

There is no general method to evaluate Duration of Protection with Aerosol compounds – as such fan integrity testing is not applicable to Aerosol Fire Systems. Each manufacturer is to specify Maximum leakage allowed in the design calculations for each risk area.

**Extract from AS4487-2013 Clause 7.6 – Duration of Protection**

“Due to the specific characteristics of the extinction process of condensed aerosols that primarily produce particulates, no method is known to evaluate the hold time in real installations, other than real discharge which is not practical. For this reason, a specific test is required for each aerosol formulation to determine the maximum leakage area to volume ratio that provides for the minimum hold time declared by the manufacturer. The approach for determining hold time is detailed in Appendix E, Paragraph E7.”

**Background**

The board of experts at the ISO TC21 SC8 (Gaseous Media and Fire Fighting Systems Using Gas) and the working group in charge to develop the ISO 15779 Standard for condensed aerosol extinguishing systems, after a long debate recognized the impossibility to measure accurately the resulting aerosol agent density generated by the solid compound reaction, due to the aerosol extinguishing agent specific characteristics (micro solid particles, the active agent, carried by a gas), thus the impossibility to derive a formula of leakage compensation.

The door fan test applied for gas agents, which is linked to a formula correlating the pressure upon discharge and the quantity of gas escaped as per leakage area, it is only applicable for measurable gaseous agents.

Aerosol agents’ density is not measurable.

The only way to address this issue is to run experimental tests (for the specific aerosol technology) and derive the leakage compensation ratio versus different leakage areas. ISO 15779 Standard defines the test protocol at Section D7: Test of the determination of the maximum leakage area/volume ratio.

FirePro have applied a leakage area after a number of tests with different fire scenarios, especially the ones run for the UL listing test program, witnessed by UL. The standard sealed test room of 100 m3 volume had a venting opening of 0.3m x 0.2m (one way flap) and the measured pressure was equivalent to 174 Pa, or 0.025 psi or 0.0017 bar.

The tests run with the opening were using the extinguishing application density but in the real projects the design application density is applied (which is 30 % higher than the extinguishing density), the additional safety factor ensures that the leakage area indicated will not affect the extinguishing performance.

For existing installations using Aerosol Systems leakage areas should be reviewed against the Maximum Leakage Allowance as disclosed on the Design Calculations. Any changes or modifications to the risk area should be analysed to determine if the system will perform as designed.

CERTIFICATION	GENERAL APPLICATION	
CLIENT NAME		
Risk Description		
Constructed from		
Classes of Fire	<input checked="" type="checkbox"/> Class A <input checked="" type="checkbox"/> Class B <input checked="" type="checkbox"/> Class E <input type="checkbox"/> Class D <input type="checkbox"/> Class F	
STREAM (m)		
GROSS DIMENSIONS (All in Meters)	Length	10.00
	Width	5.00
	Height	2.00
	Enter VOLUME	Not Used
	Actual Leakage Measurement - m <sup>2</sup>	
	Leakage Allowance without additional Agent	0.20 m <sup>2</sup>
	GROSS Volume used for Calculation	100.00 m <sup>3</sup>
	PRIMARY AGENT DISCHARGE	10,920 g
	Secondary Agent Discharge	- g

