

UL 1581 VW-1 FT1 Flame Test Chamber

Wire & Cable Vertical Flame Propagation Tester



Standards: UL 1581 (VW-1), CSA FT1/FT2, IEC 60332

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1. Product Overview

The KingPo UL 1581 VW-1 FT1 Flame Test Chamber is used to evaluate the vertical flame propagation performance of wires and cables. It is designed to perform the VW-1 test according to UL 1581 and the FT1 test according to CSA standards by subjecting vertically mounted specimens to repeated flame application.

The chamber determines the flammability of wires and cables under vertical flame conditions by applying a controlled flame to the lower end of a vertically mounted specimen for 15 seconds, then removing it for 15 seconds, with this cycle repeated up to five times while recording afterflame time, afterglow time, and flame propagation behavior.

2. Applicable Standards

- **UL 1581 (VW-1)** — Reference Standard for Electrical Wires, Cables, and Flexible Cords (Vertical Flame Test)
- **CSA FT1 / FT2** — Canadian Standards Association vertical flame tests for wires and cables
- **IEC 60332** — Tests on electric and optical fibre cables under fire conditions

3. Test Purpose

In the VW-1 test, a vertically mounted wire or cable specimen is exposed to a controlled flame applied from below at a specified angle. The flame is applied for 15 seconds and then removed for 15 seconds, with this cycle repeated up to five times.

During the test, the equipment records afterflame time, afterglow time, and observes whether the flame propagates to the upper clamp or causes dripping of burning material. This standardized method evaluates the vertical flame propagation resistance of wires and cables under repeated ignition conditions.

4. Key Features

- **Multi-Standard Compliance** — Meets UL 1581 (VW-1), IEC 60332, CSA FT1 and FT2 requirements.
- **Adjustable Test Angles** — Burner positioning at 0°, 20°, and 45°.
- **Flexible Flame Height** — Adjustable from 20 mm to 180 mm.
- **Automatic Test Cycle** — Programmable 15-second burn and 15-second off cycle, repeatable up to 5 times.
- **Large Sealed Chamber** — Internal dimensions of 2.4 m × 1 m × 1.8 m with observation window.
- **Safety System** — Exhaust ventilation and sealed operation ports.
- **High-Precision Timing** — Digital timers at 0.1 s resolution.
- **Automatic Ignition** — For consistency and improved operator safety.

5. Technical Specifications

Parameter	Specification	Notes
Applicable Standards	UL 1581 (VW-1), IEC 60332, CSA FT1, FT2	Vertical flame test for wires and cables
Burner Inner Diameter	Φ9.5 mm ± 0.3 mm	Standard Bunsen burner
Flame Height	20 mm – 180 mm adjustable	—
Test Angles	0°, 20°, 45°	Manual adjustment
Burn / Off Cycle	15 seconds burn + 15 seconds off	Repeatable up to 5 cycles
Chamber Internal Size	2.4 m × 1 m × 1.8 m	Large sealed test chamber
Timing Resolution	0.1 s	High precision measurement
Ignition System	Automatic ignition	Improves consistency and safety
Exhaust System	Top-mounted with rear air supply	Ensures safe post-test ventilation
Observation Window	Toughened glass	Allows clear viewing during testing

6. Typical Test Procedure

1. Mount the wire or cable specimen vertically in the chamber.
2. Adjust the burner to the required angle and flame height.
3. Initiate the automatic test cycle (15 s burn + 15 s off, up to 5 cycles).
4. Record afterflame time, afterglow time, and observe flame propagation behavior.
5. Document results and ensure safe ventilation before the next test.

7. Applications

- Wire and Cable Manufacturers — Vertical flame testing on power cables, communication cables, electronic wires
- Testing Laboratories — UL 1581 VW-1 and CSA FT1/FT2 compliance testing
- Certification Bodies — Product certification and compliance verification
- Research Institutions — Studying flame propagation behavior of new cable designs

8. Standard Configuration

The standard system typically includes:

- Large sealed combustion chamber with aluminum alloy frame and corrosion-resistant panels
- Toughened glass observation window and sealed operation ports
- Precision Bunsen burner system
- Automatic control unit for burn/extinguish cycle
- Integrated safety systems including exhaust ventilation
- Digital timing system

Note: Suitable for single-core and multi-core cables used in buildings, vehicles, and electronic equipment.

9. Ordering Information

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

- Cable types and sizes to be tested
- Any need for additional safety features or data logging
- Calibration or extended documentation requirements

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