



TORONTECH

SAFETY HELMET FLAME RETARDANT TESTER



Safety Helmet Flame Retardant Tester - ToronFT™ FR-SHP

ToronFT™ FR-SHP Safety Helmet Flame Retardant Tester is a specialized laboratory instrument designed to evaluate the flame retardant performance of industrial safety helmets under controlled flame exposure conditions. Safety helmets used in fire-risk industrial environments — including construction, oil and gas, forestry, and rescue operations — must demonstrate adequate flame retardant resistance to protect workers from direct flame contact and radiant heat exposure.

The ToronFT™ FR-SHP features a precision burning box with a volume of 20.5 m³ processed by CNC machine tools, a controlled fuel supply system with a flame injection head, an integrated high-performance exhaust and smoke extraction system, and a built-in timer — providing a complete, standardized platform for safety helmet flame retardant qualification testing. It is designed to meet the requirements of applicable international safety helmet flammability standards.

APPLICATIONS

Safety Helmet Flame Retardant Tester - ToronFT™ FR-SHP Applications

The ToronFT™ FR-SHP is applicable for flame retardant performance testing of:

- Industrial safety helmets for fire-risk work environments including construction, oil refining, petrochemical, and manufacturing industries
- Forestry safety helmets requiring flame retardant performance qualification for wildland firefighting and forest management applications
- Rescue and emergency response safety helmets for flame retardant certification
- New safety helmet designs and material formulations during product development and flame retardant optimization
- Quality assurance and production batch testing of safety helmet flame retardant performance

- Certification and type-testing of industrial safety helmets for flame retardant compliance with international personal protective equipment (PPE) standards



Standards

The ToronFT™ FR-SHP is designed to meet the flame retardant performance test requirements of the following international standards:

- EN 397: Industrial safety helmets: Specifications, including optional flame retardant test
- EN 443: Helmets for fire fighting in buildings and other structures
- ISO 3873: Industrial safety helmets: Specification
- ANSI/ISEA Z89.1: American National Standard for Industrial Head Protection
- NFPA 1971: Standard on Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting

FEATURES

Safety Helmet Flame Retardant Tester - ToronFT™ FR-SHP Key Features

- Complete integrated safety helmet flame retardant test system — burning box, bracket, dual timer system, flame injection head, fuel supply device, and fuel composition — providing a fully self-contained flame retardant performance test platform
- Large CNC-machined burning box with a volume of 20.5 m³ and a beautiful arc-shaped form — constructed from high-quality steel plate with electrostatic sprayed high-temperature baking paint for long-term durability, corrosion resistance, and rust prevention
- Powerful ventilation and smoke exhaust system mounted at the top of the burning box safely discharges combustion gases to the outside after each flame retardant test; the exhaust system remains in a stopped state during testing to maintain the standardized calm-air conditions required for accurate results
- Controlled fuel supply device and precision flame injection head deliver a standardized, reproducible flame to the safety helmet specimen for consistent and traceable flame retardant performance testing

- Dual integrated timer system provides independent timing of flame application duration and afterflame/afterglow periods — essential parameters in safety helmet flame retardant test reporting
- Complies with EN 397, EN 443, ISO 3873, and ANSI/ISEA Z89.1, providing internationally recognized flame retardant performance test results for safety helmet certification in North American and global markets

THEORY & METHOD

Theory and Method

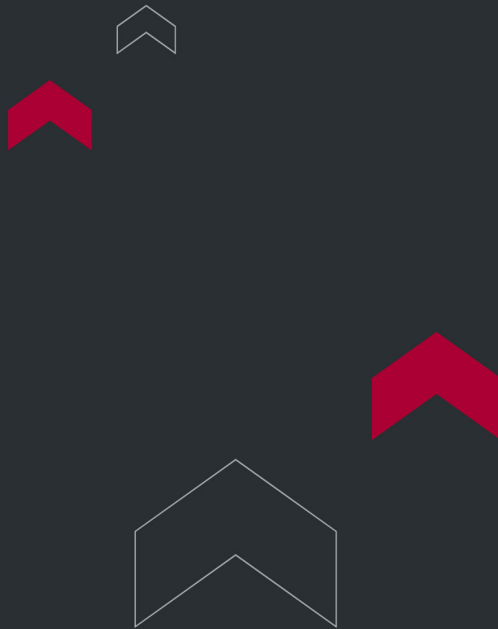
Safety helmet flame retardant testing evaluates the resistance of the helmet shell and its components to ignition, flame propagation, and continued burning when exposed to a direct flame for a specified duration. The test determines whether the helmet shell exhibits acceptable flame retardant behavior — specifically, that it does not continue to burn beyond a defined time after the ignition source is removed, and that it does not drip burning material.

In the ToronFT™ FR-SHP, the safety helmet specimen is positioned on the bracket inside the sealed burning box. The fuel supply device delivers fuel to the flame injection head, which applies the standardized flame to the helmet for the specified exposure duration. The integrated timer controls and records the flame application and afterflame periods precisely. The powerful exhaust and smoke extraction system on top of the box operates in a stopped (standby) state during the flame retardant test to maintain the required calm-air test environment, and automatically activates after test completion to safely discharge combustion gases to the outside.

TECHNICAL SPECIFICATIONS

Safety Helmet Flame Retardant Tester - ToronFT™ FR-SHP Technical Specifications

Parameter	Specification
Model	ToronFT™ FR-SHP
Product Name	Safety Helmet Flame Retardant Tester — ToronFT™ FR-SHP
Instrument Components	Burning box, bracket, timer (×2), flame injection head, fuel supply device, fuel composition
Burning Box Volume	20.5 m³
Burning Box Construction	CNC-processed arc shape; high-quality steel plate; electrostatic sprayed high-temperature baking paint
Exhaust System	Powerful ventilation and smoke exhaust at top; discharges to outdoors; stopped state during test
Flame Source	Fuel-fed flame injection head with controlled fuel supply device
Timer	Dual timer — flame application and afterflame/afterglow
Compliance Standards	EN 397; EN 443; ISO 3873; ANSI/ISEA Z89.1



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