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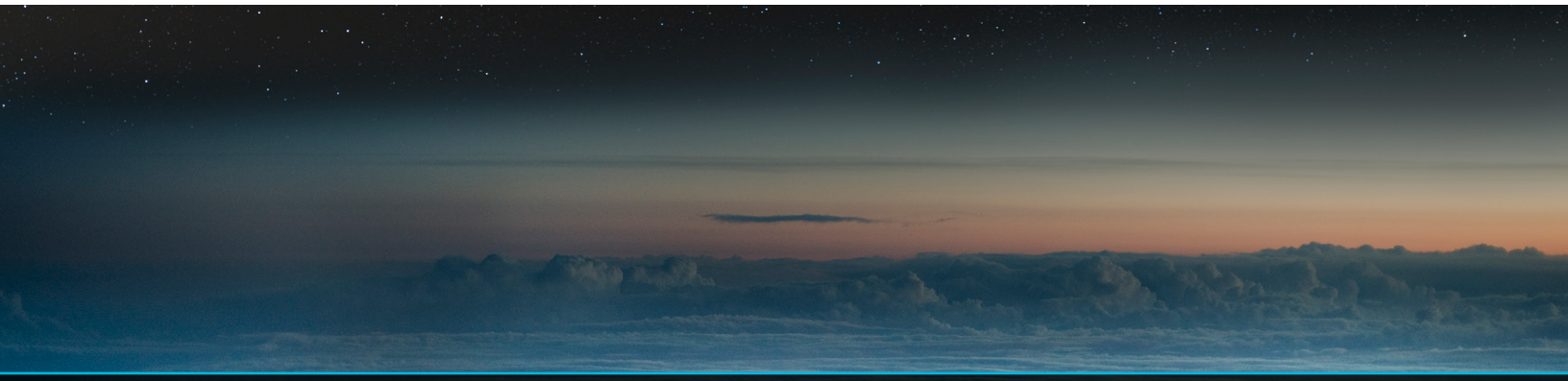

Phase-out of HCFC refrigerants hydrochlorofluorocarbons HCFC-22

HSB, a Munich Re company, is a technology-driven company built on a foundation of specialty insurance, engineering, and technology, all working together to drive innovation in a modern world.

Introduction

The Montreal Protocol, an international environmental agreement, established requirements that began the worldwide phase-out of the manufacturing of ozone depleting CFCs (chlorofluorocarbons) in 1996 and HCFCs (hydro chlorofluorocarbons) by 2020. The EPA (Environmental Protection Agency) has the power of enforcement for the Protocol.

HCFC-22 (also known as R-22) has been the refrigerant of choice for residential and commercial air-conditioning systems for more than four decades and is predominantly the affected compound. Unfortunately for the environment, releases of HCFCs, such as those from leaks, contribute to ozone depletion. In addition, HCFCs are greenhouse gases and the manufacture of them results in a byproduct that contributes to global warming. As the manufacture of R-22 is phased out over the coming years, manufacturers of air conditioning systems are offering equipment that uses ozone-friendly refrigerants. However, many insureds may be misinformed about how much longer R-22 will be available to service their central A/C systems and heat pumps.

This fact sheet provides information on the alternatives available to system owners, about the transition away from R-22, the future availability of R-22, and the new refrigerants that are replacing R-22.

Exclusions

Large-capacity centrifugal chillers utilize other listed refrigerants which will be part of a future fact sheet. These are a large part of the office building air conditioning market and have slightly different issues with other refrigerants. Carrier and Trane have a large market share in this occupancy. Carrier utilizes

R134a which is listed as "one of six greenhouse gases that must be reduced" by a similar environmental agreement known as the Kyoto protocol. Kyoto has no production elimination date as of this time. Trane "CenTraVac™" chillers run on R-123 (also an HCFC), which has the same phase-out schedule as R-22.

Opportunities

Because of the phase-out of the manufacture of HCFCs by 2020, the owners of most air conditioning and refrigeration equipment (AC&R) must determine in the near future the manner in which they want to respond to this situation.

There are three possibilities, continue to use the existing refrigerant with HCFCs, convert the equipment to an alternate refrigerant, or replace the equipment with high-efficiency equipment designed to run on non-HCFC refrigerants.

The manufacture of new equipment charged with R-22 has been terminated. There will, however, be replacement parts and assemblies available for an undetermined amount of time. Refrigerant manufacturers estimate the parts production to continue at least through 2020.

Systems kept in service will be paying market prices for R-22 which has already increased by 500% since 2003.

Continue HCFCs

A decision to continue using the existing refrigerant will result in increasing costs due to a decreasing supply of the refrigerant over time. The EPA, which has the authority to change all implementation schedules signed an allocation rule to reduce the production of these refrigerants to 10% of the 1996 production of 15,240 metric tons.

The balance can only come from refrigerant reclaiming from "replaced" systems. This refrigerant reclaiming is suddenly critical to the world's refrigeration systems. There are storage capacity issues with the reclaimed refrigerants which increase the opportunity for localized shortages.

At the least, the owner should attempt to contain the refrigerant by eliminating leaks on all systems. The average leakage rate is between 15% to 20%, but can be improved with a strict PM (Preventative Maintenance) program to less than 5%.

Conversion

A decision to convert the equipment to a new refrigerant will require detailed engineering of the existing system. An engineering analysis to determine the current and predicted performance should be made. R-22 was a universal refrigerant for a wide variety of refrigeration coolers, freezers, heat pumps, and air conditioning systems, and has no universal replacement.

There are many replacement refrigerants available but each is designed for specific operating equipment and conditions. Installation of the wrong refrigerant will risk system efficiency and possible equipment breakdown. These alternative refrigerants do not have similar properties to R-22 and changes to components will, except in rare cases, be necessary to utilize the new refrigerant with performance at acceptable levels.

Approximately 70% of the market can use the replacement refrigerants with some reduction in capacity or efficiency of 5% up to 20%. OEM-certified installers should be used for these conversions and need to be available for ongoing service contracts. Many aspects of the equipment operational settings require modifications as there are no "drop-in solutions" for R-22 replacement.

There are some risks to premature equipment failure, despite proper maintenance with these refrigerants. Large-risk items in this selection are non-Main Street installations which comprise about 30% of the market. These include the temperature critical environments, for foods and chemical processing which use liquid refrigerant instead of gas at the point of heat transfer, with flooded plate evaporators.

The replacement refrigerants are interim solutions that allow use of these older low-pressure units to operate. Equipment currently manufactured operates at higher pressures and efficiencies on new custom-blended refrigerants, very different than the ones made for these conversions.

Replacement

A decision to replace the equipment can be made for a number of reasons. When the equipment is near the end of its useful life, conversion is not cost-effective. When capacity is already marginal, either new properly sized equipment or additional equipment will be necessary to provide the capacity required. Eventually all of this equipment will require replacement and most Main Street equipment has a design life of 13 years. New equipment will have an energy savings payback period of approximately four years.

Next steps

The owner should develop a plan now that defines which steps will be taken for each system. Additionally, the strategy should consider the possibility of an equipment failure. The owner may decide at that time to convert or replace the equipment as the plan determines.

The plan should embrace the following decisions:

- How long should the equipment remain in service (age, efficiency, maintenance costs)?
- How much time, money, and effort is it worth to put up with for a conversion?
- What are the local risks for service, parts, and supplies of R-22?
- Is there a company decision or policy about not using refrigerants with ozone-depleting potential?
- Is the best business decision to move past “conversions” straight to equipment “replacement” and have this interruption and risk minimized to one event instead of two?

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ES450 (Rev. 12/2020-132)