

# Guide to Alternative Refrigerants



## Genetron® Refrigerants

### Commercial Refrigeration

#### HFC Refrigerants

ASHRAE #	Trade Name	Manufacturer	Replaces	Type <sup>(b) (e)</sup>	Typical Lubricant <sup>(a)</sup>	Applications	Comments	GWP*
<b>R-404A</b> 125/143a/134a (44%/52%/4%)	Genetron® 404A Suva® HP62 Forane® 404A	Honeywell DuPont Arkema	R-502 R-22 HP-80 R-408A	Blend HFC	Synthetic (POE, PVE)	New Equipment Retrofits	Most widely used low and medium temperature replacement.	3922
<b>R-507</b> 125/143a (50%/50%)	Genetron® AZ-50® Suva® 507	Honeywell DuPont	R-502 R-22 HP-80 R-408A	Azeotrope HFC	Synthetic (POE, PVE)	New Equipment Retrofits	Slightly higher pressures and efficiency than R-404A. Best choice for systems with flooded evaporators.	3985
<b>R-422D</b> 125/134a/600a (65.1%/31.5%/3.4%)	Genetron® 422D Isceon MO 29	Honeywell DuPont	R-22	Blend HFC/HC Blend	Mineral Oil POE	New Equipment Retrofits	Lower capacity  Use of POE will enhance oil return, if required.	2729
<b>R-407C</b> 32/125/134a (23%/25%/52%)	Genetron® 407C Suva® 9000 Forane® 407C	Honeywell DuPont Arkema	R-22	Blend HFC	Synthetic (POE, PVE)	New Equipment Retrofits	Reasonable performance match to R-22 in medium temperature refrigeration. Lower capacity in low temperature refrigeration system. Best A/C retrofit.	1744
<b>R-407F</b> 32/125/134a (30%/30%/40%)	Genetron® Performax™ LT	Honeywell	R-22	Blend HFC	Synthetic (POE, PVE)	New Equipment Retrofits	Best performance match and highest efficiency to R-22. In most cases one POE oil change is sufficient.	1824
<b>R-134a</b>	Genetron® 134a Suva® 134a Forane® 134a Klea® 134a	Honeywell DuPont Arkema INEOS	R-12	Single Component Fluid HFC	Synthetic (POE, PVE)	New Equipment	Performs well in small hermetic systems.	1430

#### Interim HCFC Based Refrigerants

ASHRAE #	Trade Name	Manufacturer	Replaces	Type <sup>(b) (e)</sup>	Typical Lubricant <sup>(a)</sup>	Applications <sup>(c)</sup>	Comments	GWP*
<b>R-401A</b> 22/152a/124 (53%/13%/34%)	Genetron® MP39 Suva® MP39	Honeywell DuPont	R-12	Blend HCFC/HFC	Alkylbenzene Synthetic (POE, PVE) Mineral Oil	Med Temp Retrofits <sup>(c)</sup>	In most cases no oil change is needed. Best for applications with >0 °F suction.	1183
<b>R-401B</b> 22/152a/124 (61%/11%/28%)	Genetron® MP66 Suva® MP66	Honeywell DuPont	R-12 R-500	Blend HCFC/HFC	Alkylbenzene Synthetic (POE, PVE) Mineral Oil	Transport Refrigeration Low Temp Retrofits <sup>(c)</sup> Retrofits including air conditioners and dehumidifiers.	In most cases no oil change is needed. Best for low temp R-12 and R-500 retrofit applications. Evaporating temperature >0°F.	1289
<b>R-409A</b> 22/124/142b (60%/25%/15%)	Genetron® 409A Suva® 409A Forane® FX-56	Honeywell DuPont Arkema	R-12 R-500	Blend HCFC	Alkylbenzene Synthetic (POE, PVE) Mineral Oil	Retrofits <sup>(c)</sup> Low and Med Temp	In most cases no oil change is needed. Good broad range R-12 substitute.	1585
<b>R-402A</b> 125/290/22 (60%/2%/38%)	Genetron® HP80 Suva® HP80	Honeywell DuPont	R-502	Blend HFC/HC/HCFC	Alkylbenzene Synthetic (POE, PVE)	Retrofits Low and Med Temp	Most widely used R-502 retrofit substitute. Higher discharge pressure than R-502. Use either synthetic oil or blend of AB/MO with AB>50%.	2788
<b>R-402B</b> 125/290/22 (38%/2% 60%)	Genetron® HP81 Suva® HP81	Honeywell DuPont	R-502	Blend HFC/HC/HCFC	Alkylbenzene Synthetic (POE, PVE)	Ice Machines	Niche refrigerant used in some ice machines.	2416
<b>R-408A</b> 125/143a/22 (7%/46%/47%)	Genetron® 408A Suva® 408A Forane® FX-10	Honeywell DuPont Arkema	R-502	Blend HFC/HCFC	Alkylbenzene Synthetic (POE, PVE)	Retrofits Low and Med Temp	Works well as R-502 substitute. Higher discharge temperatures than R-502. Use either syn-thetic oil or blend of AB/MO with AB>50%.	3152

# Ultra Low Temp Refrigerants

ASHRAE #	Trade Name	Manufacturer	Replaces	Type <sup>(b) (e)</sup>	Typical Lubricant <sup>(a)</sup>	Applications	Comments	GWP*
R-23	Genetron® 23 Suva® 23	Honeywell DuPont	R-13 R-503	Single Component Fluid HFC	Synthetic (POE, PVE)	New Equipment Retrofits	Higher discharge temperatures than R-13 or R-508B	14,800
R-508B 23/116 (46%/54%)	Genetron® 508B Suva® 95	Honeywell DuPont	R-13 R-503	Azeotropic HFC	Synthetic (POE, PVE)	New Equipment Retrofits	Lower discharge temperatures than R-13 and R-23. Good performance match to R-503.	13,396

## Air Conditioning

### Centrifugal Chiller Refrigerants

ASHRAE #	Trade Name	Manufacturer	Replaces	Type <sup>(b) (e)</sup>	Typical Lubricant <sup>(a)</sup>	Applications	Comments	GWP*
R-123	Genetron® 123 Suva® 123 Forane® 123	Honeywell DuPont Arkema	R-11	Single Component Fluid HCFC	Alkylbenzene Mineral Oil Synthetic (POE, PVE)	New Equipment Retrofits	Due for phase out in 2030	77
R-245fa	Genetron® 245fa	Honeywell	R-11	Single Component Fluid HFC	Synthetic (POE, PVE)	New Equipment	Equipment redesign Organic Rankine Cycle & as Heat Transfer Fluid	1030
R-134a	Genetron® 134a Suva® 134a Forane® 134a Klea® 134a	Honeywell DuPont Arkema INEOS	R-12 R-500	Single Component Fluid HFC	Synthetic (POE, PVE)	New Equipment Retrofits	Used in many new chiller designs.	1430

## Air Conditioning and Heat Pumps

ASHRAE #	Trade Name	Manufacturer	Replaces	Type <sup>(b) (e)</sup>	Typical Lubricant <sup>(a)</sup>	Applications	Comments	GWP*
R-407C 32/125/134a (23%/25%/52%)	Genetron® 407C Suva® 407C Forane® 407C	Honeywell DuPont Arkema	R-22 R-500	Blend HFC	Synthetic (POE, PVE)	New Equipment Retrofits	Best retrofit alternative to R-22. Close performance match with slightly higher operating pressures.	1744
R-410A 32/125 (50%/50%)	Genetron® AZ-20® Suva® 410A Forane® 410A Puron®	Honeywell DuPont Arkema	R-22	Azeotropic Mixture HFC	Synthetic (POE, PVE)	New Equipment	High pressure, high efficiency refrigerant designed for new equipment. NOT FOR RETROFITTING.	2088
R-422D 125/134a/600a (61.5%/31.5/3.4%)	Genetron® 422D Isceon MO 29	Honeywell DuPont	R-22	Blend	Mineral Oil POE	New Equipment Retrofits (Unitary Equipment close coupled systems)	Lower capacity  Use of POE will enhance oil return, if required.	2729
R-134a	Genetron® 134a Suva® 134a Forane® 134a Klea® 134a	Honeywell DuPont Arkema INEOS	R-12 R-500	Single Component Fluid HFC	Synthetic (POE, PVE)	New Equipment Retrofits	Used in large screw chillers.	1430

#### R22 Phase-out Schedule for Air Conditioning and Refrigeration

January 1, 2004: 35% reduction in HCFC consumption required by Montreal Protocol.  
 January 1, 2010: No new R-22 can be manufactured for new equipment manufactured or imported in US or Canada. 65% reduction in HCFC consumption required by Montreal Protocol.  
 January 1, 2015: 90% reduction in HCFC consumption required by Montreal Protocol  
 January 1, 2020: No new R-22 refrigerant can be manufactured or imported into the US or Canada.  
 Any servicing must be done using stockpiled or reclaimed material.  
 100% reduction in HCFC consumption required by Montreal Protocol.

#### Notes

\*Listing of GWP Values as per Report IPCC WG1 AR4 (100-yr time horizon)  
 (a) Check with the compressor manufacturer for their recommended lubricant.  
 (b) Interim replacements contain HCFCs that are scheduled for phase out.

(c) Not recommended for automotive air conditioning.  
 (d) The refrigerant R-600 is butane. The refrigerant R-600a is isobutane.  
 (e) CFC=Chlorofluorocarbon; HCFC=Hydrochlorofluorocarbon; HFC=Hydrofluorocarbon  
 HC=Hydrocarbon; FC=Fluorocarbon

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