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东尼仪器
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45 degree Flammability Tester

English Manual



Model: TW-227

I、 Summary

1 • Instrument main functions introduction

The instrument designed by overall box-type , consists of the flammability chamber and control system and install the specimens in the 45 ° angle specimen supporter, so that the nozzle close to the specimen, the nozzle return in the specified time when the specimen with the flame ignited . To observe the specimen combustion and flame spread rate on the specimen to assess the nature of the sample can be ignited and the flame spread properties. This instrument applies to test the performance of flame retardant of clothing fabrics, decorative fabrics, tents flame retardant fabrics, etc.

This instrument applies to the following standards

ASTM D1230

CRF16-1610

2 • Main technical parameters

Dimension : 540×410×300mm

Specimens Size : 152.4×50.8mm

Ignition Time : 1±0.05s

Size of Specimen fram : 149×38mm

The distance from nozzle to the surface of specimen : 8mm

Flame Height : 15.875mm



Picture 1

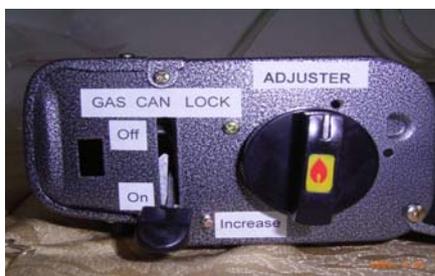
Please read this manual carefully before using the instrument.

II、 Installation

1. When opening the package, please check and use a softy, dry cloth to wipe each part of the equipment. Put it on a steady, smooth workbench. Laboratories must have a good exhaust fume hood or related devices and keep far away from the fire source.
2. Gas connection: there are two way of gas connection, one is Mini tank connection method, another is Large tank connection method. Users can choose according to the actual situation
3. Micro butane gas cylinders generally recommended for relatively safe, it is easy to operate.
(Note:the lock switch must be pressed after the tank was installed)
4. Loading the butane gas cylinders



5. Open the gas, the gas lock switch placed in "ON", counterclockwise rotation regulator, release the gas



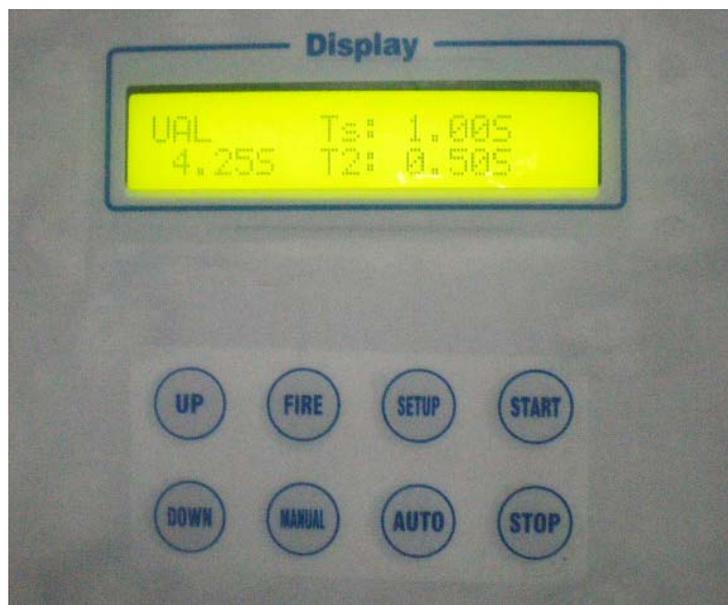
6. Shut off the gas, the gas lock switch placed in "OFF", clockwise rotation regulator, shut off the gas.



7. If the equipment used frequently, also can use an external large gas cylinders. Note: The trachea ends must be closely locked solid-tight to prevent gas leakage.
- 8 Power supply: 220VAC,50Hz,5A
Plug the power plug into an outlet on a well-grounded, then can turn the power switch.At this point, the indicator light on the operation panel is on .The display is bright,equipment is in a tested status.

Note: When the instrument connects the gas at the first time or a few days gas supply not in use, it is due to there contains large amounts of air in tracheal gas and the road system. So, for the first time will be very difficult for the ignition or flame will become unstable , In such cases the phenomenon is normal

III Control Panel



1. Button Function

Ts : Ignition Time

T1 : Spread Time

T2 : Smoldering Time

START : Start button, to make the equipment start to test.

STOP : stop button, to stop running the equipments.

TETUP : setting button , using to set the ignition time.

MANUAL : manual button, Press START button while pressing this button, fire mouth repeat to move up and down.

FIRE : Ignition button

AUTO : automatic button , can switch manual status back to automatic status.

Press SETUP button, Ts showed a flashing indication on the left, through the UP, DOWN keys to change the value, press the SETUP key to exit the setting mode.

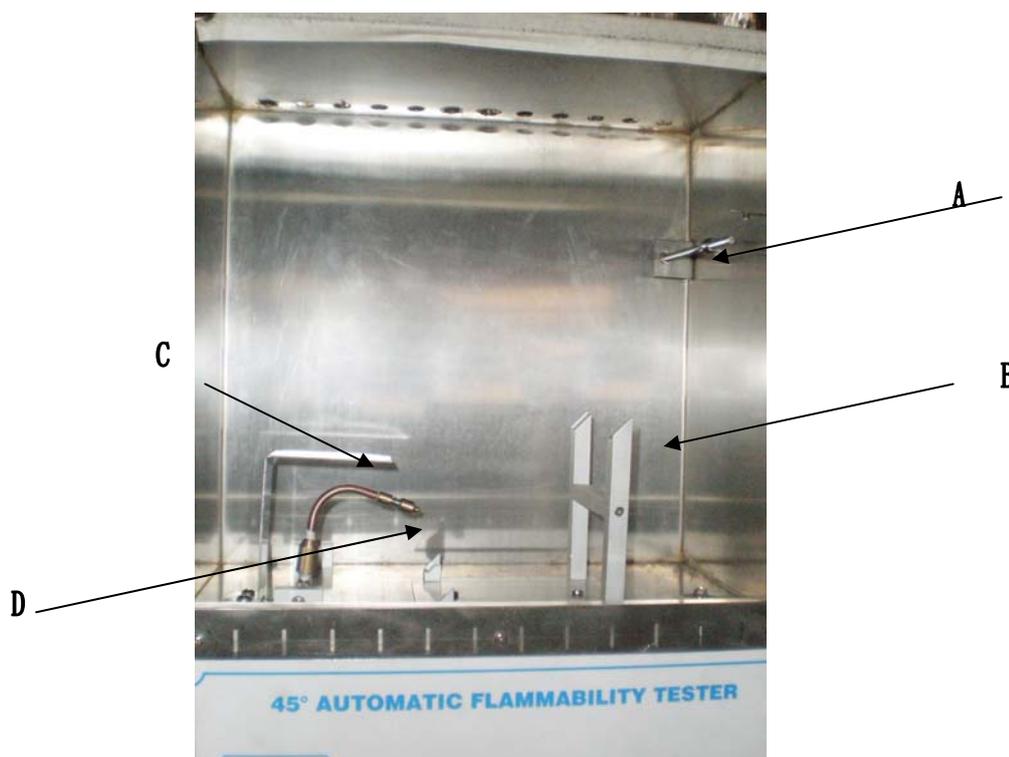
IV. Test Procedure



Press START button, equipment starts to test, the nozzle move to the distance to the surface of specimen is 8mm. Ts start to time, after specified time, the nozzle return to the original place automatic. T1 start to time, if the tag line was burned by the flame, heavy hammer would fall. If the flame does not blow the tag line, then press the STOP button when the flame extinguished. T1 time to stop, this time is for the continue burning time. T2 start time, observe the specimen combustion status. When the flame extinguished, press the STOP button, T2 stop to time, this is smoldering time.

V Structure

1. Test Room



- A : The tube for installing stop thread (refer to Picture 1)
- B : Specimen supporter
- C : Backpanel , used for protecting the nozzle
- D : Nozzl

2. Brushing device

- 2. 2. 1 Below of device is a substrate, above is a drag with back and forth on the wheel-rail extension sockets ◦ the hinge bracket of substrate fixed to the brush and with the pressure of 150 grams of weight pressed drag the vertical board.
- 2. 2. 2 Brush is consisted of two staggered rows hard nylon harness. The dimater of nylon line is 0.016 inches, length is 0.75 inches, Each beam 20, the distance between beam and beam is 0.25 inch, there have clips in front of the substrate.
- 2. 2. 3 Take the brush and fix the specimen on the board .Place the brush in the surfac of the specimen , use the drag handle board evenly pull forward to clear brush the specimen.



图 2 Brushing Device

VI Prepare specimens

- 6.1.1 specimen size : 6 inch* 2 inch (LX W).Required to prepare five samples, each sample required to detect.
- 6.1.2 For there is no raised fiber surface fabrics,Its fastest burning direction is the length direction ◦
Make the testing on the surface of faster burning.To make sure the direction of length and testing surface, should be cut in different directions, according to the mentioned below fourth testin instruction to make the testing.
- 6.1.3 For a fabric with a raised fiber surface, Extension of its protruding direction is the length direction of the test specimen. For the fabric containing villi, clusters and other plush with concentration change, use t fastest burning surface as a test specimen.
- 6.1.4 When testing according to the fourth flammability test procedures described in the instructions. make it very slow burning and not firing.,or Or coated with a layer of blocking fuel. Preparing the test sample should be large enough. Making procedures in accordance with relevant standards dry cleaning and washing, although contraction, but also to meet the flammability test sample size requirements
- 6.1.5 For the specimen with raised fiber surface , both in its original state, or after dry cleaning, cleaning,all need to be brushed in the opposite direction on the clean equipement.. the specimens without raised fiber surface are not required to clear brush.

2. Pre-test preparation

- 6.2 · 1 Dry Cleaning: Please refer to test method mentioned in the 45-degree dry-cleaning machine inside the specification , or refer to the ASTM F963 dry-cleaning test method..
- 6.2 · 2 Clean : After the dry-cleaning capacity of the sample placed in a 0.5% neutral soap powder, the weight of the fabric swatch for 30 times, the temperature is 90F-100F of the soft water in Qingrou 5 minutes
Place the dry-cleaned specimen in a water with 0.5% neutral soap powder,weight is 30 times than fabric, temperature is 90F-100F, clean 5 minutes. And then put in a water with 80F temperature rinse twice and wring. After cleaning the samples taken with the model size of 2 × 6 inches (50.8 × 152.4mm) as the specimen.

- 6.2 · 3 For the specimen with raised fiber surface , both in its original state, or after dry cleaning, cleaning,all need to be brushed in the opposite direction on the clean equipment.. the specimens without raised fiber surface are not required to clear brush.
- clamp the each specimen on the specimen holder and put in a oven in a temperature 221°F (105°, Horizontal,take out after 30 minutes, and then place them into the desiccator containing anhydrous calcium chloride, cooling for 15 minutes

3. Test procedure

- 6.3 · 1 Clamp the specimen with the specimen holder, install it on the specimen supporter.adjust the space of the specimen supporter by moving the shift knob, to make the distance between the nozzle and specimen is 8mm.
- 6.3 · 2 Set ignition time and flame spread time
- 6.3 · 3 Stop line (50 # cotton sewing) through the guide rod and through the ring, hang the havey hammer on the ring.
- 6.3 · 4 Ignited the gas, and adjust the flame height to 15.875mm. Shut the front door
- 6.3 · 5 Press the START button ,the timer automatically starts,flame reach the specimen with 1 second (this time refer to the standard requirements) and then the nozzle remove automatically,then flame spread time to start running, when the stop line was burned out,timer stopped,record the burning time of the specimen.
- 6.3 · 6 Test five specimens, and then take the average of the spread time. If the flame spread time is less than 4 seconds, or the sample does not burn, it would take five one specimens re-tested , the experimental results take the time average of 10 specimens.

4. Test report content

- 6.4.1 Instruction about this report :complies to which international standard and the relevant changes.
- 6.4.2 Test date
- 6.4.3 Handling method of the test specimen
- 6.4.4 The surrounding environmental conditions: temperature, relative humidity and atmospheric pressure °

6.5.5 Gas for litting test specimen

6.6.6 Fabric composition ◦

6.7.7 The standard of the burning head for litting the specimen.

6.8.8 Time for setting ignition

VII, Maintenance

7.1 Clean :

As a laboratory instrument, 45-degree angle tester should be kept clean as much as possible
After each test, the specimen supporter should be cleaned. generally use wet cleaning cloth with carbon dichloride to clean. When the specimen formed a soot deposition, should use the high concentration of soap to wash it.

The testing room should be cleaned once a week.Special to clean the wall of right hand and top.
These places easy to fouling. use wet cleaning cloth with carbon dichloride to clean. When using this solvent is also very difficult to clean, it is recommended to use steel wool to polish the surface

7.2 Lubricate :

Approximately once lubrication every six months , the shaft burner unit should be lubricated, the oil painting in the shaft bearings on both ends.

Report format for testing specimens.

Specimen CPSC Report Form and Data Sheet

Date Received: _____ Test: _____
Specimen No.: _____
Manufacturer: _____
Submitting Area Officer: _____

Lab Instruction: _____

Represented as Being: _____ Visual Observations & Comments: _____

Seal Broken By: _____
Initial Date

Test Analyst: _____
Textile Technologist _____
Reviewer: _____

CPSC DATA SHEET: FLAMMABLE FABRICS 16 CFR 1610

Specimen No.: _____
Manufacturer: _____

Laboratory Test Results:

Original State:

- | | |
|----------|-----------|
| 1. _____ | 6. _____ |
| 2. _____ | 7. _____ |
| 3. _____ | 8. _____ |
| 4. _____ | 9. _____ |
| 5. _____ | 10. _____ |

_____ Seconds Average _____
Tester's Initials and Date

Comments: _____

After Drycleaning and Washing:

- | | |
|----------|-----------|
| 1. _____ | 6. _____ |
| 2. _____ | 7. _____ |
| 3. _____ | 8. _____ |
| 4. _____ | 9. _____ |
| 5. _____ | 10. _____ |

_____ Seconds Average _____
Tester's Initials and Date

Comments: _____

Class 1 Class 2 Class 3 Reviewer: _____

textile flammability regulations ----- United States laws and regulations

CFR16.1610 flammability standards for clothing textiles

The regulations provision that the fabric must pass the flammability test and divide into three levels

The first Grade is for ordinary flammable, can do clothes

The second grade is medium-flammable, can do clothes

The third grade is for the rapid and intense burning, is not suit for making clothes

Grade	Textile Type	Performance requirement
The first grade	No fluff, tufting, or other type of surface pile	Flame spread time \geq 4S
	With fluff,tufting, and other type of surface pile	Flame spread time $>$ 7S
The second grade	With fluff,tufting, and other type of surface pile	4S \leq flame spread times \leq 7S
The third grade	All textile	Flame spread time $<$ 4S

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