

# Using Refrigerants Responsibly

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**U**nited States manufacturers of HVAC&R equipment have played a leadership role in making sure refrigerants are used and handled responsibly. For instance, in 1994, the Air-Conditioning and Refrigeration Institute (ARI), the trade association of North American HVAC&R equipment manufacturers, published the *Industry Recycling Guide*, a guide to recovering, recycling, and reclaiming refrigerants. This guide established the authoritative rules for those activities and was referenced in the regulations of the U.S. Environmental Protection Agency.

Recently, ARI and the industry have embarked on an ambitious program to increase their efforts to keep refrigerants contained and to properly dispose of refrigerants at the end of their useful life. ARI's Refrigerant Responsible Use Initiative involves all sectors of the refrigeration and air-conditioning industry. **This article outlines the main initiatives of the program.**

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The use of refrigerants in the U.S. extends from CFCs, still used in thousands of older chillers; to HCFCs, used mainly in split air-conditioning units, packaged equipment, commercial refrigeration and chillers; to HFCs, used at a growing rate in all types of refrigeration and air-conditioning equipment as a replacement for CFCs and HCFCs. HFCs are the recognized permanent replacement for CFCs and HCFCs and have an environmental advantage—they do not contribute to stratospheric ozone depletion. But they, as with the CFCs and HCFCs they replace, are global warming gases and need to be handled responsibly.

Despite the hard work and diligence of the HVAC&R industry, atmospheric analysis shows that a significant amount of refrigerant is escaping to the atmosphere. For HFCs to remain a viable long-term refrigerant, the HVAC&R industry must demonstrate that they can be contained and handled properly.

The first responsible use initiative deals with the regulations pertaining to refrigerants. The U.S. is a signatory of the Montreal Protocol and the U.S. government regulates the use of ozone-depleting substances, including CFCs and HCFCs through the U.S. Clean Air Act. That Act states that intentional emissions of these

refrigerants are illegal. Regulations specify in great detail how refrigerants are to be monitored and handled, how leaks are to be fixed (in large systems) and how refrigerants are to be disposed. These regulations specify the level of expertise a technician must achieve before handling refrigerants, how much vacuum must be maintained when evacuating a system, and when a leak must be repaired. For CFCs and HCFCs the rules are detailed and numerous.

The rules are a bit different for HFCs. Because the U.S. is not a signatory to the Kyoto Protocol on Climate Change, and the U.S. Clean Air Act primarily focuses on ozone-depleting chemicals such as CFCs and HCFCs, the authorizing language in the statute is not as clear about HFCs. The Clean Air Act states that HFCs cannot be vented/released to the atmosphere. Therefore, these refrigerants need to be responsibly cared for. However, the U.S. Environmental Protection Agency (EPA), the regulating authority, has not taken a strong position on enforcement of HFCs even though the rules covering CFCs and HCFCs mention that similar enforcement folds over onto the alternative refrigerants. The first goal of the Responsible Use Initiative is to encourage the EPA to aggressively enforce the no venting rules! The next step will be to strengthen and enhance the Clean Air Act to proactively promote the responsible use of HFCs. ARI is encouraging Congress and the EPA to treat the handling and use of HFCs in the same manner that they treat other refrigerants.

Another project of the Responsible Use Initiative is to demonstrate that manufacturers are proactive within their manufacturing facilities to contain refrigerants. ARI surveyed manufacturers to learn about their practices to contain refrigerants as they use them to charge the millions of units manufactured ev-

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ery year. The results of this survey were reviewed by industry experts and compiled into a list and published as the *Responsible Use Guide for Minimizing Fluorocarbon Emissions in Manufacturing Facilities*. This guide has been cosigned by the EPA and has been distributed to all ARI manufacturers. It has been printed in a format that makes it easy for facility managers to carry it with them as they inspect their plants to ensure proactive measures are taken to contain refrigerant during manufacturing. This guide is available to other industry associations and to HVAC&R equipment manufacturers at <http://tinyurl.com/zrs9h>.

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An important development in the responsible use of refrigerants is ASHRAE Standard 147, *Reducing the Release of Halogenated Refrigerants from Refrigerating and Air Conditioning Equipment and Systems*. This standard has the potential to demonstrate the industry's leadership in promoting responsible use. ASHRAE has provided a valuable service in promulgating this standard and with some revisions, it can be embraced by manufacturers. These revisions might include a repeatable method of measuring small leaks, as well as a leak rate design standard acceptable for varying types of equipment. ASHRAE has established a standards committee to consider improvements to the standard.

It is clear that technicians who are properly trained tend to be more responsible in refrigerant handling. In the U.S., technicians must pass an EPA-approved test to be able to purchase ozone-depleting refrigerants and service equipment containing them. Although that is good, U.S. industry is encouraging a higher level of competence. It has instituted a technician certification program, called the North American Technician Excellence Program (NATE). NATE administers a series of tests that measure a technician's competence. The industry believes that NATE certification should be required for technicians that work on refrigerant-containing equipment. As a first step, industry would like the U.S. federal government to require NATE certification in order to work on federal projects.

The most ambitious project in ARI's responsible use portfolio is called Refrigerant Management USA (RM USA). Some claim that every bit of refrigerant that is manufactured eventually winds up in the atmosphere, because little economic incentive exists to destroy refrigerants. RM USA will provide incentives for technicians to return used refrigerants, for wholesalers to process them and for reclaimers to either clean or destroy used refrigerants. Planning is in the formative stages and more information should be available later this year.

The Responsible Use Initiative is a wide-ranging and ambitious effort to improve the containment of refrigerants, improve refrigerant handling practices, and make refrigerants benign at their end of life. It will take the cooperation of the entire HVAC&R industry: engineers, manufacturers, installers, and service and maintenance technicians to make this effort a success. It is imperative that we succeed, if we are to have a variety of safe, efficient and reliable refrigerants available in the future. ●