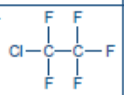
Refrigerants

Halogenate refrigerants

Refrigerant	Composition	Remarks: Ozone Displacement Potential (ODP) Global Warming Potential (GWP)
F11	Trichlorofluoro-methane CCl_3F	ODP = 1,0 (per definition) not inflammable **Substitute: F123 and F134a**
F12	Dichlorodifluoro-methane CCl_2F_2 	ODP = 1 GWP = 7100 not inflammable **Substitute: F134a**
F13	Chlorotrifluoro-methane $CClF_3$ 	not inflammable **Substitute: F410 and F23**
F22	Chlorodifluoro-methane $CHClF_2$ 	ODP = 0,05 → transition period GWP = 1650 not inflammable **Substitute: F407C and F410**
F40	Chloromethane CH_3Cl 	not inflammable
F115	Chloropentafluoro-methane $CClF_2$-CF_3 	

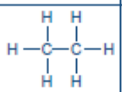
Halogene-free hydrocarbons

Refrigerant	Composition	Remarks: Ozone Displacement Potential (ODP) Global Warming Potential (GWP)
F404a	Mixtrure of 44% F143a 52% F125 4% F134a	ODP = 0 GWP = 3750 Change of temperature 0,7 °C at 1 bar
F407a	Mixtrure of 20% F 32 40% F125 40% F134a	ODP = 0 GWP = 1920 Change of temperature 6,6 °C at 1 bar
F407b	Mixtrure of 10% F 32 70% F125 20% F134a	ODP = 0 GWP = 2560 Change of temperature 4,4 °C at 1 bar
F407c	Mixtrure of 23% F 32 25% F125 52% F134a	ODP = 0 GWP = 1610 Change of temperature 7,4 °C at 1 bar

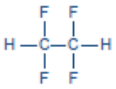
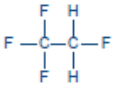
Non azeotrope mixtures

Refrigerant	Composition	Remarks: Ozone Displacement Potential (ODP) Global Warming Potential (GWP)
F410(a)	Mixtrure of 50% F 32 50% F125	ODP = 0 GWP = 1890 Change of temperature 0,2 °C at 1 bar
F502	Mixtrure of F22/F143a	ODP = 0,23 GWP = 4300 **Substitute: F507 and F404A**
F507	Mixtrure of 50% F143a 50% F125	ODP = 0 GWP = 3800 Change of temperature 0 °C at 1 bar

Halogene-free hydrocarbons

Refrigerant	Composition	Remarks: Ozone Displacement Potential (ODP) Global Warming Potential (GWP)
F50	Methane CH_4 	ODP = 0 inflammable
F170	Ethane C_2H_6 CH_3-CH_3 	inflammable
F290	Propane C_3H_8	ODP = 0 GWP = 3 inflammable
F600	n-Butane C_4H_{10}	ODP = 0 GWP = 3 inflammable → safety regulations!
F1150	Ethene (Etylene) C_2H_4 	ODP = 0 inflammable
F1270	Prophene (Propylene) C_3H_6	ODP = 0 GWP = 3 inflammable

Halogene-free hydrocarbons

Refrigerant	Composition	Remarks: Ozone Displacement Potential (ODP) Global Warming Potential (GWP)
F134	Tetrafluorethane CHF_2-CHF_2 	ODP = 0
F134a	Tetrafluorethane CF_3-CH_2F 	High availability because of use in the worldwide automotive industry ODP = 1 GWP = 1300

Halogeneous-free refrigerants

Refrigerant	Composition	Remarks: Ozone Displacement Potential (ODP) Global Warming Potential (GWP)
F717	Ammonia NH_3	GWP = 0 → for new plants adequate, flammable (exprosive with air), poisonous; caustic, prickly odour → natural warning level is 0.0005 Vol.-%; damage level 0.1 Vol.-% (factor 200!) → safety equipment necessary: • Ammonia scrubber • Separate brine loop (Calcium chloride brine)[18]
F718	water H_2O	ODP = 0 GWP = 0 Not flammable
F744	carbon dioxide CO_2	ODP = 0 **GWP = 1,0 (as definition)** Not flammable
F729	air	ODP = 0 GWP = 0 Not flammable

Source: Meier-Peter, Hansheinrich; Bernhardt, Frank (Eds.), Compendium Marine Engineering: Operation – Monitoring – Maintenance, 2009, by courtesy of PMC Media House GmbH: www.pmcmedia.com