

# Guide to Alternative Refrigerants



## Genetron® Refrigerants

### Commercial Refrigeration Long Term Refrigerants

ASHRAE #	Trade Name	Manufacturer	Replaces	Type <sup>(b)</sup> (e)	Typical Lubricant <sup>(a)</sup>	Applications	Comments
<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 (low glide)	Synthetic (POE, PVE etc.)	New Equipment Retrofits	Most widely used low and medium temperature replacement.
<b>R-507</b> 125/143a (50%/50%)	Genetron AZ-50 Suva 507	Honeywell DuPont	R-502 R-22 HP-80 R-408A	Azeotrope (no glide) HFC	Synthetic (POE, PVE etc.)	New Equipment Retrofits	Slightly higher pressures and efficiency than R-404A. Best choice for systems with flooded evaporators.
<b>R-422A</b> 125/134a/600a (85.1%/11.5%/3.4%)	One Shot Isceon 79	ICOR DuPont	R-502 R-22	Blend HFC	Synthetic (POE, PVE etc.)	New Equipment Retrofits	Similar performance to R-404A.  Equipment with suction line accumulators and receivers should use synthetic oils to avoid oil return issues.
<b>R-422D</b> 125/134a/600a (65.1%/31.5%/3.4)	Genetron422D Isceon MO 29	Honeywell DuPont	R-22	Blend (moderate glide) HFC	Mineral Oil POE	New Equipment Retrofits	Lower capacity  Use of POE will enhance oil return, if required.
<b>R-407C</b> 32/125/134a (23%/25%/52%)	Genetron 407C Suva 9000 Forane 407C	Honeywell DuPont Arkema	R-22	Blend (high glide) HFC	Synthetic (POE, PVE etc.)	New Equipment Retrofits	Reasonable performance match to R-22 in medium temperature refrigeration. Lower capacity in low temperature refrigeration system.
<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 etc.)	New Equipment	Performs well in small hermetic systems.

### Interim HCFC Based Refrigerants

ASHRAE #	Trade Name	Manufacturer	Replaces	Type <sup>(b)</sup> (e)	Typical Lubricant <sup>(a)</sup>	Applications <sup>(c)</sup>	Comments
<b>R-401A</b> 22/152a/124 (53%/13%/34%)	Genetron MP39 Suva MP39	Honeywell DuPont	R-12	Blend (moderate glide) HCFC/HFC	Alkylbenzene Synthetic (POE, PVE etc.) Mineral Oil	Med Temp Retrofits <sup>(c)</sup>	In most cases no oil change is needed. Best for applications with >0 degrees F suction.
<b>R-401B</b> 22/152a/124 (61%/11%/28%)	Genetron MP66 Suva MP66	Honeywell DuPont	R-12 R-500	Blend (moderate glide) HCFC/HFC	Alkylbenzene Synthetic (POE, PVE etc.) 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.
<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 (high glide) HCFC	Alkylbenzene Synthetic (POE, PVE etc.) Mineral Oil	Retrofits <sup>(c)</sup> Low and Med Temp	In most cases no oil change is needed. Good broad range R-12 substitute.
<b>R-402A</b> 125/290/22 (60%/2%/38%)	Genetron HP80 Suva HP80	Honeywell DuPont	R-502	Blend (low glide) HFC/HC/HCFC	Alkylbenzene Synthetic (POE, PVE etc.)	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%.
<b>R-402B</b> 125/290/22 (38%/2%/60%)	Genetron HP81 Suva HP81	Honeywell DuPont	R-502	Blend (low glide) HFC/HC/HCFC	Alkylbenzene Synthetic (POE, PVE etc.)	Ice Machines	Niche refrigerant used in some ice machines.
<b>R-408A</b> 125/143a/22 (7%/46%/47%)	Genetron 408A Suva 408A Forane FX-10	Honeywell DuPont Arkema	R-502	Blend (low glide) HFC/HCFC	Alkylbenzene Synthetic (POE, PVE etc.)	Retrofits Low and Med Temp	Works well as R-502 substitute. Higher discharge temperatures than R-502. Use either synthetic oil or blend of AB/MO with AB>50%.

# Ultra Low Temp Refrigerants

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

## Air Conditioning Centrifugal Chiller Refrigerants

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

## Long Term Refrigerants — Air Conditioning and Heat Pumps

ASHRAE #	Trade Name	Manufacturer	Replaces	Type <sup>(b) (e)</sup>	Typical Lubricant <sup>(a)</sup>	Applications	Comments
R-407C 32/125/134a (23%/25%/52%)	Genetron 407C Suva 407C Forane 407C	Honeywell DuPont Arkema	R-22 R-500	Blend (high glide) HFC	Synthetic (POE, PVE etc.)	New Equipment Retrofits	Best retrofit alternative to R-22. Close performance match with slightly higher operating pressures.
R-410A 32/125 (50%/50%)	Genetron AZ-20 <sup>(TM)</sup> Suva 410A Forane 410A Puron	Honeywell DuPont Arkema	R-22	Azeotropic Mixture (near zero glide) HFC	Synthetic (POE, PVE etc.)	New Equipment	High pressure, high efficiency refrigerant designed for new equipment. NOT FOR RETROFITTING.
R-422D 125/134a/600a (65.1/31.5/3.4)	Genetron 422D Isceon MQ 29	Honeywell DuPont	R-22	Blend (moderate glide) HFC	Mineral Oil POE	New Equipment Retrofits	Lower capacity Use of POE will enhance oil return, if required.
R-134a	Genetron 134a Suva 134a Forane 134a Klea 134a	Honeywell DuPont Arkema INEOS	R-12 R-500	Single Component Fluid (no glide) HFC	Synthetic (POE, PVE etc.)	New Equipment Retrofits	Used in large screw chillers

### 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

- (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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**Honeywell**

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G-525-043 04-07 15K  
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