

TIP

01/12/2015 09:10:10



CENTRE OF TESTING SERVICE
INTERNATIONAL

OPERATE ACCORDING TO ISO/IEC 17025

TEST REPORT

TEST REPORT NUMBER : CNB3100315-00781-L

CTS (Ningbo) Testing Service Technology Co., Ltd.
Fl.2 South, HuoJu Building, No.181 CangHai Rd., Jiangdong Hi-tech Park
Ningbo



TEST REPORT

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Applicant..... : ZHEJIANG TIANQI ELECTRIC CO.,LTD.
Address..... : TIANZI LAKE INDUSTRIAL ZONE, GAOYU, ANJI, HUZHOU, ZHEJIANG, CHINA
Sample Description..... : Polyester Enclosure
Trade Mark..... : TIBOX
Model No./Type reference.. : TIP
Taking/Receiving Date..... : 15 March 2010
Test Address..... : CTS (Ningbo) Testing Service Technology Co., Ltd.
Fl. 2 South Huoju Building No. 181. Canghai Rd.
Jiangdong High-tech. Park
Ningbo China
Telephone: + 86-574-87912121
Telefax : + 86-574-87907993
Test Date..... : 16 March 2010
Test Requested..... : Polyester Enclosure material tested at 960°C required by the applicant
Test Method..... : As specified in the relative standards see clause 2.
Test Results..... : See the attachment in detail
Conclusion..... : Pass

Tested by:

Paul Stan

Reviewed by:

Samon Lin

Approved by:

Carter Lee

Date: 16 March 2010

Date: 16 March 2010

Date: 16 March 2010

宁波市检测中心



TEST REPORT

1. Test item particulars

Test item	Polyeater Enclosure
Type or model	TIP
Trade Mark	TIBOX
Manufacture	ZHEJIANG TIANQI ELECTRIC CO.,LTD.

(all informations was provided by the applicant or detected at the sample)

2. Test standards

EN 60695-2-11: 2001
 Fire hazard testing- Part 2-11: Glowing / hot-wire based test methods-Glow-wire
 flammability test method for end-products
 (IEC 60695-2-11: 2000)

Note:The above standard was used according to the requirements of applicant.



TEST REPORT

3. Conformity verification - Summary of inspection

Clause	Summary of inspection	Test result		
		N.A.	Pass	Fail
4	Outline of the test apparatus and common test procedure	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5	Description of the test apparatus	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6	Verification of the apparatus			
7	Conditioning	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
8	Common test procedure	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
9	Initial measurements	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
10	Test procedure	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
11	Observations and measurements	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
12	Evaluation of test results	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
13	Information to be given in the relevant specification	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Annexes		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Test case verdicts

- N.A.(N) : Test case does not apply to the test object
- Pass(P): Test item does meet the requirement
- Fail (F) : Test item does not meet the requirement

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4. Test information and results

IEC 60695-2-11 and/or EN 60695-2-11			
Clause	Requirement - Test	Result	Verdict
4	Description of test considerations and test specimen selection		P
	the test specimen should be a complete end-product		N
	If the test cannot be made on a complete end-product, or unless otherwise specified by the relevant specification, it is acceptable to		P
	a) cut a piece containing the part under examination from it, or		P
	b) cut an aperture in the complete end-product to allow the glow-wire access, or		N
	c) remove the part under examination in its entirety and test it separately.		N
	any part of the equipment containing the test specimen is ignited by extraneous heat from the glow-wire and so influences the thermal conditions at the test specimen, the test shall be invalid.		P
	The test is carried out to ensure that, under defined conditions, the glow-wire does not cause ignition of parts, and that a part, if ignited, has a limited duration of burning without spreading fire by flames or by burning or glowing particles falling from the test specimen.		P
	the test specimen emits flames during the application of the glow-wire, the fire hazard created may necessitate further tests using other ignition sources such as the needle-flame applied to those parts which are reached by the emitted flames.		P
	The glow-wire test shall not be used for small parts for which reference may need to be made to other test methods		N

5	Description of the test apparatus		P
5,1	Glow-wire		P
	The glow-wire is made from nickel/chromium (80/20) wire, with an overall nominal diameter of 4 mm. The wire is formed into a loop as detailed in figure 1.		P
	The glow-wire is heated by a simple electric circuit as shown in figure 2. There shall be no feedback mechanism or circuit to maintain the temperature.		P
	the electrical connections for the glow-wire are capable of carrying the current without affecting the performance or long-term stability of the circuit.		P

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IEC 60695-2-11 and/or EN 60695-2-11			
Clause	Requirement - Test	Result	Verdict
	The test apparatus shall be so designed that the glow-wire is kept in a horizontal plane and that it applies a force of 1,0 N ± 0,2 N to the test specimen during the application of the glow-wire.		P
	The force shall be maintained at this value when the glow-wire or the test specimen is moved horizontally one towards the other. The penetration of the tip of the glow-wire into and through the test specimen shall be limited to 7 mm ± 0,5 mm.		P
	burning or glowing particles falling from the test specimen are able to fall on the layer as specified in 5.3.		P
5,2	Temperature measuring system		P
	The temperature of the tip of the glow-wire shall be measured by a class 1 (see IEC 60584-2) mineral-insulated metal-sheathed fine-wire thermocouple with an insulated junction. It shall have an overall nominal diameter of 1,0 mm or 0,5 mm and wires of,		P
	The sheath shall consist of a metal resistant to continuous operation at a temperature of at least 1 050 °C. In case of dispute, the 0,5 mm thermocouple shall be used.		P
	The thermocouple is arranged in a pocket hole, drilled in behind the tip of the glow-wire, and maintained as a close fit as shown in detail Z of figure 1.		P
5,3	Specified layer		P
	To evaluate the possible spread of fire, for example by burning or glowing particles falling from the test specimen, a specified layer is placed underneath the test specimen.		P
	Unless otherwise specified, a single layer of wrapping tissue, resting on, and in close contact with, the upper surface of a piece of flat smooth wooden board, having a minimum thickness of 10 mm, is positioned at a distance of 200 mm ± 5 mm below the place where the glow-wire is applied to the test specimen. See figures 3a and 3b.		P
	Wrapping tissue, as specified in 6.86 of ISO 4046 is a soft and strong, lightweight wrapping tissue of grammage between 12 g/m ² and 30 g/m ² .		P
5,4	Test chamber		P
	The apparatus shall be operated in a draught-free condition.		P
	This can be achieved by using a chamber with a volume of at least 0,5 m ³ which permits observation of the test specimen.		P

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	The volume of the chamber shall be such that oxygen depletion during the test does not significantly affect the result. The test specimen shall be mounted at least 100 mm from any surface of the chamber.		P
6	Severities		P
	The test temperature shall be chosen from the following values of table 1.	Test temperature : 960°C according to the requirements of applicant	P
7 (EN60695-2-10 6.2)	Verification of the temperature measuring system		P
6.2.1	Temperature measuring system described in 5.2 shall be verified periodically.		P
6.2.2	A one-point verification of the temperature of the glow-wire can be performed using a foil of silver with a purity of at least 99,8 %, approximately 2 mm ² and 0,06 mm thick, placed upon the upper surface of the tip of the glow-wire		P
	The glow-wire is heated at a suitably slow heating rate, and, when the foil starts to melt, the thermometer shall indicate 960 °C ± 15 °C. The glow-wire, while still hot, shall be cleared of all traces of silver immediately after this verification process to reduce the probability of alloying		P
8	Conditioning		P
	The test specimen and the specified layer to be used is conditioned for 24 h in an atmosphere having a temperature between 15 °C and 35 °C and a relative humidity between 45 % and 75 %		P
9	Initial measurements		P
	The test specimen shall be examined visually and, when specified in the relevant specification, the mechanical/electrical parameters measured.		P
10	Test procedure		P
8.1(EN 60695-2-10)	The test specimen shall be mounted or clamped so that		P
	a) the heat losses due to the supporting or fixing means are insignificant (see figure 4);		P
	b) the planar area of the surface is vertical;		P

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IEC 60695-2-11 and/or EN 60695-2-11			
Clause	Requirement - Test	Result	Verdict
	c) the tip of the glow-wire is applied to the centre of the planar area of the surface.		P
8.2	The glow-wire is heated to the specified temperature, which is measured by means of the calibrated temperature measurement system		P
	a) this temperature is constant within 5 K for a period of at least 60 s;		P
	b) heat radiation does not influence the test specimen during this period by providing an adequate distance i.e. 5,0 cm minimum, or by using an appropriate screen;		P
8.3	The tip of the glow-wire is then brought slowly into contact with the test specimen for 30 s \pm 1 s.		P
	An approximate rate of approach and withdrawal of 10 mm/s to 25 mm/s has been found to be satisfactory.		P
	the rate of approach shall be reduced to near zero upon contact to avoid forces of impact exceeding 1,0 N \pm 0,2 N.		P
	Following the application time, the glow-wire and the test specimen are slowly separated, avoiding any further heating of the test specimen and any movement of air which might affect the result of the test		P
	The penetration of the tip of the glow-wire into and through the test specimen shall be limited to 7 mm \pm 0,5 mm.		P

11	Observations and measurements		P
	During application of the glow-wire (t_a), and during a further period of 30 s, the test specimen, the parts surrounding the test specimen and the specified layer placed below it shall be observed and the following shall be reported:		P
	a) the duration (t_i) from the beginning of tip application up to the time at which the test specimen or the specified layer placed below it ignites;		P
	b) the duration (t_e) from the beginning of tip application up to the time when flames extinguish during or after the period of application;		P
	c) the maximum height of any flame rounded up to the next 5 mm but disregarding the start of the ignition, which may produce a high flame for a period of approximately 1 s;		N
	d) if a test specimen passes the test by virtue of most of the flaming material being withdrawn with the glow-wire, then this shall be reported in the		P

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Clause	Requirement - Test	Result	Verdict
	test report;		
	e) any ignition of the specified layer placed underneath the test specimen.	No any ignition of the specified layer	P

12	Evaluation of test results		P
	the test specimen is considered to have passed the glow-wire test if there is no flaming or glowing, or if all of the following situations apply:		P
	a) if flames or glowing of the test specimen extinguish within 30 s after removal of the glow-wire, i.e. $t_e + 30$ s; and		P
	b) when the specified layer of wrapping tissue is used there shall be no ignition of the wrapping tissue.	No ignition of the wrapping tissue	P

13	Information to be given in the relevant specification		P
	a) The type and description of the test specimen (see clause 4).		P
	b) The method of preparation (see clause 4).		P
	c) Any conditioning of the test specimens (see clause 8).		P
	d) The number of test specimens (see clause 10.3).		P
	e) The surface to be tested and the point of application of the glow-wire (see clause 10.1).		P
	f) The specified layer to be used to evaluate the effect of flaming particles (see clause 5).		P
	g) The test temperature (see table 1).		P
	h) Whether the tests shall be made at more than one point on the same test specimen (see clause 10.1).		P
	i) Whether the criteria specified are sufficient to check compliance with the safety requirements, or whether other criteria – for example on t_i , t_e , the height of flame – should be introduced (see clause 11).		P
	j) The mechanical/electrical parameters to be measured (see clauses 9 and 11).		P

Note: The test results presented in this report relate only to the object tested.

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5. Photos

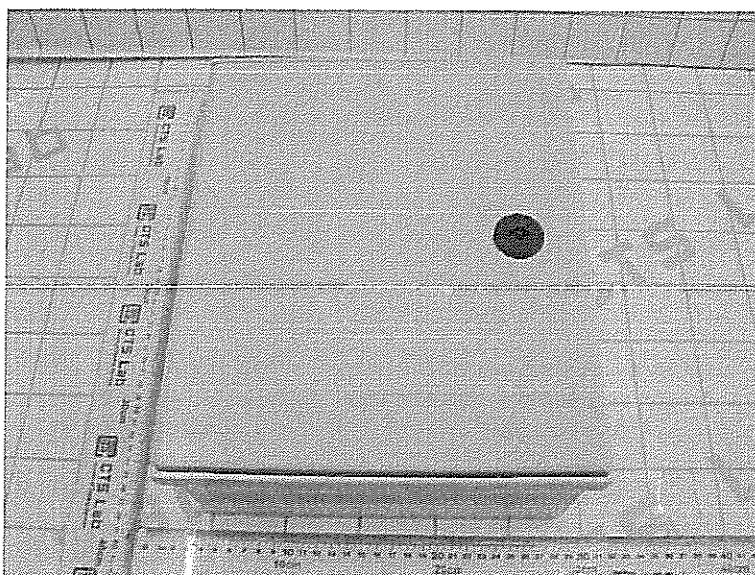


Figure 1 (external view)

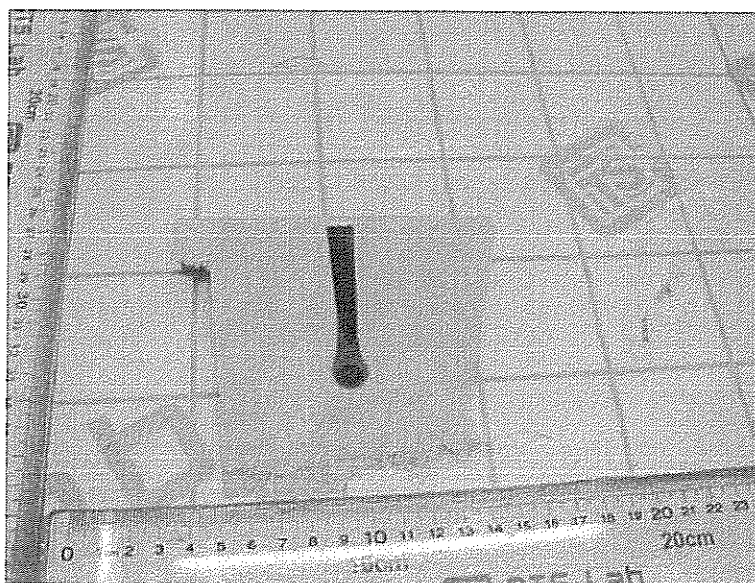


Figure 2 (After the test)

-----end of report-----

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