

climalife[®]

galco

Refrigeration . Air conditioning . Heating . Renewable Energy





A KEY PARTNER FOR ENERGY PERFORMANCE

Dehon Group Quality, Safety and Environment Policy



Listen & Satisfy:
our **customers** by paying attention to their needs and continuously improving our products and services.

By conducting
customer satisfaction surveys and formalising customer visits with visit reports.

By developing
the services we provide to suit the needs of our customers, in areas such as traceability of products and packaging.

By improving
communication between the different companies in the Group.



Anticipate Risks & Ensure:
the safety of our colleagues, our partners, and our customers and aim for zero accidents.

By complying with rules and regulations.
By implementing preventive measures at work stations and backing up with safety training.

By advising our clients/partners about the correct use of our products, in order to guarantee their safety.



Control & Reduce:
the environmental impact of our products and activities.

By developing Greenway products with reduced environmental impact.

By reducing and recovering waste.

By controlling our greenhouse gas emissions.

Developing innovative, sustainable solutions for climate control systems

For more than a century, Climalife has been Europe's specialist in cooling fluids for refrigeration and air conditioning.

Its dynamism and commitment to quality and protecting the environment has also enabled it to gain cutting-edge expertise in the heating and renewable energy markets.

More than 250 employees are available to share their knowledge on diverse sectors as: industrial markets, commercial markets (large outlets, local stores, etc.), housing and apartments, and the service sector (offices, hospitals, airports...).

They can meet your needs with a range of products and services suitable for any climate control system: refrigerants, secondary refrigerants/heat transfer fluids, lubricants, equipment, cleaning, brazing alloys, analysis, services.

Climalife benefits from the structure of the Dehon Group, a key player in performance chemistry, in developing innovative solutions and building special partnerships with professionals, particularly producers, manufacturers, industrial firms, and distributors.

Innovative services developed for safety and the environment, regular technical and regulatory information, and high-performance tools complete this comprehensive plan.

Climalife offers its products and services worldwide, thanks to a global distribution network made up of 13 subsidiaries (Germany, Belgium, Netherlands, France, United Kingdom, Spain, Hungary, Switzerland, Scandinavia, Italy, Russia, Panama, and Romania), and local representatives (India, China, Singapore and Malaysia) and an export subsidiary, Climalife Galco, for the rest of the world.

We are committed to putting at your disposal the resources necessary for the implementation of these objectives and we ask all of our colleagues to take an active part in their deployment throughout all areas of the business.

Pierre-Etienne Dehon
Chairman





Solutions for replacing R-22

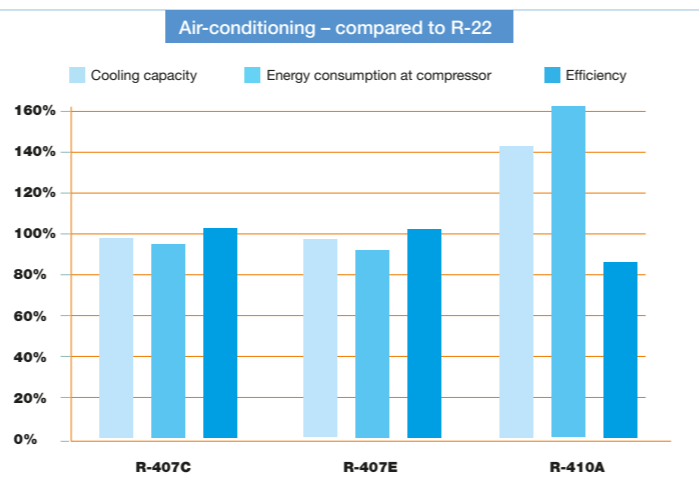
For each application, replacement fluids are possible for direct expansion installations. A preliminary comprehensive study of all parameters, checking the general condition of the installation, its economic viability and the oil to use, is essential before any fluid change over.

Replacement refrigerants for R-22:

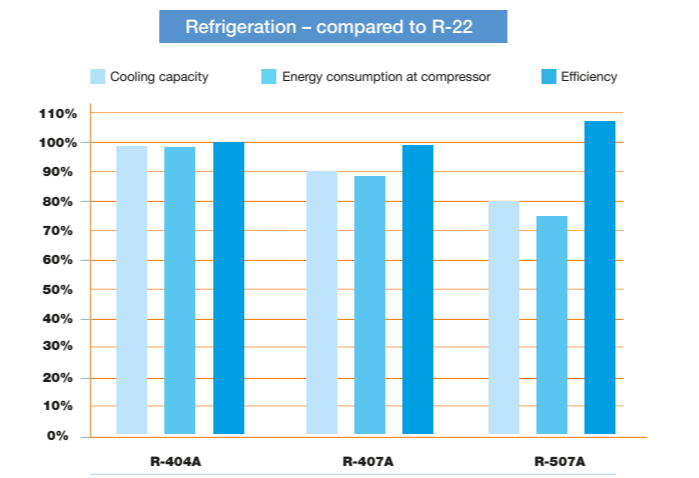
- Air-conditioning application: R-407C, R-407E*, R-410A**.
- Refrigeration application: R-404A, R-407A, R-507A.

*R-407E can be used with high ambient temperatures

**Please note! In the case of using R-410A, this equipment is designed for R-410A and not for retrofitting R-22



-5/40°C regime SC = 5k SR = 5k - Semi-hermetic reciprocating compressor



-30/40°C regime SC = 20k SR = 5k - Semi-hermetic reciprocating compressor

HFO: 4th generation fluids for future installations

HFO: molecules on the market (*)			
Current HFC	HFO Non flammable	HFO Low flammability (ASHRAE A2L)	Application examples
R-134a GWP = 1430		Solstice™ yf GWP = 4	Automotive AC, Vending Machines, Refrigerators
		R-1234ze GWP = 6	Chillers, CO ₂ Cascade, Refrigerators
R-123 GWP = 77	R-1233zd GWP = 5		Centrifugal chillers

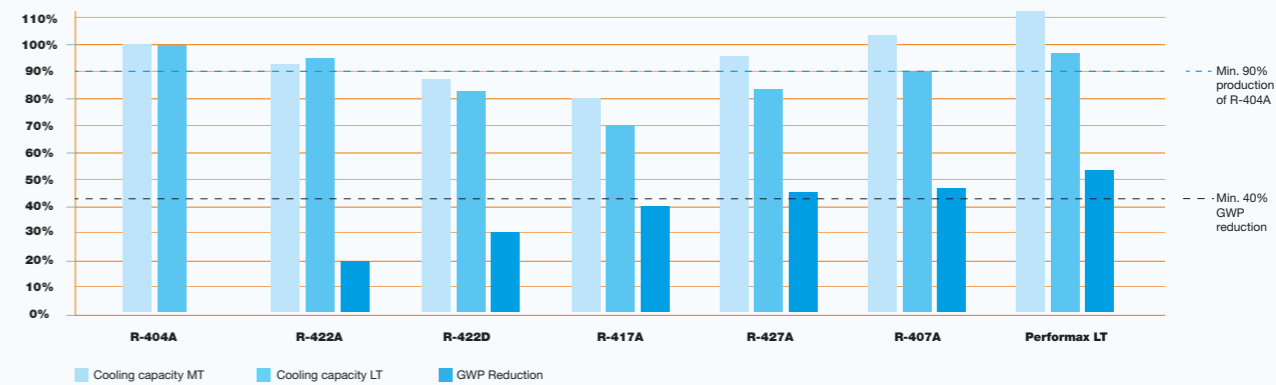
(*) Mixes are currently in development phase. Climalife will accompany you and present these new solutions to you.

Solutions for replacing R-404A

As per the European regulations, now a low GWP fluid is available to replace R-404A.

Selection criteria:

- Cooling capacity at medium or low temperature: 90% minimum compared to R-404A
- GWP reduced by at least 40% compared to R-404A (GWP = 3922).





Refrigerants

Refrigerant gases intended for refrigeration and air conditioning

We offer a full range of refrigerants that can be applied in different sectors. These refrigerants are available in innovative packaging and varying in sizes. The packagings are either in refillable cylinders or in disposables.

HCFC (Hydrochlorofluorocarbons):

It is commonly used as a propellant and refrigerant. These applications are in process of being phased out due to the compound's ozone depletion potential (ODP) and high global warming potential (GWP).



HFC (Hydrofluorocarbons):

Refrigerants in this group not contribute to the destruction the ozone layer. HFC refrigerants were designed to replace HCFCs.



HCFC		
Product	Packaging	Charge
R-123	Drum	50 kg
R-141b	Disposable	13,6 kg
R-22	Disposable	13,6 kg
R-22	Disposable	22,7 kg
R-22	Ton drum	940 kg
R-22	Isotank	20 T
R-406A	Disposable	13,6 kg
R-408A	Disposable	10,9 kg
R-409A	Disposable	13,6 kg

HFC		
Product	Packaging	Charge
R-134a	Can	340 g to 1 kg
R-134a	Disposable	13,6 kg
R-134a	Disposable	22,7 kg
R-134a	Ton drum	940 kg
R-134a	Isotank	20 T
R-23	HP Cylinder 12 L	9 kg
R-32	Cylinder 12 L	10 kg
R-32	Ton drum	720 kg
R-404A	Disposable	10,9 kg
R-404A	Ton drum	= 750 kg
R-404A	Isotank	= 18 T
R-407A	Disposable	11,3 kg
R-407C	Disposable	11,3 kg
R-407C	Ton drum	850 kg
R-407E	Disposable	11,3 kg
R-407F	Disposable	11,3 kg
R-410A	Disposable	11,3 kg
R-410A	Container	740 kg
R-410A	Isotank	18 T
R-427A	Disposable	11,3 kg
R-507A	Disposable	11,3 kg
R-507A	Ton drum	700 kg
R-507A	Isotank	17,5 T
R-508B	HP Cylinder 12 L	9 kg

HFO		
Product	Packaging	Charge
R-1234ze	Disposable	13,6 kg
Solstice® yf	Cylinder 6 L	5 kg
Solstice® yf	Cylinder 12,3 L	10 kg

Ammonia		
Product	Packaging	Charge
Ammonia	Cylinder 88 L	45 kg
Ammonia	Drum 930 L	480 kg

HC		
Product	Packaging	Charge
Propan R-290	Cylinder 1 L	390 g
Isobutane R-600a	Cylinder 1 L	420 g
Isobutane R-600a	Disposable	6,5 kg

PFC		
Product	Packaging	Charge
R-116	HP Cylinder	52,15 kg
R-14	HP Cylinder	8 kg
R-14	HP Cylinder	30 kg

HFO (HydroFluoro-Olefins)

are 4th generation refrigerants. They are an alternative with low GWP values that reduce environmental impact while offering energy efficiency.

HC (Hydrocarbons)

R-290 and R-600a are hydrocarbons that are classified as flammable, used. See the specifications to check the conditions of their use in refrigeration systems.

PFC (Perfluorocarbons)

Refrigerant for ultra low temperature.

Possible replacement refrigerant according to applications

CFC banned	HCFC	HFC - NH ₃
R-12	R-406A R-409A	R-134a R-437A
	R-22 Air conditioning application	R-134a / R-407C R-407A / R-407F / R-407E R-410A / R-417A R-422D / R-427A
	R-22 Refrigeration application	R-134a R-404A / R-507A R-407A / R-407F R-422D / R-427A NH ₃
R-114	R-124	R-227ea / R-236fa / R-245fa
R-502	R-408A	R-404A / R-507A / R-422A / R-407A / R-407F
R-13 R-503		R-23 R-508B



Refrigerants

Refrigerant gases intended for refrigeration and air conditioning

What is Frio +?

Frio + is a trademark of the Climalife Company. Under this brand we deliver high quality Refrigerants. All Refrigerants are tested before each shipment in our "Climalife" Laboratory. This ensures that the chemical composition of the gas in the packaging is fully consistent with the Specification. High quality refrigerant Frio + is most appreciated and demanded product by our customers worldwide.

- Bar handle type.
- One time filling valve.
- Valve with Climalife logo hence quality approved.
- Good and strong quality 3 layers carton.
- Palletizing while packaging to ensure safe transport.
- Valve laminated with plastic cover / valve rotated with a torque as per Climalife SOP.
- Every disposable has hologram with unique number to track.
- Container covered with bubble sheet from inside to prevent moisture



- As per government regulations, it is illegal to refill a disposable.
- As a standard practice, It is highly risky to reuse the valve and disposable cylinder.
- Always store refrigerant cylinders in dry area.
- Do not store in direct sun light (temperature exceeding 52 Degree C / 125 Degree F).
- Please check the standard of packaging and quality of product before using.

Logistic & Supply Chain Support

We select for you the best possible prices, products, services and these negotiations are supported by a professional team of local and international staff on site.

- Product specifications are guaranteed, cargo inspection and certifications are available
- Offering you the best possible incoterms
- Short lead time and best possible delivery terms
- Warranties benefit on our high end goods
- Strong Trademarks with respect for copyrights and existing patents

We offer branded products for an exclusive overseas network of distributors so we can differentiate us from competing products that you possibly can find on the local market.



HCFC / HFC: physico-chemical properties*

	Units	R-22	R-134a	R-23	R-32	R-404A	R-407A	R-407C	R-407E	R-407F
Composition		CHF ₂ Cl	CH ₂ F-CF ₃	CHF ₃		44% R-125, 52% R-143a, 4% R-134a	20% R-32, 40% R-125, 40% R-134a	23% R-32, 25% R-125, 52% R-134a	25% R-32, 15% R-125, 60% R-134a	23% R-32, 25% R-125, 52% R-134a
Boiling point (under 1,013 bar)	°C	-40,81	-26,08	-82	- 51,65	-46,57	-45,01	-43,81	-42,66	-46,06
Temperature glide under 1,013 bar	K	0	0	0	0	0,75	6,41	7	7,17	6,4
Density of liquid at 25°C	kg/m ³	1194,6	1206,71	680,09	961	1044	1145	1137,5	1132	1116,9
Density of saturating vapour at normal boiling point	kg/m ³	4,82	5,257	4,662	2,987	5,48	4,881	4,63	4,48	4,46
Saturation pressure (Liquid sat.)										
25°C	bar	10,44	6,654	49,986	16,9	12,55	12,53	11,9	11,49	13,11
50°C		19,43	13,18		31,4	23,11	23,24	22,16	21,45	24,31
Critical temperature	°C	96,15	101,06	26,14	78,11	72,05	82,26	86,03	88,46	82,66
Critical pressure	bar absolute	49,9	40,59	48,32	57,82	37,29	45,15	46,29	47,02	47,55
Critical density	kg/m ³	523,8	511,9	526,5	424	486,54	499	484,2	474	477,34
Latent vapourisation heat at normal boiling point	kJ/kg	233,7	216,97	239,4	381	200,94	235,57	249,8	257,85	257,21
Specific heat at 25°C										
Liquid	kJ/(kg.K)	0,08365	1,425	18,87	0,135	1,542	1,52	1,535	1,546	1,575
Vapor under 1,013 bar		0,01058	0,8512	0,737	0,0124	0,877	0,829	0,837	0,843	0,834
Cp/Cv ratio at 25°C under 1,013 bar		1,185	1,119	1,201	1,252	1,118	1,138	1,144	1,148	1,152
NF-EN 378 classification		L1	L1	L1	A2	L1	L1	L1	L1	L1
ODP	(R11 = 1)	0,055	0	0	0	0	0	0	0	0
GWP	(CO ₂ = 1)	1810	1430	14800	675	3922	2107	1774	1552	1824

*All elements are simulated using Refprop 8 and 9 and given purely as an indication.

HFC / HFO / HC: physico-chemical properties*

	Units	R-410A	R-427A	R-507A	R-508B	R-1234ze	Solstice [®] yf	R-290	R-600a
Composition		50% R-32, 50% R-125	50% R-134a, 25% R-125, 15% R-32, 10% R-143a	50% R-125, 50% R-143a	46% R-23, 54% R-116	CF ₃ -CH=CHF	CH ₂ =CFCF ₃	Propane C ₃ H ₈	Isobutane C ₄ H ₁₀
Boiling point (under 1,013 bar)	°C	-51,6	-46,55	-46,75	-87,6	-18,96	-29,49	-42,22	-11,7
Temperature glide under 1,013 bar	K	0,08	6,75	0	0,44	0	0	0	0
Density of liquid at 25°C	kg/m ³	1058,6	1124,98	1047,9	Not applicable	1163	1092	580	550,65
Density of saturating vapour at normal boiling point	kg/m ³	4,173	4,78	5,585	6,548	5,71	5,98	2,417	2,826
Saturation pressure (Liquid sat.)									
25°C	bar	16,57	11,43	12,83	Not applicable	4,99	6,83	2,03	0,58
50°C		30,71	21,25	23,61		9,97	13,02	-	-
Critical temperature	°C	71,35	85,32	70,62	11,2	109,37	94,7	96,7	134,98
Critical pressure	bar absolute	49	43,91	37,05	37,72	36,36	33,82	42,4	37,2
Critical density	kg/m ³	459,53	689,97	490,77	568	489,24	475,55	220,48	225,5
Latent vapourisation heat at normal boiling point	kJ/kg	272,97	236,52	196,94	165,36	195,43	180,25		366,70
Specific heat at 25°C									
Liquid	kJ/(kg.K)	7,708	1,517	1,539	Not applicable	1,383	1,392	1,64	2,38
Vapor under 1,013 bar		0,823	0,847	0,87	0,757	0,887	0,905	-	-
Cp/Cv ratio at 25°C under 1,013 bar		1,176	1,131	1,117	1,136	1,102	1,099	1,1364	1,0958
NF-EN 378 classification		L1	L1	L1	L1	L2L	L2L	A3	A3
ODP	(R11 = 1)	0	0	0	0	0	0	0	0
GWP	(CO ₂ = 1)	2088	2138	3985	13396	6	4	3	3

*All elements are simulated using Refprop 8 and 9 and given purely as an indication.

EXPORT**Galco - Climalife**

Avenue Carton de Wiart, 79
 B-1090 BRUSSELS / BELGIUM
 Tel.: 00 32 2 421 01 84
 Fax: 00 32 2 426 46 03
climalife.galco@climalife.dehon.com

CHINA**IPCT-Climalife**

中国上海市莘庄工业区元科路185号6号楼1-2楼 邮编201108
 1-2/F Building 6, No. 185 Yuanke Road, Xinzhuang Ind. Park, Shanghai, 201108, China
 Tel.: 0086-21-6442 3962*(extension 808)
 Fax: 0086-21-6442 3952

RUSSIA**ООО Teknalys - Climalife**

Prospect Mira 101, bat. 1, bureau 1212
 RU-129085 MOSCOW
 Tel.: 00 7 (495) 410-3419
 Fax: 00 7 (499) 995-1215
climalife.ru@climalife.dehon.com

BELGIUM**dehon service belgium**

Av. Carton de Wiart, 79
 B-1090 BRUSSELS
 Tel.: 00 32 2 421 01 70
 Fax: 00 32 2 426 96 62
climalife.be@climalife.dehon.com

**FRANCE (Head Office)
dehon service SA**

26, avenue du Petit Parc
 F-94683 VINCENNES Cedex
 Tel.: 00 33 1 43 98 75 00
 Fax: 00 33 1 43 98 21 51
climalife.fr@climalife.dehon.com

GERMANY**DKF Dehon Kälte-Fachvertriebs GmbH**

Robert-Bosch-Strasse 14
 D-40668 MEERBUSCH
 Tel.: 00 49 2150 7073 0
 Fax: 00 49 2150 7073 17
climalife.de@climalife.dehon.com

HUNGARY**Climalife kft**

Rét u.2.
 H-2040 BUDAÖRS
 Tel.: 00 36 23 431 660
 Fax: 00 36 23 431 661
climalife.hu@climalife.dehon.com

ITALY**Climalife**

Via Pusterla n° 8
 I-20013 MAGENTA (MI)
 Tel.: 00 39 02 48401 206
 Fax: 00 39 02 48461 341
climalife.it@climalife.dehon.com

NETHERLANDS**dehon service nederland**

Van Konijnenburgweg 84
 NL-4612 PL BERGEN OP ZOOM
 Tel.: 00 31 164 212 830
 Fax: 00 31 164 212 831
climalife.nl@climalife.dehon.com

ROMANIA**Climalife kft Budapesta Sucursala Bucuresti Romania**

Bulevardul Hristo Botev, Nr. 28
 Biroul nr. 4 Modulul I. Sectorul 3
 RO-BUCHAREST
 Tel.: 00 40 76 11 49 741
climalife.ro@climalife.dehon.com

SCANDINAVIA**dehon nordic service**

Östra Hamngatan 50B 3tr
 SE-41109 GÖTEBORG
 Tél. /Fax: 00 46 44 21 58 80
climalife.se@climalife.dehon.com

SPAIN**friogas**

Poligono Industrial SEPES
 Parcela 10
 ES-46500 SAGUNTO (Valencia)
 Tel.: 00 34 9 6 266 36 32
 Fax: 00 34 9 6 266 50 25
administracion@friogas.climalife.es

SWITZERLAND**Prochimac SA**

Rue du Château 10
 CH-2000 NEUCHÂTEL
 Tel.: 00 41 32 727 3600
 Fax: 00 41 32 727 3619
climalife.ch@climalife.dehon.com

UNITED KINGDOM**IDS Refrigeration Ltd**

Green Court
 Kings Weston Lane
 Avonmouth
 BRISTOL BS11 8AZ - UK
 Tel.: 00 44 11 79 80 25 20
 Fax: 00 44 11 79 80 25 21
climalife.uk@climalife.dehon.com



climalife[®]
 galco

www.climalife.dehon.com

Authorized Distributor