



## Major Advancement in Halon Bottle Recertification Uses Cost-Saving Acoustic Emission Test Method



The Halon Bottle Recertification System has a stainless steel, roll out shelf capable of holding Halon bottle and fixture up to 200 lbs.

### System Description

The *Halon Bottle Recertification System* (HBRS) is a dedicated product, designed for testing Halon 1301 fire extinguisher spheres from 5 to 16 inches in diameter. Conceptually developed by the Sandia National Laboratory, funded by FAA's aging aircraft initiative and fully developed by Physical Acoustics Corporation (PAC), the system consists of state-of-the-art Acoustic Emission (AE) instrumentation and application-specific software.

**Technical Superiority to the Traditional Hydrostatic Test Method** - Offering significant advantages over the traditional method, the HBRS detects smaller and more damaging "crack-like" flaws, as well as interior corrosion. As the temperature rises in the test chamber, stress in the metal wall is increased above normal service pressure. This results in the emission of stress waves indicative of minute flaws/corrosion within the bottle. The system detects and analyzes these waves to provide a pass/fail result.

**Minimum Bottle Handling** - The greatest financial advantage resulting from this test procedure is in decreased bottle handling. After removal from the aircraft, the Halon bottle is recertified immediately and returned to the aircraft. Signifi-

cant cost savings are gained from a reduction of inventory and inventory-related record keeping because the Halon is not removed from the container. Depending on the size of the bottle, the actual test procedure takes an average of only 30 minutes.

### Automated Test Procedure

- Load bottle in fixture, and slide into test chamber
- Document bottle serial number and information
- Initiate automatic test
- The system then:
  - Performs auto calibration
  - Initiates temperature cycle
  - Collects and interprets data
  - Provides pass/fail results
  - Completes test through chamber shutdown
- Remove fixture and return bottle to service or maintenance as required

**Bottles Never Cut Open** - A major drawback to the traditional hydrostatic test procedure is that the bottle must be cut open and the Halon removed prior to hydro testing. The Halon must then be purified before it can be replaced into the bottle. The rewelding process, which can only be conducted 3 times in the life of the bottle, offers an additional opportunity to introduce flaws. The new test procedure eliminates these drawbacks and does not damage or limit the life of the bottle in any way.



The Halon bottle fixture has a welded steel frame with flip-open top clamshell. 6 spring-loaded sensor rods (12" long) with sensors and coupling pad at end make contact with the Halon bottle when placed in the fixture.

**Automatic Paper Report Generation and Disk File Storage** - Report generation and record keeping

is an important part of any regulated DOT recertification test procedure and is subject to periodic audit. Because the new test procedure is carried out under computer control, the test report is automatically printed at the conclusion of the test sequence. Additionally, the raw data is automatically stored for archiving multiple test data files.

## System Components

The System is a “turnkey” package capable of performing the entire test automatically, with minimal operator involvement or data interpretation. It consists of two main parts, the Test Chamber and the Operator Console.

The **Test Chamber** is essentially a high-precision industrial oven with the following specifications:

- Overall dimensions of 48" wide by 68" deep by 80" high
- Interior test chamber area is 36" x 36" x 36" (1 cubic yd.)
- Overall shipping weight is approximately 1200 lbs
- Bottle test temperature range is 0 - 145°F
- Chamber heat-up rate is 0 - 145°F in 15 minutes (no load)
- Electrical requirements (*choose one*):
  - 230 V, 3 Phase, 60 Hz.; ~ 30 FLA **OR**
  - 460 V, 3 Phase, 60 Hz., ~ 15 FLA

A 200 lb. capacity slide-out tray in the Test Chamber holds the Halon bottle test fixture. The Halon bottle is inserted into this fixture, whose holding (or resting) points are the sensors used to detect AE signals during the test sequence. Sensor cables from the fixture are neatly routed through the side of the Test Chamber to the Operator Console.

A thermocouple is attached to the Halon bottle prior to the test. This thermocouple is also fed to an outside digital temperature meter, and a voltage indicative of the actual temperature is fed to the system console.

Because the bottles vary in size, from 5 to 16 inches in diameter, the test chamber and fixture are designed to accommodate the entire range, including all spherical 4DA and 4DS bottles. Non-spherical bottles can also be tested using a different fixture provided with the system.



Two fixtures are provided to accommodate to spherical or cylindrical halon bottles.

## Operator Console specifications include:

- 6 channels of acoustic emission
- PAC Nano-30 Sensors are attached to special sensor holders
- AC Power Requirements: 115 VAC, single phase, 5 Amps (~ 600 watts)
- Overall dimensions are 53" high (with wheels), 22.5" wide and 23" deep
- Overall weight is approximately 120 lbs

## System Support

**On-Site System Support** - Due to the high cost of down time, we provide service and calibration on-site.

MISTRAS is a team of skilled researchers, engineers, technicians and manufacturing personnel dedicated to the development of practical and cost saving solutions for your challenging inspection and monitoring needs.

For additional information, please contact our Princeton Junction headquarters at 609-716-4000

195 Clarksville Road, Princeton Junction, NJ 08550 USA  
Phone: (609) 716-4000 • Fax: (609) 716-0706  
Email: [sales.systems@mistrasgroup.com](mailto:sales.systems@mistrasgroup.com) • [www.mistrasgroup.com](http://www.mistrasgroup.com)