

REPORT OF TESTS AND EXAMINATION

ISSeP11INES009

APPLICANT : ELNOR MOTOR
De Costerstraat 45
B – 3150 Haacht

MATERIAL

The prototypes submitted to the tests are three meters length cables H05VV5-F 3G2.5 mm² and H05VV5-F 7G1.0 mm².

These cables have been registered with the following references: parcel no 2011/0023 and delivery no – Li/20110117/1145/0432.

TYPE OF TESTS

Control of the above-mentioned cable according to the standard EN 13617-1:2004 + A1:2009 – articles 6.1.4.1 & 6.1.4.2 & 6.1.4.3 & 6.1.4.4 & 6.1.4.5

DESCRIPTIVE DOCUMENTS

The letter from ELNOR MOTORS N.V. Ref. BD:10.0.69
Data sheets of the cable – document (3 pages)

EXAMINATION AND TESTS

Three lengths of around 1 meter of cable were submitted to the tests prescribed by the above referenced standard. These samples are identified under the numbers 10E144/1 & 10E144/2 & 10E144/3 for the cable 3G2.5 and 10E144/4 & 10E144/5 & 10E144/6 for the cable 7G1.0. The results of examinations and tests are described here-after.
The ambient temperature during the tests remained between the limits (20 +/-5) °C.

Solvent test (article 6.1.4.2)

Each sample of cables was placed inside a glass vessel in order to be exposed to the vapours of the following solvents

Samples references 10E144/1 and 4: methanol

Samples references 10E144/2 and 5: ethanol

Samples references 10E144/3 and 6: unleaded petrol

The cables were placed inside a ventilated oven after each period in the vessel containing the solvent.

No visible alteration was observed on these samples.



The sequence of the tests is detailed in the table: to see annex

This report may only be reproduced in its entirety without any modifications

Impact test (article 6.1.4.3)

The six samples of cable were submitted to the impact tests by using the test set-up described under figure 7 of the standard – hammer with a mass of 1 kg – height=0.5m

The samples were carefully examined after this test; they don't present any visible alterations. A test voltage was performed on each sample before and after the impact in order to check any variation due to the impact.

	Hour	Test voltage (before impact) (60 +/- 5) sec 1500V +5% - 0%	Impact and observation under a magnification(10x)	Test voltage (after impact) (60 +/- 5) sec 1500V +5% - 0%
Cable no 10E144/1	9.35	0 mA	No alteration	0 mA
Cable no 10E144/2	8.55	0 mA	No alteration	0 mA
Cable no 10E144/3	9.18	0 mA	No alteration	0 mA
Cable no 10E144/4	9.30	0 mA	No alteration	0 mA
Cable no 10E144/5	9	0 mA	No alteration	0 mA
Cable no 10E144/6	9.12	0 mA	No alteration	0 mA

Low temperature bend test (article 6.1.4.4)

At the end of the solvent test the samples of cable were placed inside a climatic chamber at the temperature of (-20+/-2) °C maintained during a period of 18 hours.

The test set-up was based on the figure 3 of the standard IEC 60079-30-1:2007.

The radius of the mandrels used for the tests (around 7.5 times the diameter of the cable) are :

60 mm - samples 10E144/1 & 10E144/2 & 10E144/3 (cable 3G2.5)

80 mm - samples 10E144/4 & 10E144/5 & 10E144/6 (cable 7G1.0)

At the end of the tests performed in accordance with the prescriptions of the article 6.1.4.4, the samples were examined with a magnification x 10.

No alteration was observed on these samples.

Voltage test (article 6.1.4.5.2)

The external sheath of the three samples of cable is wrapped in a thin aluminium sheet.

The results of the tests are mentioned in the table here-below

		Sample no 10E144/1	Sample no 10E144/2	Sample no 10E144/3	Sample no 10E144/4	Sample no 10E144/5	Sample no 10E144/6
Ambient Temperature (°C)		18	18	18	18	18	18
Working voltage "U" of the prototype (V)		500					
Test voltage (V): (2U + 1500V)		2500 tolerance +5%					
Points where the voltage is applied	Between circuits electrically isolated (mA)	0.05	0.08	0.04	0.05	0.05	0.04
	Between each circuit and the grounded parts (mA)	0.05	0.05	0.04	0.04	0.06	0.05
	Between each circuit (mA)	0.05	0.05	0.04	0.04	0.06	0.05
Duration of application of the voltage (sec)		60 +5/0					
Results		No breakdown					

This report may only be reproduced in its entirety without any modifications

Insulation resistance test (article 6.1.4.5.3)

The external sheath of the three samples of cable is wrapped in a thin aluminium sheet.
The results of the tests are mentioned in the table here-below

	Sample no 10E144/1	Sample no 10E144/2	Sample no 10E144/3	Sample no 10E144/4	Sample no 10E144/5	Sample no 10E144/6
Ambient temperature (°C)	16	16	16	16	16	16
Working voltage "U" of the prototype (V)	500					
Test voltage 500 V DC	500					
Insulation Résistance	Between each wires	1 GΩ	1 GΩ	1 GΩ	1 GΩ	1 GΩ
	Between each wires and aluminium sheet	10 GΩ	2.5 GΩ	2.5 GΩ	5 GΩ	5 GΩ
	Between each wires and ground wire	1 GΩ	1 GΩ	1 GΩ	1 GΩ	1 GΩ

Conclusion

Based on the tests carried out on the samples of cables 3G2.5 and 7G1.0 we consider that the cables types H05VV5-F 2G0.5 mm² & H05VV5-F 3G0.5 mm² & H05VV5-F 3G1.5 mm² & H05VV5-F 3G2.5 mm² & H05VV5-F 4G1.5 mm² & H05VV5-F 5G1.5 mm² & H05VV5-F 5G2.5 mm² & H05VV5-F 6G1.0 mm² & H05VV5-F 7G1.0 mm² comply with the requirements of above-referenced articles of the standard EN 13617-1:2004 + A1:2009



C. GUERIN,
Inspecteur.



A. DERAMEAUX,
Responsable laboratoire électromécanique.

ANNEX

Sequence of the tests

Period	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Number of hours	66+/-2	> 6	17+/-1	> 6	17+/-1	> 6	17+/-1	> 6	17+/-1	> 6	17+/-1	> 6	17+/-1	> 6	17+/-1	> 6
sample no 10E144/1 to sample no 10E144/6																
Date	2/02	4/02	7/02	8/02	9/02	10/02	10/02	11/02	14/02	15/02	15/02	16/02	16/02	17/02	17/02	18/02
Starting hour	14.40	10	15.40	9	16	9	16	9	16	9	16	9	16	9	16	9
Date	4/02	7/02	8/02	9/02	10/02	10/02	11/02	14/02	15/02	15/02	16/02	16/02	17/02	17/02	18/02	23/02
Ending hour	+/- 9	15.30	8.40	16	9	15.55	9	15.50	9	16	8.50	15.55	8.55	16	9	9.45

↓
Impact test

↓
Bending test

This report may only be reproduced in its entirety without any modifications