

Mexichem.
FLUOR

KLEA® Refrigerants



PRODUCT INFORMATION GUIDE





At Mexichem Fluor, our mission is to make refrigerants work for our customers and for the benefit of society. We aim to create real value through innovation, quality and achieving the best levels of service in our industry.

Our employees understand that our success and future prosperity depends on our ability to generate real value for our customers. We aim to do so through technical innovation, a commitment to quality and striving to offer the best customer service in our industry.

Innovation has made us one of the leading fluorine technology companies and new developments remain the life blood of our business. Mexichem Fluor has a proven record of innovation in fluorine chemistry and refrigerants dating back over 50 years in ICI and 10 years with INEOS.

A casual glance at Mexichem Fluor's products will show a comprehensive range that covers the requirement of a rapidly changing industry. A closer inspection will quickly establish that it has a product range of the highest quality that can be relied upon, time after time.

Quality is guaranteed, rigorously enforced and designed into the manufacturing processes. However, it is only when a customer starts to work with Mexichem Fluor that they fully appreciate the real value and the depth of expertise supporting each and every one of its refrigerant products.

The company is also committed to the long-term sustainability of its business and has invested heavily in environmental technology to reduce the environmental impact of its operations around the world. The company strongly supports the European F-Gas Regulation to improve the containment of HFCs and minimise emissions. This is a requirement from manufacture of HFCs, through distribution and delivery, in use and at end of life. We are working with our customers, hauliers and on our own facilities to implement measures to improve HFC containment.

Our role is to manufacture and deliver high quality products that provide a seamless transition to sustainable refrigeration within the current legislative framework. Our programme to develop and evaluate efficient lower GWP refrigerant options for a variety of applications supports this. In addition Mexichem Fluor is committed to being fully compliant with the REACH Regulation requirements.

Our KLEA® range of HFCs (hydrofluorocarbons) was developed to replace CFCs and HCFCs in many refrigeration, air conditioning, aerosol and foam blowing systems around the world, and we are working to expand our range of refrigerants to include a range of lower GWP refrigerant options in order to provide customers with the benefits and characteristics they seek but at the smallest carbon footprint.

For more information please visit our website:

www.mexichemfluor.com

Effective and efficient refrigerant blends for every application:

KLEA® 407A and KLEA® 404A

Ideal for supermarket refrigeration

KLEA® 407C

Developed for air-conditioning

KLEA® 410A

For efficient and compact A/C-units

The table below sets out our range of KLEA® refrigerants with lubricant recommendations. We continue to explore new refrigerants - built on extensive reserves of expertise and experience. Please note that not all products are available in all markets. Note that KLEA® 32 is a moderately flammable refrigerant, which is used in some industrial refrigeration applications.

Refrigerant	Refrigerant Number	Type of oil to be used	Temperatures (low/medium)
KLEA® 134a	R-134a	POE Oils	Medium
KLEA® 407A	R-407A	POE Oils	Medium/Low
KLEA® 407C	R-407C	POE Oils	Medium/High
KLEA® 410A	R-410A	POE Oils	Medium/High
KLEA® 404A	R-404A	POE Oils	Low
KLEA® 507	R-507	POE Oils	Low
KLEA® 508	R-508	A/B POE	Very Low
KLEA® 23	R-23	A/B POE	Very Low
KLEA® 32	R-32	POE Oils	Low/Medium

While the transition from CFCs is essentially complete, alternatives to HCFC 22 for use in existing or new systems continue to be important, as HCFCs are phased-out. Mexichem Fluor offers a full range of HFC products to replace HCFC 22 in a range of applications and continue to explore new product offerings.

Traditional Refrigerant	Alternative	Refrigerant Number	Type of oil to be used	A 'drop-in' yes/no	Temperatures (low/medium)
ARCTON® 22	KLEA® 134a	R-134a	POE Oils	No	Medium
	KLEA® 407A	R-407A	POE Oils	No	Medium/Low
	KLEA® 407C	R-407C	POE Oils	No	Medium/High
	KLEA® 410A	R-410A	POE Oils	No	Medium/High

Physical Properties

KLEA® 134a

Widely accepted as the most appropriate alternative to R-12 over the majority of the application range for both retrofit and new equipment. A very good match to R-12 in air-conditioning, high and medium temperature usage.

Property	SI Units	British Units
Boiling Point	-26.07 (°C @ 1 atm)	-14.93 (°F @ 14.7 psia)
Vapour Pressure	6.7 (bara @ 25°C)	85.8 (psia @ 70°F)
Critical Temperature	101.03 (°C)	213.9 (°F)
Critical Pressure	40.6 (bara)	588.9 (psia)

KLEA® 407A

KLEA®407A is an energy efficient, low GWP refrigerant designed for use in medium and low temperature supermarket applications. It is suitable for new installations and retrofits on existing R-22 units or R-404A units to achieve a lower GWP refrigerant.

Composition (wt%) R-32/R-125/R-134a = 20/40/40

Property	SI Units	British Units
Bubble Point	45.3 (°C @ 1bar)	-49.0 (°F @ 14.7psia)
Dew Point	-38.9 (°C @ 1bar)	-37.5 (°F @ 14.7psia)
Evaporator Glide	4.3 (°C @ 1bar)	7.7 (°F @ 14.7psia)
Bubble Point Pressure	12.5 (bara @ 25°C)	163.5 (psia @ 70°F)
Critical Temperature	82.3 (°C)	180.1 (°F)

KLEA® 407C

All of the R-407 refrigerants are based on blends of the three HFC refrigerants, R-32 (difluoromethane), R-125 (pentafluoroethane) and R-134a. R-407C has been formulated as a good match to the existing HCFC refrigerant, R-22, for use in air-conditioning, chilling and refrigeration applications and is the first of the R-22 alternatives to be used on a commercial scale. Suitable for retrofit and original equipment usage.

Composition (wt%) R-32/R-125/R-134a = 23:25:52

Property	SI Units	British Units
Bubble Point	-44.0 (°C @ 1 atm)	-47.2 (°F @ 14.7 psia)
Dew Point	-36.8 (°C @ 1 atm)	-34.2 (°F @ 14.7 psia)
Evaporator Glide	4.8 (K)	8.6 (°F)
Bubble Point Pressure	11.9 (bara @ 25°C)	155.7 (psia @ 70°F)
Critical Temperature	86.0 (°C)	186.8 (°F)

KLEA® 410A

A leading high-pressure alternative to R-22, comprising of R-32 and R-125, for air-conditioning and refrigerant applications.

Composition (wt%) R-32/R-125 = 50/50

Property	SI Units	British Units
Boiling Point	-51.95 (°C @ 1 atm)	-61.51 (°F @ 14.7 psia)
Vapour Pressure	16.7 (bara @ 25°C)	217.5 (psia @ 70°F)
Critical Temperature	71.0 (°C)	159.8 (°F)
Critical Pressure	49.1 (bara)	712.1 (psia)

Physical Properties

KLEA® 404A

A long-term alternative to R-502 for retrofit and refrigeration applications.

Composition (wt%) R-143a/R-125/R-134a = 44:52:4

Property	SI Units	British Units
Bubble Point	-46.9 (°C @ 1 atm)	-52.4 (°F @ 14.7 psia)
Dew Point	-46.1 (°C @ 1 atm)	-51.0 (°F @ 14.7 psia)
Evaporator Glide	0.5 (K)	1.0 (°F)
Bubble Point Pressure	12.6 (bara @ 25°C)	164.9 (psia @ 70°F)
Critical Temperature	71.6 (°C)	160.9 (°F)

KLEA® 507

A long-term alternative to R-502, comprising of R-125 and R-143a, for retrofit and refrigerant applications.

Composition (wt%) R-125/R-143a = 50:50

Property	SI Units	British Units
Boiling Point	-47.48 (°C @ 1 atm)	-53.46 (°F @ 14.7 psia)
Vapour Pressure	12.9 (bara @ 25°C)	168.5 (psia @ 70°F)
Critical Temperature	70.2 (°C)	158.4 (°F)

KLEA® 508

Ideal for use in low temperature applications, such as biomedical freezing.

Composition (wt%) R-23/R-116 = 39/61

Property	SI Units	British Units
Boiling Point	-85.7 (°C @ 1 atm)	-122.2 (°F @ 14.7 psia)
Vapour Pressure	8.2 (bara @ -40°C)	119.1 (psia @ -40°F)
Critical Temperature	13.2 (°C)	55.8 (°F)

KLEA® 23

An alternative for ultra low temperature refrigeration applications.

Property	SI Units	British Units
Boiling Point	-82.10 (°C @ 1 atm)	-115.76 (°F @ 14.7 psia)
Vapour Pressure	7.1 (bara @ -40°C)	103.5 (psia @ -40°F)
Critical Temperature	25.9 (°C)	78.7 (°F)
Critical Pressure	48.36 (bara)	701.4 (psia)

Physical Properties

KLEA® 32

Of interest as a blend component for R-22 and R-502 alternatives. In many ways R-32 can be regarded as a non-toxic, non-corrosive, high-capacity ammonia, as far as its refrigeration characteristics are concerned. Like ammonia, its high compressor discharge temperatures require the use of appropriate compressor technology.

Property	SI Units	British Units
Boiling Point	-51.7 (°C @ 1 atm)	-61.0 (°F @ 14.7 psia)
Vapour Pressure	16.9 (bara @ 25°C)	220.6 (psia @ 70°F)
Critical Temperature	78.35 (°C)	173.0 (°F)
Critical Pressure	57.16 (bara)	829.04 (psia)





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