FORANE® 427A: the closest retrofit for R-22 at any level of temperature, from air conditioning to medium and low temperature refrigeration

Main benefits of FORANE® 427A

- One fluid to cover the full range of temperature (AC, medium and low temperature refrigeration)
- Better allowance to the FORANE® gas temperature than any other R-22 retrofits, with notably a same superheat pressure in R-22 and FORANE® 427A, which allows a smooth transition to FORANE® 427A.
- No modification to the installation required when retrofitting to FORANE® 427A, only small adjustments of settings may be necessary:
  - Highly tolerant to residual moisture at all up to 15%.
  - Change of temperature up to 10°C linear (including equipment design). One of the few GWP (2138) among R-22 retrofit solutions.

Contacts
For any commercial or technical request (or for more information, see additional information at www.forane427a.com)

Additional information
Additional information (technical data, case studies, additional on product availability in your country), please contact us at the following address:

www.forane427a.com

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www.info.forane@arkema.com

Forane® re© 427A

Main benefits

- Easy and fast retrofit procedure, most cost-effective solution to keep your R-22 installations running
- One fluid to cover the full range of temperature (AC, medium and low temperature refrigeration)
- Highly tolerant to residual moisture at all up to 15%
- Change of temperature up to 10°C linear (including equipment design)
- One of the few GWP (2138) among R-22 retrofit solutions.

FORANE® REFRIGERANTS: available worldwide

Additional information (technical data, case studies, additional on product availability in your country), please contact us at the following address:

www.forane427a.com

FORANE® 427A has proven to be a robust retrofit of R-22 since 2005 in various fields: Commercial and domestic air conditioning, chillers, rooftop units, split systems, heat pumps, etc.

- Commercial refrigeration and food-processing sector: supermarkets, warehouses, cold rooms, etc.
- Commercial and domestic air conditioning: chillers, rooftop units, split systems, heat pumps, etc.

COP

Mass flowrate

Cooling power

Operating conditions: evaporating temperature 2°C, ambient temperature 35°C, inlet temperature -11°C, outlet temperature -15°C

FORANE® 427A is the retrofit solution which offers the closest match to R-22 in term of performances as well as regarding the risk from his low boiling pressure in both the conditioning and refrigeration. Due to its similar behavior to R-22, FORANE® 427A is the only retrofit that can be used in equipment designed for R-22 without requiring any changes so the installation (no need to change the expansion valve, liquid lines, condensing coils or any other really parts of your system).
**SAFETY**

Forane® 427A is environment-friendly and non-flammable with an A1/A1HC4 fire safety classification.

**MATERIAL COMPATIBILITY**

Forane® 427A as an 100% HFC blend is completely compatible with stainless steels or with plastics normally compatible with R-404A, R-410A and R-507.

**LUBRICANTS**

Forane® 427A as an 100% HFC blend is completely compatible with Polyethylene POE lubricants, mineral oil (oil with a viscosity of 32 to 50 cSt), it is not necessary to perform the retro-fit procedure. However, one specificity of Forane® 427A is that it cannot be mixed with R-22.

Forane® 427A can be used without changing the original oil if the system has been filled with R-22. For cases where the POE lubricant charge is necessary, Arkema recommends that the retro-fit procedure be performed. In some cases, it has been noticed that Forane® 427A has difficulty in getting along with the original oil of the system has an oil separator and reliable oil return.

**RETROFIT PROCEDURE**

- Drainage of the original oil from the system (detailed procedure is included in the kit).
- An analysis of the original oil is recommended to ensure that the R-22 installation is in a good state of repair.
- For R-22, charge when necessary—see label for limitations.
- In certain cases, no mixing process is required.
- Change of the filter drier.
- Recovery of the whole R-22 charge.
- Forane® 427A is non-toxic and non-flammable with an A1/A1HC4 fire safety classification.
С 2005 года Forane® 427а — полностью замедленный хладагент сблизился с R-22 в самых различных областях: при работе в холодильных установках. Благодаря аналогичному поведению при работе Forane® 427а является к хладагенту R-22, а также по величинам массового расхода и рабочим давлениям как при кондиционировании воздуха, так и оборудовании, предназначенном для использования хладагента R-22, без необходимости внесения в установку каких-либо изменений (не требуется заменять терморегулирующие единственные усовершенствованные материал-заменители, которые могут применяться в технической поддержке компании Arkema.

Однако очень важно убедиться, что система позволяет использовать неазеотропные смеси (проверить расчетные давления, распределение материалов и т.д.). Прежде чем модернизировать систему с затопленным испарителем, настоятельно рекомендуется связаться со службой технической поддержки компании Arkema.

FORANE® 427A:

- Среднетемпературные морозильные установки (AC, medium and low temperature refrigeration)
- Нагнетание от кипятильника до минус 24°С (temperature up from boiling point to -24°C)
- Кондиционирование воздуха (water and indoor temperature regulation)
- Промышленные установки кондиционирования воздуха: охладители, агрегаты для кондиционирования воздуха, тепловые насосы и т.д. (Industrial air conditioning: air coolers, air conditioning units, heat pumps and so on)
- Низкотемпературное охлаждение (Low temperature cooling)
- Промышленные холодильные установки и пищевая промышленность: супермаркеты, склады, холодильные камеры и т.д. (Industrial refrigeration and food industry: supermarkets, warehouses, refrigerated chambers and so on)
- Промышленные и бытовые установки кондиционирования воздуха: охладители, агрегаты для кондиционирования воздуха, тепловые насосы и т.д. (Industrial and domestic air conditioning: air coolers, air conditioning units, heat pumps and so on)
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Forane® 427A, a simplified retrofit solution, for existing R-22 installations is a large range of applications.

Forane® 427A can be used in retrofit low and medium temperature refrigeration applications as well as conditioning applications.

Forane® 427A is a simplified retrofit solution for existing R-22 installations in a large range of applications.

In this context, the need for retrofit solutions is growing worldwide and the most cost efficient solution to keep your R-22 installations running is Forane® 427A.

No modification of the installation is necessary, similar performance to HFC-22, works well with residual mineral oil or alkylbenzene.

Forane® 427a is a non-toxic, non-flammable and zero-ODP refrigerant, an aerosol, which can be achieved without the need for a residual oil (mineral or alkylbenzene).

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Forane® 427A is a simplified retrofit solution for existing R-22 installations in a large range of applications.

For Article 5 countries (developing countries), the cap of recycled R-22 will be totally banned in Europe after 2015. This is required to fulfill the obligations under the Montreal Protocol, which call for amendments.

Thermodynamic properties; however, like all HCFCs it requires just one drainage of the system’s oil followed by its replacement by a POE lubricant.

Recovery of the whole R-22 charge is necessary. Drainage of the original oil from the system is required as a preliminary step. An analysis of the original oil is recommended to ensure that the R-22 installation is in a good state of repair.

HCFC-22 charge change (when necessary, see text in brackets). It is recommended that no moving process is required before the change is accepted.

Change of the filter drier.

Vacuum pumping of the installation and recharge with Forane® 427A. Arkema recommends to first fill the system with 100% Forane® 427A, then to top up to 95% if necessary.

Forane® 427A refrigerant is non-toxic and non-flammable with an A1/A3/A4 safety classification.

Lubricants

Forane® 427A as an HFC blend is ideally compatible with ester oils or with plastic materials compatible with HFC, HFO and HCAs.

Composition of Forane® 427A

A 100% HFC blend

HFCs Consumption Reduction Schedule

-100% of HCFC-22 from 2013.

Even +2.8 per cent of 1989 CFC consumption.

Baseline calculated as 1989 HCFC consumption.

1988 consumption level allowed.

1988 consumption level allowed.

1988 consumption level allowed.

FORANE® 427A: the closest retrofit for R-22 at any level of temperature, from air conditioning to medium and low temperature refrigeration

PERFORMANCE COMPARISON OF R-22 alternatives vs. R-22

Air Conditioning (water chiller)

Operating conditions: evaporating temperature 2°C, condensing temperature 35°C, chilled water temperature -11°C, chilled water temperature -15°C

Low temperature refrigeration

Operating conditions: evaporating temperature -1°C, condensing temperature 10°C, chilled water temperature 0°C, chilled water temperature -5°C

FORANE® 427A has proven to be a robust retrofit of R-22 since 2005 in various fields:

- Commercial and domestic air conditioning, chillers, rooftop units, split systems, heat pumps, etc.
- Industrial refrigeration and back-pumping systems: supermarkets, cold rooms, etc.
- Industrial refrigeration*

FORANE® 427A is the retrofit solution which offers the closest match to R-22 in terms of performance as well as regarding the mass flow rates and operating pressures in both air conditioning and refrigeration. Due to its lower behaviour coefficient, FORANE® 427A is the only retrofit that can be used in existing systems designed for R-22 without requiring any changes on the installation (no need to change the expansion valves, liquid lines, condensing units or any other costly parts of your system).

Due to the low-GWP of FORANE® 427A, it can be used in any application. The low-GWP of FORANE® 427A helps to reduce greenhouse gas emissions and has a low environmental impact. It is also compatible with existing equipment and can be easily retrofitted into R-22 systems without requiring any changes to the installation. FORANE® 427A is a highly efficient refrigerant that provides energy savings and cost savings for customers. It is a good solution for those who want to reduce their carbon footprint and lower their operating costs.