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TESTING EUROPE

T4-11

GLOW WIRE TEST APPARATUS WITH FUME CUPBOARD

KEYWORDS

T4-11 GLOW WIRE TEST APPARATUS WITH FUME CUPBOARD, TESTER, IEC TEST EQUIPMENT, APPAREILLAGE ET MÉTHODE COMMUNE D'ESSAI, IEC 60695-2-10:2013, IEC 60730-1, IEC 60950-1, IEC 60335-1, IEC 60884-1, IEC 60238, IEC 60400, IEC 60598-1, IEC 60320-1, IEC 61058-1, IEC 61050, UL 746A, BS EN 60695-2-1, BS 6458, NF C20-921-1, IS:11000, GB/T 5169.10, IEC 60947-1, EN, TS, SIST …

COMPLIANCE

It is constructed in compliance with IEC 60695-2-10:2013, IEC 60950-1, IEC 60335-1, IEC 60884-1, IEC 60238, IEC 60695-2-11, IEC 60695-2-12, IEC 60745-1, IEC 60400, IEC 60730-1, IEC 60598-1, IEC 61050, IEC 60320-1, IEC 61058-1, IEC 60742, IEC 60669-1, UL 746A, BS EN 60695-2-1, BS 6458, NF C20-921-1, IS:11000, EN, TS, SIST …
http://webstore.iec.ch/preview/info_iec60695-2-10%7Bed2.0%7Db.pdf

INTRODUCTION

As it is usually the case with other flammability tests also with this test it is not easy to obtain repeatable results. Therefore we designed GLOW WIRE TEST APPARATUS WITH FUME CUPBOARD with the goal of improved repeatability of test results and ease of operation. The **BOLD** features below are some of the advantages that were introduced to reach these goals.

MAIN FEATURES

- Fully automatic, motorized forward & reverse motion of carriage with the test specimen
- **Dual speed** - both speeds adjustable - the **rate of approach is reduced** before contact (adjustable position of speed reduction)
- – enables its operation inside the test chamber (T1-14 or similar), to avoid health hazards and to prevent air movement – stable temperature
- Microprocessor controlled regulator – power supply **stabilizer** (better than +- 2%) It works without a temperature feedback mechanism.
- A-meter which indicates a true rms value with a maximum error of 1,0 %
- Wire loop (> 77 % Ni/20 ± 1 % Cr), 4,00 mm ± 0,07 mm (before bending), shaped as specified in the standard, hole dia. 1,1 mm. A wire loop is **hard soldered** to connection discs and easy user-replaceable. Each loop is **engraved** with its serial number to enable its traceability/calibration.
- Each glow wire loop is pre-**annealed** for more than 10 h. This saves valuable time for test engineers since they do not lose 10 hours of their time for annealing each glow wire loop. They can immediately perform the test.
- **A timer that automatically starts** when the sample contacts the wire loop and triggers the reverse motion of carriage after a set time (30 seconds)
- Precise temperature adjustment in two ranges - 10 turns numeric potentiometer (0-999)
- Thermocouple type K, class 1 (see IEC 60584-2), mineral-insulated, metal-sheathed, fine-wire with an insulated junction, outside diameter 1 mm, Metal sheath resistant to 1000 deg. C.
- **Mirror polished** stainless surface, on which wooden board with wrapping tissue is positioned, enables easy cleaning of burned plastic and other burning residues
- Micro-controller based thermometer with ambient temperature compensation, short circuit protection, thermocouple breakage protection, and overheating protection.
- Siemens LOGO LAN microcontroller with multicolor display for measuring and controlling some parameters of the test
- The tester automatically measures the penetration depth and reports if/when penetration depth of 7 mm was achieved. The penetration is limited to 7 mm.
- Carriage with 4 wheels with precise **stainless steel** ball bearings, moving on 2 tracks, preloaded with a force of 0,95 N when the sample is in contact with the wire loop.
- On the carriage is mounted perforated stainless steel specimen support that enables precise sample positioning (**4 adjustments)**
- Precision scale for measuring flame height
- Timer, for timing the flame duration, with START/STOP button on the front plate
- 20 pcs. Silver foil with a purity of 99,99 %, cut to approximately 2 mm2 and 0,06 mm thick for calibration of the temperature measuring system, purity certificate included
- 200 pcs. paper - wrapping tissue, as specified in 6.86 of ISO 4046, soft and strong, lightweight wrapping tissue of grammage 28 g/m2

- The anodized aluminum front plate, with inscriptions that clearly explain the function of each component on the front plate
- Front doors are made of **security glass**.
- The chamber permits observation of tests in progress through a complete frontal surface/window.
- Chamber is equipped with **2 adjustable LED light bars** on one side each, and its switch on the front panel.
- On top of the chamber is located a turbine with duct connection, for ventilating the chamber after the test is finished.
- On the front plate is located switch for operation of extraction turbine
- **The chamber is draught free**
- It allows normal thermal circulation of air past the test specimen during burning.
- **All stainless steel interior and exterior AISI 304**
- Powder-coated interior, **black** non-reflective – **scratch resistant.** This minimizes light level inside and **prevents radiation** as per Standard's requests.
- Exhaust tube connector dia. 100 mm
- Inner volume: 0,53 m3
- Dimensions: 1105 mm x 645 mm x 1135 mm
- Weight 99 kg
- Power supply: 230 V, 50 Hz (other optional)

DESCRIPTION

T4-11 GLOW WIRE TEST APPARATUS WITH FUME CUPBOARD – MOTOR DRIVEN AUTOMATIC is intended for testing the flammability and ignitability of components and materials. It includes electronic voltage stabilizer – current regulator, A-meter, thermometer, motor drive, timer, and FUME CUPBOARD.

Apparatus consists of:

The Control Unit with the electric circuit is built into the housing of the bottom part of the fume cupboard, so that all controls handy and in not contaminated position. A mechanism for performing the test is also located below the baseplate and therefore protected from contamination. Measuring instruments and components for controlling the operation of the apparatus are located on the front plate of the apparatus. The source of heating current is a toroidal transformer that is controlled (its primary side) through a microprocessor-controlled electronic circuit that operates as a power supply stabilizer. Potentiometer, that is located on the front plate, is intended for heating current regulation (adjustment).

To enable more precise current (temperature) regulation ten-turn potentiometer with 1000 digital dial is built-in. When the requested temperature stabilizes, push-button should be pressed and by that voltage stabilization becomes active.

The electric circuit also contains control and switching elements for controlling the electric motor drive that slowly moves the tested sample to the wire loop after its activation by a push-button on the front plate. Just before the sample contacts the glow wire loop it slows down, and at the time of contact, the timer is activated which, after 30 seconds (or other set time), returns the carriage with the sample to the start position.

Mechanism with a wire loop, thermocouple, and motor drive is located under the base plate of the fume cupboard. Carriage with sample mounting support is so designed that mounting support can be easily removed for sample mounting. All regulating elements of the mechanism are equipped with handle-screws to enable easy operation. Wire loop and thermocouple are easily exchangeable. Apparatus detects loop penetration depth and time at which it reached 7 mm. It also has a scale for flame height reading with zero-point adjustments.

PROTECTION

The apparatus is protected against overheating, short circuit and break off in the circuit. Three limit comparators are built in the thermometer, of which the first is used as protection against too high temperature that could shorten the lifetime of the thermocouple. It switches off the heating of glow wire at a temperature of 1000 deg.C, which is 40 deg.C over the maximal temperature that is requested by standard (960 deg.C).

In the case of a short circuit between the loop carrying rods or between the heating current leads in manual or stabilization mode, the processor detects irregular conditions and turns the heating off. This is indicated by the blinking of the signal push-button. After the cause of interruption has been removed, heating can be turned on by pressing the “STOP” and “START” push-button. In case of break off in the circuit or bad connection in the heating current in manual or stabilization mode, the processor detects irregular conditions and turns the heating off. This is indicated by the blinking of the signal push-button. Heating can be turned on by pressing the “STOP” and “START” push-button.

DESIGN

Tabletop apparatus, solid case, Non-sensitive, scratch-resistant surfaces through powder-coating, side panels, Al extrusion Frame, adjustable case feet with an anti-slip protection, front plate anodized aluminum 2,5 mm.

All parts of the mechanism are nickel-plated or made of stainless steel (AISI 304, DIN W. No. 1.4301 X5CrNi18-10) http://en.wikipedia.org/wiki/Stainless_steel.

ADVANTAGES

Voltage stabilizer ensures better repeatability of test results, to avoid the following possibility: during the setting of heating current needed for temperature (e.g. 960 deg. C), the network voltage was 230V. At that voltage-current 130 A results in 960 deg. C. Then you begin the test. The voltage in the network drops (or oscillates) to 225V, which is approx 2% and this would result in different current (e.g. 127A) and different temperatures (18 deg. C difference).

Of course, if you do not like or do not need stabilization you can switch it off.

Due to the high currents involved, the wire loop is hard soldered to two stainless steel discs with smooth and large contact surfaces that ensure constant contact resistance (which means constant current during the test). This is important because if it was not hard soldered, the contact resistance between loop and stud (column) can change because of oxides formation due to the heat. That would result in a change of current and temperature which are the main parameters of this test. Again repeatability of test results improves.

The temperature stability depends on air movements around the glow wire loop. Control through the elements on the front plate that is outside the fume cupboard enables the operation of the glow wire test apparatus inside a closed test chamber. The test chamber enables draught-free conditions, has a volume of more than 0,5 m3, and has black painted inner walls as per standard requests. Draught-free conditions again mean more stable temperature and better repeatability of test results.

After the conditions stabilize, you can press the START button on the front plate, the complete test is executed automatically, just record the height and duration of the flames and start the ventilator after the test is finished.

TECHNICAL SPECIFICATION

Power supply	230(120)V ±10%, 50(60)Hz ±2Hz (Other optional)
Temperature adjustment	370°C-1000°C in two ranges
Control and Stabilization system	microprocessor, Voltage stabilization – current regulation
Thermocouple	Ni-Cr-Ni Type K, dia. 1 mm; -200—1150°C
Thermometer	digital programmable, accuracy ±0.05%, -200—1000°C
Heating transformer	toroidal-separating 500VA, secondary winding 2.5 V, 150A

ACCESSORIES (Included in price)

1 pcs. T4-08F WIRE LOOP FOR GLOW WIRE TEST APPARATUS FOR THERMOCOUPLE DIA. 1 mm – pre - annealed for 10 hours

1 pcs. T4-08E THERMOCOUPLE DIA. 1 mm FOR GLOW WIRE TEST APPARATUS

1 pcs. Timing device with resolution better than 0,2 s

20 pcs. Silver foil with a purity of 99,99 %, approximately 2 mm2 and 0,06 mm thick for calibration of the temperature measuring system, purity certificate included

1 pcs. Mirror polished stainless steel plate that enables easy cleaning of possible burned plastic remains

1 pcs. Flat smooth wooden board, having a minimum thickness of 10 mm

200 pcs. Paper - wrapping tissue, as specified in 6.86 of ISO 4046, soft and strong, lightweight wrapping tissue of grammage 28 g/m2

SPARE PARTS (only one thermocouple and one wire loop are included with apparatus)

T4-08E THERMOCOUPLE DIA. 1 mm FOR GLOW WIRE TEST APPARATUS

T4-08F WIRE LOOP FOR GLOW WIRE TEST APPARATUS (for TC dia. 1 mm)

T4-08D SILVER FOIL 2 mm2 - 20 pcs.

CALIBRATION CERTIFICATES

Certificates for force, dimensions of wire loop and temperature are available on request but are not included in the price.

OTHER CONDITIONS

Warranty: 2 years
Support by E-mail: support@testing.si
On line Skype VIDEO Support: Testing_support, matejsimonic

We will be glad to help you solve your problems and to hear any feedback from you.

The equipment described here is subject to redesign without notice. The change will not impair the function of apparatus its characteristics or the price.