



Balanced & cost effective approach for low GWP flammable refrigerant certification

A UL/C-UL Recognition for ignition-protected components for use in flammable refrigerant systems offers confidence to the OEM that their component selection will streamline the overall certification of their product.



Flammable refrigerant use in the HVAC/R industry

The use of flammable refrigerants like R600a (Isobutane), R290 (Propane), Ethane, and hydrocarbon blends like R32 and R441 are increasing due to their low global warming potential (GWP), environmental impact and excellent thermodynamic performance. These hydrocarbon refrigerants are flammable gases that fall under Hazardous Location Gas Group IIA (Zone system), and Group D (Class/Division system) due to the risk of explosion in the event of a refrigerant leak. Because of this explosion risk, care must be taken in the selection of components for use in equipment utilizing R600a, R290, R32, R441 and other hydrocarbon blends to help ensure that the components are ignition-protected.

To assist the industry in the selection of components for use in systems utilizing these refrigerants, UL has created a new product category, "Ignition-protected Components for Use in Refrigeration and Air-conditioning Equipment." This category specifically addresses the need for a balanced approach to certification and provides critical material/design traceability without necessitating the need for full HazLoc certification, but is more robust than a letter of test results., This approach is quicker, more cost efficient for this specific application and helps keep intellectual property private.

UL and C-UL Recognition

This product category will be used specifically for refrigeration/air-conditioning components, e.g., switches, relays, DC motors, etc., to be evaluated as safe in the presence of flammable refrigerants. Currently, UL is the only NRTL offering this solution for the refrigeration/HVAC industry.

Evaluation and Testing:

- Ordinary Location requirements – Certification for risks associated with shock, fire and personal injury do not change and are covered by the existing UL file.
- Ignition-protection requirements – Testing conducted from a variety of standards including UL/CSA and IEC .
 - Utilizing existing ATEX and IECEx evaluations for other product categories can help to further streamline certification for new this product category.

The tests currently could include:

- Sealed device test
- Non-incendive component test
- Enclosed break / flameproof “dc” test
- Non-incendive analysis / spark Ignition test
- This category provides critical material/design traceability, but does not necessitate all the Hazardous Location specific NEC/CEC installation/marketing/temperature requirements.
- Subject to quarterly inspections in accordance with OSHA and SCC regulations.

Protection Concept Standards**Non-Sparking:**

- Per Standard UL/CSA/IEC 60079-15 (2010), or
- Per Standard ISA 12.12.01/UL 121201, or
- Per Standard UL/CSA/IEC 60079-7 “ec”

Sealed / Hermetically sealed:

- Per Standard ISA 12.12.01/UL 121201, or
- Per Standard UL/CSA/IEC 60079-15 (2010), or
- Per Standard UL/CSA/IEC 60079-15 (2017).

Non-incendive Component:

- Per Standard ISA 12.12.01/UL 121201, or
- Per Standard UL/CSA/IEC 60079-15

Non-incendive Circuit or Intrinsically Safe Circuit:

- Per Standard ISA 12.12.01/UL 121201, or by
- Per Standard UL/CSA/IEC 60079-11

Enclosed-break / Flameproof:

- Per Standard ISA 12.12.01/UL 121201

Why choose UL?

With over 100 years of experience in explosion protection, UL drives global research and standards to continually advance and meet ever-evolving product safety, performance and interoperability needs. UL’s global network of technical experts and state-of-the-art facilities, along with our longstanding relationships with regulatory authorities, partner laboratories and industry technical leaders, helps manufacturers gain the compliance credentials they need to compete in a more complex global supply chain.

Knowledge you can trust

Our experienced staff advises you from the initial design stage of product development through testing and production for your specific market.

Speed and efficiency

Leverage our HazLoc experience early in the design phase. We have technical expertise versed in all protection methods with comprehensive industry knowledge that translates into actionable business efficiencies for our customers to speed time to market.

Global reach and access

Our global network of expert HazLoc engineers helps you understand the various national and global requirements, as well as create standards based on industry demands. Leverage UL’s active participation and leadership in the global standards writing process. You can benefit with faster time to a global marketplace with the UL certification process, not only do we understand the requirements - we helped develop them. In fact, we participate in over 50 standards writing committees, including TC31 (IECEX), STP (North America), NFPA, API and BSEE, and CFR committees.

To learn more, call 1.877.854.3577, visit us at UL.com/HazLoc or email: HazLoc@ul.com.



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