate any measure of Approval, Certification, Supervision, Control or Surveillance by BSI of any product. No extract, abridgement or abstraction from a Test Report may be published or used to advertise a product without the written consent of the General Manager, BSI Product Services, who reserves the absolute right to agree or reject all or any of the details of any items or publicity for which consent may be sought.	

1. Introduction

This Report relates to tests conducted on two samples of electric cable submitted by National Cables Industry, Sharjah, U.A.E.

This Report applies only to the particular samples tested and to the specific tests carried out and detailed within the Report. It does not indicate any measure of Approval, Certification, Supervision, Control or Surveillance by BSI of these or any related products.

2. Samples

The client submitted two samples of Electric Cable described as follows;

- 1) 4x300mm²
- 2) 4x150mm²

3. Testing

The samples submitted were subjected to the tests specified in CEI IEC 60502-1: 1997

4. Results

Note 1:- The test results were taken from the original test report 243/4351382

Note 2:- The potential variability in, both the items tested and the method of measurement used, means that for measurements close to a specified limit, the level of confidence in a compliance statement may or may not be reduced.

Further advice on the specific measurements in this report that may be affected can be obtained from the report authoriser shown on the front cover.

The results of the tests carried out are detailed in the following report

5. Conclusion

The samples submitted complied with the requirements of the Specification for the tests which were requested

TESTING OF CABLE MANUFACTURED TO CEI IEC 60502-1:1997

4 core

Conductor size: 300 sq.mm

ASSESSMENT

Marking

Embossed on sheath
ELECTRIC CABLE 600/1000V BS 5467 4x300 MM2 CU/XLPE/SWA/PVC
NATIONAL CABLES UAE 2003

Marking on 2 line(s) Character size 10 mm. Repeat intervals:-466 mm N/A*

Clauses 5, 7, 12 and 13:- Construction

Sheath colour	Black		PASS
Filler	Textile fibres		PASS
Extruded bedding			PASS
Conductor:-	Shaped stranded plain annealed Cu	Core lay up RH	PASS
Armoured	Galvanised steel wire	LH Lay	Size: 2.47 mm
			PASS

Clause 15.3:- Voltage Tests:-

Complete Cable @ 3.5 kV PASS

Clauses 7.1.3 and 13.3:- Bedding thickness and Oversheath thickness

Thickness of oversheath	Min 2.57 mm	PASS
Thickness of extruded bedding	Mean 1.36 mm	**

** No requirement

*Note :- "The IEC provides no marking procedure to indicate its approval. Therefore no assessment required for marking".

Date samples received:- 24/01/03	Testing commenced:- 25/02/03	Tested by:- C.R.Mead
Date job raised:- 19/07/02	Testing completed:- 31/03/03	Checked by:- C.Yogarathnam

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TESTING OF CABLE MANUFACTURED TO CEI IEC 60502-1:1997

4 core

Conductor size: 300 sq.mm

ASSESSMENT

Tests on individual cores

Clauses 5 and 15.2

Core I.D and sequence	Red	Yellow	Blue	Black	PASS
Indelibility	P	P	P	P	PASS
Class of conductor	2	2	2	2	PASS
No. of Wires	61	61	61	61	PASS
Conductor resistance @ 20°C (ohms/km)	0.0593	0.0594	0.0592	0.0592	PASS

Clauses 6.2:- Insulation Thickness

Mean (mm)	2.10	2.71	2.67	2.05	PASS
Min (mm)	1.66	2.46	2.47	1.81	PASS

Overall assessment:- PASS

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TESTING OF CABLE MANUFACTURED TO CEI IEC 60502-1:1997**4 core****Conductor size: 300 sq.mm****ASSESSMENT****Clause 18.14:-**

Flame Test on complete cable

PASS**Clauses 6.1, 13.2,18.3 and 18.5 :-****Tensile tests on Sheath**

Compound	ST2
Tensile strength unaged (N/mm ²)	19.3
Elongation at Break-unaged (%)	302
Tensile strength aged 7 days Air @ 100° C	18.9
% Var Tensile strength aged 7 days in air @ 100° C	-2
Elongation @ break aged 7 days Air @ 100° C	314
% Var.Elongation aged 7 days Air @ 100° C	4
Compatibility Tensile Strength after ageing	19.9
Compatibility Elongation @ break after ageing	325
Compatibility % Var Tensile Strength	3
Compatibility % Var Elongation at break	8

Assessment of tensile tests on sheath

PASS**Tensile tests on Cores**

Compound	XLPE			
	Red	Yellow	Blue	Black
Tensile strength unaged (N/mm ²)	26.3	27.1	28.0	29.6
Elongation at Break-unaged (%)	636	632	645	649
% Var Tensile strength, aged 7 days @ 135° C air	11	7	4	-7
% Var.Elongation at break, aged 7 days @ 135° C air	-2	-3	-6	-10
% Var Tensile strength, aged with CU conductor 7 days @ 135° C air	-2	-3	-10	-1
% Var.Elongation at break, aged with CU conductor 7 days @ 135° C air	-13	-14	-17	-10
Compatibility Tensile Strength after ageing	26.5	28.6	26.2	27.3
Compatibility Elongation @ break after ageing	614	613	585	595
Compatibility % Var Tensile Strength	1	5	-7	-8
Compatibility % Var Elongation at break	-3	-3	-9	-8

Assessment of tensile tests on cores

PASS**Overall assessment :- PASS**

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TESTING OF CABLE MANUFACTURED TO CEI IEC 60502-1:1997

4 core

Conductor size: 300 sq.mm

ASSESSMENT

Tests on Sheath or complete cable

Clauses 18.6, 18.7, 18.8 and 18.9:-

Compound	ST2	
Cold elongation @ -15° C		PASS
Cold Impact @ -15° C		PASS
Loss of mass mg/cm ²	0.7	PASS
Hot pressure (%)	28	PASS
Heat shock test	PASS	PASS

Tests on individual cores

Clauses 6.1, 16.9, 17.2, 18.13 and 18.16:-

Compound	XLPE				
CORE COLOURS	Red	Yellow	Blue	Black	
Hot set test Max Elongation %	78	68	63	70	PASS
Hot set test Permanent Elongation	5	5	5	5	PASS
Water absorption (Gravimetric) mg/cm ²	0.03	0.02	0.05	0.04	PASS
Volume resistivity @ 90° C ohms.cm	4.3x10 ¹⁶	1.9x10 ¹⁶	2.7x10 ¹⁶	4.9x10 ¹⁶	PASS
Insulation resistance constant @ 90° C Mohms.km	11.76	14.85	76.71	25.22	PASS
Voltage test for 4 hours	PASS	PASS	PASS	PASS	PASS
% Shrinkage of cores after test 1hr @ 130° C	2.5	2.5	2.5	2.5	PASS

Overall assessment:- PASS

The sample complied with the requirements of the standard

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TESTING OF CABLE MANUFACTURED TO CEI IEC 60502-1:1997**4 core****Conductor size: 150 sq.mm****ASSESSMENT****Marking**

Embossed on sheath
 ELECTRIC CABLE 600/1000V BS 5467 4x150 MM2 CU/XLPE/SWA/PVC
 NATIONAL CABLES UAE 2002

Marking on 2 line(s) Character size 6 mm. Repeat intervals:-495 mm N/A*

Clauses 5, 7, 12 and 13:- Construction

Sheath colour	Black		PASS
Filler	Textile fibres		PASS
Extruded bedding			PASS
Conductor:-	Shaped stranded plain annealed Cu	Core lay up RH	PASS
Armoured	Galvanised steel wire	LH Lay	PASS
		Size: 2.47 mm	PASS

Clause 15.3:- Voltage Tests:-

Complete Cable @ 3.5 kV PASS

Clauses 7.1.3 and 13.3:- Bedding thickness and Oversheath thickness

Thickness of oversheath	Min 2.47 mm	PASS
Thickness of extruded bedding	Mean 1.38 mm	**

** No requirement

*Note :- "The IEC provides no marking procedure to indicate its approval. Therefore no assessment required for marking".

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TESTING OF CABLE MANUFACTURED TO CEI IEC 60502-1:1997

4 core

Conductor size: 150 sq.mm

ASSESSMENT

Tests on individual cores

Clauses 5 and 15.2

Core I.D and sequence	Red	Yellow	Blue	Black	PASS
Indelibility	P	P	P	P	PASS
Class of conductor	2	2	2	2	PASS
No. of Wires	37	37	37	37	PASS
Conductor resistance @ 20°C (ohms/km)	0.122	0.124*	0.121	0.123	PASS*

Clauses 6.2:- Insulation Thickness

Mean (mm)	1.50	1.64	1.55	1.69	PASS
Min (mm)	1.29	1.45	1.39	1.39	PASS

Overall assessment:- PASS

***Note:-** The resistance value of the Yellow core falls within the range of Uncertainty of measurement. Uncertainty of the measurement is $\pm 0.32\%$ Of the measured value.

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TESTING OF CABLE MANUFACTURED TO CEI IEC 60502-1:1997**4 core****Conductor size: 150 sq.mm****ASSESSMENT****Clause 18.14:-**

Flame Test on complete cable

PASS

Clauses 6.1, 13.2, 18.3 and 18.5 :-**Tensile tests on Sheath**

Compound	ST2
Tensile strength unaged (N/mm ²)	19.5
Elongation at Break-unaged (%)	300
Tensile strength aged 7 days Air @ 100° C	19.2
% Var Tensile strength aged 7 days in air @ 100° C	-1
Elongation @ break aged 7 days Air @ 100° C	339
% Var.Elongation aged 7 days Air @ 100° C	13
Compatibility Tensile Strength after ageing	19.8
Compatibility Elongation @ break after ageing	287
Compatibility % Var Tensile Strength	2
Compatibility % Var Elongation at break	-5

Assessment of tensile tests on sheath

PASS

Tensile tests on Cores

Compound	XLPE			
	Red	Yellow	Blue	Black
Tensile strength unaged (N/mm ²)	26.7	29.2	28.8	26.9
Elongation at Break-unaged (%)	621	655	671	627
% Var Tensile strength, aged 7 days @ 135° C air	1	1	1	6
% Var.Elongation at break, aged 7 days @ 135° C air	-6	-7	-4	-4
% Var Tensile strength, aged with CU conductor 7 days @ 135° C air	5	-5	-5	-2
% Var.Elongation at break, aged with CU conductor 7 days @ 135° C air	-8	-12	-14	-10
Compatibility Tensile Strength after ageing	27.0	27.4	25.5	28.2
Compatibility Elongation @ break after ageing	583	593	628	622
Compatibility % Var Tensile Strength	1	-6	-11	5
Compatibility % Var Elongation at break	-6	-9	-6	-1

Assessment of tensile tests on cores

PASS

Overall assessment :- PASS

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TESTING OF CABLE MANUFACTURED TO CEI IEC 60502-1:1997**4 core****Conductor size: 150 sq.mm****ASSESSMENT****Tests on Sheath or complete cable****Clauses 11.1:-**

Compound	ST2	
Cold elongation @ -15° C		PASS
Cold Impact @ -15° C		PASS
Loss of mass mg/cm ²	0.61	PASS
Hot pressure (%)	30	PASS
Heat shock test	PASS	PASS

Tests on individual cores**Clauses 6.1,16.9, 17.2, 18.13 and 18.16:-**

Compound	XLPE				
CORE COLOURS	Red	Yellow	Blue	Black	
Hot set test Max Elongation %	63	60	65	70	PASS
Hot set test Permanent Elongation	5	0	3	5	PASS
Water absorption (Gravimetric) mg/cm ²	0.01	0.06	0.03	0.05	PASS
Volume resistivity @ 90° C ohms.cm	2.7x10 ¹⁶	1.9x10 ¹⁶	1.7x10 ¹⁶	2.7x10 ¹⁶	PASS
Insulation resistance constant @ 90° C Mohms.km	4.46	4.57	5.09	11.6	PASS
Voltage test for 4 hours	PASS	PASS	PASS	PASS	PASS
% Shrinkage of cores after test 1hr @ 130° C	2.5	1.5	2.0	2.0	PASS

Overall assessment:- PASS**The sample complied with the requirements of the standard**

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