

AIRCRAFT AIRBORNE EQUIPMENT FIRE RESISTANCE TESTER



Aircraft Airborne Equipment Fire Resistance Tester — ToronFT™ AAE

ToronFT™ AAE Aircraft Airborne Equipment Fire Resistance Tester is a precision fire resistance and flammability testing instrument designed for the qualification of equipment installed on fixed-wing propeller aircraft, fixed-wing turbojet aircraft, turbofan aircraft, and helicopters. Fully compliant with RTCA DO-160G and CCAR25-R4 standard requirements, the ToronFT™ AAE provides the precisely controlled high-temperature flame exposure, real-time surface temperature monitoring, burner calibration, and heat flow density measurement infrastructure required for comprehensive aircraft airborne equipment fire resistance certification.

The aircraft airborne equipment fire resistance tester integrates Ni-Cr or Ni-Al type surface thermocouples (outer diameter ≤ 3 mm), a rake thermocouple burner assembly (minimum 7 channels, 100 mm from burner face), water-cooled copper tube Gardon heat flow density sensors (380 mm long, 12–13 mm diameter), a 16-bit high-precision microcomputer control board, and a triple-layer safety protection system — all operated at the standard burner temperature of $1100^{\circ}\text{C} \pm 80^{\circ}\text{C}$ with a minimum three-minute pre-stabilization requirement.

APPLICATIONS

Aircraft Airborne Equipment Fire Resistance Tester — ToronFT™ AAE

Applications

- Aircraft equipment and avionics manufacturers: fire resistance and flammability qualification for airborne equipment across all aircraft type categories
- Aerospace OEM quality assurance departments: incoming material and component fire resistance verification for airborne equipment type certification programs

- Third-party aviation fire testing and certification laboratories: RTCA DO-160G Category F fire resistance testing for airborne equipment approval
- Aviation regulatory compliance programs: fire resistance qualification for FAA type certificate and EASA approval submissions
- R&D departments: evaluation of new avionics enclosure materials, fire-resistant coatings, and thermal protection systems under standardized high-temperature flame exposure



Standards

The ToronFT™ AAE supports aircraft airborne equipment fire resistance testing in compliance with internationally recognized aviation fire safety standards, including:

- RTCA DO-160G: Environmental conditions and test procedures for airborne equipment — Section 26: Fire flammability
- CCAR-25-R4: Civil aviation administration of China airworthiness standards (equivalent to FAR Part 25)

FEATURES

Aircraft Airborne Equipment Fire Resistance Tester — ToronFT™ AAE Key Features

- Suitable for fire resistance and flammability testing of airborne equipment on fixed-wing propeller, turbojet, turbofan aircraft, and helicopters
- Surface temperature measurement: Ni-Cr or Ni-Al thermocouples; outer diameter ≤ 3 mm; sensing wire diameter 0.6–1.0 mm — precise, minimally intrusive specimen surface temperature monitoring
- Rake thermocouple burner assembly: minimum 7 measurement channels; 100 mm from burner face — comprehensive burner temperature distribution verification
- Standard burner temperature: $1100^{\circ}\text{C} \pm 80^{\circ}\text{C}$; pre-stabilized with data collected every ≥ 30 s for minimum 3 minutes before test start
- Heat flow density measurement: water-cooled copper tube Gardon sensor; 380 mm long, 12–13 mm diameter; adjustable cooling water flow; steel wool pre-cleaning of water path before calibration
- Triple-layer safety protection: power overload protection, short circuit protection, control loop overload protection
- 16-bit high-precision microcomputer control: stable performance, reasonable structure, easy operation
- Real-time result display during test; dynamic performance curve drawn continuously; data permanently saved, retrievable, printable, and report-ready

- Compliant with RTCA DO-160G Section 26 and CCAR25-R4 — the primary aviation authority fire resistance standards for airborne equipment

THEORY & METHOD

Theory and Method

Aircraft airborne equipment fire resistance testing subjects the equipment specimen to direct flame from a standardized hydrocarbon burner at $1100^{\circ}\text{C} \pm 80^{\circ}\text{C}$ — replicating the fire zone thermal attack specified by RTCA DO-160G Section 26. The surface temperature of the specimen is continuously monitored using Ni-Cr or Ni-Al type thermocouples (outer diameter ≤ 3 mm; temperature-sensing wire diameter 0.6–1.0 mm), which can monitor specimen surface temperatures throughout the exposure period without interfering with the flame.

The rake thermocouple assembly (minimum 7 channels, positioned 100 mm from the burner face) measures the burner temperature distribution to verify that the $1100^{\circ}\text{C} \pm 80^{\circ}\text{C}$ flame condition is achieved and maintained across the full flame cross-section. Temperature data is collected at intervals of at least every 30 seconds for a minimum of three minutes before the test begins, confirming that steady-state burner conditions are fully established. Heat flow density is measured using water-cooled copper tube Gardon sensors (380 mm long, 12–13 mm diameter); high-quality steel wool cleans the copper tube cooling water path before calibration; cooling water flow is adjustable. Sensor geometric specifications and installation configurations follow Figures 5 and 6 of the applicable standard.

TECHNICAL SPECIFICATIONS

Aircraft Airborne Equipment Fire Resistance Tester — ToronFT™ AAE Technical Specifications

Parameter	Specification
Applicable Aircraft Types	Fixed-wing propeller, turbojet, turbofan, helicopter
Surface Thermocouple Type	Ni-Cr or Ni-Al; OD $\leq$ 3 mm; sensing wire 0.6–1.0 mm
Rake Thermocouple Channels	Minimum 7; positioned 100 mm from burner face
Standard Burner Temperature	1100°C $\pm$ 80°C
Pre-Test Stabilization	Data every $\geq$ 30 s for minimum 3 minutes before test
Heat Flow Sensor Type	Water-cooled copper tube Gardon sensor
Copper Tube Dimensions	380 mm long, 12–13 mm diameter
Safety Protections (3 layers)	Power overload, short circuit, control loop overload
Control System	16-bit high-precision microcomputer
Data Output	Real-time display; dynamic curve; permanently saved; printable; report-ready
Standard Compliance	RTCA DO-160G Section 26; CCAR25-R4



Torontech Inc.

251 Consumers Road, Suite 1200
Toronto, Ontario, M2J 4R3, Canada 

Phone: +1 416 368 2721 | Fax: +1 416 981 7652
Email: info@torontech.com

Torontech, LLC

601 Brickell Key Drive, Suite 700
Miami, FL 33131, USA 

Toll-Free: 1-866-383-7919
Email: sales@torontech.com

Torontech ME FZE

Meydan Grandstand, 6th Floor,
Meydan Road, Nad Al Sheba,
Dubai-261440, UAE 

Phone: +971 488 19252
Email: me@torontech.com

