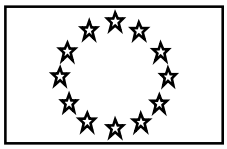

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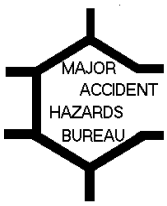

Seveso Directive Annex III substances in the Seveso II Directive

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Introduction

The follow-up to the “Seveso” Directive (82/501/EEC), the so called “Seveso II” Directive (96/82/EC), entered into force on 3 February 1997. Since the scope has been revised, establishments covered by the new Seveso II Directive do not necessarily correspond to those establishments hitherto covered by the previous Seveso Directive.

This paper defines where substances listed in Annex III of Directive 82/501/EEC are found in the new Seveso II Directive. The information is given in form of a table, listing substance number and name, number of existing installations (based on information given by the Competent Authorities up to and including 1990), classification (according to Directive 67/548/EEC, including 22nd ATP), Annex III threshold according to Directive 82/501/EEC, assignment (named substance or category) according to Directive 96/82/EC and corresponding Article 9 threshold.

Substances that are individually named in Part 1 of the Seveso II Directive appear in shaded rows in the table. For substances listed in Annex I of Directive 67/548/EEC, the dominating hazard has been underlined, i.e. the risk phrase (R-phrase) according to which the substance has been assigned to a particular category in Part 2 of Annex I of the Seveso II Directive.

For a number of substances, data needed for the assignment into one of the categories in Part 2 of Annex I are not available. For these substances, probable categories and thresholds appear in brackets. However, in all but three of these cases, the number of existing installations (as reported by the Competent Authorities up to and including 1990) is zero, although the thresholds are often as low as 0.001 tonnes. (As a comparison, in the Seveso II Directive the lowest threshold (article 9) for a category in Part 2 of Annex I is 20 tonnes, “very toxic”). In the three remaining cases, only one or two installations have been reported.

For substances not listed in Annex I of the 67/548 Directive, background information (toxicity data etc.) for the assignment into categories, together with other useful information, can be found in Appendix 1 of this document. Appendix 2 lists the categories of substances in Part 2 of Annex I and their corresponding risk phrases and threshold values. In Appendix 3, risk phrases according to Directive 67/548/EEC are listed.

Seveso Directive Annex III substances in the Seveso II Directive

Number and substance name according to Annex III, Directive 82/501/EEC	Number of existing Annex III installations Directive 82/501/EEC	Classification according to Directive 67/548/EEC (including 22nd ATP)	Annex III threshold (tonnes) Directive 82/501/EEC	Named substance or category, Directive 96/82/EC	Article 9 threshold (tonnes) Directive 96/82/EC
1. 4-Aminodiphenyl	2	Carc.cat.1: R45, Xn: R22	0.001	Named substance	0.001
2. Benzidine	1	Carc.cat.1: R45, Xn: R22, N: R50-53	0.001	Named substance	0.001
3. Benzidine salts	none	Carc.cat.1: R45, Xn: R22, N: R50-53	0.001	Named substance	0.001
4. Dimethylnitrosamine	2	Carc.cat.2: R45, T+: R26, T: R25-48/25, N: R51-53	0.001	Named substance	0.001
5. 2-Naphthylamine	8	Carc.cat.1: R45, Xn: R22, N: R51-53	0.001	Named substance	0.001
6. Beryllium (powder, compounds)	2	T+: R26, Carc.cat.2: R49, T: R25-48/23, Xi: R36/37/38, R43	0.01	Very toxic	20
7. Bis(chloromethyl)ether	3	Carc.cat.1: R45, T+: R26, T: R24, R10, Xn: R22	0.001	Named substance	0.001
8. 1,3-Propanesultone	4	Carc.cat 2: R45, Xn: R21/22	0.001	Named substance	0.001
9. 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	none	Not listed in Annex I to Dir. 67/548/EEC	0.001	Named substance group "Polychloro-dibenzo-furans and polychloro-dibenzo-dioxins"	0.001
10. Arsenic pentoxide, Arsenic (V) acid and salts	124	Carc.cat.1: R45, T: R23/25	0.5	Named substances	2
11. Arsenic trioxide, Arsenious (III) acid and salts	51	Carc.cat.1: R45, T+: R28, C: R34 (As-trioxide) T: R23/25 (arsenious acid and salts)	0.1	Named substances	0.1
12. Arsenic hydride (Arsine)	8	T+: R26, F+: R12, Xn: R48/20, N: R50-53	0.01	Named substance	1
13. Dimethylcarbamoyl chloride	6	Carc.cat.2: R45, T: R23, Xn: R22, Xi: R36/37/38	0.001	Named substance	0.001

Number and substance name	Number of existing installations	Classification	Existing threshold (tonnes)	Named substance or category	New threshold (tonnes)
14. 4-(Chloroformyl) morpholine	none	R14, Carc.cat.3: R40, Xi: R36/38	0.001	Reacts violently with water	500
15. Carbonyl chloride (Phosgene)	67	T+: R26, C: R34	0.75	Named substance	0.75
16. Chlorine	240	T: R23, Xi: R36/37/38, N: R50	25	Named substance	25
17. Hydrogen sulphide	79	T+: R26, F+: R12, N: R50	50	Very toxic	20
18. Acrylonitrile	71	T: R23/24/25, F: R11, Carc.cat.2: R45, Xi: R38	200	Toxic and highly flammable if category 7a	200
19. Hydrogen cyanide	50	T+: R26, F+: R12	20	Very toxic	20
20. Carbon disulphide	9	T: R48/23, F: R11, Repr.cat.3: R62-63, Xi: R36/38	200	Toxic and highly flammable if category 7a	200
21. Bromine	25	T+: R26, C: R35	500	Named substance	100
22. Ammonia	78	T: R23, R10, C: R34, N: R50	500	Toxic	200
23. Acetylene (Ethyne)	none	F+: R12, R5, R6	50	Named substance	50
24. Hydrogen	7	F+: R12	50	Named substance	50
25. Ethylene oxide	26	F+: R12, T: R23, Carc.cat.2: R45, Muta.cat.2: R46, Xi: R36/37/38	50	Named substance	50
26. Propylene oxide	23	F+: R12, Carc.cat.2: R45, Xn: R20/21/22, Xi: R36/37/38	50	Named substance	50
27. 2-Cyanopropan-2-ol (Acetone cyanohydrin)	7	T+: R26/27/28, N: R50	200	Very toxic	20
28. 2-Propenal (Acrolein)	15	T+: R26, T: R25, F: R11, C: R34	200	Very toxic	20
29. 2-Propen-1-ol (Allyl alcohol)	1	T: R23/24/25, R10, N: R50, Xi: R36/37/38	200	Toxic and highly flammable if category 7a	200
30. Allylamine	none	T: R23/24/25, F: R11, N: R51-53	200	Toxic and highly flammable if category 7a	200
31. Antimony hydride (Stibine)	none	Not listed in Annex I to Dir. 67/548/EEC. Available data indicate “very toxic”	0.1	(Very toxic)	(20)
32. Ethyleneimine	3	T+: R26/27/28, F: R11, N: R51-53, Carc.cat.2: R45, Mut.cat.2:R46, C:R34	50	Named substance	20

Number and substance name	Number of existing installations	Classification	Existing threshold (tonnes)	Named substance or category	New threshold (tonnes)
33. Formaldehyde (conc.≥ 90%)	none	T: R23/24/25, Carc.cat.3: R40, C: R34, R43	50	Named substance	50
34. Hydrogen phosphide (Phosphine)	8	Not listed in Annex I to Dir. 67/548/EEC According to toxicity data: "very toxic"	0.1	Named substance	1
35. Bromomethane (Methyl bromide)	none	T: R23, N: R50-53, R59, Xi: R36/37/38	200	Toxic	200
36. Methyl isocyanate	6	F+: R12, T: R23/24/25, Xi: R36/37/38	0.15	Named substance	0.15
37. Nitrogen oxides	28	NO_2 , N_2O_4 : T+: R26, C: R34 NO: Available data indicate "toxic" N_2O: According to toxicity data: "toxic" , but not considered as that toxic to humans	50	Very toxic (Toxic) (Toxic)	20 (200) (200)
38. Sodium selenite	11	Not listed in Annex I to Dir. 67/548/EEC According to toxicity data: "very toxic"	0.1	Very toxic	20
39. Bis(2-chloroethyl) sulphide	none	Not listed in Annex I to Dir. 67/548/EEC According to toxicity data: "very toxic"	0.001	Very toxic	20
40. Phosacetim	none	T+: R27/28, N: R50-53	0.1	Very toxic	20
41. Tetraethyl lead	38	T+: R26/27/28, R33, Repr.cat.1: R61, Repr.cat.3: R62, N: R50-53	50	Named substance group "Lead alkyls"	50
42. Tetramethyl lead	15	T+: R26/27/28, R33, Repr.cat.1: R61, Repr.cat.3: R62 N: R50-53	50	Named substance group "Lead alkyls"	50
43. Promurit (1-(3,4-Dichlorophenyl)-3-triazenethio-carboxamide)	none	T+: R28	0.1	Very toxic	20
44. Chlorfenvinphos	9	T+: R28, T: R24, N: R50-53	0.1	Very toxic	20
45. Crimidine	2	T+: R28	0.1	Very toxic	20
46. Chloromethyl methyl ether	2	Carc.cat.1: R45, F: R11, Xn: R20/21/22	0.001	Named substance	0.001
47. Dimethyl phosphoramido-cyanidic acid	none	Not listed in Annex I to Dir. 67/548/EEC No data available	1		
48. Carbophenothion	1	T: R24/25, N: R50-53	0.1	Toxic	200
49. Dialifos	4	T+: R28, T: R24, N: R50-53	0.1	Very toxic	20
50. Cyanthoate	1	T+: R28, T: R24	0.1	Very toxic	20

Number and substance name	Number of existing installations	Classification	Existing threshold (tonnes)	Named substance or category	New threshold (tonnes)
51. Amiton	none	Not listed in Annex I to Dir. 67/548/EEC According to toxicity data: "very toxic"	0.001	Very toxic	20
52. Oxydisulfoton	none	T+: R28, T: R24	0.1	Very toxic	20
53. O,O-Diethyl S-ethylsulphinylmethyl phosphorothioate	none	Not listed in Annex I to Dir. 67/548/EEC According to toxicity data: "very toxic"	0.1	Very toxic	20
54. O,O-Diethyl S-ethylsulphonylmethyl phosphorothioate	none	Not listed in Annex I to Dir. 67/548/EEC According to toxicity data: "very toxic"	0.1	Very toxic	20
55. Disulfoton	4	T+: R27/28, N: R50-53	0.1	Very toxic	20
56. Demeton	3	T+: R27/28, N: R50	0.1	Very toxic	20
57. Phorate	5	T+: R27/28	0.1	Very toxic	20
58. O,O-Diethyl S-ethylthiomethyl phosphorothioate	none	Not listed in Annex I to Dir. 67/548/EEC According to toxicity data: "very toxic"	0.1	Very toxic	20
59. O,O-Diethyl S-isopropylthiomethyl phosphorodithioate	none	Not listed in Annex I to Dir. 67/548/EEC According to toxicity data: "very toxic"	0.1	Very toxic	20
60. Pyrazoxon	none	T+: R26/27/28	0.1	Very toxic	20
61. Fensulfothion	none	T+: R27/28, N: R50-53	0.1	Very toxic	20
62. Paraoxon (Diethyl 4-nitrophenyl phosphate)	none	Not listed in Annex I to Dir. 67/548/EEC According to toxicity data: "very toxic"	0.1	Very toxic	20
63. Parathion	29	T+: R27/28, N: R50-53	0.1	Very toxic	20
64. Azinphos-ethyl	12	T+: R28, T: R24	0.1	Very toxic	20
65. O,O-Diethyl S-propylthiomethyl phosphorodithioate	none	Not listed in Annex I to Dir. 67/548/EEC According to toxicity data: "very toxic"	0.1	Very toxic	20
66. Thionazin	3	T+: R27/28	0.1	Very toxic	20
67. Carbofuran	10	T+: R26/28	0.1	Very toxic	20
68. Phosphamidon	6	T+: R28, T: R24, N: R50-53, Muta.cat.3: R40	0.1	Very toxic	20
69. Tirpate (2,4-Dimethyl-1,3-dithiolane-2-carboxaldehyde O-methylcarbamoyloxime)	none	Not listed in Annex I to Dir. 67/548/EEC According to toxicity data: "very toxic"	0.1	Very toxic	20
70. Mevinphos	5	T+: R27/28	0.1	Very toxic	20
71. Parathion-methyl	28	T+: R28, T: R24	0.1	Very toxic	20

Number and substance name	Number of existing installations	Classification	Existing threshold (tonnes)	Named substance or category	New threshold (tonnes)
72. Azinphos-methyl	16	T+: R28, T: R24	0.1	Very toxic	20
73. Cycloheximide	none	Not listed in Annex I to Dir. 67/548/EEC According to toxicity data: "very toxic"	0.1	Very toxic	20
74. Diphacinone	none	T+: R28, T: R48/23/24/25	0.1	Very toxic	20
75. Tetramethylenedisulpho-tetramine	none	Not listed in Annex I to Dir. 67/548/EEC Available data indicate "very toxic"	0.001	(Very toxic)	(20)
76. EPN	none	T+: R27/28, N: R50-53	0.1	Very toxic	20
77. 4-Fluorobutyric acid	none	Not listed in Annex I to Dir. 67/548/EEC Available data indicate "very toxic"	0.001	(Very toxic)	(20)
78. 4-Fluorobutyric acid, salts	none	Not listed in Annex I to Dir. 67/548/EEC Available data indicate "very toxic"	0.001	(Very toxic)	(20)
79. 4-Fluorobutyric acid, esters	none	Not listed in Annex I to Dir. 67/548/EEC Available data indicate "very toxic"	0.001	(Very toxic)	(20)
80. 4-Fluorobutyric acid, amides	none	Not listed in Annex I to Dir. 67/548/EEC Available data indicate "very toxic"	0.001	(Very toxic)	(20)
81. 4-Fluorocrotonic acid	none	Not listed in Annex I to Dir. 67/548/EEC Available data indicate "very toxic"	0.001	(Very toxic)	(20)
82. 4-Fluorocrotonic acid, salts	none	Not listed in Annex I to Dir. 67/548/EEC Available data indicate "very toxic"	0.001	(Very toxic)	(20)
83. 4-Fluorocrotonic acid, esters	none	Not listed in Annex I to Dir. 67/548/EEC Available data indicate "very toxic"	0.001	(Very toxic)	(20)
84. 4-Fluorocrotonic acid, amides	none	Not listed in Annex I to Dir. 67/548/EEC Available data indicate "very toxic	0.001	(Very toxic)	(20)
85. Fluoroacetic acid	none	T+: R28	0.001	Very toxic	20
86. Fluoroacetic acid, salts	none	Sodium salt: T+: R26/27/28. Other salts not listed in Annex I to Dir. 67/548/EEC	0.001	Very toxic	20
87. Fluoroacetic acid, esters	2	T+: R28	0.001	Very toxic	20

Number and substance name	Number of existing installations	Classification	Existing threshold (tonnes)	Named substance or category	New threshold (tonnes)
88. Fluoroacetic acid, amides	none	Fluoroacetamide: T+: R28, T: R24. Other amides not listed in Annex I to Dir. 67/548/EEC	0.001	Very toxic	20
89. Fluenetil	none	T+: R27/28	0.1	Very toxic	20
90. 4-Fluoro-2-hydroxybutyric acid	none	Not listed in Annex I to Dir. 67/548/EEC Available data indicate "very toxic" or "toxic"	0.001	(Very toxic or toxic)	(20/200)
91. 4-Fluoro-2-hydroxybutyric acid, salts	none	Not listed in Annex I to Dir. 67/548/EEC Available data indicate "very toxic" or "toxic"	0.001	(Very toxic or toxic)	(20/200)
92. 4-Fluoro-2-hydroxybutyric acid, esters	none	Not listed in Annex I to Dir. 67/548/EEC Available data indicate "very toxic" or "toxic"	0.001	(Very toxic or toxic)	(20/200)
93. 4-Fluoro-2-hydroxybutyric acid, amides	none	Not listed in Annex I to Dir. 67/548/EEC Available data indicate "very toxic" or "toxic"	0.001	(Very toxic or toxic)	(20/200)
94. Hydrogen fluoride	47	T+: R26/27/28, C: R35	50	Very toxic	20
95. Hydroxyacetonitrile (Glycolonitrile)	2	Not listed in Annex I to Dir. 67/548/EEC According to toxicity data: "very toxic"	0.1	Very toxic	20
96. 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	2	Not listed in Annex I to Dir. 67/548/EEC	0.1	Named substance group "Polychloro-dibenzo-furans and polychloro-dibenzo-dioxins"	0.01 (equivalent to 0.001 kg TCDD)
97. Isodrin	1	T+: R26/27/28, N: R50-53	0.1	Very toxic	20
98. Hexamethylphosphoramide	3	Carc.cat.2: R45, Muta.cat.2: R46	0.001	Named substance	0.001
99. Juglone (5-Hydroxy-naphthalene-1,4-dione)	none	Not listed in Annex I to Dir. 67/548/EEC According to toxicity data: "toxic"	0.1	Toxic	200
100. Warfarin	7	T: R48/25, Repr.cat.1: R61	0.1	Toxic	200
101. 4,4'-Methylenebis (2-chloroaniline)	4	Carc.cat.2: R45, N: R50-53, Xn: R22	0.01	Named substance	0.01
102. Ethion	4	T: R25, Xn: R21	0.1	Toxic	200

Number and substance name	Number of existing installations	Classification	Existing threshold (tonnes)	Named substance or category	New threshold (tonnes)
103. Aldicarb	2	T+: R27/28	0.1	Very toxic	20
104. Nickel tetracarbonyl	2	T+: R26, F: R11, Carc.cat.3: R40, Repr.cat.2: R61	0.01	Very toxic	20
105. Isobenzan	none	T+: R27/28, N: R50	0.1	Very toxic	20
106. Pentaborane	none	Not listed in Annex I to Dir. 67/548/EEC According to toxicity data: “very toxic”	0.1	Very toxic	20
107. 1-Propen-2-chloro-1,3-diol-diacetate	none	Not listed in Annex I to Dir. 67/548/EEC Available data indicate “very toxic” or “toxic”	0.01	(Very toxic or toxic)	(20/200)
108. Propyleneimine	none	T+: R26/27/28, F: R11, Carc.cat.2: R45, Xi: R41	50	Very toxic	20
109. Oxygen difluoride	1	Not listed in Annex I to Dir. 67/548/EEC Available data indicate “very toxic”	0.01	(Very toxic)	(20)
110. Sulphur dichloride	10	R14, C: R34, Xi: R37	1	Named substance	1
111. Selenium hexafluoride	none	Not listed in Annex I to Dir. 67/548/EEC Available data indicate “toxic”	0.01	(Toxic)	(200)
112. Hydrogen selenide	2	Not listed in Annex I to Dir. 67/548/EEC Available data indicate “toxic”	0.01	(Toxic)	(200)
113. TEPP	1	T+: R27/28, N: R50	0.1	Very toxic	20
114. Sulfotep	5	T+: R27/28	0.1	Very toxic	20
115. Dimefox	1	T+: R27/28	0.1	Very toxic	20
116. 1-Tri(cyclohexyl) stannyl-1H-1,2,4-triazole	2	Not listed in Annex I to Dir. 67/548/EEC According to toxicity data: “toxic”	0.1	Toxic	200
117. Triethylenemelamine	none	Not listed in Annex I to Dir. 67/548/EEC According to toxicity data: “very toxic”	0.01	Very toxic	20
118. Cobalt, metal, oxides, carbonates, sulphides, as powders	55	R42/43 (metal), Xn: R22, R43 (oxide), R43 (sulphide)	1	- - -	- - -
119. Nickel, metal, oxides, carbonates, sulphides, as powders	81	Carc.cat.1: R49, R43 (oxides, sulphides) Carc.cat.3: R40, R43 (metal) Carc.cat.3: R40, Xn: R22, R43 (carbonate)	1	Named substances - -	1 - -

Number and substance name	Number of existing installations	Classification	Existing threshold (tonnes)	Named substance or category	New threshold (tonnes)
120. Anabasine	none	Not listed in Annex I to Dir. 67/548/EEC. Available data indicate "very toxic"	0.1	(Very toxic)	(20)
121. Tellurium hexafluoride	none	Not listed in Annex I to Dir. 67/548/EEC Available data indicate "very toxic"or "toxic"	0.1	(Very toxic or toxic)	(20/200)
122. Trichloromethanesulphenyl chloride	2	Not listed in Annex I to Dir. 67/548/EEC According to toxicity data: "toxic"	0.1	Toxic	200
123. 1,2-Dibromoethane (Ethylene dibromide)	16	T: R23/24/25, Carc.cat.2: R45,Xi: R36/37/38, N: R51-53	50	Toxic	200
124. Flammable substances as defined in Annex IV (c) (i)	748	F: R12	200	Extremely flammable (Excluding liquefied gases)	50 (Excluding liquefied gases; 200t)
125. Flammable substances as defined in Annex IV (c) (ii)	307	F: R11 or F: R12	50000	Highly flammable Extremely flammable (excluding automotive petrol and other petroleum spirits)	50000 50 (excluding automotive petrol and other petroleum spirits; 50000t)
126. Diazodinitrophenol	none	Not listed in Annex I to Dir. 67/548/EEC Explosive	10	Explosive	(50/200)
127. Diethylene glycol dinitrate	none	T+: R26/27/28, E: R3, R33	10	Very toxic	20
128. Dinitrophenol, salts	none	T: R23/24/25, R33	200	Toxic	200
129. 1-Guanyl-4-nitrosaminoguanyl-1-tetrazene	none	Not listed in Annex I to Dir. 67/548/EEC Explosive	10	Explosive	(50/200)
130. Bis (2,4,6-trinitrophenyl) amine	none	T+: R26/27/28, E: R2, N: R51-53, R33	50	Very toxic	20
131. Hydrazine nitrate	none	Not listed in Annex I to Dir. 67/548/EEC Explosive	50	Explosive	(50/200)
132. Nitroglycerine	none	T+: R26/27/28, E: R3, R33	10	Very toxic	20
133. Pentaerythritol tetranitrate	none	E: R3	50	Explosive	50
134. Cyclotrimethylene trinitramine	none	Not listed in Annex I to Dir. 67/548/EEC Explosive and toxic	50	Explosive and toxic	(50/200)

Number and substance name	Number of existing installations	Classification	Existing threshold (tonnes)	Named substance or category	New threshold (tonnes)
135. Trinitroaniline	none	Not listed in Annex I to Dir. 67/548/EEC Explosive	50	Explosive	(50/200)
136. 2,4,6-Trinitroanisole	none	E: R2, Xn: R20/21/22	50	Explosive	200
137. Trinitrobenzene	none	T+: R26/27/28, E: R2, R33	50	Very toxic	20
138. Trinitrobenzoic acid	none	Not listed in Annex I to Dir. 67/548/EEC Explosive	50	Explosive	(50/200)
139. Chlorotrinitrobenzene	none	T+: R26/27/28, E: R2	50	Very toxic	20
140. N-Methyl-N,2,4,6-N-tetranitroaniline	none	E: R2, T: R23/24/25, R33	50	Explosive and toxic	200
141. 2,4,6-Trinitrophenol (Picric acid)	none	E: R2, T: R23/24/25, R4	50	Explosive and toxic	200
142. Trinitrocresol	none	E: R2, R4, Xn: R20/21/22	50	Explosive	200
143. 2,4,6-Trinitrophenetole	none	Not listed in Annex I to Dir. 67/548/EEC	50	Explosive	(50/200)
144. 2,4,6-Trinitroresorcinol (Styphnic acid)	none	E: R2, R4, Xn: R20/21/22	50	Explosive	200
145. 2,4,6-Trinitrotoluene	none	E: R2, T: R23/24/25, R33	50	Explosive and toxic	200
146a. Ammonium nitrate	28 (146a and b)	Not listed in Annex I to Dir. 67/548/EEC	2500	Named substance	2500
146b. Ammonium nitrate in form of fertilisers		Not listed in Annex I to Dir. 67/548/EEC	5000	Named substance	5000
147. Cellulose nitrate (containing > 12.6% nitrogen)	1	E: R3, R1	100	Explosive	50
148. Sulphur dioxide	12	T: R23, C: R34	250	Toxic	200
149. Hydrogen chloride (liquefied gas)	2	T: R23, C: R35	250	Named substance	250
150. Flammable substances as defined in Annex IV (c) (iii)	116	F: R10 or R11 or F: R12	200	Highly flammable Extremely flammable	200 50
151. Sodium chlorate	4	O: R9, Xn: R22	250	Oxidising	200
152. tert-Butyl peroxyacetate (conc. ≥ 70%)	none	Not listed in Annex I to Dir. 67/548/EEC Oxidising and explosive	50	Oxidising and explosive	(200)
153. tert-Butyl peroxyisobutyrate (conc. ≥ 80%)	none	Not listed in Annex I to Dir. 67/548/EEC Oxidising and explosive	50	Oxidising and explosive	(200)
154. tert-Butyl peroxymaleate (conc. ≥ 80%)	none	Not listed in Annex I to Dir. 67/548/EEC Oxidising and explosive	50	Oxidising and explosive	(200)
155. tert-Butyl peroxy isopropyl carbonate (conc. ≥ 80%)	none	Not listed in Annex I to Dir. 67/548/EEC Oxidising (and explosive)	50	Oxidising (and explosive)	(200)

Number and substance name	Number of existing installations	Classification	Existing threshold (tonnes)	Named substance or category	New threshold (tonnes)
156. Dibenzyl peroxydicarbonate (conc. ≥ 90%)	none	Not listed in Annex I to Dir. 67/548/EEC Oxidising and explosive	50	Oxidising and explosive	(200)
157. 2,2-Bis (tert-butylperoxy) butane (conc. ≥ 70%)	none	Not listed in Annex I to Dir. 67/548/EEC Oxidising (and explosive)	50	Oxidising (and explosive)	(200)
158. 1,1-Bis (tert-butylperoxy) cyclohexane (conc. ≥ 80%)	none	Not listed in Annex I to Dir. 67/548/EEC Oxidising (and explosive)	50	Oxidising (and explosive)	(200)
159. Di-sec-butyl peroxydicarbonate (conc. ≥ 80%)	none	Not listed in Annex I to Dir. 67/548/EEC Oxidising (and explosive)	50	Oxidising (and explosive)	(200)
160. 2,2-Dihydroperoxypropane (conc. ≥ 30%)	none	Not listed in Annex I to Dir. 67/548/EEC Oxidising and explosive	50	Oxidising and explosive	(200)
161. Di-n-propyl peroxydicarbonate (conc. ≥ 80%)	none	Not listed in Annex I to Dir. 67/548/EEC Oxidising (and explosive)	50	Oxidising (and explosive)	(200)
162. 3,3,6,6,9,9-Hexamethyl-1,2,4,5-tetroxacyclononane (conc. ≥ 75%)	none	Not listed in Annex I to Dir. 67/548/EEC Oxidising and explosive	50	Oxidising and explosive	(200)
163. Methyl ethyl ketone peroxide (conc. ≥ 60%)	none	Not listed in Annex I to Dir. 67/548/EEC Oxidising and explosive	50	Oxidising and explosive	(200)
164. Methyl isobutyl ketone peroxide (conc. ≥ 60%)	none	Not listed in Annex I to Dir. 67/548/EEC Oxidising (and explosive)	50	Oxidising (and explosive)	(200)
165. Peracetic acid (conc. ≥ 60%)	none	O: R7, R10, C: R35, Xn: R20/21/22	50	Oxidising and highly flammable if category 7a	200
166. Lead azide	2	E: R3, Repr.cat.1. R61, Repr.cat.3: R62, Xn: R20/22, R33	50	Explosive	50
167. Lead 2,4,6-trinitroresorcinoxide (Lead styphnate)	none	E: R3, Repr.cat.1. R61, Repr.cat.3: R62, Xn: R20/22, R33	50	Explosive	50
168. Mercury fulminate	none	E: R3, T: R23/24/25, R33	10	Explosive	50

Number and substance name	Number of existing installations	Classification	Existing threshold (tonnes)	Named substance or category	New threshold (tonnes)
169. Cyclotetramethylene-tetranitramine	none	Not listed in Annex I to Dir. 67/548/EEC Explosive	50	Explosive	(50/200)
170. 2,2',4,4', 6,6'-Hexanitrostilbene	none	Not listed in Annex I to Dir. 67/548/EEC Explosive	50	Explosive	(50/200)
171. 1,3,5-Triamino-2,4,6-trinitrobenzene	none	Not listed in Annex I to Dir. 67/548/EEC Explosive	50	Explosive	(50/200)
172. Ethylene glycol dinitrate	none	T+: R26/27/28, E: R2, R33	10	Very toxic	20
173. Ethyl nitrate	none	E: R2	50	Explosive	200
174. Sodium picramate	1	Not listed in Annex I to Dir. 67/548/EEC Explosive	50	Explosive	(50/200)
175. Barium azide	none	Not listed in Annex I to Dir. 67/548/EEC Explosive (and toxic)	50	Explosive (and toxic)	(50/200)
176. Di-isobutyryl peroxide (conc. ≥ 50%)	none	Not listed in Annex I to Dir. 67/548/EEC Oxidising and explosive	50	Oxidising and explosive	(200)
177. Diethyl peroxydicarbonate (conc. ≥ 30%)	none	Not listed in Annex I to Dir. 67/548/EEC Oxidising (and explosive)	50	Oxidising (and explosive)	(200)
178. tert-Butyl peroxypivalate (conc. ≥ 77%)	none	Not listed in Annex I to Dir. 67/548/EEC Oxidising (and explosive)	50	Oxidising (and explosive)	(200)
179. Liquid oxygen	15	O: R8	2000	Named substance	2000
180. Sulphur trioxide	16	Not listed in Annex I to Dir. 67/548/EEC	75	Named substance	75

Appendix 1

Background information on properties of substances not listed in Annex I of Directive 67/548/EEC

Substance no	Comment
31	Toxicity comparable to arsine which is “very toxic”.
37	N_2O, laughing gas. LC50 inhalation rat indicate “toxic”: 1.068 mg/l/4h but not considered that toxic to humans. There is also a number of other nitrogen oxides, those listed in the table are the main ones for industrial use.
38	LD50 oral rat 7 mg/kg.
39	Mustard gas. LD50 dermal rat 5 mg/kg.
47	No data reported in literature.
51	LD50 oral rat 3.3 mg/kg.
53	LD 50 oral rat 1 mg/kg.
54	LD50 oral rat 0.5 mg/kg.
58	LD50 oral rat 1.1 mg/kg.
59	LD50 oral rat 1.1 mg/kg.
62	LD50 oral rat 1.8 mg/kg, LD50 dermal rabbit 5 mg/kg.
65	LD50 oral rat 2.8 mg/kg.
69	LD50 oral rat 1 mg/kg, (LD50 dermal rat 300 mg/kg, toxic).
73	LD50 oral rat 2 mg/kg.
75	LDLo oral mouse 0.2 mg/kg, LD50 oral mammal 0.1 mg/kg. Considered as very toxic in some countries.
77	No test data reported in literature. Classified as T+: R26/27/28 in some countries.
78	No test data reported in literature. Classified as T+: R26/27/28 in some countries.
79	No test data reported in literature. Classified as T+: R26/27/28 in some countries.
80	No test data reported in literature. Classified as T+: R26/27/28 in some countries.
81	No test data reported in literature. Classified as T+: R26/27/28 in some countries.
82	No test data reported in literature. Classified as T+: R26/27/28 in some countries.
83	No test data reported in literature. Classified as T+: R26/27/28 in some countries.
84	No test data reported in literature. Classified as T+: R26/27/28 in some countries.
90	Toxicity comparable to no 91.
91	Sodium salt: LDLo oral rat 1 mg/kg.
92	Toxicity comparable to no 91.
93	Toxicity comparable to no 91.
95	LD50 oral rat 16 mg/kg, LD50 dermal rabbit 5 mg/kg.
99	LD50 oral rat 112 mg/kg.
106	LC50 inhalation rat 0.016 mg/l/4h (6ppm/4h).
107	LCLo inhalation rat 0.06 mg/l/4h (8ppm/4h).
109	Described as more toxic than fluorine. LC50 inhalation rat 0.3 mg/l/1h (136 ppm/1h). Considered as very toxic in some countries.

111	LCLo inhalation rat 0.08 mg/l/1h (10 ppm/1h). Classified as T: R23/25 in some countries.
112	LCLo inhalation rat 0.001 mg/l/8h (300 ppb/8h). Classified as T: R23/25 in some countries.
116	LD50 oral rat 99 mg/kg.
117	LD50 oral rat 1 mg/kg.
120	Neo-nicotine. No relevant test data reported in literature. Considered as very toxic in some countries.
121	LCLo inhalation rat 0.05 mg/l/4h (5 ppm/4h).
122	LD50 oral rat 82.6 mg/kg, LCLo inhalation rat 0.26 mg/l/4h.
126	UN transport of dangerous goods: 1.1A mass explosion hazard, primary explosive substance.
128	UN transport of dangerous goods: 1.3C fire hazard and blast/projection hazard, deflagrating expl. substance, labelled toxic.
129	UN transport of dangerous goods: 1.1A mass explosion hazard, primary explosive substance.
134	UN transport of dangerous goods: 1.1D mass explosion hazard, secondary detonating explosive substance. LD50 oral rat 200 mg/kg.
135	UN transport of dangerous goods: 1.1D mass explosion hazard, secondary detonating explosive substance.
138	UN transport of dangerous goods: 1.1D mass explosion hazard, secondary detonating explosive substance.
143	UN transport of dangerous goods: 1.1D mass explosion hazard, secondary detonating explosive substance.
152	UN transport of dangerous goods: labelled explosive.
153	UN transport of dangerous goods: labelled explosive, SADT* ~ 30º C.
154	UN transport of dangerous goods: labelled explosive.
156	UN transport of dangerous goods: labelled explosive, SADT* ~ 35º C.
159	SADT* ~ 0º C.
160	UN transport of dangerous goods: labelled explosive.
161	SADT* ~ -5º C.
162	UN transport of dangerous goods: labelled explosive.
163	UN transport of dangerous goods: labelled explosive.
169	UN transport of dangerous goods: 1.1D mass explosion hazard, secondary detonating explosive substance.
170	UN transport of dangerous goods: 1.1D mass explosion hazard, secondary detonating explosive substance.
174	UN transport of dangerous goods: 1.3C fire hazard and blast/projection hazard, deflagrating explosive substance.
175	UN transport of dangerous goods: 1.1A mass explosion hazard, primary explosive substance.
176	UN transport of dangerous goods: labelled explosive, SADT* ~ 0º C.
177	SADT* ~ 10º C.
178	SADT* ~ 20º C.

* SADT: Self Accelerating Decomposition Temperature

Appendix 2

Categories of substances in Part 2 of Annex I and their corresponding risk phrases and threshold values

Category	Risk phrase	Threshold values Art. 6&7/Art.9
1. Very toxic	R26; R27; R28. Also in combination with R39	5/20
2. Toxic	R23; R24; R25. Also in combination with R39 or R48	50/200
3. Oxidising	R7; R8; R9	50/200
4. Explosive	R2	50/200
5. Explosive	R3	10/50
6. Flammable liquids	R10	5000/50000
7a. Highly flammable liquids	R17; R10 and R11, 2nd indent: under particular processing conditions	50/200
7b. Highly flammable liquids	R11, 2nd indent	5000/50000
8. Extremely flammable gases and liquids	R12	10/50
9(i) Dangerous for the environment	R50; R50/53	200/500
9(ii) Dangerous for the environment	R51/53	500/2000
10(i) Any classification: reacts violently with water	R14; R14/15	100/500
10(ii) Any classification: contact with water liberates toxic gas	R29	50/200

Appendix 3

Risk phrases according to Directive 67/548/EEC

R1	Explosive when dry
R2	Risk of explosion by shock, friction, fire or other sources of ignition
R3	Extreme risk of explosion by shock, friction, fire or other sources of ignition
R4	Forms very sensitive explosive metallic compounds
R5	Heating may cause an explosion
R6	Explosive with or without contact with air
R7	May cause fire
R8	Contact with combustible material may cause fire
R9	Explosive when mixed with combustible material
R10	Flammable
R11	Highly flammable
R12	Extremely flammable
R14	Reacts violently with water
R15	Contact with water liberates extremely flammable gases
R16	Explosive when mixed with oxidising substances
R17	Spontaneously flammable in air
R18	In use, may form flammable/explosive vapour-air mixture
R19	May form explosive peroxides
R20	Harmful by inhalation
R21	Harmful in contact with skin
R22	Harmful if swallowed
R23	Toxic by inhalation
R24	Toxic in contact with skin
R25	Toxic if swallowed
R26	Very toxic by inhalation
R27	Very toxic in contact with skin
R28	Very toxic if swallowed
R29	Contact with water liberates toxic gas
R30	Can become highly flammable in use
R31	Contact with acids liberates toxic gas
R32	Contact with acids liberates very toxic gas
R33	Danger of cumulative effects
R34	Causes burns
R35	Causes severe burns
R36	Irritating to eyes
R37	Irritating to respiratory system
R38	Irritating to skin
R39	Danger of very serious irreversible effects
R40	Possible risks of irreversible effects
R41	Risk of serious damage to eyes
R42	May cause sensitisation by inhalation
R43	May cause sensitisation by skin contact
R44	Risk of explosion if heated under confinement

R45 May cause cancer
R46 May cause heritable generic damage
R48 Danger of serious damage to health by prolonged exposure
R49 May cause cancer by inhalation
R50 Very toxic to aquatic organisms
R51 Toxic to aquatic organisms
R52 Harmful to aquatic organisms
R53 May cause long-term adverse effects in the aquatic environment
R54 Toxic to flora
R55 Toxic to fauna
R56 Toxic to soil organisms
R57 Toxic to bees
R58 May cause long-term adverse effects in the environment
R59 Dangerous for the ozone layer
R60 May impair fertility
R61 May cause harm to the unborn child
R62 Possible risk of impaired fertility
R63 Possible risk of harm to the unborn child
R64 May cause harm to breastfed babies