

## IEC 60695-11-3 500W Flame Tester

*500W Flame Test Apparatus for Material Flammability Evaluation*



**Standard:** IEC 60695-11-3 (500 W nominal pre-mixed test flame)

**Manufacturer:** KingPo Test Equipment Co., Ltd. [www.dgkingpo.com](http://www.dgkingpo.com) Tel: +86-769-81627526

## 1. Product Overview

The KingPo IEC 60695-11-3 500W Flame Tester is a specialized flammability testing apparatus used to assess the burning performance of materials and electrical components under a standardized 500 W test flame. It integrates a combustion chamber, adjustable burner system, specimen angle positioning, and precise timing functions into one complete system.

This equipment is designed for evaluating flame spread, afterflame duration, and residual glowing behavior of plastics, composites, and insulating materials. It provides repeatable test conditions and supports both manual and automated operation, making it suitable for research, quality control, and pre-compliance testing in laboratories.

## 2. Applicable Standards

- **IEC 60695-11-3** — Fire hazard testing – Part 11-3: Test flames – 500 W flames (nominal pre-mixed test flame)
- Related standards may reference this flame for material and product flammability evaluation (e.g., UL 94 horizontal/vertical burning tests in certain configurations).

## 3. Test Purpose

The purpose of the 500 W flame test is to evaluate the flammability characteristics of materials when exposed to a standardized high-energy flame. The test measures critical parameters such as ignition time, afterflame duration, residual glowing time, and flame spread behavior to assess the material's contribution to fire hazard under demanding thermal conditions.

This test is particularly useful for larger specimens or materials intended for applications where higher thermal energy exposure is expected, helping manufacturers and laboratories qualify materials for electrical and electronic equipment safety.

## 4. Key Features

- **Standard 500 W Flame Generation** — Produces a nominal pre-mixed methane or propane-air flame per IEC 60695-11-3 requirements.
- **Adjustable Test Angles** — Supports 0°, 20°, and 45° specimen positioning with manual conversion.
- **Wide Flame Height Range** — Adjustable from 20 mm ± 2 mm to 180 mm ± 10 mm for flexible testing needs.
- **High-Precision Digital Timing** — Records ignition time, afterflame time, and residual glowing time with 0.1 s resolution.
- **Touch Screen / Microcomputer Control** — User-friendly interface with automatic ignition support.
- **Large Enclosed Combustion Chamber** — Volume > 0.75 m<sup>3</sup> with observation window and exhaust interface for safety.
- **Robust & Repeatable Performance** — Precision-engineered burner assembly ensures consistent flame characteristics.

## 5. Technical Specifications

Parameter	Specification	Notes
Applicable Standard	IEC 60695-11-3	500 W nominal pre-mixed test flame
Flame Type	500 W nominal pre-mixed methane or propane-air flame	Depending on test method and configuration
Burner	Bunsen burner, inner diameter $\Phi 9.5$ mm ± 0.3 mm	Standard burner configuration
Test Angle	0°, 20°, 45° manual conversion	Adjustable specimen positioning
Flame Height Adjustment	20 mm ± 2 mm to 180 mm ± 10 mm	Adjustable range
Ignition / Afterflame / Residual Glowing Time	0–999.9 s ± 0.1 s	Programmable / digital timing with high resolution

Combustion Chamber Volume	> 0.75 m <sup>3</sup>	With observation window
Control System	Touch screen / microcomputer control	Automatic ignition supported
Safety Features	Enclosed chamber with exhaust interface	Operator protection
Power Supply	AC 220V / 50Hz	Subject to final configuration

## 6. Testing Principle

The IEC 60695-11-3 standard defines the requirements for producing and applying a standardized 500 W nominal pre-mixed test flame to evaluate material flammability. The apparatus generates a stable flame by precisely controlling gas flow and burner configuration, then applies the flame to the test specimen at a specified angle and duration.

Throughout the test, the equipment records critical parameters such as ignition time, afterflame duration, and residual glowing time. These measurements provide valuable data on the material's burning behavior and help assess its contribution to fire hazard under high-energy flame conditions.

## 7. Typical Test Procedure

1. Prepare and position the specimen in the combustion chamber at the required angle (0°, 20°, or 45°).
2. Adjust the burner to achieve the specified flame height and stabilize the flame.
3. Apply the flame to the specimen for the defined ignition time.
4. Record ignition time, afterflame duration, and residual glowing time using the digital timer.
5. Observe and document flame spread behavior if required by the test method.
6. Remove the specimen, clean the chamber if necessary, and prepare for the next test.

## 8. Applications

- Material Manufacturers — Flammability performance testing of plastics and composites
- Testing Laboratories — 500 W flame testing based on IEC 60695-11-3 requirements
- Electrical & Electronic Product Developers — Material qualification under standardized flame conditions
- Quality Assurance Departments — Routine flammability verification
- Research Institutions — Comparative studies of flame-retardant materials

## 9. Standard Configuration

The standard system typically includes:

- Integrated combustion chamber with observation window (> 0.75 m<sup>3</sup>)
- Adjustable Bunsen burner system (inner diameter  $\Phi 9.5 \text{ mm} \pm 0.3 \text{ mm}$ )
- Manual test angle positioning (0°, 20°, 45°)
- Flame height adjustment mechanism
- Digital timing system (0.1 s resolution)
- Touch screen / microcomputer control with automatic ignition
- Enclosed chamber with exhaust interface

*Note:* Brass nozzle and other components are included for standard 0° test position. Customization available upon request.

## 10. Ordering Information

To provide the most suitable configuration, please confirm the following when requesting a quotation:

- Primary test methods or standards to be followed
- Specimen size range and typical test angles required
- Need for automation features or data logging integration
- Gas type preference (methane or propane)

- Any additional accessories or calibration requirements

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