

Operation & Maintenance Guidance Sheet

1

Safe Storage and Proper Handling of Refrigerants

INTRODUCTION

A refrigerant is a chemical used for heat transfer in a refrigeration system. Refrigerants absorb heat at a low temperature and low pressure and transfer heat at a higher temperature and a higher pressure. The heat transfer process usually involves state changes in the fluid. Refrigerants are an asset and not a consumable.

Although it is a key substance used in the refrigeration and air-conditioning industry, refrigerants can be harmful to humans and the environment. Technicians can prevent injuries and costly mistakes by consistently following defined procedures and using common sense when handling refrigerants.

Technicians must take extreme care to avoid direct ingestion of refrigerant vapors. Refrigerants are heavier than air and will replace air in a confined space. This situation can lead to possible asphyxiation for anyone working in the space. Oxygen starvation is the leading cause of death in accidents involving a refrigerant. If a spill occurs, they must put on a self-contained breathing apparatus or evacuate the area until it has been properly ventilated.

Refrigerants are shipped and stored in pressurized cylinders. Careless cylinder handling can result in sudden refrigerant releases, which can cause frostbite, skin damage, or blindness. To avoid these circumstances, workers should wear safety glasses with side shields or a full-face shield, safety shoes, a hard hat, long pants, gloves, and a long-sleeved shirt.

Disposable cylinders are constructed of common steel, which can oxidize and become weakened by rust. As a result, cylinder walls and seams can no longer tolerate pressure or contain gases. Refillable cylinders must be retested and recertified every five years, and the test date must be stamped on the cylinder shoulder. Retesting by visual inspection alone is not permitted. Technicians should discard rusted containers and never use them for recovery or refilling. To prevent cylinder corrosion, technicians should store containers in dry locations.

Further information on proper leaking checking can be found in O&M Guidance Sheet 2, “Periodic Leak Checking and Proper Documentation.”

ADDITIONAL INFORMATION AND RESOURCES

- Section 7 of ANSI/ASHRAE Standard 15-2022 covers leak detection and machine room ventilation, and Section 10 covers general requirements and storage and handling of refrigerants.
- ANSI/ASHRAE Standard 34-2022 includes lists of refrigerants and their safety classifications.
- ASHRAE Guideline 6-2015 has additional information on refrigerant properties and definitions of terms associated with refrigerants.
- Material safety data sheets (MSDSs) provide information on shipping, storage, and handling of specific refrigerants/secondary fluids (SFs) or secondary refrigerants, like glycol, brine, or even CO₂).
- Refer to ASHRAE Standards 15 and 34; ISO 817 and ISO 5149, Parts 1, 2, 3, and 4; EN 378; and IEC 60335-2-40 and IEC 60335-2-89 for additional information.

The above list is not exclusive to all possible references on this topic.