

Burn Test Demonstration Cell Setup

To demonstrate a dry sprinkler bulb breaking safely and effectively, construct a compact, portable Burn Test Demonstration Cell. This mock-up is designed to concentrate heat quickly to activate the sprinkler while protecting spectators and managing smoke.

Because this is a dry sprinkler test, no water will discharge, making it a "clean" demonstration that relies strictly on thermal activation. The cell is structured as a small, three-sided enclosure featuring a clear viewing window to ensure visual access while maintaining strict physical containment.

Specifications & Material List

Component	Dimensions	Material Options	Purpose
Enclosure Size	50 cm x 50 cm x 100 cm (W x D x H)	Steel frame or heavy-gauge sheet metal	Creates a small thermal envelope to trap heat quickly.
Viewing Walls	Left and Right sides	6mm Tempered Glass or high-temperature Lexan/Polycarbonate	Allows multi-angle viewing while shielding <u>persons</u> from cracking glass or flame.
Top & Bottom Plates	50 cm x 50 cm	Stainless steel or thick sheet metal	Top: Houses the sprinkler thread. Bottom: Provides a fireproof surface for the heat source.
Back Wall	50 cm x 100 cm	Stainless steel or thick sheet metal	Maximizes visual contrast so the red liquid inside the bulb is highly visible.

Sprinkler Mounting & Setup

- **The Mount:** Drill a hole in the center of the top metal plate. Weld or securely bolt a 1-inch or 1/2-inch NPT pipe coupling (matching your dry sprinkler thread size) to the top plate.
- **Installation:** Screw the dry sprinkler head into the coupling from the inside of the cell. Ensure it points downward just as it would in a real ceiling grid.
- **Open Front:** Keep the front face of the cell entirely open. This serves two purposes: it allows you to introduce the heat source safely and provides an exhaust route for smoke.

How to Conduct the Demonstration

- **The Heat Source:** Use a small portable butane torch or a high-wattage industrial heat gun. Avoid using large open wood or paper fires, as they create excessive soot that will instantly cloud your viewing windows.
- **The Test:** Aim the heat source from the open front toward the ceiling of the enclosure, letting the heat naturally rise and engulf the sprinkler deflector and bulb.
- **The Activation:** Within 15 to 45 seconds (depending on whether it is a quick-response or standard-response bulb), the liquid inside the glass bulb will expand, fracturing the glass with a distinct pop and releasing the pip cap.

Safety Protocols

- **PPE Required:** The presenter and anyone within 3 meters must wear safety glasses (in case the bulb fragments project outward) and heat-resistant gloves.
- **Ventilation:** Conduct this test outdoors or inside a well-ventilated room.

