

Refrigeration

# Refrigerant Retrofits: Why Mixing Refrigerants Is a Bad Idea

***Refrigerant retrofitting is a viable alternative to replacement, provided contractors select the right refrigerant, handle system modifications, and maintain safety standards for optimal performance.***

**Kris Crosby**

## *Key Highlights*

- Proper retrofitting can extend system life and improve efficiency, but shortcuts can lead to costly repairs and customer dissatisfaction.
- Never mix different refrigerants in a system to avoid hazardous chemical reactions and performance issues.
- Retrofitting requires careful planning, including system evacuation, oil replacement, and component adjustments, to ensure safety and efficiency.

We've all been there. You're working on a system that's in great shape mechanically, but it's lost most or all of its refrigerant charge. The catch? It was built for a refrigerant that's either hard to find or way too expensive now. So what do you do?

If it's a small, low-cost unit — like a mini fridge or a window AC — it might make more sense to replace it. New units use current refrigerants and often come with better efficiency and updated tech. But when replacement isn't practical or affordable, a refrigerant retrofit might be the best option.

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## *What Is a Refrigerant Retrofit?*

A retrofit means adapting a system designed for one refrigerant to work with another. Sometimes it's as simple as recovering the old charge, evacuating the system, and refilling with a new refrigerant. Other times, it's more involved — like changing the oil, adjusting controls, or replacing seals.

How much work is needed depends on:

- The system's type and condition;
- The retrofit refrigerant you choose;
- The oil currently in the system; and
- The elastomers used for sealing.

## *Choosing the Right Retrofit Refrigerant*

Sometimes your options are limited. Other times, there are too many choices. Either way, retrofitting usually involves trade-offs. You might pick a refrigerant that's compatible with the existing oil, but sacrifice a bit of performance. Or you might choose one with better efficiency, but you need to change the oil.

Whatever you choose, keep these key points in mind:

**1. Never Mix Refrigerants — Ever**

This is a big one. Mixing refrigerants in the field can cause serious problems:

You create a chemical cocktail with unknown properties;

- There's no reliable pressure-temperature data, making it impossible to charge the system correctly or calculate superheat;
- The mixed refrigerant can't be reclaimed or reused — it becomes hazardous waste; and
- You risk poor performance, compressor damage, and repeat service calls.

*Bottom line:* Mixing refrigerants is unsafe, unprofessional, and costly — for you and your customer.

**2. Don't Use Flammable Refrigerants in Systems Designed for Non-Flammable Ones**

If the original refrigerant was rated A1 (non-flammable), you cannot retrofit it with A2L, A2, or A3 refrigerants. It's not just a bad idea — it's against code and dangerous. These systems weren't built with the safety features needed for flammable refrigerants.

**3. Check Oil Compatibility**

Always verify what oil is in the system. If the retrofit refrigerant isn't compatible, you'll need to replace the oil. Leaving incompatible oil in place can lead to:

- Poor oil circulation;
- Reduced performance; and
- Compressor failure.

Skipping this step might save time now, but it'll cost you later.

## *Will the System Run with the Wrong Refrigerant? Maybe. Will It Run Well? Probably Not*

Just because a system turns on doesn't mean it's working properly. A mismatched refrigerant might keep the unit running, but it'll likely lead to:

- Inefficient operation;
- Frequent breakdowns;
- Shortened equipment life; and
- Unhappy customers.

A properly retrofitted system, on the other hand, can deliver years of reliable service — and save your customer from a costly replacement.

## *Final Thought: Do It Right the First Time*

Retrofits can be a great solution when done correctly. Take the time to choose the right refrigerant, check compatibility, and follow best practices. Cutting corners — especially by mixing refrigerants — only leads to bigger problems.

Protect your customer. Protect your reputation. And keep systems running the way they're supposed to.

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***Kris Crosby is a senior business development engineer with Arkema's refrigerant division. Crosby has worked in the HVAC and refrigerant industry for the last 20 years in roles including product engineering, technical services, supply chain, R&D, and business development. His role is currently focused on the launch and support of Arkema's lower GWP refrigerant portfolio.***