A2L GUIDE

Understanding the A2L Changeover for Commercial Refrigeration

WHY ARE A2L REFRIGERANTS REQUIRED BY 2026?

The transition to A2L refrigerants in commercial refrigeration is driven by global and domestic efforts to reduce the environmental impact of high-GWP (Global Warming Potential) refrigerants. The Kigali Amendment to the Montreal Protocol mandates the phasedown of HFCs like R-404A and R-134a. In the U.S., the AIM Act (American Innovation and Manufacturing Act) requires significant reductions in the use of HFCs by 2024, with further restrictions coming in 2026. This impacts all sectors, including commercial refrigeration, which must shift to low-GWP alternatives such as A2Ls.

TRANSITION TO LOW-GWP REFRIGERANTS BY 2026:

By January 1, 2026, all new commercial refrigeration systems must utilize low-GWP refrigerants, such as the mildly flammable A2L category, instead of high-GWP options like R-404A. After this date, the production and importation of high-GWP refrigerants will be heavily restricted, affecting both the installation of new systems and maintenance of older systems.

COMPLIANCE BY INSTALLATION DATE

To meet the EPA's compliance standards under the AIM Act, it is essential to understand that compliance hinges on the installation date. Specifically, the EPA defines "installation" as the point at which a field-assembled system's circuit is completed, fully charged, and capable of functioning for its intended purpose. This means that any new commercial refrigeration system designed to use HFC refrigerants must be installed and fully operational before January 1, 2026. After January 1, 2026 any new commercial refrigeration system must be designed to use the new low-GWP (A2L) refrigerants.

WHAT ARE THE KEY DIFFERENCES BETWEEN A2LS AND CURRENT REFRIGERANTS IN COMMERCIAL REFRIGERATION?

MILD FLAMMABILITY (A2L VS. A1):

A2L refrigerants are classified as mildly flammable, which distinguishes them from non-flammable A1 refrigerants like R-404A and R-134a. Although A2Ls have a lower risk of ignition, they still require specific safety precautions due to their mild flammability.

PERFORMANCE CHARACTERISTICS:

In commercial refrigeration, A2L refrigerants like R-454A offer similar cooling performance and efficiency to their HFC counterparts but operate at slightly different pressures. These refrigerants also have a much lower GWP, making them essential for regulatory compliance while maintaining energy efficiency.

HOW TO ENSURE SAFE HANDLING OF A2L REFRIGERANTS

SAFETY PROTOCOLS

When handling A2L refrigerants, it's critical to ensure proper ventilation in storage areas and avoid any ignition sources during maintenance or servicing. Install leak detection systems, and ensure technicians use tools rated for A2L refrigerants to reduce risks associated with their flammability.

BUILDING CODES & STANDARDS

Compliance with safety standards like ASHRAE 15 and UL 60335-2-89 is vital. These standards set forth safety systems, charge limits, and ventilation requirements for commercial refrigeration units that use A2Ls. For instance, ASHRAE 15 limits the amount of A2L refrigerant allowed in commercial applications, especially in confined spaces like walk-in freezers.

WHAT TRAINING IS NEEDED FOR REFRIGERATION TECHNICIANS?

Certification Requirements

While EPA Section 608 certification is necessary for handling refrigerants, additional training specific to A2Ls is recommended. This training covers safe handling, leak detection, and system pressure adjustments tailored for the refrigeration industry.

Ongoing Education

Industry organizations like AHRI and RSES offer specialized courses for A2Ls in commercial refrigeration, helping technicians stay current on best practices for safety and compliance.

HOW DO A2LS IMPACT INSURANCE AND LIABILITY IN COMMERCIAL REFRIGERATION?

Insurance Considerations

The introduction of A2L refrigerants into commercial refrigeration may require adjustments to your insurance policies, particularly for fire-related risks. It is important to inform your insurer of the transition to A2Ls and any associated changes to safety systems, which may impact your premiums or coverage.

Risk Management

Engage with insurers early to discuss safety measures such as advanced leak detection systems and emergency ventilation protocols, which can help reduce risks and mitigate potential liabilities.

SHOULD I RETROFIT EXISTING REFRIGERATION SYSTEMS OR INVEST IN NEW A2L-COMPATIBLE EQUIPMENT?

RETROFIT VS. REPLACEMENT

Retrofitting existing commercial refrigeration systems to use A2L refrigerants is generally not viable, as federal regulations prohibit the use of these refrigerants in retrofits for existing equipment. While older systems may still be serviced and repaired, including component replacements, they will remain incompatible with A2Ls. For customers aiming to transition to A2L-friendly systems, a full system replacement is recommended to ensure compliance and safety with current refrigerant standards.

MANUFACTURER GUIDANCE

Many refrigeration equipment manufacturers advise against retrofitting older systems due to the differences in pressure, safety requirements, and compatibility with A2L refrigerants. Investing in new, A2L-compatible refrigeration systems may be the better long-term strategy for compliance and operational efficiency.

WHAT IS THE ROI ON A2L REFRIGERATION SYSTEMS?

INITIAL COSTS VS. LONG-TERM SAVINGS

Commercial refrigeration systems designed for A2L refrigerants may have higher upfront costs due to safety upgrades, like enhanced leak detection and ventilation. However, A2L systems often provide 5-10% energy savings compared to legacy HFC systems, which can offset initial investments over time.

EFFICIENCY GAINS

Refrigerants like R-454A and R-1234yf offer improved energy efficiency in commercial applications, providing not only compliance but also cost savings through reduced energy consumption.

HOW CAN I PREPARE FOR SUPPLY CHAIN CHALLENGES IN THE REFRIGERATION SECTOR?

- **Availability of A2L Systems and Parts:** As the 2026 deadline approaches, demand for A2L-compatible refrigeration equipment and parts is expected to rise. It's important to establish relationships with trusted suppliers early and plan for potential lead times to ensure timely installation and upgrades.
- **Planning Ahead:** Begin sourcing A2L refrigeration systems and parts well before the 2026 deadline to avoid delays due to supply chain bottlenecks, ensuring smooth transitions and minimizing disruptions to your operations.

WHAT DO I NEED TO CONSIDER FOR NEW BUILD REFRIGERATION CONSTRUCTION?

- **Designing for A2L Compliance**: When designing new commercial refrigeration systems, ensure the facility accommodates A2L refrigerants from the outset. This includes proper ventilation, leak detection systems, and accessible maintenance points.
- **Collaboration with Building Inspectors:** Early collaboration with local inspectors will help ensure your system design meets the latest safety standards for A2L refrigerants, reducing the risk of construction delays or approval issues.

WHAT ARE THE PENALTIES FOR NON-COMPLIANCE IN REFRIGERATION?

Failure to comply with A2L refrigerant regulations could lead to fines, restrictions on equipment use, or even forced shutdowns. These penalties may vary depending on enforcement by agencies like the EPA.

Maintain detailed records of refrigerant use, technician certifications, and safety inspections to ensure compliance during audits or inspections.

CHOOSING THE RIGHT A2L REFRIGERANTS FOR COMMERCIAL REFRIGERATION

COMPARISON OF POPULAR A2L OPTIONS:

- R-454A: Ideal for commercial refrigeration due to its balance of efficiency and low GWP, making it suitable for various commercial applications.
- R-1234yf: Often used in smaller refrigeration systems and specialized applications due to its very low GWP.

ENVIRONMENTAL IMPACT:

A2L refrigerants such as R-454A and R-1234yf offer significant reductions in GWP compared to older HFCs like R-404A, contributing to a lower overall carbon footprint.

HOW TO ENSURE SAFE HANDLING OF A2L REFRIGERANTS

TECHNICAL ASSISTANCE:

Leading refrigeration manufacturers offer installation guides, technical support, and training specific to A2L refrigerants. These resources can assist contractors and technicians in ensuring proper installation and compliance.

INCENTIVES AND REBATES:

Some utilities and manufacturers offer rebates or incentives for upgrading to energy-efficient A2L-compatible refrigeration systems. Check with local energy offices and suppliers for available programs.

QUICK REFERENCE CHECKLIST FOR TRANSITIONING TO A2L REFRIGERANTS IN COMMERCIAL REFRIGERATION

- **Review Compliance Deadlines and Requirements**
  Confirm that you fully understand all EPA requirements for A2L refrigerant transition by January 1, 2026, including installation and operational compliance.
- **Verify Technician Certification for A2L Handling**
  Ensure all technicians working on your refrigeration systems are certified and trained in the safe handling, installation, and servicing of A2L refrigerants. Arrange certification or refresher training as needed.
- **Assess Existing Systems**
  Conduct a detailed inspection of your current refrigeration systems. Identify which systems require full replacement for A2L compliance.
- **Integrate A2L Requirements in New System Specifications**
  When planning new refrigeration system designs or upgrades, include A2L compatibility from the outset. Specify components and safety features that comply with A2L standards to avoid change orders later.
- **Coordinate with Insurance Providers on Risk Coverage**
  Engage your insurance provider to discuss coverage adjustments related to A2L refrigerants. Confirm any policy updates needed to cover fire and safety considerations for systems using mildly flammable refrigerants.
- **Source A2L-Compatible Equipment and Components Early**
  Identify trusted suppliers and place advance orders for A2L refrigerant-compatible equipment and parts to mitigate risks from supply chain delays as the 2026 compliance deadline approaches.

WHERE CAN I FIND MORE INFORMATION?

Key organizations such as the EPA, AHRI, and ASHRAE provide up-to-date information, white papers, and webinars on the transition to A2Ls in commercial refrigeration. Contact your manufacturer for specific details by visiting www.rdt.com/contact-us.