UNITED NATIONS

UNEP

UNEP/OzL.Pro.WG.1/44/INF/5

Montreal Protocol on Substances that Deplete the Ozone Layer

Distr.: General
20 May 2022

English only

Open-ended Working Group of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer
Forty-fourth meeting
Bangkok, 11–16 July 2022

Mixtures containing controlled substances

Note by the Secretariat

1. The present note summarizes information related to mixtures containing controlled substances that the Secretariat wishes to bring to the attention of the parties.

Information on mixtures containing controlled substances

2. For the forty-first meeting of the Open-ended Working Group of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer, held in July 2019, the Secretariat issued document UNEP/OzL.Pro.WG.1/41/INF/5/Rev.1, which was to be periodically updated. The document summarized information related to mixtures used primarily in the refrigeration sector, whether containing controlled substances or not. The information is intended to facilitate the process by which parties report quantities of mixtures traded,[1] given that mixtures used in the refrigeration industry are evolving rapidly.

3. The last update to the parties was provided in document UNEP/OzL.Pro.WG.1/42/INF/3, issued for the forty-second meeting of the Open-ended Working Group held in July 2020. Since that meeting, the Secretariat has received information on many new custom mixtures being traded among parties, as reported by the parties in their Article 7 data. The custom mixtures reported by parties are reflected in table 5 in the annex to the present note.

4. The annex presents a consolidated and updated version of the annex to document UNEP/OzL.Pro.WG.1/42/INF/3. The information in this document was submitted for review by the Scientific Assessment Panel and the Technology and Economic Assessment Panel and its technical options committees. Their input and comments have been taken into account.

[1] Previously, parties were required to calculate and report only the derived/calculated amounts of controlled substances contained in mixtures.

Annex

Illustrative lists of refrigerant mixtures and blends

1. The information in the present annex updates the illustrative lists of mixtures containing substances controlled under the Montreal Protocol on Substances that Deplete the Ozone Layer, which are outlined in section 11 of the instructions and guidelines appended to the revised forms for reporting Article 7 data that were approved in decision XXX/10 of the Thirtieth Meeting of the Parties to the Montreal Protocol (UNEP/OzL.Pro.30/11, annex III, appendix I).

2. The lists in this document contain known mixtures, some of which contain controlled substances and some of which do not,[1] together with their compositions. Based on the percentages of the controlled substances in the mixtures, the Secretariat has calculated their ozone-depleting-potential and global-warming-potential values.[2] Those values are for information purposes only; the Secretariat uses the values for each component of the mixtures when calculating production and consumption levels in ozone-depleting potential (in metric tons) and carbon dioxide equivalence, in order to reflect the appropriate production and consumption values in the corresponding annex groups.

3. The following colour code has been applied to the rows in the tables to allow easier identification of the different updates or types of information:

(a) Rows in tables 1 to 5 for mixtures that do not contain any controlled substances are coloured light green;

(b) Rows in table 1 for new mixtures that contain controlled substances and have not received an ASHRAE or ISO designation or classification are coloured yellow;

(c) Rows in tables 1 to 5 for mixtures that contain controlled substances and were not listed in section 11 of the instructions and guidelines approved under decision XXX/10 are coloured light orange.

4. The tables in the present annex have not been formally edited.

Table 1
Zeotropic mixtures[a]

No.	*ASHRAE number / trade name*	*Other trade names*	*ODP[b]*	*GWP[b]*	*Composition*
1	R-400[C]		1	10450	CFC-12=50%; CFC-114=50%
			1	10540	CFC-12=60%; CFC-114=40%
2	R-401A	MP 39; MP-39	0.03663	1182.48	HCFC-22=53%; HCFC-124=34%; HFC-152a=13%
3	R-401B	MP 66; MP-66	0.03971	1288.26	HCFC-22=61%; HCFC-124=28%; HFC-152a=11%
4	R-401C	MP 52; MP-52	0.02959	932.58	HCFC-22=33%; HCFC-124=52%; HFC-152a=15%
5	R-402A	HP 80; HP-80	0.0209	2787.8	HCFC-22=38%; HFC-125=60%; HC-290 (propane)=2%
6	R-402B	HP 81; HP-81	0.033	2416	HCFC-22=60%; HFC-125=38%; HC-290 (propane)=2%
7	R-403A	69S; ISCEON 69-S/69S	0.04125	1357.5	HCFC-22=75%; PFC-218 (octafluoropropane)=20%; HC-290 (propane)=5%
8	R-403B	69L; ISCEON 69-L/69L	0.0308	1013.6	HCFC-22=56%; PFC-218 (octafluoropropane)=39%; HC-290 (propane)=5%

[1] Mixtures that do not contain controlled substances are listed for parties' information in order to reduce queries about mixtures that would otherwise have been excluded from the list.

[2] The values of ozone-depleting potential (ODP) and global-warming potential (GWP) are based on the values assigned under the Montreal Protocol. For substances for which ODP and/or GWP values are not assigned, default values of 0 have been applied.

No.	*ASHRAE number / trade name*	*Other trade names*	*ODP[b]*	*GWP[b]*	*Composition*
9	R-404A	HP-62, FX-70, Forane 404A		3921.6	HFC-125=44%; HFC-134a=4%; HFC-143a=52%
10	R-405A	G2015; GreenCool G2015	0.028325	950.23	HCFC-22=45%; HCFC-142B=5.5%; HFC-152a=7%; PFC-C318 (octafluorocyclobutane)=42.5%
11	R-406A	GHG/GHG 12	0.0569	1942.6	HCFC-22=55%; HCFC-142B=41%; HC-600a (isobutane)=4%
12	R-406B	GHG-HP	0.0559	1892.6	HCFC-22=65%; HCFC-142B=31%; HC-600a (isobutane)=4%
13	R-407A	Klea 60, Forane 407A		2107	HFC-32=20%; HFC-125=40%; HFC-134a=40%
14	R-407B	Klea 61		2803.5	HFC-32=10%; HFC-125=70%; HFC-134a=20%
15	R-407C	Klea 66, AC9000, Forane 407C		1773.85	HFC-32=23%; HFC-125=25%; HFC-134a=52%
16	R-407D			1627.25	HFC-32=15%; HFC-125=15%; HFC-134a=70%
17	R-407E			1551.75	HFC-32=25%; HFC-125=15%; HFC-134a=60%
18	R-407F	Genetron Performax LT		1824.5	HFC-32=30%; HFC-125=30%; HFC-134a=40%
19	R-407G			1462.875	HFC-32=2.5%; HFC-125=2.5%; HFC-134a=95%
20	R-407H			1495.125	HFC-32=32.5%; HFC-125=15%; HFC-134a=52.5%
21	R-407I			1458.725	HFC-32=19.5%; HFC-125=8.5%; HFC-134a=72%
22	R-408A	FX-10, Forane 408A	0.02585	3151.9	HCFC-22=47%; HFC-125=7%; HFC-143a=46%
23	R-409A	FX56; FX-56	0.04825	1584.75	HCFC-22=60%; HCFC-124=25%; HCFC-142B=15%
24	R-409B	FX 57; FX-57	0.04775	1559.75	HCFC-22=65%; HCFC-124=25%; HCFC-142B=10%
25	R-410A	AZ-20, Puron, Suva 9100, Forane 410A		2087.5	HFC-32=50%; HFC-125=50%
26	R-410B	AC9100		2228.75	HFC-32=45%; HFC-125=55%
27	R-411A	GreenCool G2018a	0.048125	1597.39	HCFC-22=87.5%; HFC-152a=11%; HO-1270 (propene (propylene))=1.5%
28	R-411B	GreenCool G2018b	0.0517	1705.12	HCFC-22=94%; HFC-152a=3%; HO-1270 (propene (propylene))=3%
29	R-411C	GreenCool G2018c	0.052525	1730.41	HCFC-22=95.5%; HFC-152a=1.5%; HO-1270 (propene (propylene))=3%
30	R-412A	Arcton TP5R	0.05475	1844.5	HCFC-22=70%; HCFC-142B=25%; PFC-218 (octafluoropropane)=5%
31	R-413A	ISCEON 49		1258.4	HFC-134a=88%; PFC-218 (octafluoropropane)=9%; HC-600a (isobutane)=3%

No.	ASHRAE number / trade name	Other trade names	ODP[b]	GWP[b]	Composition
32	R-414A	GHG-X4, Autofrost, Chill-It	0.045045	1477.815	HCFC-22=51%; HCFC-124=28.5%; HCFC-142B=16.5%; HC-600a (isobutane)=4%
33	R-414B	Hot Shot, Kar Kool	0.042255	1361.96	HCFC-22=50%; HCFC-124=39%; HCFC-142B=9.5%; HC-600a (isobutane)=1.5%
34	R-415A		0.0451	1506.52	HCFC-22=82%; HFC-152a=18%
35	R-415B		0.01375	545.5	HCFC-22=25%; HFC-152a=75%
36	R-416A	FRIGC (FR-12)	0.00869	1084.255	HCFC-124=39.5%; HFC-134a=59%; HC-600 (butane)=1.5%
37	R-417A	ISCEON 59, NU-22		2346	HFC-125=46.6%; HFC-134a=50%; HC-600 (butane)=3.4%
38	R-417B			3026.69	HFC-125=79%; HFC-134a=18.3%; HC-600 (butane)=2.7%
39	R-417C			1809.34	HFC-125=19.5%; HFC-134a=78.8%; HC-600 (butane)=1.7%
40	R-418A		0.0528	1740.7	HCFC-22=96%; HFC-152a=2.5%; HC-290 (propane)=1.5%
41	R-419A			2966.7	HFC-125=77%; HFC-134a=19%; HC-E170 (Dimethyl Ether (DME))=4%
42	R-419B			2383.9	HFC-125=48.5%; HFC-134a=48%; HC-E170 (Dimethyl Ether (DME))=3.5%
43	R-420A	Choice Refrigerant, Choice R420A	0.0078	1535.6	HCFC-142B=12%; HFC-134a=88%
44	R-421A	Choice R421A		2630.6	HFC-125=58%; HFC-134a=42%
45	R-421B	Choice 421B		3189.5	HFC-125=85%; HFC-134a=15%
46	R-422A	ISCEON 79		3142.95	HFC-125=85.1%; HFC-134a=11.5%; HC-600a (isobutane)=3.4%
47	R-422B	ICOR XAC1		2525.6	HFC-125=55%; HFC-134a=42%; HC-600a (isobutane)=3%
48	R-422C	ICOR XLT1		3084.5	HFC-125=82%; HFC-134a=15%; HC-600a (isobutane)=3%
49	R-422D	ISCEON MO29		2728.95	HFC-125=65.1%; HFC-134a=31.5%; HC-600a (isobutane)=3.4%
50	R-422E			2591.99	HFC-125=58%; HFC-134a=39.3%; HC-600a (isobutane)=2.7%
51	R-423A			2280.25	HFC-134a=52.5%; HFC-227ea=47.5%
52	R-424A	RS-44 (new comp.)		2439.6	HFC-125=50.5%; HFC-134a=47%; HC-600 (butane)=1%; HC-600a (isobutane)=0.9%; HC-601a (Isopentane)=0.6%
53	R-425A			1505.125	HFC-32=18.5%; HFC-134a=69.5%; HFC-227ea=12%
54	R-426A	RS-24 (new comp.)		1508.4	HFC-125=5.1%; HFC-134a=93%; HC-600 (butane)=1.3%; HC-601a (Isopentane)=0.6%
55	R-427A	Forane 427A		2138.25	HFC-32=15%; HFC-125=25%; HFC-134a=50%; HFC-143a=10%
56	R-427B			2381.99	HFC-32=20.6%; HFC-125=25.6%; HFC-134a=34.8%; HFC-143a=19%
57	R-427C			2062.75	HFC-32=25%; HFC-125=25%; HFC-134a=40%; HFC-143a=10%

No.	*ASHRAE number / trade name*	*Other trade names*	*ODP[b]*	*GWP[b]*	*Composition*
58	R-428A	RS-52		3606.5	HFC-125=77.5%; HFC-143a=20%; HC-290 (propane)=0.6%; HC-600a (isobutane)=1.9%
59	R-429A			12.4	HFC-152a=10%; HC-E170 (Dimethyl Ether (DME))=60%; HC-600a (isobutane)=30%
60	R-430A			94.24	HFC-152a=76%; HC-600a (isobutane)=24%
61	R-431A			35.96	HFC-152a=29%; HC-290 (propane)=71%
62	R-432A				HO-1270 (propene (propylene))=80%; HC-E170 (Dimethyl Ether (DME))=20%
63	R-433A				HO-1270 (propene (propylene))=30%; HC-290 (propane)=70%
64	R-433B				HO-1270 (propene (propylene))=5%; HC-290 (propane)=95%
65	R-433C				HO-1270 (propene (propylene))=25%; HC-290 (propane)=75%
66	R-434A	RS-45		3245.4	HFC-125=63.2%; HFC-134a=16%; HFC-143a=18%; HC-600a (isobutane)=2.8%
67	R-435A			24.8	HFC-152a=20%; HC-E170 (Dimethyl Ether (DME))=80%
68	R-436A				HC-290 (propane)=56%; HC-600a (isobutane)=44%
69	R-436B				HC-290 (propane)=52%; HC-600a (isobutane)=48%
70	R-436C				HC-290 (propane)=95%; HC-600a (isobutane)=5%
71	R-437A			1805.05	HFC-125=19.5%; HFC-134a=78.5%; HC-600 (butane)=1.4%; HC-601 (Pentane)=0.6%
72	R-438A	KDD5, ISCEON MO99		2264.435	HFC-32=8.5%; HFC-125=45%; HFC-134a=44.2%; HC-600 (butane)=1.7%; HC-601a (Isopentane)=0.6%
73	R-439A			1982.5	HFC-32=50%; HFC-125=47%; HC-600a (isobutane)=3%
74	R-440A			144.152	HFC-134a=1.6%; HFC-152a=97.8%; HC-290 (propane)=0.6%
75	R-441A	HCR-188C			HC-170 (Ethane)=3.1%; HC-290 (propane)=54.8%; HC-600 (butane)=36.1%; HC-600a (isobutane)=6%
76	R-442A	RS-50		1887.97	HFC-32=31%; HFC-125=31%; HFC-134a=30%; HFC-152a=3%; HFC-227ea=5%
77	R-443A				HO-1270 (propene (propylene))=55%; HC-290 (propane)=40%; HC-600a (isobutane)=5%
78	R-444A			87.2	HFC-32=12%; HFC-152a=5%; HFO-1234ze(E)=83%
79	R-444B			292.525	HFC-32=41.5%; HFC-152a=10%; HFO-1234ze(E)=48.5%
80	R-445A			128.7	HFC-134a=9%; HFO-1234ze(E)=85%; R-744 (carbon dioxide)=6%
81	R-446A			459	HFC-32=68%; HFO-1234ze(E)=29%; HC-600 (butane)=3%

No.	*ASHRAE number / trade name*	*Other trade names*	*ODP[b]*	*GWP[b]*	*Composition*
82	R-447A			581.5	HFC-32=68%; HFC-125=3.5%; HFO-1234ze(E)=28.5%
83	R-447B			739	HFC-32=68%; HFC-125=8%; HFO-1234ze(E)=24%
84	R-448A	Solstice N-40		1385.8	HFC-32=26%; HFC-125=26%; HFC-134a=21%; HFO-1234yf=20%; HFO-1234ze(E)=7%
85	R-448B			1320.05	HFC-32=21%; HFC-125=21%; HFC-134a=31%; HFO-1234yf=20%; HFO-1234ze(E)=7%
86	R-449A	Forane 449A, Opteon XP-40		1396.035	HFC-32=24.3%; HFC-125=24.7%; HFC-134a=25.7%; HFO-1234yf=25.3%
87	R-449B	Arkema		1410.99	HFC-32=25.2%; HFC-125=24.3%; HFC-134a=27.3%; HFO-1234yf=23.2%
88	R-449C			1249.7	HFC-32=20%; HFC-125=20%; HFC-134a=29%; HFO-1234yf=31%
89	R-450A	Solstice N-13		600.6	HFC-134a=42%; HFO-1234ze(E)=58%
90	R-451A			145.86	HFC-134a=10.2%; HFO-1234yf=89.8%
91	R-451B			160.16	HFC-134a=11.2%; HFO-1234yf=88.8%
92	R-452A			2139.25	HFC-32=11%; HFC-125=59%; HFO-1234yf=30%
93	R-452B			697.25	HFC-32=67%; HFC-125=7%; HFO-1234yf=26%
94	R-452C			2219.375	HFC-32=12.5%; HFC-125=61%; HFO-1234yf=26.5%
95	R-453A			1765.34	HFC-32=20%; HFC-125=20%; HFC-134a=53.8%; HFC-227ea=5%; HC-600 (butane)=0.6%; HC-601a (Isopentane)=0.6%
96	R-454A			236.25	HFC-32=35%; HFO-1234yf=65%
97	R-454B			465.075	HFC-32=68.9%; HFO-1234yf=31.1%
98	R-454C			145.125	HFC-32=21.5%; HFO-1234yf=78.5%
99	R-455A			145.125	HFC-32=21.5%; HFO-1234yf=75.5%; R-744 (carbon dioxide)=3%
100	R-456A			684	HFC-32=6%; HFC-134a=45%; HFO-1234ze(E)=49%
101	R-457A			136.38	HFC-32=18%; HFC-152a=12%; HFO-1234yf=70%
102	R-457B			248.65	HFC-32=35%; HFC-152a=10%; HFO-1234yf=55%
103	R-458A			1649.955	HFC-32=20.5%; HFC-125=4%; HFC-134a=61.4%; HFC-227ea=13.5%; HFC-236fa=0.6%
104	R-459A			459	HFC-32=68%; HFO-1234yf=26%; HFO-1234ze(E)=6%
105	R-459B			141.75	HFC-32=21%; HFO-1234yf=69%; HFO-1234ze(E)=10%
106	R-460A			2101.2	HFC-32=12%; HFC-125=52%; HFC-134a=14%; HFO-1234ze(E)=22%
107	R-460B			1350	HFC-32=28%; HFC-125=25%; HFC-134a=20%; HFO-1234ze(E)=27%

No.	*ASHRAE number / trade name*	*Other trade names*	*ODP[b]*	*GWP[b]*	*Composition*
108	R-460C			762.175	HFC-32=2.5%; HFC-125=2.5%; HFC-134a=46%; HFO-1234ze(E)=49%
109	R-461A			2767.1	HFC-125=55%; HFC-134a=32%; HFC-143a=5%; HFC-227ea=5%; HC-600a (isobutane)=3%
110	R-462A			2249.35	HFC-32=9%; HFC-125=42%; HFC-134a=44%; HFC-143a=2%; HC-600 (butane)=3%
111	R-463A	XP41		1493.2	HFC-32=36%; HFC-125=30%; HFC-134a=14%; HFO-1234yf=14%; R-744 (carbon dioxide)=6%
112	R-464A			1320.45	HFC-32=27%; HFC-125=27%; HFC-227ea=6%; HFO-1234ze(E)=40%
113	R-465A			141.75	HFC-32=21%; HFO-1234yf=71.1%; HC-290 (propane)=7.9%
114	R-466A			733.25	HFC-32=49%; HFC-125=11.5%; IFC-13I1 (Trifluoroiodomethane (CF3I))=39.5%
115	R-467A			1358.82	HFC-32=22%; HFC-125=5%; HFC-134a=72.4%; HC-600a (isobutane)=0.6%
116	R-468A			145.125	HFC-32=21.5%; HFO-1132a=3.5%; HFO-1234yf=75%
117	R-468B			87.75	HFC-32=13%; HFO-1132a=6%; HFO-1234yf=81%
118	R-468C			283.5	HFC-32=42%; HFO-1132a=6%; HFO-1234yf=52%
119	R-469A			1356.875	HFC-32=32.5%; HFC-125=32.5%; R-744 (carbon dioxide)=35%
120	R-470A			976.45	HFC-32=17%; HFC-125=19%; HFC-134a=7%; HFC-227ea=3%; HFO-1234ze(E)=44%; R-744 (carbon dioxide)=10%
121	R-470B			748.425	HFC-32=11.5%; HFC-125=11.5%; HFC-134a=3%; HFC-227ea=7%; HFO-1234ze(E)=57%; R-744 (carbon dioxide)=10%
122	R-471A			138.46	HFC-227ea=4.3%; HFO-1336mzz(E)=17%; HFO-1234ze(E)=78.7%
123	R-472A			352.7	HFC-32=12%; HFC-134a=19%; R-744 (carbon dioxide)=69%
124	R-472B			525.1	HFC-32=10%; HFC-134a=32%; R-744 (carbon dioxide)=58%
125	R-473A			1830	HFC-125=10%; HFC-23=10%; HFO-1132a=20%; R-744 (carbon dioxide)=60%
126	R-475A			614.9	HFC-134a=43%; HFO-1234yf=45%; HFO-1234ze(E)=12%

[a] See para. 3 of the annex for an explanation of the colours used for different rows.

[b] The values of ozone-depleting potential (ODP) and global-warming potential (GWP) are based on the values assigned under the Montreal Protocol. For substances for which ODP and/or GWP values are not assigned, default values of 0 have been applied. GWP values for CFCs and HCFCs contained in mixtures would normally be applied for the baseline years used to determine HFC baselines.

[c] No specific formulation exists for R-400; therefore, the percentage of each component in the mixture must be specified.

Table 2
Azeotropic mixtures[a]

No.	*ASHRAE number / trade name*	*Other trade names*	*ODP*[b]	*GWP*[b]	*Composition*
1.	R-500	Carrene #7	0.738	8076.688	CFC-12=73.8%; HFC-152a=26.2%
2.	R-501		0.29125	4082.5	CFC-12=25%; HCFC-22=75%
3.	R-502		0.33404	4656.72	CFC-115=51.2%; HCFC-22=48.8%
4.	R-503		0.599	5934.8	CFC-13=59.9%; HFC-23=40.1%
5.	R-504		0.3108	4143.01	CFC-115=51.8%; HFC-32=48.2%
6.	R-505		0.7844	8502	CFC-12=78%; HCFC-31=22%
7.	R-506		0.461	4500	CFC-114=45%; HCFC-31=55%
8.	R-507A / R-507C	AZ-50; Forane 507A		3985	HFC-125=50%; HFC-143a=50%
9.	R-508A	Klea 5R3		5772	HFC-23=39%; PFC-116 (hexafluoroethane)=61%
10.	R-508B	Suva 95		6808	HFC-23=46%; PFC-116 (hexafluoroethane)=54%
11.	R-509	TP5R2	0.0253	832.6	HCFC-22=46%; PFC-218 (octafluoropropane)=54%
12.	R-509A	Arcton TP5R2	0.0242	796.4	HCFC-22=44%; PFC-218 (octafluoropropane)=56%
13.	R-510A				HC-E170 (Dimethyl Ether (DME))=88%; HC-600a (isobutane)=12%
14.	R-511A				HC-E170 (Dimethyl Ether (DME))=5%; HC-290 (propane)=95%
15.	R-512A			189.3	HFC-134a=5%; HFC-152a=95%
16.	R-513A	XP10 / DR11; Opteon XP-10		629.2	HFC-134a=44%; HFO-1234yf=56%
17.	R-513B			593.45	HFC-134a=41.5%; HFO-1234yf=58.5%
18.	R-514A				HCO-1130(E)=25.3%; HFO-1336mzz(Z)=74.7%
19.	R-515A			386.4	HFC-227ea=12%; HFO-1234ze(E)=88%
20.	R-515B			286.58	HFC-227ea=8.9%; HFO-1234ze(E)=91.1%
21.	R-516A			138.91	HFC-134a=8.5%; HFC-152a=14%; HFO-1234yf=77.5%

[a] See para. 3 of the annex for an explanation of the colours used for different rows.

[b] The values of ozone-depleting potential (ODP) and global-warming potential (GWP) are based on the values assigned under the Montreal Protocol. For substances for which ODP and/or GWP values are not assigned, default values of 0 have been applied. GWP values for CFCs and HCFCs contained in mixtures would normally be applied for the baseline years used to determine HFC baselines.

Table 3
Other common mixtures containing controlled substances

No.	*Trade name*	*ODP*[a]	*GWP*[a]	*Composition*
1.	FX20	0.03025	2570.5	HCFC-22=55%; HFC-125=45%
2.	FX55	0.059	2010	HCFC-22=60%; HCFC-142B=40%
3.	D136	0.03784	1191.23	HCFC-22=50%; HCFC-124=47%; HC-600a (isobutane)=3%
4.	Daikin Blend	0.0154	911.3	HCFC-124=70%; HFC-32=28%; HFC-23=2%
5.	FRIGC	0.00858	1081.21	HCFC-124=39%; HFC-134a=59%; HC-600a (isobutane)=2%
6.	Free Zone	0.01235	1568.6	HCFC-142B=19%; HFC-134a=79%; Lubricant=2%

No.	*Trade name*	*ODP*[a]	*GWP*[a]	*Composition*
7.	GHG-X5	0.0323	2376.6	HCFC-22=41%; HCFC-142B=15%; HFC-227ea=40%; HC-600a (isobutane)=4%
8.	NARM-502	0.0495	2375.2	HCFC-22=90%; HFC-152a=5%; HFC-23=5%
9.	NASF-S-III[b]	0.04814	1545.7125	HCFC-22=82%; HCFC-123=4.75%; HCFC-124=9.5%; HC-600a (isobutane)=3.75%

[a] The values of ozone-depleting potential (ODP) and global-warming potential (GWP) are based on the values assigned under the Montreal Protocol. For substances for which ODP and/or GWP values are not assigned, default values of 0 have been applied. GWP values for HCFCs contained in mixtures would normally be applied for the baseline years used to determine HFC baselines.

[b] A halon alternative.

Table 4
Methyl bromide mixtures

No.	*Trade name*	*ODP*[a]	*Composition*
	Methyl bromide with chloropicrin (67/33)	0.402	Methyl bromide=67%; Chloropicrin=33%
	Methyl bromide with chloropicrin (98/2)	0.588	Methyl bromide=98%; Chloropicrin=2%

[a] The values of ozone-depleting potential (ODP) and global-warming potential (GWP) are based on the values assigned under the Montreal Protocol. For substances for which ODP and/or GWP values are not assigned, default values of 0 have been applied.

Table 5
Mixtures reported by parties as part of their submissions of Article 7 data

No.	*Trade name (where provided)*	*ODP*[a]	*GWP*[a]	*Composition*
1		0.449532	3515.648	CFC-11=26.9%; CFC-12=7.7%; CFC-113=0.9%; CFC-114=3.4%; CFC-13=5.2%; HCFC-22=14.4%; HCFC-123=4.8%; HCFC-124=0.1%; HCFC-141B=1.3%; HFC-125=14%; HFC-134a=16.7%; HFC-152a=0.2%; Cyclopentane=2.7%; Unspecified substance(s)=1.7%
2		0.06445	1900.9	CFC-12=1%; HCFC-22=99%
3				HC-290 (propane)=99.5%; HC-600a (isobutane)=0.5%
4				HC-290 (propane)=6.9%; Unspecified substance(s)=93.1%
5				HC-290 (propane)=7%; Unspecified substance(s)=93%
6				HC-290 (propane)=7.4%; Unspecified substance(s)=92.6%
7				HC-290 (propane)=7.5%; Unspecified substance(s)=92.5%
8				HC-290 (propane)=8.1%; Unspecified substance(s)=91.9%
9			2300	HFC-125=50%; HFC-134=50%
10			1657.7	HFC-125=11%; HFC-134a=89%
11			1699.1	HFC-125=13%; HFC-134a=87%
12			1841.93	HFC-125=19.9%; HFC-134a=80.1%
13			2824.973	HFC-125=67.39%; HFC-134a=32.61%
14			2982.5	HFC-125=75%; HFC-134a=25%
15			1626.9	HFC-125=33%; HFC-134a=33%; HC-600 (butane)=34%
16			2366.4	HFC-125=48%; HFC-134a=48%; HC-600 (butane)=4%
17			2525.6	HFC-125=55%; HFC-134a=42%; HC-600 (butane)=3%
18			1508.4	HFC-125=5.1%; HFC-134a=93%; HC-600 (butane)=1.3%; HC-600a (isobutane)=0.6%
19	R-437D		1809	HFC-125=19%; HFC-134a=80%; HC-600a (isobutane)=1%
20			2697.6	HFC-125=64%; HFC-134a=32%; HC-600a (isobutane)=4%
21			2675.8	HFC-125=22%; HFC-134a=52%; HFC-143a=26%
22			2447.14	HFC-125=9.3%; HFC-134a=0.9%; HFC-143a=11.1%; HFC-245fa=10%; HFC-23=10.2%; PFC-116 (hexafluoroethane)=15.9%;

No.	*Trade name (where provided)*	*ODP[a]*	*GWP[a]*	*Composition*
				PFC-14 (Tetrafluoromethane)=26.5%; HC-50 (Methane)=5.9%; HC-600 (butane)=4.2%; R-740 (Argon)=6%
23			2455.22	HFC-125=9.6%; HFC-134a=0.9%; HFC-143a=11.4%; HFC-245fa=9.9%; HFC-23=10.1%; PFC-116 (hexafluoroethane)=15.8%; PFC-14 (Tetrafluoromethane)=26%; HC-50 (Methane)=6.1%; HC-600 (butane)=4.2%; R-740 (Argon)=6%
24			2576.7	HFC-125=10%; HFC-134a=1%; HFC-143a=11%; HFC-245fa=9%; HFC-23=11%; PFC-116 (hexafluoroethane)=22%; PFC-14 (Tetrafluoromethane)=24%; HC-50 (Methane)=6%; HC-600 (butane)=4%; R-740 (Argon)=2%
25			2769.4	HFC-125=10%; HFC-134a=1%; HFC-143a=12%; HFC-245fa=9%; HFC-23=12%; PFC-116 (hexafluoroethane)=18%; PFC-14 (Tetrafluoromethane)=25%; HC-50 (Methane)=5%; HC-600 (butane)=4%; R-740 (Argon)=4%
26			2769.4	HFC-125=10%; HFC-134a=1%; HFC-143a=12%; HFC-245fa=9%; HFC-23=12%; PFC-116 (hexafluoroethane)=18%; PFC-14 (Tetrafluoromethane)=25%; HC-50 (Methane)=6%; HC-600 (butane)=4%; R-740 (Argon)=3%
27			2769.4	HFC-125=10%; HFC-134a=1%; HFC-143a=12%; HFC-245fa=9%; HFC-23=12%; PFC-116 (hexafluoroethane)=18%; PFC-14 (Tetrafluoromethane)=25%; HC-50 (Methane)=7%; HC-600 (butane)=4%; R-740 (Argon)=2%
28			2891.82	HFC-125=11%; HFC-134a=1%; HFC-143a=13%; HFC-245fa=7.4%; HFC-23=12.4%; PFC-116 (hexafluoroethane)=19.5%; PFC-14 (Tetrafluoromethane)=22.7%; HC-50 (Methane)=5.1%; HC-600 (butane)=3.2%; R-740 (Argon)=4.7%
29			2905.4	HFC-125=11.3%; HFC-134a=1%; HFC-143a=13.4%; HFC-245fa=7.4%; HFC-23=12.3%; PFC-116 (hexafluoroethane)=19.2%; PFC-14 (Tetrafluoromethane)=22.2%; HC-50 (Methane)=5.3%; HC-600 (butane)=3.2%; R-740 (Argon)=4.7%
30	YH222		1762.7	HFC-125=35%; HFC-134a=35%; HFC-152a=30%
31			2507.91	HFC-125=60.1%; HFC-134a=27.5%; HFC-152a=9%; HC-290 (propane)=3.4%
32			2586	HFC-125=73%; HFC-152a=25%; HC-600a (isobutane)=2%
33			3056.1	HFC-125=16.7%; HFC-23=16.7%; HC-170 (Ethane)=16.7%; HFE-347 mcc3 (HFE-7000)=16.7%; PFC-14 (Tetrafluoromethane)=16.7%; R-740 (Argon)=16.5%
34			1615	HFC-125=25%; HFC-23=5%; HC-170 (Ethane)=3%; HFE-347 mcc3 (HFE-7000)=24%; PFC-14 (Tetrafluoromethane)=37%; R-740 (Argon)=6%
35			1615	HFC-125=25%; HFC-23=5%; HC-170 (Ethane)=5%; HFE-347 mcc3 (HFE-7000)=33%; PFC-14 (Tetrafluoromethane)=28%; R-740 (Argon)=4%
36			1354	HFC-125=26%; HFC-23=3%; HC-170 (Ethane)=3%; HFE-347 mcc3 (HFE-7000)=34%; PFC-14 (Tetrafluoromethane)=31%; R-740 (Argon)=3%
37			1650	HFC-125=26%; HFC-23=5%; HC-170 (Ethane)=5%; HFE-347 mcc3 (HFE-7000)=34%; PFC-14 (Tetrafluoromethane)=26%; R-740 (Argon)=4%
38			1642	HFC-125=30%; HFC-23=4%; HC-170 (Ethane)=4%; HFE-347 mcc3 (HFE-7000)=30%; PFC-14 (Tetrafluoromethane)=27%; R-740 (Argon)=5%
39			1456	HFC-125=12%; HFC-23=7%; HC-170 (Ethane)=9%; PFC-14 (Tetrafluoromethane)=50%; R-740 (Argon)=22%
40			1456	HFC-125=12%; HFC-23=7%; HC-170 (Ethane)=9%; PFC-14 (Tetrafluoromethane)=60%; R-740 (Argon)=12%
41			3363.75	HFC-125=25.49%; HFC-23=16.7%; PFC-14 (Tetrafluoromethane)=48.56%; R-740 (Argon)=9.25%

No.	*Trade name (where provided)*	*ODP[a]*	*GWP[a]*	*Composition*
42			6379.552	HFC-125=6.93%; HFC-236fa=38.42%; HFC-23=16%; PFC-14 (Tetrafluoromethane)=27.99%; R-740 (Argon)=10.66%
43			6871.069	HFC-125=10.23%; HFC-236fa=39.99%; HFC-23=17.5%; PFC-14 (Tetrafluoromethane)=25.89%; R-740 (Argon)=6.39%
44			6814.582	HFC-125=10.73%; HFC-236fa=29.52%; HFC-23=23.94%; PFC-14 (Tetrafluoromethane)=31.91%; R-740 (Argon)=3.9%
45			6626.435	HFC-125=11.02%; HFC-236fa=30.35%; HFC-23=22.05%; PFC-14 (Tetrafluoromethane)=30.51%; R-740 (Argon)=6.07%
46			6749.38	HFC-125=11.2%; HFC-236fa=37.8%; HFC-23=17.9%; PFC-14 (Tetrafluoromethane)=27.3%; R-740 (Argon)=5.8%
47			6652.3	HFC-125=13%; HFC-236fa=33%; HFC-23=20%; PFC-14 (Tetrafluoromethane)=30%; R-740 (Argon)=4%
48			6623.02	HFC-125=13.31%; HFC-236fa=33.3%; HFC-23=19.53%; PFC-14 (Tetrafluoromethane)=29.8%; R-740 (Argon)=4.06%
49			6529.17	HFC-125=14.6%; HFC-236fa=35.7%; HFC-23=17%; PFC-14 (Tetrafluoromethane)=27%; R-740 (Argon)=5.7%
50			6691.97	HFC-125=14.6%; HFC-236fa=35.7%; HFC-23=18.1%; PFC-14 (Tetrafluoromethane)=27%; R-740 (Argon)=4.6%
51			6472.8	HFC-125=15%; HFC-236fa=38%; HFC-23=15%; PFC-14 (Tetrafluoromethane)=28%; R-740 (Argon)=4%
52			5925.915	HFC-125=15.63%; HFC-236fa=31.25%; HFC-23=15.63%; PFC-14 (Tetrafluoromethane)=31.25%; R-740 (Argon)=6.24%
53			6614.283	HFC-125=23.53%; HFC-236fa=23.53%; HFC-23=23.53%; PFC-14 (Tetrafluoromethane)=23.53%; R-740 (Argon)=5.88%
54	PFC1102HC		4613	HFC-125=25%; HFC-236fa=20%; HFC-23=12%; Unspecified substance(s)=43%
55			3907.193	HFC-125=11.8%; HFC-245ca=30.1%; HFC-23=22.2%; PFC-14 (Tetrafluoromethane)=30.6%; R-740 (Argon)=5.3%
56			2254.8	HFC-125=20%; HFC-245fa=36%; HFC-23=8%; PFC-116 (hexafluoroethane)=13%; PFC-14 (Tetrafluoromethane)=23%
57			2201.5	HFC-125=23%; HFC-245fa=35%; HFC-23=7%; PFC-116 (hexafluoroethane)=13%; PFC-14 (Tetrafluoromethane)=22%
58			4014.19	HFC-125=11.9%; HFC-245fa=30.3%; HFC-23=22.2%; PFC-14 (Tetrafluoromethane)=30.6%; R-740 (Argon)=5%
59			4189.749	HFC-125=12.32%; HFC-245fa=30.83%; HFC-23=23.25%; PFC-14 (Tetrafluoromethane)=31.14%; R-740 (Argon)=2.46%
60			4168	HFC-125=13%; HFC-245fa=30%; HFC-23=23%; PFC-14 (Tetrafluoromethane)=29%; R-740 (Argon)=5%
61			4946.325	HFC-125=13.09%; HFC-245fa=9.85%; HFC-23=29.64%; PFC-14 (Tetrafluoromethane)=40.95%; R-740 (Argon)=6.47%
62			3639.5	HFC-125=15%; HFC-245fa=15%; HFC-23=20%; PFC-14 (Tetrafluoromethane)=30%; R-740 (Argon)=20%
63			4733.5	HFC-125=15%; HFC-245fa=35%; HFC-23=26%; PFC-14 (Tetrafluoromethane)=9%; R-740 (Argon)=15%
64			3688.932	HFC-125=17.56%; HFC-245fa=20.44%; HFC-23=19.35%; PFC-14 (Tetrafluoromethane)=35.75%; R-740 (Argon)=6.9%
65			3499.854	HFC-125=19.1%; HFC-245fa=14.38%; HFC-23=18.13%; PFC-14 (Tetrafluoromethane)=38.2%; R-740 (Argon)=10.19%
66	Isceon 89		3010	HFC-125=86%; PFC-218 (octafluoropropane)=9%; HC-290 (propane)=5%
67	ISCEON 80		3010	HFC-125=86%; Unspecified substance(s)=14%
68			746.31	HFC-134=9.3%; HFC-134a=40.7%; HFC-152a=50%
69			484	HFC-134=44%; HFO-1234yf=56%
70			407	HFC-134=37%; HFO-1234ze(E)=63%

No.	*Trade name (where provided)*	*ODP[a]*	*GWP[a]*	*Composition*
71			1368.51	HFC-134a=95.7%; HC-E170 (Dimethyl Ether (DME))=4.3%
72			777	HFC-134a=50%; HFC-152a=50%
73			1260.22	HFC-134a=87%; HFC-152a=13%
74			2798.4	HFC-134a=21%; HFC-245fa=27%; HFC-23=15%; PFC-14 (Tetrafluoromethane)=25%; R-740 (Argon)=12%
75	CL-Chesterton 296		1028	HFC-134a=40%; HFC-245fa=25%; HFC-365mfc=25%; Unspecified substance(s)=10%
76	Chesterton 296 EU		1099.5	HFC-134a=45%; HFC-245fa=25%; HFC-365mfc=25%; Unspecified substance(s)=5%
77			643.5	HFC-134a=45%; HFO-1234yf=55%
78			143	HFC-134a=10%; HFO-1234ze(E)=90%
79			171.6	HFC-134a=12%; Unspecified substance(s)=88%
80			394.68	HFC-134a=27.6%; Unspecified substance(s)=72.4%
81			401.83	HFC-134a=28.1%; Unspecified substance(s)=71.9%
82			421.85	HFC-134a=29.5%; Unspecified substance(s)=70.5%
83			673.53	HFC-134a=47.1%; Unspecified substance(s)=52.9%
84			953.81	HFC-134a=66.7%; Unspecified substance(s)=33.3%
85			1.24	HFC-152a=1%; HC-E170 (Dimethyl Ether (DME))=99%
86			49.6	HFC-152a=40%; HC-E170 (Dimethyl Ether (DME))=60%
87			74.4	HFC-152a=60%; HC-E170 (Dimethyl Ether (DME))=40%
88			86.8	HFC-152a=70%; HC-E170 (Dimethyl Ether (DME))=30%
89			93	HFC-152a=75%; HC-E170 (Dimethyl Ether (DME))=25%
90			122.76	HFC-152a=99%; HC-E170 (Dimethyl Ether (DME))=1%
91			62	HFC-152a=50%; Unspecified substance(s)=50%
92			915.3	HFC-227ea=5%; HFC-365mfc=95%
93			963.82	HFC-227ea=7%; HFC-365mfc=93%
94			988.08	HFC-227ea=8%; HFC-365mfc=92%
95			1109.38	HFC-227ea=13%; HFC-365mfc=87%
96			2904.62	HFC-227ea=87%; HFC-365mfc=13%
97			2994.6	HFC-227ea=93%; n-Propanol=7%
98			2516	HFC-23=17%; PFC-116 (hexafluoroethane)=26%; HC-290 (propane)=23%; HC-600 (butane)=34%
99			2960	HFC-23=20%; PFC-116 (hexafluoroethane)=20%; HC-290 (propane)=30%; HC-600a (isobutane)=30%
100			8846	HFC-236fa=60%; HFC-23=20%; PFC-14 (Tetrafluoromethane)=20%
101			1854.6	HFC-245fa=22%; HFC-23=11%; HC-170 (Ethane)=3.5%; PFC-218 (octafluoropropane)=12.5%; PFC-14 (Tetrafluoromethane)=36.5%; HC-50 (Methane)=3.5%; HC-600a (isobutane)=7%; R-740 (Argon)=4%
102			3372.71	HFC-245fa=25.7%; HFC-23=21%; HFO-1234yf=14.5%; PFC-14 (Tetrafluoromethane)=35.4%; HC-50 (Methane)=3.4%
103			3169.9	HFC-245fa=29%; HFC-23=19.4%; HFO-1234yf=15.2%; PFC-14 (Tetrafluoromethane)=33.2%; HC-50 (Methane)=3.2%
104			3201.3166	HFC-245fa=30.642%; HFC-23=19.498%; HFO-1234yf=13.927%; PFC-14 (Tetrafluoromethane)=33.426%; HC-50 (Methane)=2.507%
105			3287.1295	HFC-245fa=32.105%; HFC-23=19.976%; HFO-1234yf=14.269%; PFC-14 (Tetrafluoromethane)=30.915%; HC-50 (Methane)=2.735%
106			2823.02	HFC-245fa=33.4%; HFC-23=16.75%; HFO-1234yf=16.75%; PFC-14 (Tetrafluoromethane)=29.3%; HC-50 (Methane)=3.8%

No.	*Trade name (where provided)*	*ODP[a]*	*GWP[a]*	*Composition*
107			2719.0819	HFC-245fa=40.293%; HFC-23=15.568%; HFO-1234yf=15.568%; PFC-14 (Tetrafluoromethane)=25.641%; HC-50 (Methane)=2.93%
108			3101.971	HFC-245fa=29.69%; HFC-23=18.893%; HFO-1234yf=13.495%; PFC-14 (Tetrafluoromethane)=32.389%; HC-50 (Methane)=2.429%; R-740 (Argon)=3.104%
109			3203.3618	HFC-245fa=31.286%; HFC-23=19.467%; HFO-1234yf=13.905%; PFC-14 (Tetrafluoromethane)=30.128%; HC-50 (Methane)=2.665%; R-740 (Argon)=2.549%
110			2641.6935	HFC-245fa=39.145%; HFC-23=15.125%; HFO-1234yf=15.125%; PFC-14 (Tetrafluoromethane)=24.911%; HC-50 (Methane)=2.847%; R-740 (Argon)=2.847%
111			5177.33	HFC-245fa=37.1%; HFC-23=32.4%; PFC-14 (Tetrafluoromethane)=14.7%; HC-600 (butane)=15.8%
112			4566.3	HFC-245fa=41%; HFC-23=28%; PFC-14 (Tetrafluoromethane)=13%; HC-600 (butane)=18%
113			4957.28	HFC-245fa=41.6%; HFC-23=30.6%; PFC-14 (Tetrafluoromethane)=9.9%; HC-600 (butane)=17.9%
114			4672.61	HFC-245fa=42.7%; HFC-23=28.6%; PFC-14 (Tetrafluoromethane)=10.5%; HC-600 (butane)=18.2%
115			4290.9	HFC-245fa=43%; HFC-23=26%; PFC-14 (Tetrafluoromethane)=12%; HC-600 (butane)=19%
116			4438.9	HFC-245fa=43%; HFC-23=27%; PFC-14 (Tetrafluoromethane)=11%; HC-600 (butane)=19%
117			4438.9	HFC-245fa=43%; HFC-23=27%; PFC-14 (Tetrafluoromethane)=12%; HC-600 (butane)=18%
118			4586.9	HFC-245fa=43%; HFC-23=28%; PFC-14 (Tetrafluoromethane)=10%; HC-600 (butane)=19%
119			4635.42	HFC-245fa=43.4%; HFC-23=28.3%; PFC-14 (Tetrafluoromethane)=9.7%; HC-600 (butane)=18.6%
120			4670.17	HFC-245fa=43.9%; HFC-23=28.5%; PFC-14 (Tetrafluoromethane)=8.8%; HC-600 (butane)=18.8%
121			4898.35	HFC-245fa=44.5%; HFC-23=30%; PFC-14 (Tetrafluoromethane)=6.4%; HC-600 (butane)=19.1%
122			4903.5	HFC-245fa=45%; HFC-23=30%; PFC-14 (Tetrafluoromethane)=6%; HC-600 (butane)=19%
123			4642.25	HFC-245fa=45.5%; HFC-23=28.2%; PFC-14 (Tetrafluoromethane)=6.8%; HC-600 (butane)=19.5%
124			3755.28	HFC-245fa=45.6%; HFC-23=22.2%; PFC-14 (Tetrafluoromethane)=12.7%; HC-600 (butane)=19.5%
125			4617.8	HFC-245fa=46%; HFC-23=28%; PFC-14 (Tetrafluoromethane)=7%; HC-600 (butane)=19%
126			4428.6	HFC-245fa=42%; HFC-23=27%; PFC-14 (Tetrafluoromethane)=8%; HC-600 (butane)=18%; HC-601 (Pentane)=5%
127			1982.5	HFC-32=50%; HFC-125=47%; HC-600 (butane)=3%
128			7988.3	HFC-32=10%; HFC-125=32%; HFC-134=10%; HFC-143a=4%; HFC-23=44%
129			2555.1	HFC-32=10%; HFC-125=58%; HFC-134a=32%
130			2581.4	HFC-32=12%; HFC-125=60%; HFC-134a=28%
131			1755	HFC-32=24.4%; HFC-125=24.6%; HFC-134a=51%
132			1741.825	HFC-32=24.5%; HFC-125=24%; HFC-134a=51.5%
133			1758.75	HFC-32=25%; HFC-125=25%; HFC-134a=50%
134			2142.7	HFC-32=6%; HFC-125=38%; HFC-134a=54%; HC-600a (isobutane)=2%

No.	Trade name (where provided)	ODP[a]	GWP[a]	Composition
135			1754.15	HFC-32=29%; HFC-125=29%; HFC-134a=38%; HC-600a (isobutane)=4%
136			1625.9105	HFC-32=4.99%; HFC-125=7.51%; HFC-134a=84.93%; HFC-143a=2.57%
137			3652.25	HFC-32=11%; HFC-125=35%; HFC-134a=2%; HFC-143a=52%
138			2518.75	HFC-32=25%; HFC-125=25%; HFC-134a=25%; HFC-143a=25%
139			3004.55	HFC-32=25%; HFC-125=47%; HFC-134a=2%; HFC-143a=26%
140			2659	HFC-32=20%; HFC-125=20%; HFC-134a=20%; HFC-143a=20%; HFC-227ea=20%
141			1596.02	HFC-32=20%; HFC-125=3.5%; HFC-134a=60.9%; HFC-227ea=13%; HFC-236fa=0.5%; HC-600 (butane)=2.1%
142			1413.055	HFC-32=23.9%; HFC-125=25.1%; HFC-134a=26.1%; HFO-1234yf=24.9%
143			1401.25	HFC-32=25%; HFC-125=25%; HFC-134a=25%; HFO-1234yf=25%
144			4349.35	HFC-32=7%; HFC-125=17%; HFC-143a=73%; HFC-23=3%
145			2087.725	HFC-32=12.7%; HFC-125=57.2%; HFO-1234yf=30.1%
146			529.875	HFC-32=78.5%; HFO-1234yf=21.5%
147			555.8	HFC-365mfc=70%; HCO-1130(E)=30%
148			516.1	HFC-365mfc=65%; perfluoropolymethylisopropylether (PFPMIE)=35%
149			1574.4	HFC-43-10mee=96%; Ethanol=4%
150			246	HFC-43-10mee=15%; HCO-1130(E)=85%
151			1016.8	HFC-43-10mee=62%; HCO-1130(E)=38%
152			820	HFC-43-10mee=50%; HCO-1130(E)=45%; Cyclopentane=5%
153			834.76	HFC-43-10mee=50.9%; HCO-1130(E)=43%; Cyclopentane=2%; Methanol=4%; Nitromethane=0.1%
154			418.2	HFC-43-10mee=25.5%; HCO-1130(E)=68.2%; Ethanol=6.3%
155			164	HFC-43-10mee=10%; HCO-1130(E)=83%; Heptafluorocyclopentane=7%
156			295.2	HFC-43-10mee=18%; HCO-1130(E)=67.2%; Heptafluorocyclopentane=12%; Methanol=2.8%
157			867.56	HFC-43-10mee=52.9%; HCO-1130(E)=43%; Methanol=4%; Nitromethane=0.1%
158			16.4	HFC-43-10mee=1%; HCO-1130(E)=95%; Methoxytridecafluoroheptene=4%
159			1015.816	HFC-43-10mee=61.94%; HCO-1130(E)=37.96%; Unspecified substance(s)=0.1%
160			934.8	HFC-43-10mee=57%; Hexamethyldisiloxane =43%
161			1586.7	HFC-43-10mee=96.75%; Isopropyl alcohol=3.25%
162			1630.16	HFC-43-10mee=99.4%; Nitromethane=0.5%; Unspecified substance(s)=0.1%
163				HFO-1234yf=0.5%; HC-600a (isobutane)=99.5%
164				HFO-1234ze(E)=97%; R-744 (carbon dioxide)=3%
165				HFO-1234ze(E)=97.4%; Unspecified substance(s)=2.6%
166				PFC-116 (hexafluoroethane)=6.5%; Oxygen=93.5%
167				PFC-14 (Tetrafluoromethane)=50%; R-740 (Argon)=50%
168				PFC-3-1-10 (Decafluorobutane (Perfluorobutane) C4F10)=33.333%; PFC-4-1-12 (Dodecafluoropentane (Perfluoropentane))=33.333%; PFC-5-1-14 (Tetradecafluorohexane (Perfluorohexane))=33.334%

Table 6
Examples of mixtures traded as blowing agent blends and mixtures contained in pre-blended polyols[a]

Foam type	*Component 1*	*Component 2*	*Component 3*
XPS	Any HFC or HFO/ HCFO	HFC-152a, CO_2, butane, ethanol, methylenchloride (DME), alcohols	
PU	Any HFC or HFO/ HCFO	Pentanes, methyl formate, formic acid, trans-dichloroethane (DCE), water	
PU and polyol blends	HFC-365mfc	HFC-227ea	
PU	HFC-245fa	HFC-365mfc	
PU	HFC-245fa	HFC-134a	
PU	HFC-245fa	HFC-134a	Pentane[b]
PU	HFO-1233zd(E)	Cyclopentane	
PU	HFO-1336mzzm(Z)	HFO-1336mzzm(E)	
PU	HFO-1336mzzm(Z)	Other pentanes	
PU	HFO-1233zd(E)	Other pentanes	
PU and XPS	HFO-1233zd(E)	HFO-1234ze(E)	
XPS	HFO-1234ze(E)	Methylenchloride (DME)	
XPS	HFO-1234ze(E)	Ethanol	
XPS	HFO-1234ze(E)	Normal butane	
XPS	HFO-1234ze(E)	Isobutane	
XPS	HFC-134a	HFC-152a	
XPS	HFC-134a, HFC-134	HFC-152a	
PU	HFC-134a	HFC-134	
XPS	HCFC-142b	HCFC-22	
PU	HCFC-141b[c]	HFC-245fa[c]	
PU	HFC-245fa	Trans 1,2-dichloroethylene	
Flexible foams	Super-critical CO_2[d]	Methylal	
Flexible foams	Methylene chloride	Water	
Phenolic	2-chloropropane	Pentane	
PU	Pentane blends	Combinations of iso-, n-, cyclopentanes	

Note: For polyurethane (PU), water may be added in the foam-making process as a co-blowing agent. Similarly, for extruded polystyrene (XPS), carbon dioxide may be added as a co-blowing agent. The use of water and/or carbon dioxide in basic foam technology helps to reduce costs.

[a] In accordance with decision I/12A of the First Meeting of the Parties, imports and exports of pre-blended polyols containing controlled substances (either alone or in mixtures) are excluded from the calculation of consumption. Foam manufacturers may combine any blowing agents (e.g., methyl formate, pentanes, HCFCs, HFCs, HFOs, HCFOs, CO_2) in foams or polyol blends in proprietary or commercially marketed blends.

[b] Pentanes could be any isomers: iso-, normal or cyclo-pentane.

[c] HCFC-141b is blended with HFC-245fa in some cases when the allocation or quota of HCFC-141b is reduced and the supply of HCFC-141b is insufficient to meet demand.

[d] Nucleation agent for flexible foams.

Table 7
Non-exhaustive list of examples of mixtures containing HFC-43-10mee used as solvent blends

No.	*Trade Name*	*Component 2*	*Component 3*	*Component 4*
1	Vertrel MCA	t-1,2-dichloroethylene		
2	Vertrel MCA Plus	t-1,2-dichloroethylene	cyclopentane	
3	Vertrel SDG	t-1,2-dichloroethylene	1,2-butylene oxide	
4	Vertrel SFR	t-1,2-dichloroethylene	heptafluorocyclopentane	methanol
5	Vertrel SMT	t-1,2-dichloroethylene	methanol	
6	Vertrel X-DF	t-1,2-dichloroethylene		

No.	*Trade Name*	*Component 2*	*Component 3*	*Component 4*
7	Vertrel XE	ethanol		
8	Vertrel XM	methanol		
9	Vertrel XP	2-propanol		
10	Vertrel P10	2-propanol		
11	Vertrel X-Si	hexamethyldisiloxane		
12	Vertrel XMS Plus	t-1,2-dichloroethylene	methanol	cyclopentane
13	Vertrel XH	heptane		
14	Vertrel X-E10	ethanol	methanol	
15	Vertrel C-HD	t-1,2-dichloroethylene	ethanol	
16	Vertrel NT01	t-1,2-dichloroethylene	hexamethyldisiloxane	
17	Vertrel NTM	t-1,2-dichloroethylene	hexamethyldisiloxane	
18	Vertrel X-B3	2-butoxyethanol		

NB: Component 1 is HFC-43-10mee in all the examples given above.