

CUSTOMS OFFICER'S QUICK TOOL FOR SCREENING ODS

The most common Ozone Depleting Substances (ODS)

Name/Group	Chemical name	Formula	ASHRAE # for refrigerants only	ASHRAE ¹ safety group	CAS ² #	UN ³ #	HS code since 1 Jan 2012	HS code until 31 Dec 2011
Annex A, Group I (CFCs)								
CFC-11	Trichlorofluoromethane	CFCl ₃	R-11	A1	75-69-4	1017	2903.77	2903.41
CFC-12	Dichlorodifluoromethane	CF ₂ Cl ₂	R-12	A1	75-71-8	1028	2903.77	2903.42
CFC-113	Trichlorotrifluoroethanes	C ₂ F ₃ Cl ₃	R-113	A1	76-13-1		2903.77	2903.43
CFC-114	Dichlorotetrafluoroethanes	C ₂ F ₄ Cl ₂	R-114	A1	76-14-2	1958	2903.77	2903.44
CFC-115	Chloropentafluoroethane	CClF ₂ CF ₃	R-115	A1	76-15-3	1020	2903.77	2903.44
Annex A, Group II (Halon)								
Halon-1211	Bromochlorodifluoromethane	CF ₂ BrCl	R-12B1		353-59-3	1974	2903.76	2903.46
Halon-1301	Bromotrifluoromethane	CF ₃ Br	R-13B1		75-63-8	1009	2903.76	2903.46
Halon-2402	Dibromotetrafluoroethanes	C ₂ F ₄ Br ₂	R-114B2		124-73-2		2903.76	2903.46
Annex B, Group I (Other CFCs)								
CFC-13	Chlorotrifluoromethane	CF ₃ Cl	R-13	A1	75-72-9		2903.77	2903.45
Annex B, Group II								
Tetrachloromethane or carbon tetrachloride		CCl ₄		B1	56-23-5	1864	2903.14	2903.14
Annex B, Group III								
1,1,1-trichloroethane or methyl chloroform		C ₂ H ₃ Cl ₃	R-140a		71-55-6	2831	2903.19	2903.19
Annex C, Group I (HCFCs)								
HCFC-22	Chlorodifluoromethane	CHF ₂ Cl	R-22		75-45-6	1018	2903.71	2903.49
HCFC-123	Dichlorotrifluoroethanes	C ₂ HF ₃ Cl ₂	R-123		306-83-2		2903.72	2903.49
HCFC-124	Chlorotetrafluoroethanes	C ₂ HF ₄ Cl	R-124		2837-89-0		2903.79	2903.49
HCFC-141	Dichlorofluoroethanes	C ₂ H ₃ FCl ₂			1717-00-6		2903.73	2903.49
HCFC-141b	1,1-dichloro-1-fluoroethane	CH ₃ CFCl ₂	R-141b		1717-00-6		2903.73	2903.49
HCFC-142	Chlorodifluoroethanes	C ₂ H ₃ F ₂ Cl			75-68-3		2903.74	2903.49
HCFC-142b	1-chloro-1,1-difluoroethane	CH ₃ CF ₂ Cl	R-142b		75-68-3		2903.74	2903.49
HCFC-225	Dichloropentafluoropropanes	C ₃ HF ₅ Cl ₂					2903.75	2903.49
Annex C, Group II (HBFCs)								
HBFC-22B1	Bromodifluoromethane	CHF ₂ Br			1511-62-2		2903.79	2903.49
Annex C, Group III								
Bromochloromethane		CH ₂ BrCl			74-97-5		2903.79	2903.49
Annex E, Group I								
Methyl bromide (or Bromomethane)		CH ₃ Br			74-83-9	1062	2903.39	2903.39
The most popular ODS-containing mixtures (Refrigerants)								
R-500 ⁵	CFC-12 / HFC-152a		R-500		**		3824.71	3824.71
R-502 ⁵	HCFC-22 / CFC-115		R-502		**	1973	3824.71	3824.71
R-401A (MP-39)	HCFC-22/HFC-152a/HCFC-124		R-401A		**		3824.74	3824.74
R-406A	R-22/R-600a/R-142b (55/04/41)				**		3824.74	3824.74
R-408A (FX 10)	HCFC-22/HFC-143a/HFC-125		R-408A		**		3824.74	3824.74
R-409A (FX 56)	HCFC-22 / HCFC-124/HCFC-142b		R-409A		**		3824.74	3824.74
R-415B	R-22/R-152a (25/75)		R-415B		**		3824.74	3824.74
R-418A	HC-290/HCFC-22/HFC-152a		R-418A		**		3824.74	3824.74

Selected Non-Ozone Depleting Substances⁴

Name/Group	Chemical name	Formula	ASHRAE # for refrigerants only	ASHRAE ¹ safety group	CAS ² #	UN ³ #	HS code
Hydrofluorocarbons (HFCs)							
HFC-134a	1,1,1,2-Tetrafluoroethane	CF ₃ CH ₂ F	R-134a	A1	811-97-2	3159	2903.39
HFC-152a	1,1-Difluoroethane	CHF ₂ CH ₃	R-152a	A2	75-37-6		2903.39
HFC-125	Pentafluoroethane	CF ₃ CHF ₂	R-125	A1	354-33-6		2903.39
HFC-143a	1,1,1-trifluoroethane	CF ₃ CH ₃	R-143a	A2	420-46-2		2903.39
HFC-32	Difluoromethane	CH ₂ F ₂	R-32	A2	75-10-5		2903.39
HFC-23	Trifluoromethane	CHF ₃	R-23	A1	75-46-7		2903.39
HFC-245fa	1,1,1,3,3-Pentafluoropropane	CF ₃ CH ₂ CHF ₂	R-245fa	A1	460-73-1		2903.39
HFC-1,2,3,4yf	2,3,3,3-Tetrafluoropropene	CH ₂ =CFCF ₃	R-1,2,3,4yf				2903.39

Name/Group	Chemical name	Formula	ASHRAE # for refrigerants only	ASHRAE ¹ safety group	CAS ² #	UN ³ #	HS code
Hydrofluorocarbons blends (HFCs mixtures)							
R-404A	R143a/125/134a		R-404A	A1/A1	**		3824.78
R-507A	R143a/125		R-507A	A1	**		3824.78
R-407A	R32/125/134a		R-407A	A1/A1	**		3824.78
R-407B	R32/125/134a		R-407B	A1/A1	**		3824.78
R-407C	R32/125/134a		R-407C	A1/A1	**		3824.78
R-410A	R32/125		R-410A	A1/A1	**		3824.78
R-508A	R23/116		R-508A	A1/A1	**		3824.78
R-508B	R23/116		R-508B	A1/A1	**		3824.78
Halogen-free Refrigerants							
R-717	Ammonia	NH ₃	R-717	B2	7664-41-7	1005	2814.10
R-744	Carbon dioxide	CO ₂			124-38-9		2811.21
R-600	Butane	CH ₃ CH ₂ CH ₂ CH ₃			106-97-8		2901.10*
R-600a	Iso-Butane	C ₄ H ₁₀	R-600a	A3	75-28-5	1969	2901.10*
R-290	Propane	C ₃ H ₈	R-290	A3	74-98-6	1978	2711.12

* The HS Code applies only if the concentration of butane or Iso-butane is **higher than 95%**. Otherwise, the substance should be classified in the specific provision of subheading 2711.13 for "Butanes".

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

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

2- **CAS #**: Chemical Abstract Service Number











4 - Their HS codes may be used to disguise ODS

3- **UN #**: United Nations Number for some Chemicals

5 - International trade not allowed (contains CFCs)

** CAS # for mixtures is a combination of the CAS # of its components

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

Most popular refrigerants trade names		
ARCTON - ASAHIFRON - ASAHIKLIN - FORANE - FREON - GENETRON - ISCEON - SOLKANE - SUVA - FLORON		
DANGER SYMBOLS  Toxic substances  Flammable Substances  Explosive Substances  Oxidising Substances  Corrosive Substances  Irritating Substances  Environmentally Dangerous Substances  Hazardous to Health  Pressurised Gas	Countries that produce ODS Source: Article 7 data for 2011 reporting year, only countries with positive production figures.	
	Group	Producing Countries
	Chlorofluorocarbons (CFCs)	China, Russian Federation
	Halons	NONE
	Carbon tetrachloride (CCl₄)	China, Germany, Japan
	Hydrochlorofluorocarbons (HCFCs)	Argentina, Canada, China, Democratic People's Republic of Korea, France, India, Japan, Mexico, Republic of Korea, Russian Federation, United States of America, Venezuela
	Methyl Bromide	China, Israel, Japan, United States of America
	HS codes for selected products that rely on, or may contain ODS (list is not exhaustive)	
	Product	HS code/codes
	AC systems (including components and parts)	All codes under 84.15
Refrigerators & Freezers	84.18, 84.19, 85.10	
Compressors of a kind used in refrigeration equipment	8414.30	
Vehicles	CHAPTER 87	
Fire Extinguishers	8424.10	
Insulating boards & pipe covers	39.17, 39.20, 39.21, 39.25, 39.26	
Polyurethanes	3909.50	
Composite solvents	3814.00	
Dehumidifiers*	8509, 8479	
Pre-blended polyols	3907	
* Air dehumidifiers can be classified in heading 84.79 (under the residual subheading 8479.89), while certain types could also fall under heading 85.09 (subheading 8509.80), as electro-mechanical domestic appliances, with self-contained electric motor, provided their weight is 20kg or less. Heading 85.09 has priority over heading 84.79.		
 United Nations Environment Programme	Prepared by: Compliance Assistance Programme (CAP) Regional Office for West Asia (ROWA) Quality reviewed and revised by: Dr. Janusz Kozakiewicz	