Redefining Aerosol Leak Detection with Speed, Accuracy & Reliability
Aerosol manufacturers are looking to improve safety, lower risk, and increase quality while ensuring compliance and profitability of their production lines.

What if you could...

**Increase Safety and Reduce Risk**
- Perform complete can testing and remove the risk of faulty cans remaining in production, going to the storage facility or being released for transport.
- Implement rapid detection and rejection of all different aerosol can shapes, sized, and materials of construction.
- Guarantee accurate, reliable, and instant identification of a wide range of aerosol propellants.

**Optimize Production and Reduce Waste**
- Provide your operators with easy-to-use software for insight into can rejection rates and patterns to troubleshoot the production line.
- Instantly provide complete visibility of production data and batch quantities.
- Leverage remote diagnostics, system integration, and configurable alarms to support your manufacturing needs.

**Improve Regulatory and Quality Compliance**
- Maximize production output with 20-millisecond leak detection analysis time for up to 600 cans per minute.
- Avoid product recalls with reliable and automated can rejection and alarm capabilities.

**Ensure Regulatory and Quality Compliance**
- Meet, or exceed, industry and brand owner regulations and standards with Quantum Cascade Laser Technology.
- Implement a modular system to support easy field upgrades to measure new propellants.
- Leverage independently certified leak detection performance.
Quantum Cascade Leak Detection Systems

Emerson’s Cascade™ Aerosol Micro Leak Detection Systems leverage Quantum Cascade Laser (QCL) Technology to deliver the most sophisticated leak detection solution available today.

**Instantaneous Aerosol Leak Detection Analysis**
Using Quantum Cascade Laser (QCL) technology, with patent laser chirp technique, a leak from any can is detected and rejected instantaneously as it passes through the system.

As cans pass under the sample arch, any leaking propellant is drawn into the sample cell where the QCL pulses at high frequencies (up to 100 KHz) in the mid-infrared to identify any released propellant aerosol gases. Software analyzes the resulting concentration profile to identify leaks in real time. If a leak is indicated, a signal instantly rejects the leaking can out of the production line. The system is certified to perform leak detection on productions lines up to 600 cans per minute.

<table>
<thead>
<tr>
<th>Features</th>
<th>Benefits</th>
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<tbody>
<tr>
<td>Quantum Cascade Laser detection technology</td>
<td>Realize true savings from a more powerful device that gives greater process insight and analysis.</td>
</tr>
<tr>
<td>Easy-to-use operating software</td>
<td>Reduce waste and optimize operations with clear diagnostic data and production line performance information.</td>
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<tr>
<td>Fully-compliant and easily-upgradeable system</td>
<td>Ensure adherence to quality and safety requirements with advanced technology in a modular, rugged design.</td>
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<tr>
<td>Complete service and support</td>
<td>Simplify installation, commissioning, upgrades, and any required maintenance with available lifecycle services and support.</td>
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**Broad Range of Applications**
Multi-component detection system helps eliminate risk and improve profitability for manufacturers around the world.

**Process Industries**
- Personal Care
- Automotive and Industrial
- Paints
- Household
- Food
- Medical

**Propellants**
- Propane
- Butane
- LPG
- N₂O
- CO₂
- DME
- R1234ze, R134a, R227
- Others on request
Advantages of Cascade™ Technology

Increase Safety and Reduce Risk
Faulty cans that leave production and are stored, transported or sold to customers are at risk of releasing flammable or explosive gases or liquids.

Cascade™ Aerosol Micro Leak Detection Systems offer 100% can testing and accuracy regardless of the shape, size or material of construction.

Testing all can failure points (valves, crimps, tri-weld and seams), operators can rest assured that any faulty can will be removed from the moving production line. The system can alarm if multiple leaking cans are detected, prompting intervention.

Complete Can Analysis
- Valves
- Crimps
- Tri-Weld
- Seams

Optimize Production and Reduce Waste
With the ability to easily monitor aerosol production in real-time, manufacturers are assured that waste is minimized and production optimized.

Cascade™ Aerosol Micro Leak Detection Systems give valuable insight to allow for continuous improvement and increased operating margins.

- Complete visibility of production data, batch quantities, and cans rejected
- Tiered security settings for operators and engineers
- Reporting capabilities
- Data logging for process trend analysis and discrete measurement data
- Configurable alarm outputs for seamless integration with existing processes
- Easy-Automated system level health diagnostics for immediate fault identification and resolution

Improve Control and Prevent Recalls
Whether producing own-label products or manufacturing for another brand, high quality output is critical to avoid costly product recalls, prevent brand reputation damage, and ensure profitability.

Cascade™ Aerosol Micro Leak Detection Systems with patented QCL technology instantly detects, identifies, and rejects leaking cans at speeds of up to 600 cans per minute as they travel through the production line. The easy-to-use operator interface helps manufacturers identify patterns and trends for advanced analysis and process improvements.
Emerson’s Cascade™ Micro Leak Detection System is independently certified for use as part of a water bath alternative solution

**Ensure Regulatory Compliance**

Cascade™ Aerosol Micro Leak Detection Systems are fully compliant with all existing industry regulations, including UN ADR and DOT among others.

Due to the modular design, the leak detection systems support simple upgrades for future propellants and levels of sensitivity.

Emerson’s Cascade Aerosol Micro Leak Detection Systems can be installed as a water bath alternative leak test or can be installed in addition to the water bath test. Either way, aerosol manufacturers will quickly realize quality improvements.

### Water Bath Alternative Option

- Gas House
- Crimping
- Filling
- Empty can loading
- Checkweigh (weight test)
- Micro Leak (leak test)
- Button placement
- Cap placement
- Palletisation
- Labelling

**Water Bath Alternative Detection Limits**

- $2 \times 10^{-3}$ mbarLs$^{-1}$
- 1 bubble / 5 sec at 20 °C

**Requirements**

- All production lines

### Post Water Bath Option

- Gas House
- Crimping
- Filling
- Empty can loading
- Checkweigh (weight test)
- Waterbath (burst test)
- Boxing
- Labelling
- Micro Leak (leak test)
- Button placement
- Cap placement
- Palletisation

**Post Water Bath Alternative Detection Limits**

- $8 \times 10^{-3}$ mbarLs$^{-1}$
- 1 bubble / sec at 50 °C

**Requirements**

- Production lines faster than 60 cans per minute
Flexible Configuration Options

Cascade™ Aerosol Micro Leak Detection Systems are offered in different configuration types to ensure alignment to your leak detection requirements.

<table>
<thead>
<tr>
<th>Configuration</th>
<th>Carbon</th>
<th>Gold</th>
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<tbody>
<tr>
<td>Line Speed – cans per minute (CPM)</td>
<td>220</td>
<td>600</td>
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**Standard Equipment**
- ATEX Zone 2 Leak Detector
- Interface to customer PLC / DCS
- Air preparation equipment
- Automated line speed compensation
- Configurable health system monitoring
- Programmable alarms
- Automated mirror cleaning
- Reject verification

**Specifications**

**IR Source**
Quantum Cascade Laser

**Performance**
- **Sensitivity**
  - Standard: $8 \times 10^{-3}$ mbarLs
  - Water bath alternative: $2 \times 10^{-3}$ mbarLs
- **Line speed**
  - Up to 600 cans per minute
- **Can dimensions**
  - Up to Height: 350 mm (14 in.), Diameter: 80 mm (3 in.), Others on request
- **Response time**
  - 20 ms

**Environmental**
- **Ambient temperature range**
  - 10 to 40 °C (50 to 104 °F)
- **Control console size**
  - Height x Width x Depth: 1200 x 600 x 560 mm (47 x 24 x 22 in.)
- **Sensor head size**
  - Height x Width x Depth: 590 x 330 x 330 mm (23 x 13 x 13 in.)
- **Max factory air consumption**
  - 25 L/min approximately on regular usage
- **Factory compressed air pressure**
  - 8–10 bar, clean, dry, and oil free
- **Line space requirement**
  - 1.6 m (5.2 ft) straight free line (maximum)

**Utilities**
- **Air supply**
  - 25 L/min, 8–10 bar
- **System operating voltage**
  - 110–124 Vac 50–60 Hz, specify on order
- **System power consumption**
  - 1 kW maximum power requirement

**Certifications**
- **Laser Certifications**
  - Class 1
  - BS EN 60825-1: 2007 Safety of Laser products
  - Equipment classification and requirements (Identical to IEC 60825-1: 2007)
- **Hazardous area classification**
  - Ex II 3G nR II T6 (10 °C ≤ $T_{\text{amb}}$ ≤ 40 °C)
Cascade™ Aerosol Micro Leak Detection Systems are designed to keep your operation running smoothly and effectively without interruption. Whether installed on a new or within an existing line, little or no down time is needed to get production moving.

**Lifecycle Service & Support**

The Emerson team of trained and certified experts provide complete solutions and problem-solving support to ensure continuous, high-performance operation of Cascade™ Leak Detection Systems.

Whether you require consultation on installation options, full installation support, maintenance, troubleshooting, or on-site technician training, Emerson is your service and support partner.

Count on Emerson for a full range of services, including:

- Installation
- Start-up and commissioning
- Remote system monitoring
- Scheduled maintenance
- Field retrofits
- System upgrades
- On-site training and support
- On-call support

**Other Cascade™ Micro Leak Detection Systems**

**Modified Atmosphere Packaging Food Leak Detection System**

- 100% online testing for CO₂ leaks from Modified Atmosphere packaging
- Reduce waste, minimize rework, and decrease product recalls

**Pressurized Metered-Dose Inhaler (pMDI) Leak Detection System**

- Online leak detection system with proven capabilities
- Compliant with cGMP regulatory guidelines to improve product quality and reduce waste

**LOCAL SUPPORT | GLOBAL REACH**

150+ Countries Supported

- Headquarters
- Regional Offices
Achieve unmatched quality and compliance with automated, in-line leak detection.

The drawing above represents the recommended production line layout for a typical aerosol filling line incorporating the Cascade™ Aerosol Micro Leak Detection system, in line with UN ADR requirements.