



→ Large buildings with interior mechanical rooms will need to use R-22 or similar refrigerant due to their location.

## R-22 Phaseout: by JESSI PIERCE

# TRUTH or MYTH?

**R**inks around the country will need to become more environmentally friendly in the future, thanks in large part to the Montreal Protocol and R-22 phaseout.

But like with any change, it comes with some confusion. We asked STAR vendor members Peeter Nielander of Berg Chilling Systems, and Dave Wescott of All Star Arenas some common questions that rink operators have about the R-22 phaseout.



→ This is an example of a system that was converted from R-22 to Genetron 422D.

### What is the Montreal Protocol?

**Peeter Nielander:** The Montreal Protocol is an international treaty designed to protect the ozone layer by phasing out the production of numerous substances that are responsible for ozone depletion. R-22, a commonly used refrigerant in the ice rink industry, is such a substance.

**Dave Wescott:** Every country in the world is a party to the protocol and it has successfully phased out or is in the process of phasing out several key classes of chemicals, including chlorofluorocarbons (CFCs), hydro chlorofluorocarbons (HCFCs), and halons. The transition away from CFCs and HCFCs provides major ozone-layer protection benefits, but the unintended consequence is the rapid current and projected growth of climate-damaging HFCs.

### What happens in the year 2020 in the U.S. with regards to the Montreal Protocol?

**PN:** In 2020, production and importing of R-22 will be banned.

**DW:** The Montreal Protocol requires the U.S. to reduce its consumption of HCFCs by 99.5 percent below the U.S. baseline. Refrigerant that has been recovered and recycled or reclaimed will be allowed beyond 2020 to service existing systems, but chemical manufacturers will no longer be able to produce R-22 to service existing air conditioners and heat pumps.

### Can I build a new refrigeration system using R-22 now?

**PN:** Although refrigeration system components for R-22 can still be found, a new R-22 refrigeration system cannot be built today. 2010 was the last time a new R-22 system could be built, per the Montreal Protocol.

### If I do all the required and recommended maintenance on my R-22 system, can I still operate it past the year 2020?

**PN:** Yes. Refrigerant that has been recovered and recycled or reclaimed will be allowed beyond 2020.

### If I can buy R-22 after 2020, what do you predict the price will be?

**PN:** The price may increase enough to look at replacing your ice rink chiller. But only time will tell what the price will be.

**DW:** There is really no way to predict the price. The phaseout is already going quicker than anticipated, and if shopped, R-22 can still be found for under \$15 per pound. The goal of the phaseout of the gas is to make it more practical to replace the equipment rather than buy the gas, so you can expect the price to keep rising.

### If I have R-22 in my rink, do I have to convert to an alternate refrigerant in 2020?

**PN:** As an environmentally conscious company, it is strongly suggested that an R-22 chiller would be replaced.

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## What refrigerant drop-in alternatives are available for R-22?

**PN:** R-507A is a suitable refrigerant for the ice rink application and has no ozone depletion potential. Natural refrigerants such as ammonia may also be used.

**DW:** There are some replacement gases available such as Genetron 422D, Isecon MO99, MO59, however, it may require the replacement of seals and oil in the system. Also, the type of system will have an impact on the replacement gas. Some will work with dry chillers and not flooded chillers.

## If I change refrigerants in my existing system, will it affect my current equipment or floor piping?

**PN:** The floor piping will not have to be changed, unless you have a direct system. However, the refrigeration plant will need to be replaced if you choose to use R-507A or ammonia.

## Do you think there will be any new refrigerants or technology available by then?

**PN:** New environmentally friendly refrigerants are always being developed and there may very well be new refrigerants that can be used for ice rink applications.

→ The first step in converting a system is to know the type and amount of refrigerant.



→ A clean compressor room allows leaks to be easily identified.

## What will the cost be to convert my rink to a more environmentally friendly refrigerant? What factors will affect this cost?

**PN:** An R-507A refrigeration system will have the lowest capital cost, but operation costs will be slightly higher. An ammonia system would have a higher capital cost, but operating costs will be lower. Heat reclaim options can be integrated into the system to help save energy costs.

**DW:** The size of the system will dictate the cost to convert to new refrigeration. If the system has 500 pounds of refrigerant, the gas alone could be \$15,000. Converting a system is not a low-cost operation, however, compared to an entirely new system, it could be a good option.

## My current R-22 refrigeration system is close to 30 years old right now. We are looking at replacing it. What are my options?

**PN:** Each individual rink has its own set of requirements that would dictate what kind of system to install. Our company would review the facility and with the customer's input make a recommendation as to go with either an R-507A or ammonia chiller package.

**DW:** Many options exist starting with your local service company. Get them involved. What would they recommend?

## My city ordinance will not allow ammonia as a refrigerant in my plant. Are there natural refrigerant alternatives to ammonia?

**PN:** CO<sub>2</sub> is also being used in many ice rink applications and shows lots of promise in the future. ⚡



## What's happening in Minnesota

There is no shortage of hockey rinks in Minnesota. Dubbed "The State of Hockey," arenas — which are 98 percent publicly owned—are almost as common as lakes.

But with the phaseout of R-22, will the cost force some rinks to close their doors?

"It's going to hit our smaller arenas the hardest," said John Evans, volunteer lobbyist and avid hockey fan. "We have rinks that just aren't going to be able to afford to convert. It's in our culture here so we would hate to have that happen to even one rink."

There are more than 140 refrigeration systems that currently use R-22 in Minnesota. Of those, roughly 44 were built in the mid-'70s and their systems (direct-type systems) use 6,000 pounds or more of R-22. Newer models that make up the rest (indirect-type systems) use 800 pounds or more. The indirect-type systems can simply replace the R-22 refrigerant with a more environmentally friendly refrigerant at a cost range of \$50,000 to \$100,000. For others, such as direct-type systems, equipment replacement will be necessary at costs significantly higher, ranging from \$900,000 to \$1.2 million.

Evans is working with a group to get the financial support they need.

"We'd have a pretty good hockey team with spouses of those involved," joked Evans. "But together we're making a push to get money from legislation. It's hard when you think that some of those smaller rinks in smaller communities can't fund this on their own."

"It puts them in danger of closing their doors for good."

Evans hopes an \$8 million bonding bill will pass, with the intent to provide communities with Mighty Ducks grants.

"It's not exactly a death sentence for all area arenas," Evans said. "And many of those rinks were in need of a refrigeration update anyway."

"But we just hope the cost isn't going to overwhelm some of those northern rinks or the ones that don't have the funding. That would be devastating."

