

**Environmental Protection Agency**

**Pt. 98, Subpt. A, Table A-1**

to verify the amount of GHG emissions, and failure to calculate GHG emissions following the methodologies specified in this part. Each day of a violation constitutes a separate violation.

**§ 98.9 Addresses.**

All requests, notifications, and communications to the Administrator pursuant to this part must be submitted electronically and in a format as specified by the Administrator. For example, any requests, notifications and communications that can be submitted

through the electronic GHG reporting tool, must be submitted through that tool. If not specified, requests, notifications or communications shall be submitted to the following address:

(a) For U.S. mail. Director, Climate Change Division, 1200 Pennsylvania Ave., NW., Mail Code: 6207J, Washington, DC 20460.

(b) For package deliveries. Director, Climate Change Division, 1310 L St, NW., Washington, DC 20005.

[74 FR 56374, Oct. 30, 2009, as amended at 76 FR 73900, Nov. 29, 2011]

**TABLE A-1 TO SUBPART A OF PART 98—GLOBAL WARMING POTENTIALS**  
[100-Year Time Horizon]

Name	CAS No.	Chemical formula	Global warming potential (100 yr.)
<b>Chemical-Specific GWPs</b>			
Carbon dioxide .....	124-38-9	CO <sub>2</sub> .....	1
Methane .....	74-82-8	CH <sub>4</sub> .....	<sup>a</sup> 25
Nitrous oxide .....	10024-97-2	N <sub>2</sub> O .....	<sup>a</sup> 298
<b>Fully Fluorinated GHGs</b>			
Sulfur hexafluoride .....	2551-62-4	SF <sub>6</sub> .....	<sup>a</sup> 22,800
Trifluoromethyl sulphur pentafluoride .....	373-80-8	SF <sub>5</sub> CF <sub>3</sub> .....	17,700
Nitrogen trifluoride .....	7783-54-2	NF <sub>3</sub> .....	17,200
PFC-14 (Perfluoromethane) .....	75-73-0	CF <sub>4</sub> .....	<sup>a</sup> 7,390
PFC-116 (Perfluoroethane) .....	76-16-4	C <sub>2</sub> F <sub>6</sub> .....	<sup>a</sup> 12,200
PFC-218 (Perfluoropropane) .....	76-19-7	C <sub>3</sub> F <sub>8</sub> .....	<sup>a</sup> 8,830
Perfluorocyclopropane .....	931-91-9	C-C <sub>3</sub> F <sub>6</sub> .....	17,340
PFC-3-1-10 (Perfluorobutane) .....	355-25-9	C <sub>4</sub> F <sub>10</sub> .....	<sup>a</sup> 8,860
PFC-318 (Perfluorocyclobutane) .....	115-25-3	C-C <sub>4</sub> F <sub>8</sub> .....	<sup>a</sup> 10,300
PFC-4-1-12 (Perfluoropentane) .....	678-26-2	C <sub>5</sub> F <sub>12</sub> .....	<sup>a</sup> 9,160
PFC-5-1-14 (Perfluorohexane, FC-72) .....	355-42-0	C <sub>6</sub> F <sub>14</sub> .....	<sup>a</sup> 9,300
PFC-6-1-12 .....	335-57-9	C <sub>7</sub> F <sub>16</sub> ; CF <sub>3</sub> (CF <sub>2</sub> ) <sub>5</sub> CF <sub>3</sub> .....	<sup>b</sup> 7,820
PFC-7-1-18 .....	307-34-6	C <sub>8</sub> F <sub>18</sub> ; CF <sub>3</sub> (CF <sub>2</sub> ) <sub>4</sub> CF <sub>3</sub> .....	<sup>b</sup> 7,620
PFC-9-1-18 .....	306-94-5	C <sub>10</sub> F <sub>18</sub> .....	7,500
PFPME (HT-70) .....	NA	CF <sub>3</sub> OCF(CF <sub>3</sub> )CF <sub>2</sub> OCF <sub>2</sub> OCF <sub>3</sub> .....	10,300
Perfluorodecalin (cis) .....	60433-11-6	Z-C <sub>10</sub> F <sub>18</sub> .....	<sup>b</sup> 7,236
Perfluorodecalin (trans) .....	60433-12-7	E-C <sub>10</sub> F <sub>18</sub> .....	<sup>b</sup> 6,288
<b>Saturated Hydrofluorocarbons (HFCs) With Two or Fewer Carbon-Hydrogen Bonds</b>			
HFC-23 .....	75-46-7	CHF <sub>3</sub> .....	<sup>a</sup> 14,800
HFC-32 .....	75-10-5	CH <sub>2</sub> F <sub>2</sub> .....	<sup>a</sup> 675
HFC-125 .....	354-33-6	C <sub>2</sub> H <sub>5</sub> F .....	<sup>a</sup> 3,500
HFC-134 .....	359-35-3	C <sub>2</sub> H <sub>2</sub> F <sub>4</sub> .....	<sup>a</sup> 1,100
HFC-134a .....	811-97-2	CH <sub>2</sub> FCF <sub>3</sub> .....	<sup>a</sup> 1,430
HFC-227ca .....	2252-84-8	CF <sub>3</sub> CF <sub>2</sub> CHF <sub>2</sub> .....	<sup>b</sup> 2640
HFC-227ea .....	431-89-0	C <sub>3</sub> H <sub>7</sub> F .....	<sup>a</sup> 3,220
HFC-236cb .....	677-56-5	CH <sub>2</sub> FCF <sub>2</sub> CF <sub>3</sub> .....	1,340
HFC-236ea .....	431-63-0	CHF <sub>2</sub> CHF <sub>2</sub> CF <sub>3</sub> .....	1,370
HFC-236fa .....	690-39-1	C <sub>3</sub> H <sub>3</sub> F <sub>6</sub> .....	<sup>a</sup> 9,810
HFC-329p .....	375-17-7	CHF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>3</sub> .....	<sup>b</sup> 2360
HFC-43-10mee .....	138495-42-8	CF <sub>3</sub> CFHCFHCF <sub>2</sub> CF <sub>3</sub> .....	<sup>a</sup> 1,640
<b>Saturated Hydrofluorocarbons (HFCs) With Three or More Carbon-Hydrogen Bonds</b>			
HFC-41 .....	593-53-3	CH <sub>3</sub> F .....	<sup>a</sup> 92
HFC-143 .....	430-66-0	C <sub>2</sub> H <sub>5</sub> F <sub>3</sub> .....	<sup>a</sup> 353
HFC-143a .....	420-46-2	C <sub>2</sub> H <sub>3</sub> F <sub>3</sub> .....	<sup>a</sup> 4,470
HFC-152 .....	624-72-6	CH <sub>2</sub> FCH <sub>2</sub> F .....	53

[100-Year Time Horizon]

Name	CAS No.	Chemical formula	Global warming potential (100 yr.)
HFC-152a	75-37-6	CH <sub>3</sub> CHF <sub>2</sub>	<sup>a</sup> 124
HFC-161	353-36-6	CH <sub>3</sub> CH <sub>2</sub> F	12
HFC-245ca	679-86-7	C <sub>4</sub> H <sub>9</sub> F <sub>3</sub>	<sup>a</sup> 693
HFC-245cb	1814-88-6	CF <sub>3</sub> CF <sub>2</sub> CH <sub>3</sub>	<sup>b</sup> 4620
HFC-245ea	24270-66-4	CHF <sub>2</sub> CHFCHF <sub>2</sub>	<sup>b</sup> 235
HFC-245eb	431-31-2	CH <sub>2</sub> FCHFCF <sub>3</sub>	<sup>b</sup> 290
HFC-245fa	460-73-1	CHF <sub>2</sub> CH <sub>2</sub> CF <sub>3</sub>	1,030
HFC-263fb	421-07-8	CH <sub>3</sub> CH <sub>2</sub> CF <sub>3</sub>	<sup>b</sup> 76
HFC-272ca	420-45-1	CH <sub>3</sub> CF <sub>2</sub> CH <sub>3</sub>	<sup>b</sup> 144
HFC-365mfc	406-58-6	CH <sub>3</sub> CF <sub>2</sub> CH <sub>2</sub> CF <sub>3</sub>	794
<b>Saturated Hydrofluoroethers (HFEs) and Hydrochlorofluoroethers (HCFEs) With One Carbon-Hydrogen Bond</b>			
HFE-125	3822-68-2	CHF <sub>2</sub> OCF <sub>3</sub>	14,900
HFE-227ea	2356-62-9	CF <sub>3</sub> CHFOCF <sub>3</sub>	1,540
HFE-329mcc2	134769-21-4	CF <sub>3</sub> CF <sub>2</sub> OCF <sub>2</sub> CHF <sub>2</sub>	919
HFE-329me3	428454-68-6	CF <sub>3</sub> CFHCF <sub>2</sub> OCF <sub>3</sub>	<sup>b</sup> 4,550
1,1,1,2,2,3,3-Heptafluoro-3-(1,2,2,2-tetrafluoroethoxy)-propane.	3330-15-2	CF <sub>3</sub> CF <sub>2</sub> CF <sub>2</sub> OCHF <sub>2</sub> CF <sub>3</sub>	<sup>b</sup> 6,490
<b>Saturated HFEs and HCFEs With Two Carbon-Hydrogen Bonds</b>			
HFE-134 (HG-00)	1691-17-4	CHF <sub>2</sub> OCHF <sub>2</sub>	6,320
HFE-236ca	32778-11-3	CHF <sub>2</sub> OCF <sub>2</sub> CHF <sub>2</sub>	<sup>b</sup> 4,240
HFE-236ca12 (HG-10)	78522-47-1	CHF <sub>2</sub> OCF <sub>2</sub> OCHF <sub>2</sub>	2,800
HFE-236ea2 (Desflurane)	57041-67-5	CHF <sub>2</sub> OCHF <sub>2</sub> CF <sub>3</sub>	989
HFE-236fa	20193-67-3	CF <sub>3</sub> CH <sub>2</sub> OCF <sub>3</sub>	487
HFE-338mcf2	156053-88-2	CF <sub>3</sub> CF <sub>2</sub> OCH <sub>2</sub> CF <sub>3</sub>	552
HFE-338mmz1	26103-08-2	CHF <sub>2</sub> OCH(CF <sub>3</sub> ) <sub>2</sub>	380
HFE-338pcc13 (HG-01)	188690-78-0	CHF <sub>2</sub> OCF <sub>2</sub> CF <sub>2</sub> OCHF <sub>2</sub>	1,500
HFE-43-10pccc (H-Galden 1040x, HG-11)	E1730133	CHF <sub>2</sub> OCF <sub>2</sub> OC <sub>2</sub> F <sub>4</sub> OCHF <sub>2</sub>	1,870
HCFE-235ca2 (Enflurane)	13838-16-9	CHF <sub>2</sub> OCF <sub>2</sub> CHFCI	<sup>b</sup> 583
HCFE-235da2 (Isoflurane)	26675-46-7	CHF <sub>2</sub> OCHClCF <sub>3</sub>	350
HG-02	205367-61-9	HF <sub>2</sub> C-(OCF <sub>2</sub> CF <sub>2</sub> ) <sub>2</sub> -OCF <sub>2</sub> H	<sup>b</sup> 3,825
HG-03	173350-37-3	HF <sub>2</sub> C-(OCF <sub>2</sub> CF <sub>2</sub> ) <sub>3</sub> -OCF <sub>2</sub> H	<sup>b</sup> 3,670
HG-20	249932-25-0	HF <sub>2</sub> C-(OCF <sub>2</sub> ) <sub>2</sub> -OCF <sub>2</sub> H	<sup>b</sup> 5,300
HG-21	249932-26-1	HF <sub>2</sub> C-OCF <sub>2</sub> CF <sub>2</sub> OCF <sub>2</sub> OCF <sub>2</sub> O-CF <sub>3</sub> H.	<sup>b</sup> 3,890
HG-30	188690-77-9	HF <sub>2</sub> C-(OCF <sub>2</sub> ) <sub>3</sub> -OCF <sub>2</sub> H	<sup>b</sup> 7,330
1,1,3,3,4,4,6,6,7,7,9,9,10,10,12,12,13,13,15,15-eicosafuoro-2,5,8,11,14-Pentaoxapentadecane.	173350-38-4	HCF <sub>2</sub> O(CF <sub>2</sub> CF <sub>2</sub> O) <sub>4</sub> CF <sub>2</sub> H	<sup>b</sup> 3,630
1,1,2-Trifluoro-2-(trifluoromethoxy)-ethane	84011-06-3	CHF <sub>2</sub> CHFOCF <sub>3</sub>	<sup>b</sup> 1,240
Trifluoro(fluoromethoxy)methane	2261-01-0	CH <sub>2</sub> FOCF <sub>3</sub>	<sup>b</sup> 751
<b>Saturated HFEs and HCFEs With Three or More Carbon-Hydrogen Bonds</b>			
HFE-143a	421-14-7	CH <sub>3</sub> OCF <sub>3</sub>	756
HFE-245cb2	22410-44-2	CH <sub>3</sub> OCF <sub>2</sub> CF <sub>3</sub>	708
HFE-245fa1	84011-15-4	CHF <sub>2</sub> CH <sub>2</sub> OCF <sub>3</sub>	286
HFE-245fa2	1885-48-9	CHF <sub>2</sub> OCH <sub>2</sub> CF <sub>3</sub>	659
HFE-254cb2	425-88-7	CH <sub>3</sub> OCF <sub>2</sub> CHF <sub>2</sub>	359
HFE-263fb2	460-43-5	CF <sub>3</sub> CH <sub>2</sub> OCH <sub>3</sub>	11
HFE-263m1; R-E-143a	690-22-2	CF <sub>3</sub> OCH <sub>2</sub> CH <sub>3</sub>	<sup>b</sup> 29
HFE-347mcc3 (HFE-7000)	375-03-1	CH <sub>3</sub> OCF <sub>2</sub> CF <sub>2</sub> CF <sub>3</sub>	575
HFE-347mcf2	171182-95-9	CF <sub>3</sub> CF <sub>2</sub> OCH <sub>2</sub> CHF <sub>2</sub>	374
HFE-347mmy1	22052-84-2	CH <sub>2</sub> OCF(CF <sub>3</sub> ) <sub>2</sub>	343
HFE-347mmz1 (Sevoflurane)	28523-86-6	(CF <sub>3</sub> ) <sub>2</sub> CHOCH <sub>2</sub> F	<sup>c</sup> 216
HFE-347pcf2	406-78-0	CHF <sub>2</sub> CF <sub>2</sub> OCH <sub>2</sub> CF <sub>3</sub>	580
HFE-356mcc3	382-34-3	CH <sub>3</sub> OCF <sub>2</sub> CHFCF <sub>3</sub>	101
HFE-356mff2	333-36-8	CF <sub>3</sub> CH <sub>2</sub> OCH <sub>2</sub> CF <sub>3</sub>	<sup>b</sup> 17
HFE-356mmz1	13171-18-1	(CF <sub>3</sub> ) <sub>2</sub> CHOCH <sub>3</sub>	27
HFE-356pcc3	160620-20-2	CH <sub>3</sub> OCF <sub>2</sub> CF <sub>2</sub> CHF <sub>2</sub>	110
HFE-356pcf2	50807-77-7	CHF <sub>2</sub> CH <sub>2</sub> OCF <sub>2</sub> CHF <sub>2</sub>	265
HFE-356pcf3	35042-99-0	CHF <sub>2</sub> OCH <sub>2</sub> CF <sub>2</sub> CHF <sub>2</sub>	502
HFE-365mcf2	22052-81-9	CF <sub>3</sub> CF <sub>2</sub> OCH <sub>2</sub> CH <sub>3</sub>	<sup>b</sup> 58
HFE-365mcf3	378-16-5	CF <sub>3</sub> CF <sub>2</sub> CH <sub>2</sub> OCH <sub>3</sub>	11
HFE-374pc2	512-51-6	CH <sub>3</sub> CH <sub>2</sub> OCF <sub>2</sub> CHF <sub>2</sub>	557
HFE-449s1 (HFE-7100) Chemical blend	163702-07-6	C <sub>4</sub> F <sub>9</sub> OCH <sub>3</sub>	297
	163702-08-7	(CF <sub>3</sub> ) <sub>2</sub> CF <sub>2</sub> OCH <sub>3</sub>	
HFE-569sf2 (HFE-7200) Chemical blend	163702-05-4	C <sub>4</sub> F <sub>9</sub> OC <sub>2</sub> H <sub>5</sub>	59

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[100-Year Time Horizon]

Name	CAS No.	Chemical formula	Global warming potential (100 yr.)
HG-01	163702-06-5	(CF <sub>3</sub> ) <sub>2</sub> CF <sub>2</sub> OC <sub>2</sub> H <sub>5</sub>	
HG-02	73287-23-7	CH <sub>3</sub> OCF <sub>2</sub> CF <sub>2</sub> OCH <sub>3</sub>	<sup>b</sup> 222
HG-03	485399-46-0	CH <sub>3</sub> O(CF <sub>2</sub> CF <sub>2</sub> O) <sub>2</sub> CH <sub>3</sub>	<sup>b</sup> 236
Difluoro(methoxy)methane	485399-48-2	CH <sub>3</sub> O(CF <sub>2</sub> CF <sub>2</sub> O) <sub>3</sub> CH <sub>3</sub>	<sup>b</sup> 221
2-Chloro-1,1,2-trifluoro-1-methoxyethane	359-15-9	CH <sub>3</sub> OCHF <sub>2</sub>	<sup>b</sup> 144
1-Ethoxy-1,1,2,2,3,3,3-heptafluoropropane	425-87-6	CH <sub>3</sub> OCF <sub>2</sub> CHFCF <sub>3</sub>	<sup>b</sup> 122
2-Ethoxy-3,3,4,4,5-pentafluorotetrahydro-2,5-bis[1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethyl]-furan	22052-86-4	CF <sub>3</sub> CF <sub>2</sub> CF <sub>2</sub> OCH <sub>2</sub> CH <sub>3</sub>	<sup>b</sup> 61
1-Ethoxy-1,1,2,3,3,3-hexafluoropropane	920979-28-8	C <sub>12</sub> H <sub>5</sub> F <sub>19</sub> O <sub>2</sub>	<sup>b</sup> 56
Fluoro(methoxy)methane	380-34-7	CF <sub>3</sub> CHFCF <sub>2</sub> OCH <sub>2</sub> CH <sub>3</sub>	<sup>b</sup> 23
1,1,2,2-Tetrafluoro-3-methoxy-propane; Methyl 2,2,3,3-tetrafluoropropyl ether	460-22-0	CH <sub>3</sub> OCHF <sub>2</sub>	<sup>b</sup> 13
1,1,2,2-Tetrafluoro-1-(fluoromethoxy)ethane	60598-17-6	CHF <sub>2</sub> CF <sub>2</sub> CH <sub>2</sub> OCH <sub>3</sub>	<sup>b</sup> 0.5
Difluoro(fluoromethoxy)methane	37031-31-5	CH <sub>2</sub> FOCF <sub>2</sub> CF <sub>2</sub> H	<sup>b</sup> 871
Fluoro(fluoromethoxy)methane	461-63-2	CH <sub>2</sub> FOCHF <sub>2</sub>	<sup>b</sup> 617
	462-51-1	CH <sub>2</sub> FOCH <sub>2</sub> F	<sup>b</sup> 130

**Fluorinated Formates**

Trifluoromethyl formate	85358-65-2	HCOOCF <sub>3</sub>	<sup>b</sup> 588
Perfluoroethyl formate	313064-40-3	HCOOCF <sub>2</sub> CF <sub>3</sub>	<sup>b</sup> 580
1,2,2,2-Tetrafluoroethyl formate	481631-19-0	HCOOCHF <sub>2</sub> CF <sub>3</sub>	<sup>b</sup> 470
Perfluorobutyl formate	197218-56-7	HCOOCF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>3</sub>	<sup>b</sup> 392
Perfluoropropyl formate	271257-42-2	HCOOCF <sub>2</sub> CF <sub>2</sub> CF <sub>3</sub>	<sup>b</sup> 376
1,1,1,3,3,3-Hexafluoropropan-2-yl formate	856766-70-6	HCOOCH(CF <sub>3</sub> ) <sub>2</sub>	<sup>b</sup> 333
2,2,2-Trifluoroethyl formate	32042-38-9	HCOOCH <sub>2</sub> CF <sub>3</sub>	<sup>b</sup> 33
3,3,3-Trifluoropropyl formate	1344118-09-7	HCOOCH <sub>2</sub> CH <sub>2</sub> CF <sub>3</sub>	<sup>b</sup> 17

**Fluorinated Acetates**

Methyl 2,2,2-trifluoroacetate	431-47-0	CF <sub>3</sub> COOCH <sub>3</sub>	<sup>b</sup> 52
1,1-Difluoroethyl 2,2,2-trifluoroacetate	1344118-13-3	CF <sub>3</sub> COOCF <sub>2</sub> CH <sub>3</sub>	<sup>b</sup> 31
Difluoromethyl 2,2,2-trifluoroacetate	2024-86-4	CF <sub>3</sub> COOCHF <sub>2</sub>	<sup>b</sup> 27
2,2,2-Trifluoroethyl 2,2,2-trifluoroacetate	407-38-5	CF <sub>3</sub> COOCH <sub>2</sub> CF <sub>3</sub>	<sup>b</sup> 7
Methyl 2,2-difluoroacetate	433-53-4	HCF <sub>2</sub> COOCH <sub>3</sub>	<sup>b</sup> 3
Perfluoroethyl acetate	343269-97-6	CH <sub>3</sub> COOCF <sub>2</sub> CF <sub>3</sub>	<sup>b</sup> 2.1
Trifluoromethyl acetate	74123-20-9	CH <sub>3</sub> COOCF <sub>3</sub>	<sup>b</sup> 2.0
Perfluoropropyl acetate	1344118-10-0	CH <sub>3</sub> COOCF <sub>2</sub> CF <sub>2</sub> CF <sub>3</sub>	<sup>b</sup> 1.8
Perfluorobutyl acetate	209597-28-4	CH <sub>3</sub> COOCF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>3</sub>	<sup>b</sup> 1.6
Ethyl 2,2,2-trifluoroacetate	383-63-1	CF <sub>3</sub> COOCH <sub>2</sub> CH <sub>3</sub>	<sup>b</sup> 1.3

**Carbonofluoridates**

Methyl carbonofluoridate	1538-06-3	FCOOCH <sub>3</sub>	<sup>b</sup> 95
1,1-Difluoroethyl carbonofluoridate	1344118-11-1	FCOOCF <sub>2</sub> CH <sub>3</sub>	<sup>b</sup> 27

**Fluorinated Alcohols Other Than Fluorotelomer Alcohols**

Bis(trifluoromethyl)-methanol	920-66-1	(CF <sub>3</sub> ) <sub>2</sub> CHOH	195
(Octafluorotetramethyl-ene) hydroxymethyl group	NA	X-(CF <sub>2</sub> ) <sub>4</sub> CH(OH)-X	73
2,2,3,3,3-Pentafluoropropanol	422-05-9	CF <sub>3</sub> CF <sub>2</sub> CH <sub>2</sub> OH	42
2,2,3,3,4,4,4-Heptafluorobutan-1-ol	375-01-9	C <sub>3</sub> F <sub>7</sub> CH <sub>2</sub> OH	<sup>b</sup> 25
2,2,2-Trifluoroethanol	75-89-8	CF <sub>3</sub> CH <sub>2</sub> OH	<sup>b</sup> 20
2,2,3,4,4,4-Hexafluoro-1-butanol	382-31-0	CF <sub>3</sub> CHFCF <sub>2</sub> CH <sub>2</sub> OH	<sup>b</sup> 17
2,2,3,3-Tetrafluoro-1-propanol	76-37-9	CHF <sub>2</sub> CF <sub>2</sub> CH <sub>2</sub> OH	<sup>b</sup> 13
2,2-Difluoroethanol	359-13-7	CHF <sub>2</sub> CH <sub>2</sub> OH	<sup>b</sup> 3
2-Fluoroethanol	371-62-0	CH <sub>2</sub> FCH <sub>2</sub> OH	<sup>b</sup> 1.1
4,4,4-Trifluorobutan-1-ol	461-18-7	CF <sub>3</sub> (CH <sub>2</sub> ) <sub>3</sub> CH <sub>2</sub> OH	<sup>b</sup> 0.05

**Unsaturated Perfluorocarbons (PFCs)**

PFC-1114; TFE	116-14-3	CF <sub>2</sub> = CF <sub>2</sub> ; C <sub>2</sub> F <sub>4</sub>	<sup>b</sup> 0.004
PFC-1216; Dyneon HFP	116-15-4	C <sub>3</sub> F <sub>6</sub> ; CF <sub>3</sub> CF = CF <sub>2</sub>	<sup>b</sup> 0.05
PFC C-1418	559-40-0	c-C <sub>3</sub> F <sub>8</sub>	<sup>b</sup> 1.97
Perfluorobut-2-ene	360-89-4	CF <sub>3</sub> CF = CFCF <sub>3</sub>	<sup>b</sup> 1.82
Perfluorobut-1-ene	357-26-6	CF <sub>3</sub> CF <sub>2</sub> CF = CF <sub>2</sub>	<sup>b</sup> 0.10
Perfluorobuta-1,3-diene	685-63-2	CF <sub>2</sub> = CFCF = CF <sub>2</sub>	<sup>b</sup> 0.003

**Unsaturated Hydrofluorocarbons (HFCs) and Hydrochlorofluorocarbons (HCFCs)**

HFC-1132a; VF2	75-38-7	C <sub>2</sub> H <sub>2</sub> F <sub>2</sub> ; CF <sub>2</sub> = CH <sub>2</sub>	<sup>b</sup> 0.04
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[100-Year Time Horizon]

Name	CAS No.	Chemical formula	Global warming potential (100 yr.)
HFC-1141; VF	75-02-5	C <sub>2</sub> H <sub>3</sub> F, CH <sub>2</sub> = CHF	<sup>b</sup> 0.02
(E)-HFC-1225ye	5595-10-8	CF <sub>3</sub> CF = CHF(E)	<sup>b</sup> 0.06
(Z)-HFC-1225ye	5528-43-8	CF <sub>3</sub> CF = CHF(Z)	<sup>b</sup> 0.22
Solstice 1233zd(E)	102687-65-0	C <sub>3</sub> H <sub>2</sub> ClF <sub>3</sub> ; CHCl = CHCF <sub>3</sub>	<sup>b</sup> 1.34
HFC-1234yf; HFO-1234yf	754-12-1	C <sub>3</sub> H <sub>2</sub> F <sub>4</sub> ; CF <sub>3</sub> CF = CH <sub>2</sub>	<sup>b</sup> 0.31
HFC-1234ze(E)	1645-83-6	C <sub>3</sub> H <sub>2</sub> F <sub>4</sub> ; trans-CF <sub>3</sub> CH = CHF	<sup>b</sup> 0.97
HFC-1234ze(Z)	29118-25-0	C <sub>3</sub> H <sub>2</sub> F <sub>4</sub> ; cis-CF <sub>3</sub> CH = CHF; CF <sub>3</sub> CH = CHF.	<sup>b</sup> 0.29
HFC-1243zf; TFP	677-21-4	C <sub>3</sub> H <sub>3</sub> F <sub>3</sub> ; CF <sub>3</sub> CH = CH <sub>2</sub>	<sup>b</sup> 0.12
(Z)-HFC-1336	692-49-9	CF <sub>3</sub> CH = CHCF <sub>3</sub> (Z)	<sup>b</sup> 1.58
HFC-1345zfc	374-27-6	C <sub>2</sub> F <sub>5</sub> CH = CH <sub>2</sub>	<sup>b</sup> 0.09
Capstone 42-U	19430-93-4	C <sub>6</sub> H <sub>3</sub> F <sub>9</sub> ; CF <sub>3</sub> (CF <sub>2</sub> ) <sub>3</sub> CH = CH <sub>2</sub>	<sup>b</sup> 0.16
Capstone 62-U	25291-17-2	C <sub>8</sub> H <sub>3</sub> F <sub>13</sub> ; CF <sub>3</sub> (CF <sub>2</sub> ) <sub>5</sub> CH = CH <sub>2</sub>	<sup>b</sup> 0.11
Capstone 82-U	21652-58-4	C <sub>10</sub> H <sub>3</sub> F <sub>17</sub> ; CF <sub>3</sub> (CF <sub>2</sub> ) <sub>7</sub> CH = CH <sub>2</sub>	<sup>b</sup> 0.09
<b>Unsaturated Halogenated Ethers</b>			
PMVE; HFE-216	1187-93-5	CF <sub>3</sub> OCF = CF <sub>2</sub>	<sup>b</sup> 0.17
Fluoroxene	406-90-6	CF <sub>3</sub> CH <sub>2</sub> OCH = CH <sub>2</sub>	<sup>b</sup> 0.05
<b>Fluorinated Aldehydes</b>			
3,3,3-Trifluoro-propanal	460-40-2	CF <sub>3</sub> CH <sub>2</sub> CHO	<sup>b</sup> 0.01
<b>Fluorinated Ketones</b>			
Novac 1230 (perfluoro (2-methyl-3-pentanone))	756-13-8	CF <sub>3</sub> CF <sub>2</sub> C(O)CF (CF <sub>3</sub> ) <sub>2</sub>	<sup>b</sup> 0.1
<b>Fluorotelomer Alcohols</b>			
3,3,4,4,5,5,6,6,7,7,7-Undecafluoroheptan-1-ol	185689-57-0	CF <sub>3</sub> (CF <sub>2</sub> ) <sub>4</sub> CH <sub>2</sub> CH <sub>2</sub> OH	<sup>b</sup> 0.43
3,3,3-Trifluoropropan-1-ol	2240-88-2	CF <sub>3</sub> CH <sub>2</sub> CH <sub>2</sub> OH	<sup>b</sup> 0.35
3,3,4,4,5,5,6,6,7,7,8,8,9,9,9-Pentadecafluorononan-1-ol	755-02-2	CF <sub>3</sub> (CF <sub>2</sub> ) <sub>6</sub> CH <sub>2</sub> CH <sub>2</sub> OH	<sup>b</sup> 0.33
3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,11-Nonadecafluoroundecan-1-ol.	87017-97-8	CF <sub>3</sub> (CF <sub>2</sub> ) <sub>8</sub> CH <sub>2</sub> CH <sub>2</sub> OH	<sup>b</sup> 0.19
<b>Fluorinated GHGs With Carbon-Iodine Bond(s)</b>			
Trifluoroiodomethane	2314-97-8	CF <sub>3</sub> I	<sup>b</sup> 0.4
<b>Other Fluorinated Compounds</b>			
Dibromodifluoromethane (Halon 1202)	75-61-6	CBR <sub>2</sub> F <sub>2</sub>	<sup>b</sup> 231
2-Bromo-2-chloro-1,1,1-trifluoroethane (Halon-2311/ Halothane).	151-67-7	CHBrClCF <sub>3</sub>	<sup>b</sup> 41
Fluorinated GHG Group <sup>d</sup>			Global warming potential (100 yr.)
<b>Default GWPs for Compounds for Which Chemical-Specific GWPs Are Not Listed Above</b>			
Fully fluorinated GHGs			10,000
Saturated hydrofluorocarbons (HFCs) with 2 or fewer carbon-hydrogen bonds			3,700
Saturated HFCs with 3 or more carbon-hydrogen bonds			930
Saturated hydrofluoroethers (HFEs) and hydrochlorofluoroethers (HCFEs) with 1 carbon-hydrogen bond			5,700
Saturated HFEs and HCFEs with 2 carbon-hydrogen bonds			2,600
Saturated HFEs and HCFEs with 3 or more carbon-hydrogen bonds			270
Fluorinated formates			350
Fluorinated acetates, carbonofluoridates, and fluorinated alcohols other than fluorotelomer alcohols			30
Unsaturated perfluorocarbons (PFCs), unsaturated HFCs, unsaturated hydrochlorofluorocarbons (HCFs), unsaturated halogenated ethers, unsaturated halogenated esters, fluorinated aldehydes, and fluorinated ketones			1
Fluorotelomer alcohols			1
Fluorinated GHGs with carbon-iodine bond(s)			1
Other fluorinated GHGs			2,000

<sup>a</sup>The GWP for this compound was updated in the final rule published on November 29, 2013 [78 FR 71904] and effective on January 1, 2014.

<sup>b</sup>This compound was added to Table A-1 in the final rule published on December 11, 2014, and effective on January 1, 2015.

<sup>c</sup>The GWP for this compound was updated in the final rule published on December 11, 2014, and effective on January 1, 2015.

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<sup>d</sup>For electronics manufacturing (as defined in § 98.90), the term “fluorinated GHGs” in the definition of each fluorinated GHG group in § 98.6 shall include fluorinated heat transfer fluids (as defined in § 98.98), whether or not they are also fluorinated GHGs.

[79 FR 73779, Dec. 11, 2014]

TABLE A-2 TO SUBPART A OF PART 98—UNITS OF MEASURE CONVERSIONS

To convert from	To	Multiply by
Kilograms (kg)	Pounds (lbs)	2.20462
Pounds (lbs)	Kilograms (kg)	0.45359
Pounds (lbs)	Metric tons	$4.53592 \times 10^{-4}$
Short tons	Pounds (lbs)	2,000
Short tons	Metric tons	0.90718
Metric tons	Short tons	1.10231
Metric tons	Kilograms (kg)	1,000
Cubic meters (m <sup>3</sup> )	Cubic feet (ft <sup>3</sup> )	35.31467
Cubic feet (ft <sup>3</sup> )	Cubic meters (m <sup>3</sup> )	0.028317
Gallons (liquid, US)	Liters (l)	3.78541
Liters (l)	Gallons (liquid, US)	0.26417
Barrels of Liquid Fuel (bbl)	Cubic meters (m <sup>3</sup> )	0.15891
Cubic meters (m <sup>3</sup> )	Barrels of Liquid Fuel (bbl)	6.289
Barrels of Liquid Fuel (bbl)	Gallons (liquid, US)	42
Gallons (liquid, US)	Barrels of Liquid Fuel (bbl)	0.023810
Gallons (liquid, US)	Cubic meters (m <sup>3</sup> )	0.0037854
Liters (l)	Cubic meters (m <sup>3</sup> )	0.001
Feet (ft)	Meters (m)	0.3048
Meters (m)	Feet (ft)	3.28084
Miles (mi)	Kilometers (km)	1.60934
Kilometers (km)	Miles (mi)	0.62137
Square feet (ft <sup>2</sup> )	Acres	$2.29568 \times 10^{-5}$
Square meters (m <sup>2</sup> )	Acres	$2.47105 \times 10^{-4}$
Square miles (mi <sup>2</sup> )	Square kilometers (km <sup>2</sup> )	2.58999
Degrees Celsius (°C)	Degrees Fahrenheit (°F)	$^{\circ}\text{C} = (\% / 9) \times (^{\circ}\text{F} - 32)$
Degrees Fahrenheit (°F)	Degrees Celsius (°C)	$^{\circ}\text{F} = (\% / 9) \times ^{\circ}\text{C} + 32$
Degrees Celsius (°C)	Kelvin (K)	$\text{K} = ^{\circ}\text{C} + 273.15$
Kelvin (K)	Degrees Rankine (°R)	1.8
Joules	Btu	$9.47817 \times 10^{-4}$
Btu	MMBtu	$1 \times 10^{-6}$
Pascals (Pa)	Inches of Mercury (in Hg)	$2.95334 \times 10^{-4}$
Inches of Mercury (inHg)	Pounds per square inch (psi)	0.49110
Pounds per square inch (psi)	Inches of Mercury (in Hg)	2.03625

TABLE A-3 TO SUBPART A OF PART 98—SOURCE CATEGORY LIST FOR § 98.2(a)(1)

SOURCE CATEGORY LIST FOR § 98.2(a)(1)

- Source Categories<sup>a</sup> Applicable in 2010 and Future Years
- Electricity generation units that report CO<sub>2</sub> mass emissions year round through 40 CFR part 75 (subpart D).
  - Adipic acid production (subpart E).
  - Aluminum production (subpart F).
  - Ammonia manufacturing (subpart G).
  - Cement production (subpart H).
  - HCFC-22 production (subpart O).
  - HFC-23 destruction processes that are not collocated with a HCFC-22 production facility and that destroy more than 2.14 metric tons of HFC-23 per year (subpart O).
  - Lime manufacturing (subpart S).
  - Nitric acid production (subpart V).
  - Petrochemical production (subpart X).
  - Petroleum refineries (subpart Y).
  - Phosphoric acid production (subpart Z).
  - Silicon carbide production (subpart BB).
  - Soda ash production (subpart CC).
  - Titanium dioxide production (subpart EE).
  - Municipal solid waste landfills that generate CH<sub>4</sub> in amounts equivalent to 25,000 metric tons CO<sub>2</sub>e or more per year, as determined according to subpart HH of this part.
  - Manure management systems with combined CH<sub>4</sub> and N<sub>2</sub>O emissions in amounts equivalent to 25,000 metric tons CO<sub>2</sub>e or more per year, as determined according to subpart JJ of this part.
- Additional Source Categories<sup>a</sup> Applicable in 2011 and Future Years
- Electrical transmission and distribution equipment use at facilities where the total nameplate capacity of SF<sub>6</sub> and PFC containing equipment exceeds 17,820 pounds, as determined under § 98.301 (subpart DD).