

Ozone Depleting Substances ODS

Name/Group	Chemical name	Formula	ASHRAE # for refrigerants only	2002 HS code (first 6 digits)	2007 HS code (first 6 digits)
Annex A, Group I (CFCs)				--2903.40	--2903.40
CFC-11	Trichlorofluoromethane	CFCI ₃	R-11	--2903.41.00	--2903.41
CFC-12	Dichlorodifluoromethane	CF ₂ CI ₂	R-12	--2903.42.00	--2903.42
CFC-113	Trichlorotrifluoroethanes	C ₂ F ₃ CI ₃	R-113	--2903.43.00	--2903.43
CFC-114	Dichlorotetrafluoroethanes	C ₂ F ₄ CI ₂	R-114	--2903.44.10	--2903.44
CFC-115	Chloropentafluoroethane	CCIF ₂ CF ₃	R-115	--2903.44.90	--2903.44
Annex A, Group II (Halons)				--2903.40	--2903.40
Halon-1211	Bromochlorodifluoromethane	CF ₂ BrCl	R-12B1	--2903.46.10	--2903.46
Halon-1301	Bromotrifluoromethane	CF ₃ Br	R-13B1	--2903.46.20	--2903.46
Halon-2402	Dibromotetrafluoroethanes	C ₂ F ₄ Br ₂	R-114B2	--2903.46.90	--2903.46
Annex B, Group I (Other CFCs)				--2903.45	--2903.45
CFC-13	Chlorotrifluoromethane	CF ₃ Cl	R-13	--2903.45.10	--2903.45
CFC-111	Pentachlorofluoroethane	C ₂ FCI ₅	R-111	--2903.45.15	--2903.45
CFC-112	Tetrachlorodifluoroethane	C ₂ F ₂ CI ₄	R-112	--2903.45.20	--2903.45
Annex B, Group II				--2903.10	--2903.10
Tetrachloromethane or carbon		CCI ₄		--2903.14.00	--2903.14
Annex B, Group III				--2903.19	--2903.19
1,1,1-trichloroethane or methyl		C ₂ H ₃ CI ₃	R-140a	--2903.19.10	--2903.19
Annex C, Group I (HCFCs)				--2903.49	--2903.49
HCFC-22	Chlorodifluoromethane	CHF ₂ Cl	R-22	--2903.49.10	--2903.49
HCFC-123	Dichlorotrifluoroethanes	C ₂ HF ₃ CI ₂	R-123	--2903.49.10	--2903.49
HCFC-124	Chlorotetrafluoroethanes	C ₂ HF ₄ Cl	R-124	--2903.49.10	--2903.49
HCFC-141	Dichlorofluoroethanes	C ₂ H ₃ FCI ₂		--2903.49.10	--2903.49
HCFC-141b	1,1-dichloro-1-fluoroethane	CH ₃ CFCI ₂	R-141b	--2903.49.10	--2903.49
HCFC-142	Chlorodifluoroethanes	C ₂ H ₃ F ₂ Cl		--2903.49.10	--2903.49
HCFC-142b	1-chloro-1,1-difluoroethane	CH ₃ CF ₂ Cl	R-142b	--2903.49.10	--2903.49
Annex C, Group II (HBFCs)				--2903.49	--2903.49
HBFC-22B1	Bromodifluoromethane	CHF ₂ Br		--2903.49.30	--2903.49
Annex C, Group III				--2903.49	--2903.49
Bromochloromethane		CH ₂ BrCl		--2903.49.80	--2903.49
Annex E, Group I				--2903.30	--2903.30
Methyl bromide (or Bromomethane)		CH ₃ Br		--2903.30.33	--2903.30
The most popular ODS containing blends					

R-500	CFC-12 / HFC-152a	R-500	--3824.71.00	--3824.71
R-502	HCFC-22 / CFC-115	R-502	--3824.71.00	--3824.71
R-401A (MP-39)	HCFC-22/HFC-152a/HCFC-124	R-401A	--3824.90.99	--3824.74
R-408A (FX 10)	HCFC-22/HFC-143a/HFC-125	R-408A	--3824.90.99	--3824.74
R-409A (FX 56)	HCFC-22 / HCFC-124/HCFC-142b	R-409A	--3824.90.99	--3824.74

Non-Ozone Depleting Substances

Name/Group	Chemical name	Formula	ASHRAE # for refrigerants only	2002 HS code (first 6 digits)	2007 HS code (first 6 digits)
Hydrofluorocarbons (HFCs)				--2903.30	--2903.30
HFC-134a	1,1,1,2-Tetrafluoroethane	CF ₃ CH ₂ F	R-134a	--2903.30.80	--2903.30
HFC-152a	1,1-Difluoroethane	CHF ₂ CH ₃	R-152a	--2903.30.80	--2903.30
HFC-125	Pentafluoroethane	CF ₃ CHF ₂	R-125	--2903.30.80	--2903.30
HFC-143a	1.1.1-trifluoroethane	CF ₃ CH ₃	R-143a	--2903.30.80	--2903.30
HFC-32	Difluoromethane	CH ₂ F ₂	R-32	--2903.30.80	--2903.30
HFC-23	Trifluoromethane	CHF ₃	R-23	--2903.30.80	--2903.30
Hydrofluorocarbons blends (HFCs)					
R-404A	R143a/125/134a		R-404A	--3824.90.99	--3824.90
R-507A	R143a/125		R-507A	--3824.90.99	--3824.90
R-407A	R32/125/134a		R-407A	--3824.90.99	--3824.90
R-407B	R32/125/134a		R-407B	--3824.90.99	--3824.90
R-407C	R32/125/134a		R-407C	--3824.90.99	--3824.90
R-410A	R32/125		R-410A	--3824.90.99	--3824.90
R-508A	R23/116		R-508A	--3824.90.99	--3824.90
R-508B	R23/116		R-508B	--3824.90.99	--3824.90
Halogen-free Refrigerants					
R-717	Ammonia	NH ₃	R-717	--2814.10.00	--2814.10
R-600a	Iso-Butane	C ₄ H ₁₀	R-600a	--2901.10.90	--2901.10
R-290	Propane	C ₃ H ₈	R-290	--2901.10.90	--2901.10

1- ASHRAE Safety Groups (ASHRAE: American Society for Heating Refrigeration & Air-conditioning Engineers):

- A1** Lower Toxicity & No Flammability
- A2** Lower Toxicity & Lower Flammability
- A3** Lower Toxicity & Higher Flammability
- B1** Higher Toxicity & No Flammability
- B2** Higher Toxicity & Lower Flammability
- B3** Higher Toxicity & Higher Flammability

2- CAS #: Chemical Abstract Service Number

3- UN #: United Nations Number for some Chemicals

** CAS # for blend is combined of the CAS # of its components

(Example: R-500 CAS # is: 75-71-8 / 75-37-6 which CAS # for both CFC-12 & HFC-152a)

Most popular refrigerants trade names

ARCTON - ASAHIFRON - ASAHIKLIN - FORANE - FREON - GENETRON - ISCEON - SOLKANE - SUVA -

DANGER SYMBOLS



Toxic substances



Flammable substances

List of main producing countries for ODS

Group	Producing Countries
Chlorofluorocarbons (CFCs)	CHINA, INDIA, NETHERLANDS, BRAZIL, REP. OF KOREA, ITALY,
Halons	CHINA, & REP. OF KOREA



Explosive substances



Oxidizing substances



Corrosive substances



Irritating substances



Environmentally dangerous substances

Carbon tetrachloride (CCl₄)	INDIA, BRAZIL, UKRAINE & ROMANIA
Methylchloroform (CH₃CCl₃)	JAPAN, USA, FRANCE & CHINA
Hydrochlorofluorocarbon (HCFCs)	USA, FRANCE, JAPAN, CHINA, NETHERLANDS, UK, SPAIN, INDIA & RUSSIAN
Methyl Bromide	USA, ISRAEL, JAPAN, FRANCE, CHINA

Classification of ODS containing products with accordance to HS	
Product	
A/C Systems	
AC components	
Refrigerators & Freezers	
Compressors	
Vehicles	
Fire Extinguishers	
Ins. boards & pipe covers	
PRE-POLYMERS	



United Nations Environment Programme

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