

# 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 <sup>1</sup> safety group	CAS <sup>2</sup> #	UN <sup>3</sup> #	HS code
<b>Annex A, Group I (CFCs)</b>							
CFC-11	Trichlorofluoromethane	CFCl <sub>3</sub>	R-11	A1	75-69-4	1017	--2903.41
CFC-12	Dichlorodifluoromethane	CF <sub>2</sub> Cl <sub>2</sub>	R-12	A1	75-71-8	1028	--2903.42
CFC-113	Trichlorotrifluoroethanes	C <sub>2</sub> F <sub>3</sub> Cl <sub>3</sub>	R-113	A1	76-13-1		--2903.43
CFC-114	Dichlorotetrafluoroethanes	C <sub>2</sub> F <sub>4</sub> Cl <sub>2</sub>	R-114	A1	76-14-2	1958	--2903.44
CFC-115	Chloropentafluoroethane	CClF <sub>2</sub> CF <sub>3</sub>	R-115	A1	76-15-3	1020	--2903.44
<b>Annex A, Group II (Halons)</b>							
Halon-1211	Bromochlorodifluoromethane	CF <sub>2</sub> BrCl	R-12B1		353-59-3	1974	--2903.46
Halon-1301	Bromotrifluoromethane	CF <sub>3</sub> Br	R-13B1		75-63-8	1009	--2903.46
Halon-2402	Dibromotetrafluoroethane	C <sub>2</sub> F <sub>4</sub> Br <sub>2</sub>	R-114B2		124-73-2		--2903.46
<b>Annex B, Group I (Other CFCs)</b>							
CFC-13	Chlorotrifluoromethane	CF <sub>3</sub> Cl	R-13	A1	75-72-9		--2903.45
CFC-111	Pentachlorofluoroethane	C <sub>2</sub> FCl <sub>5</sub>	R-111		354-56-3		--2903.45
CFC-112	Tetrachlorodifluoroethane	C <sub>2</sub> F <sub>2</sub> Cl <sub>4</sub>	R-112		76-12-0		--2903.45
<b>Annex B, Group II</b>							
Tetrachlormethane or carbon tetrachloride		CCl <sub>4</sub>		B1	56-23-5	1864	--2903.14
<b>Annex B, Group III</b>							
1,1,1-trichloroethane or methyl chloroform		C <sub>2</sub> H <sub>3</sub> Cl <sub>3</sub>	R-140a		71-55-6	2831	--2903.19
<b>Annex C, Group I (HCFCs)</b>							
HCFC-22	Chlorodifluoromethane	CHF <sub>2</sub> Cl	R-22		75-45-6	1018	--2903.49
HCFC-123	Dichlorotrifluoroethanes	C <sub>2</sub> HF <sub>3</sub> Cl <sub>2</sub>	R-123		306-83-2		--2903.49
HCFC-124	Chlorotetrafluoroethanes	C <sub>2</sub> HF <sub>4</sub> Cl	R-124		2837-89-0		--2903.49
HCFC-141	Dichlorofluoroethanes	C <sub>2</sub> H <sub>3</sub> FCl <sub>2</sub>			1717-00-6		--2903.49
HCFC-141b	1,1-dichloro-1-fluoroethane	CH <sub>3</sub> CFCl <sub>2</sub>	R-141b		1717-00-6		--2903.49
HCFC-142	Chlorodifluoroethanes	C <sub>2</sub> H <sub>3</sub> F <sub>2</sub> Cl			75-68-3		--2903.49
HCFC-142b	1-chloro-1,1-difluoroethane	CH <sub>3</sub> CF <sub>2</sub> Cl	R-142b		75-68-3		--2903.49
<b>Annex C, Group II (HBFCs)</b>							
HBFC-22B1	Bromodifluoromethane	CHF <sub>2</sub> Br					--2903.49
<b>Annex C, Group III</b>							
Bromochloromethane		CH <sub>2</sub> BrCl					--2903.49
<b>Annex E, Group I</b>							
Methyl bromide (or Bromomethane)		CH <sub>3</sub> Br			74-83-9	1062	--2903.39
<b>The most popular ODS containing blends (Refrigerants)</b>							
R-500	CFC-12 / HFC-152a		R-500		**		--3824.71
R-502	HCFC-22 / CFC-115		R-502		**	1973	--3824.71
R-401A (MP-39)	HCFC-22/HFC-152a/HCFC-124		R-401A		**		--3824.74
R-406A	R-22/R-600a/R-142b (55/04/41)						--3824.74
R-408A (FX 10)	HCFC-22/HFC-143a/HFC-125		R-408A		**		--3824.74
R-409A (FX 56)	HCFC-22 / HCFC-124/HCFC-142b		R-409A		**		--3824.74
R-415B	R-22/R-152a (25/75)						--3824.74

## Selected Non-Ozone Depleting Substances<sup>4</sup>

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

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<b>Hydrofluorocarbons blends (HFCs)</b>							
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
<b>Halogen-free Refrigerants</b>							
R-717	Ammonia	NH <sub>3</sub>	R-717	B2	7664-41-7	1005	-2814.10
R-744	Carbon dioxide	CO <sub>2</sub>			124-38-9		--2811.21
R-600	Butane	CH <sub>3</sub> CH <sub>2</sub> CH <sub>2</sub> CH <sub>3</sub>			106-97-8		-2901.10
R-600a	Iso-Butane	C <sub>4</sub> H <sub>10</sub>	R-600a	A3	75-28-5	1969	-2901.10
R-290	Propane	C <sub>3</sub> H <sub>8</sub>	R-290	A3	74-98-6	1978	--2711.12

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

<b>A1</b> Lower Toxicity & No Flammability	<b>B1</b> Higher Toxicity & No Flammability
<b>A2</b> Lower Toxicity & Lower Flammability	<b>B2</b> Higher Toxicity & Lower Flammability
<b>A3</b> Lower Toxicity & Higher Flammability	<b>B3</b> 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

\*\* 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)

<b>Most popular refrigerants trade names</b>															
ARCTON - ASAHIFRON - ASAHIKLIN - FORANE - FREON - GENETRON - ISCEON - SOLKANE - SUVA - FLORON															
<b>DANGER SYMBOLS</b>	<b>Countries that produce ODS</b>														
 Toxic substances	Source: Article 7 data for 2007 reporting year, only countries with positive production figures.														
 Flammable substances	<table border="1"> <thead> <tr> <th>Group</th> <th>Producing Countries</th> </tr> </thead> <tbody> <tr> <td><b>Chlorofluorocarbons (CFCs)</b></td> <td>Argentina, China, India, Republic of Korea, Russian Federation, Spain, United States of America</td> </tr> <tr> <td><b>Halons</b></td> <td>China, Republic of Korea</td> </tr> <tr> <td><b>Carbon tetrachloride (CCl<sub>4</sub>)</b></td> <td>China, India, Japan, Republic of Korea, Romania, United Kingdom, United States of America</td> </tr> <tr> <td><b>Methylchloroform (CH<sub>3</sub>CCl<sub>3</sub>)</b></td> <td>China, Japan, United States of America</td> </tr> <tr> <td><b>Hydrochlorofluorocarbons (HCFCs)</b></td> <td>Argentina, Canada, China, France, Germany, India, Japan, Mexico, Netherlands, Republic of Korea, Russian Federation, United Kingdom, United States of America, Venezuela</td> </tr> <tr> <td><b>Methyl Bromide</b></td> <td>China, Israel, Japan, United States of America</td> </tr> </tbody> </table>	Group	Producing Countries	<b>Chlorofluorocarbons (CFCs)</b>	Argentina, China, India, Republic of Korea, Russian Federation, Spain, United States of America	<b>Halons</b>	China, Republic of Korea	<b>Carbon tetrachloride (CCl<sub>4</sub>)</b>	China, India, Japan, Republic of Korea, Romania, United Kingdom, United States of America	<b>Methylchloroform (CH<sub>3</sub>CCl<sub>3</sub>)</b>	China, Japan, United States of America	<b>Hydrochlorofluorocarbons (HCFCs)</b>	Argentina, Canada, China, France, Germany, India, Japan, Mexico, Netherlands, Republic of Korea, Russian Federation, United Kingdom, United States of America, Venezuela	<b>Methyl Bromide</b>	China, Israel, Japan, United States of America
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 Explosive substances															
 Oxidizing substances															
 Corrosive substances															
 Irritating substances															
 Environmentally dangerous substances															
 Hazardous to Health															
 Pressurized Gases															
<b>HS codes for selected products that may contain ODS (list is not exhaustive)</b>															
<b>Product</b>	<b>HS code/codes</b>														
AC systems	8415.10, 8415.20, 8415.81, 8415.83														
AC components	8415.90														
Refrigerators & Freezers	84.18, 84.19, 85.09														
Compressors	8414.30														
Vehicles	CHAPTER 87														
Fire Extinguishers	8424.10														
Insulating boards & pipe covers	3917, 3920, 3921, 3925, 3926														
Prepolymers	3901 – 3911														



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