

R-410A Rooftop Systems with 2010 Efficiencies, Competitive Pricing

What is the most cost-effective rooftop HVAC system I can specify today—taking into account installed costs, operating costs and EPA phase-out of R-22 refrigerant in 2010?

Daikin has the most complete line in the industry of rooftop products, 30 tons or larger, that use HFC-410A (R-410A)—a non-ozone-depleting refrigerant with no phase-out concerns. All of these products are available with efficiencies that exceed ASHRAE 90.1-2010 requirements. And they are competitively priced. These products include:

- Maverick II™ commercial packaged rooftop systems, from 30 to 50 tons.
- Model RPS and RDT applied packaged rooftop systems, from 50 to 140 tons.
- Daikin split systems, with 50 to 140 ton Model RCS condensing units matched to Vision™ or Destiny™ indoor air handlers or Hi-F5 DX Coils.

Benefits

- **No ozone depletion potential or phase-out date.** Using chlorine-free R-410A with zero Ozone Depletion Potential (ODP) helps protect both the environment and your investment. That's because new equipment using R-410A faces no mandated phase-out date over a 20 to 30 year equipment life expectancy.

Most HVAC products with DX coils still use HCFC-22 (R-22) refrigerant, which has a phase-out date mandated by the U.S. Environmental Protection Agency (EPA). As of January 1, 2010, R-22 can no longer be used in new equipment. As of January 1, 2020, it can no longer be produced or imported, which means all service work will require recycled, and likely expensive, R-22 refrigerant.

- **Excellent energy efficiency for lower operating costs.** Daikin R-410A systems are available with EERs that exceed ASHRAE 90.1-2010 requirements. They are approximately 6% more efficient than ASHRAE 90.1-2004 requirements.
- **Reduced service costs.** R-410A refrigerant has no significant “glide.” If a leak occurs, only the lost refrigerant must be replaced. With R-407C, the remaining charge may not have a proper mix of components, thus requiring a complete replacement.
- **Robust, long-life, microchannel condensers.** These R-410A systems use all-aluminum, microchannel condensers, which are more robust than traditional designs and more corrosion-resistant (see page 2). The result is longer condenser life. Microchannel condensers have considerably less volume, requiring less refrigerant charge. And, they weigh less, thus reducing the overall weight of Daikin R-410A rooftop systems.
- **Perfect for LEED buildings.** High-efficiency units with robust condensers and low volumes of HFC refrigerant make these R-410A refrigerant units ideal for projects seeking LEED® certification.



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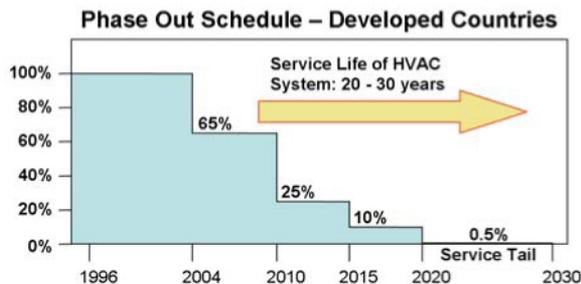
Refrigerants And Our Environment

In 1987, the Montreal Protocol was ratified, which requires the phaseout of CFC and HCFC refrigerants because they are damaging the world's ecology. Production and importation of CFC refrigerants were halted in the United States in 1995, including common refrigerants such as R-11 and R-12.

The EPA now allocates production of HCFC refrigerants, including R-141B, R-142B, R-123a and R-22. These allocations will be cut back to meet stepped reductions in 2010, 2015 and 2020 (see chart above right). In 2010, EPA regulations will prevent shipping new equipment with R-22 in the United States. After 2020, the servicing of R-22-based systems will rely on recycled refrigerants.

An amendment to the Montreal Protocol, adopted in September 2007, accelerated reductions. It foreshadows further reductions by requiring a scheduled review in 2015 for developed countries. This review will be used to determine if service tail quantities of refrigerant will be allowed. This raises the possibility that R-22 could become cost-prohibitive in 2020 in developed countries, even though the expected service life of an R-22 rooftop unit you purchase today may extend well beyond that date.

Hydrofluorocarbons (HFCs) have no ozone depletion potential and include HFC refrigerants R-407C, R-134a



HCFC Phase Out Schedule per the Montreal Protocol for developed countries.

and R-410A. All are classified as A1 (lower toxicity – no flame propagation). R-410A is an excellent refrigerant for all new equipment that uses positive-displacement compressors, such as energy-efficient scroll compressors.

For More Information

Daikin has published a comprehensive Application Guide on Refrigerants (AG31-007) that is available on our website at www.DaikinApplied.com. For more information on environmentally friendly, R-410A refrigerant and Daikin rooftop products, contact your local Daikin representative. To locate your local representative, call 800-432-1342 or visit www.DaikinApplied.com.

All-Aluminum Microchannel Condensers

All Daikin R-410A rooftop products are equipped with all-aluminum microchannel condenser coils, which are constructed of the following items, oven-brazed together:

- Extruded flat tubes with many small flow channels arranged in a two-bypass configuration. These tubes provide better fluid-to-tube heat transfer than traditional round tubes and more heat transfer per square foot than traditional coils. They also require much less refrigerant charge per ton of cooling.
- Aluminum fins brazed between the adjoining tubes. This arrangement protects the fins from the surface damage that is common in traditional coil arrangements which can inhibit cooling performance and is difficult to comb out.
- Two aluminum refrigerant manifolds.

This all-aluminum construction eliminates galvanic corrosion (which occurs when dissimilar metals, such as copper and aluminum, are in contact with each other). As a result, all-aluminum condensers are more resistant to corrosion in any environment, including seacoast applications.

