

**TEST REPORT****EN 12830:1999****Temperature recorders for the transport, storage and distribution of chilled, frozen, deepfrozen/ quick-frozen food and ice cream -Tests, performance and suitability**

## Report

Report reference No .....: SCC (16) -30904A-1-10

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Testing location/procedure.....: CHINA CEPREI (SICHUAN) LABORATORY.

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**Applicant's name** .....: Jiangsu Jingchuang Electronics Co., LtdAddress .....: No.1 Huangshan Rd. Tongshan Economic Development Zone Xuzhou  
Jiangsu China**Test specification**

Standard.....: EN 12830:1999

Test procedure .....: CE

Procedure deviation.....: N.A.

Non-standard test method .....: N.A.

**Test report form/blank test report**

Test report form No.....: SCC12380\_1

TRF Originator.....: CHINA CEPREI (SICHUAN) Laboratory.

Master TRF .....: Dated 2012

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**Test item**

Product name.....: Temperature label

Model and/or type reference.....: Ti-20

Manufacturer.....: Jiangsu Jingchuang Electronics Co., Ltd

Rating .....: 3V

**Testing**

Date of receipt of test item.....: April 5, 2016

Date(s) of performance of test.....: April 5, 2016– April 18, 2016

**Test case verdicts**

Test case does not apply to the test object.....: N (Not Applicable)

Test item does meet the requirement .....: P (Pass)

Test item does not meet the requirement .....: F (Fail)

**General remarks**

This test report shall not be reproduced except in full without the written approval of the testing laboratory.

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

"(see remark #)" refers to a remark appended to the report.

"(see appended table)" refers to a table appended to the report.

Throughout this report a comma is used as the decimal separator

**Summary of testing:**

Ambient temperature :21°C, humidity:67%

Complete test was conducted on Ti-20.

EN 12830:1999			
Clause	Requirement – Test	Result - Remark	Verdict
4	<b>Requirements</b>		<b>P</b>
4.1	General		P
	The means of temperature measurement used by the recorder shall be independent of any temperature measurement which is used to control the refrigerating system.	Pass muster	P
	Manufacturers shall make recommendations on the specification of ancillary equipment in order to meet the performance requirements of this European Standard.	Pass muster	P
4.2	Measuring range		P
	The measuring range shall be appropriate to the use or the refrigerating system used in all cases, the measuring range shall conform to the following limits		P
	In all cases, the measuring range shall conform to the following limits		P
	-the lower limit value shall be lower than or equal to -25 °C		N
	-the higher limit value shall be higher than or equal to +15 °C	+30 °C	P
	-the span shall be higher than or equal to 50 K		N
4.3	Locking of settings		P
	The date and time of the beginning of recording shall be readable from the recorded data or it shall be possible to make them readable.	Pass muster	P

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Clause	Requirement – Test	Result - Remark	Verdict
	-The means for adjusting settings which configure the recording shall:	Pass muster	P
	-either be protected against accidental or unauthorized modifications or record each adjustment of any settings that remain accessible	Pass muster	P
4.4	Recording		P
4.4.1	General		P
	At least the temperature and the time shall be recorded. The place of measurement (e.g. vehicle, cold store) and the date has to be indicated.	Pass muster	P
4.4.2	Traceability		P
	It shall be possible to identify and consult the charts and the recorded data. It shall be possible to consult those intended for archiving for a period of at least a year.	Pass muster	P
	The manufacturer shall specify storage conditions so that the data remain readable	Pass muster	P
4.4.3	Chart (disk, tape)		
	The scrolling speed of the chart shall be greater than or equal to for transport:	Pass muster	P
	-6 mm/h for a recording duration lower than or equal to 24 h -2 mm/h for a recording duration higher than 24 h and lower than or equal to 7 d -0,5 mm/h for a recording duration higher than 7 d	Pass muster	P
	The choice of the recorder shall be made according to the use including the duration of transport.	Pass muster	P

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Clause	Requirement – Test	Result - Remark	Verdict
	-for storage: -1 mm/h		
	The speed shall be verified on the following graduations:	Pass muster	P
	-20 °C for deep-frozen applications -0 °C for chilled applications	Pass muster	P
4.5	Autonomous power supply		P
	For devices with an autonomous power supply, this shall be indicated on the recorder or on the power supply or in the technical documentation, with the corresponding usage temperature.		P
4.6	Degree of protection provided by the enclosure (EN 60529)		P
	The degree of protection provided by the enclosure shall be		P
	IP 20 for recorders used in heated/air conditioned closed IP remises or in the cabin of transport vehicles IP 55 for recorders used inside cold enclosures (storage or transport vehicles) and for external sensor IP 65 for recorders used outside buildings or transport vehicles, with sensor inside the cold enclosure		P
4.7	Electrical safety (if applicable)		N
	The recorder shall conform to the requirements of EN 61010-1		N

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Clause	Requirement – Test	Result - Remark	Verdict
4.8	Operating characteristics linked to external electrical influences		P
4.8.1	External supply voltage (if applicable)		N
	A recorder which requires an external electrical supply shall be suitable for connection to one of the supplies given in Table I.		N
4.8.2	Autonomous supply (if applicable)		P
	The manufacturer shall specify the operating time without external power at a reference temperature		P
4.8.3	Frequency (a.c.) (if applicable)		N
	The manufacturer shall specify the operating frequency with a tolerance of + 3 Hz		N
4.8.4	Power cut-offs		P
	The recorded data shall not be lost during a power cut-off. The manufacturer shall state the duration for which the data is protected when the recorder is disconnected from the primary source of power.	Pass muster	P
4.8.5	Electrical power disturbances and susceptibility to radiated electromagnetic field		N
	The recorder shall conform with the requirements of EN 50081-1 and EN 50082-1, or any other specific standard, if applicable.		N
4.9	Metrological characteristics and usage profiles		P
4.9.1	General		P
	The metrological characteristics of the recorders result from usage profiles which determine the operating criteria.		P

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Clause	Requirement – Test	Result - Remark	Verdict
4.9.2	Metrological characteristics		P
4.9.2.1	Maximum permissible errors and resolution The recorder, under rated operating conditions, shall conform to one of the classes indicated in Table 2		P
4.9.2.2	Recording interval		P
	The maximum recording interval shall be one of the three following values for transport:		P
	-5 min for a recording duration lower than or equal to 24 h		N
	-15 min for a recording duration higher than 24 h and lower than or equal to 7 d	7 d	P
	-60 min for a recording duration higher than 7 d for storage		N
	The manufacturer shall specify the chosen value with its minimum and maximum limits		P
	These values do not apply to recorders where the record is continuous line on paper		P
4.9.2.3	Recording duration		P
	-The manufacturer shall specify the recording capacity either as the recording duration at the recording interval chosen according to 4.9.2.2 -or as the number of recorded temperature values	Pass muster	P
4.9.2.4	Maximum relative timing error		P
	-0,2 % of the recording duration when the date is reset up to 31 d -0,1 % of the recording duration including the error of the date and time when the date is reset after 31		P

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Clause	Requirement – Test	Result - Remark	Verdict
	d		
4.9.2.5	Response time		P
	The response time shall be: -for recorders with external sensor -maximum 10 min for transport -maximum 20 min for storage -for recorders with internal sensor -maximum 60 min	Pass muster	P
	The response time is the time needed for the recorded value to reach 90 % of the actual change of applied temperature in the conditions mentioned in 5.4.		P
4.9.3	Usage profiles		P
4.9.3.1	Climatic environment		P
	It shall be possible for the recorders to operate and be stored in conditions corresponding to one of the three types of climatic environments given in Table 3:	Pass muster	P
4.9.3.2	Mechanical vibrations		P
	Equipment for use on transport vehicles shall be able to operate in the following environment conditions	Pass muster	P
	-vibration frequency: 5 Hz to 8,6 Hz; displacement amplitude: 10 mm -vibration frequency: 8,6 Hz to 150 Hz; acceleration: 3g		P
4.9.3.3	Shock resistance		P



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Clause	Requirement – Test	Result - Remark	Verdict
	Equipment for use on transport vehicles shall be able to operate in the conditions as defined in 5.6.6	Pass muster	P
4.10	Data security		P
	The data shall be protected against alteration	Pass muster	P
<b>5</b>	<b>Test methods</b>		<b>P</b>
5.1	Test list		P
	The recorder shall be subjected to the tests listed in Table 4	Pass muster	P
5.2	General conditions for tests		P
5.2.1	Pre-tests adjustments		P
	The tests shall be carried out without change to the adjustments made in the factory by the manufacturer	Pass muster	P
	All elements of the recorder shall be put in place according to the manufacturer's instructions		P
	When possible or necessary the recorder is configured in order to conduct the following tests	Pass muster	P
5.2.2	Normal atmospheric conditions		P
	Unless otherwise prescribed the tests are carried out in the atmospheric conditions defined as follows - Temperature: 23°C ± 3°C measured at 10 cm from the recorder - relative humidity: 60 % RH + 20 % RH - - atmospheric pressure : to be indicated as measured	Pass muster	P
	Before testing the recorders are placed in these conditions for 24 h. The charts and ink devices are	Pass muster	P

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Clause	Requirement – Test	Result - Remark	Verdict
	stored in these conditions.		
5.2.3	Reference conditions		P
	The reference conditions for the tests are given in Table 5	Pass muster	P
5.3	Determination of temperature measurement error		P
5.3.1	Test method		P
	The temperature sensor, or the recorder when the sensor is internal, is placed		P
	-either in an enclosure with forced air circulation at 1m/s + 0.3 m/s -or in a thermostatic bath. The manufacturer shall state whether the equipment is designed to be immersed.	Pass muster	P
	For a cycle of measurements, the temperature is successively held at 0 %, 50 %, and 100 % of the span, or at the following fixed values: -30°C, 0 °C and +30 °C if the span is greater than those values.	Pass muster	P
	For electronic recorders, one cycle is carried out with increasing and then decreasing values		P
	For mechanical recorders, three similar cycles are carried out		P
	The stabilization time of the recorder for each temperature value is at least 1 h, or a duration sufficient to obtain temperature stabilization of the enclosure or thermostatic bath better than the resolution of the recorder under test.		P
	The real temperature surrounding the sensor is		P

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Clause	Requirement – Test	Result - Remark	Verdict
	measured with a working standard thermometer, the sensor of which is placed 1 cm from the sensor of the recorder under test.		
5.3.2	Reading the recording		P
	Following the test, the recorded values are read using devices provided by the manufacturer		P
5.3.3	Expression of results		P
	The errors at each temperature value shall be tabulated and all shall fall within the maximum permissible errors for the class of the recorder.		P
	These values shall be given with the uncertainty of the measurement		P
5.4	Determination of response time		P
	For this test the recording interval shall if possible be held at its minimum value. The temperature sensor of the recorder is initially placed at a temperature measured using a working standard thermometer.		P
	The recorder sensor is placed as rapidly as possible in an air flow, the temperature of which is stabilized at a value that is 20 K lower or higher than the initial temperature.		P
	The air speed is 1 m/s + 0,3 m/s		P
	The response time is the time needed for the recorded value to reach 90 % of the actual change of applied temperature.		P
5.5	Determination of time recording error		P

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Clause	Requirement – Test	Result - Remark	Verdict
	The device is placed in reference conditions		P
	A recording device using diagrammatic charts is started before the beginning of the measurement, for a time sufficient to take up any mechanical play.		P
	For this test the recording interval shall if possible be held at its minimum value. The test is carried out during a recording duration of at least three days or the whole recording duration. The beginning and the end of the recording duration are defined by a sudden variation in the temperature measured. The elapsed time is measured using a suitable clock.		P
	if applicable, the correspondance between the real time and the time recorded is checked		P
	The requirements of 4.9.2.4 shall be satisfied		P
5.6	Action of influence quantities		P
5.6.1	General		P
	Unless otherwise indicated, during or at the end of these tests, the determination of the temperature measurement error is carried out using the method given in 5.3 but with only one cycle.		P
5.6.2	Variation in voltage supply (if applicable)		P
	The temperature measurement error is determined while supplying the recorder successively at the minimum and maximum value of the rated operating conditions.		P
	For each value of the supply voltage, the pre-heating time is one hour at the minimum		P
	The measurement errors shall not exceed the		P

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Clause	Requirement – Test	Result - Remark	Verdict
	maximum permissible errors in 4.9.2.1		
5.6.3	Influence of ambient temperature		P
5.6.3.1	General		P
	The recorder is subjected to its limiting temperatures, and then the measurement performance is tested at the maximum and minimum operating temperatures.		P
5.6.3.2	Test applicable to recorders with external sensor The recorder in operation is placed in a case which is brought successively through the temperature phases of Table 6 and as defined in 4.9.3.1.		P
	Each phase shall last a minimum of 4 h		P
	The temperature measurement error is determined during phases 2 and 4 with the enclosure maintained at the maximum and minimum operating temperatures stabilized within $\pm 2$ °C.		P
5.6.3.3	Test applicable to recorders with internal sensor		P
	The recorder in operation is placed in a case which is brought successively through the temperatures phases of Table 7 and as defined in 4.9.3.1.		P
	The ambient temperature shall be stabilized within $\pm 2$ °C.		P
	Each phase shall last a minimum of 4 h. Following the test, the temperature measurement error is determined after a resettling time of 4 h at the reference temperature (23 °C $\pm$ 3 °C).		P
5.6.4	Temperature testing under storage and transport conditions for the recorder		P

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Clause	Requirement – Test	Result - Remark	Verdict
	The test shall be carried out under the following conditions:		P
	-the recorder is not in operation		P
	- minimum and maximum temperatures as shown in 4.9.3.1 for storage and transport conditions -temperature variation speed is 1 °C/min -air speed is between 1m/s and 2 m/s -dwell time: 3 h -number of cycles is 5		P
	Following the test, the temperature measurement error is determined after a resettling time of 2 h at the reference temperature.		P
5.6.5	Shock resistance test (if applicable)		P
	The test shall be carried out according to the method of EN 60068-2-27 under the following conditions:		P
	-acceleration: 10g -time duration: 10 ms -recorder in normal operating position -number of shocks: 1		P
	If there is more than one operating position, the test shall be repeated for each of the operating positions The shock is applied in the upward vertical direction.		P
	Following the test, the temperature measurement error is determined after a resettling time of 2 h at the reference temperature.		P
5.6.6	Mechanical vibrations (if applicable)		P

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Clause	Requirement – Test	Result - Remark	Verdict
	The test applies to the recorder and its temperature sensor		P
	The recorder is in operation during the entire duration of the test		P
	The internal or external temperature sensor is kept at a constant temperature within the span		P
	The equipment under test is attached to the vibration table by means of a rigid component which holds the device by its usual system of attachment.		P
	The recorder is subjected to sinusoidal rectilinear vibrations that are applied to it in three trirectangular directions. The vibration values are defined in 4.9.3.2.		P
	The sweep (frequency range path) is continuous and its speed is logarithmic according to time (1 octave/min).		P
	Twenty successive sweep cycles are carried out in each of the three directions		P
	During the test all resonance phenomena are observed		P
	After the test, the variations in the value recorded during the test are determined		P
5.6.7	Degrees of protection provided by enclosures (IP Code)		P
	The degrees of protection provided by the enclosures of the recorder and any external temperature sensor are checked following the		P

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Clause	Requirement – Test	Result - Remark	Verdict
	methods defined in EN 60529.		
5.6.8	Electrical safety (if applicable)		N
	The manufacturer shall confirm that the recorder conforms to the requirements of EN 61010-1		N
5.6.9	Dielectric strength (if applicable)		N
	The test voltage is applied for 1 min between the two supply wires joined together and the earth terminal of the device linked to the metal envelope of an external sensor and to accessible metallic parts.		N
	The test voltage shall be as specified in EN 61010-1, for recorders supplied with external a.c. power source		N
	500 V, r.m.s. value, 50 Hz, for recorders supplied with external d.c. power source		N
<b>6</b>	<b>Conditions of acceptance</b>		<b>P</b>
6.1	Requirements		P
	The recorder shall correspond with the characteristics set out in clause 4		P
6.2	Operating error limits		P
	The maximum error values shall be less than or equal to maximum permissible errors as given in the class specified by the manufacturer.		P
<b>7</b>	<b>Designation</b>		<b>P</b>
	The designation shall include the following data in the indicated order:		P
	-reference to this European Standard		P
	-suitability for transport (T) or storage use (S)		P



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Clause	Requirement – Test	Result - Remark	Verdict
	-type of climatic environment (A, B, C or D)	C or D	P
	-accuracy class (1 or 2)	1	P
	-measuring range in degree Celsius	See the instruction	P
<b>8</b>	<b>Marking</b>		<b>P</b>
	Each temperature recorder shall be marked, clearly, permanently and in the indicated order on the housing of the recorder, with the following indications:		P
	-reference of this European Standard	EN12830	P
	-name of the manufacturer or trade mark		P
	-individual identification of the product		P
	-suitability for storage (S) or transport (T)		P
	-type of climatic environment (A, B, C or D)	C or D	P
	-accuracy class (1 or 2)	1	P
	-Each sensor separable from the recorder shall carry		P
	-identification marks which permit, directly or indirectly -determination of its conditions for use with the recorder.		P
<b>9</b>	<b>Periodic verification</b>		<b>P</b>
	The temperature recorders, when in service, shall be verified periodically in accordance with prEN 13486		P





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

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