



AN EXCHANGE OF TECHNICAL INFORMATION

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Subject: Refrigerant Practices

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Carrier would like to remind all service providers and end users to ensure only authentic refrigerant is used when servicing refrigerated containers. Authenticity of the refrigerant can be verified against the latest revision of Air-Conditioning Heating and Refrigeration Institute (AHRI) Standard 700, by reviewing the refrigerant's certificate of analysis (COA), and by checking the refrigerant purity using refrigerant analyzers or other test methods. Based on the refrigeration unit's serial plate, the following refrigerants are used with the Carrier container units: R-134a, R-513A, R-1234yf and R-744.

Refrigerant testing should adhere to applicable local laws and regulations.

Using contaminated or counterfeit refrigerant can lead to severe mechanical failures, safety hazards, and environmental legal risks. For example, counterfeit R-134a sometimes contains **R-40 (Methyl Chloride)**, which is highly reactive with aluminum components of the refrigeration unit. This reaction can cause spontaneous combustion or violent system ruptures.

To assist in your efforts to ensure refrigerant authenticity, Carrier recommends the following:

- All people handling refrigerant are familiar with and understand safe handling procedures and their company's refrigerant handling policy.
- Be cautious when handling cylinders that have no or unusual looking serial numbers.
- Use only internationally known refrigerant brands purchased from reputable sources.
- Request a certificate of origin or chemical analysis documentation from your refrigerant supplier for each purchase or delivery. AHRI Standard 700 is a good reference for refrigerant purity specifications. Reputable suppliers will be able to provide such information.
- Visually inspect every refrigerant package for misspelled words, unusual logos or other obvious changes from previous deliveries.
- Do not accept disposable cylinders that are not in their original, sealed cardboard box. Check the serial/LOT numbers, which are often hologram or QR codes, to be sure that they match the cylinder inside the box.

Service Engineering / Container Products

Please circulate copies of this bulletin to all service and management personnel as soon as possible.

- Visually inspect every gas cylinder for any changes in shape, color or fittings on the bottle, as these rarely change for refrigerant sourced from major manufacturers.
- Implement processes to test each new refrigerant cylinder’s contents when it is delivered by your supplier and before use.
- Be cautious of refrigerant offered for sale at prices well below normal market price. Counterfeit or contaminated refrigerant is frequently offered at a significant discount.
- Use exchange refillable cylinders from direct gas suppliers should be preferred, which typically have shorter supply chains and easier traceability. (Note that refillable cylinders are required by law in some locations. Including the EU).
- Store refrigerant in a secure location.
- Follow all refrigerant manufacturers’ recommendations and applicable local regulations for gas handling, charging, recovery, recycling, etc.
- A detailed procedure with documentation should be followed for cleaning recovery cylinders after each use.
- Implement a record retention system which includes the following:
 - A gas cylinder numbering or identification system.
 - Delivery logs that track refrigerant source and authenticity by cylinder number.
 - Technician logs that track the amount of refrigerant used from each numbered cylinder on every refrigerant unit (container ID).
- Use refrigerant logs to establish a “chain of custody” for every refrigerant cylinder passing through a depot or terminal.

Sample Refrigerant log:

| Warehouse Log: | Technician Log: |
|---|------------------------|
| Supplier & Quantity | Cylinder Serial Number |
| *Cylinder Serial #'s | Container Number |
| Certificate of Analysis | Quantity Used |
| Cylinder tested on delivery | |
| Cylinder issued to | |
| <i>*If cylinders are not serialized from the supplier, consider adding your own number system to ensure traceability.</i> | |