SCHEDULE- XII.

[See rule 152(a)]

Permissible levels of certain chemical substances in the work environment

Sr. No	Substance	Permissible limit of exposure limit			
		Time- weighted average concentration (TWA)(8hrs.)		Short- term exposure (STEL) (15min)*	
		ppm	Mg/ m^3 **	ppm	Mg/ m^3 **
1.	2.	3.	4.	5.	6.
1.	Acetaldehyde	100	180	150	270
2.	Acetic acid	10	25	15	37
3.	Acetone	750	1780	1000	2375
4.	Aerolein	0.1	0.25	0.3	0.8
5.	Acrylonitrile- Skin(S.C.)	2	4.5	-	-
6.	Aldrine- Skin	-	0.25	-	-
7.	Allyl chloride	1	3	2	6
8.	Ammnoia	25	18	35	27
9.	Aniline- Skin	2	10	-	
10.	Anisidine (O-,p- isomers)Skin	0.1	0.5	-	
11.	Arsenic & soluble compounds (as As)	-	0.2	-	-
12.	Benzene (S.C.)	10	30	-	-
13.	Beryllium & compound (As Be) (S.C.)	-	0.002	-	-
14.	Boron trifluride- C	1	3	-	-
15.	Boromine	0.1	0.7	0.3	2

16.	Butane	800	1900	-	-
17.	2- Butanone (Methyl ethyl Ketone –MBK)	200	590	300	885
18.	n-Butyl acetate	150	710	200	950
19.	n-Butyl	50	150	-	-
20.	Sec/ tart. Butyl acetate	200	950	-	-
21.	Butyl mercaptan	0.5	1.5	-	-
22.	Cadmium Dust and salts (as CD)	-	0.05	-	-
23.	Calcium oxide	-	2	-	-
24.	Carbaryl (Sevin)	-	5	-	-
25.	Carbofuran (Furadan)	-	0.1	-	-
26.	Carbon disulphade- Skin	10	30	-	-
27.	Carbon monoxide	50	55	400	440
28.	Carbon tetrachloride- Skin(S.C.)	5	30	-	-
29.	Chlodane- Skin	-	0.5	-	-
30.	Chlorine	1	3	3	9
31.	Chlorobenzene (monochlorobenzene)	75	350	-	-
32.	Chlorofom (S.C.)	10	50	-	-
33.	Bis (Chloromethy) ether (H.C)	0.001	0.005	-	-
34.	Chromic acid and chromates (as Cr.)	-	-	-	-
35.	Chromous salts (as Cr.)	-	0.5	-	-
36.	Copper fume	-0.2	-	-	
37.	Cotton dust, raw	-	0.2	-	-
38.	Cresolall isoi- ners- Skin	5	22	-	-
39.	Cyanides(as CN)- Skin	-	1	-	-
40.	Cyanogens	10	20	-	-
41.	DDT (Dishloro diphenyl tri chloro-				

	ethane)	-	1	-	-
42.	Demeton- Skin	0.01	0.1	-	-
43.	Diazinon- Skin	-	0.1	-	-
44.	Dibutyl phthalate	-	5	-	-
45.	Dichlorvos (DDVP)- Skin	0.1	1	-	-
46.	Dieldrin-Skin	-	0.25	-	-
47.	Dinitrobenzene (all isomers)- Skin	0.15	1	-	-
48.	Dinitrotoluence- Skin	-	0.25	-	-
49.	Diphenyl (Biphenyl)	0.2	1.5	-	-
50.	Endosulfan (Thiodan) Skin	-	0.1	-	-
51.	Endrin- Skin	-	0.1	-	-
52.	Ethyl acetate	400	1400	-	-
53.	Ethyl alcohal	1000	1900	-	-
54.	Ethylamine	10	18	-	-
55.	Flurides (as F)	-	2.5	-	-
56.	Flurine	1	2	2	4
57.	Formadehyde (S.C)	1.0	1.5	2	3
58.	Formic acid	5	9	-	-
59.	Gasoline	300	900	500	1500
60.	Hydrazine-Skin(S.C)	0.1	0.1	-	-
61.	Hydrogen chloride-C	5	7	-	-
62.	Hydrogen cyanide-Skin-C	10	10	-	-
63.	Hydrogen fluorine (as F)-C	3	2.5	-	-
64.	Hydrogen peroxide	1	1.5	-	-
65.	Hydrogen sulphide	10	14		
66.	Iodine- C.1	0.1	1	-	-
67.	Iron Oxide Fume (Fe 0) (as Fe)	-	5	-	-
68.	Isoarnyl acetate	100	525	-	-
69.	Isoamyi alcohol	100	360	125	450

70.	Isobutyl alcohol	50	150	-	-
71.	Lead, inorg, dusts and fumes (asPb)	-	0.15	-	-
72.	Lindane- Skin	-	0.5	-	-
73.	Malathion- Skin	-	10	-	-
74.	Manganese dust and compounds (as Mn)- C	-	5	-	-
75.	Manganese Fume (as Mn)	-	1	-	-
76.	Mercury (as Hg)- Skin (i) Alkyi compounds (ii) All forms except alkyi vapour (iii) Aryl & inorganic compounds	- - - -	- 0.01 0.05 0.1	- - - -	- 0.03 - -
77.	Methyl Alcohol (Mehanol)- Skin	200	260	250	310
78.	Methyl collosolve (2-Methoxy-ethanol)-Skin	5	16	-	-
79.	Methyl isobutyl ketone	50	205	75	300
80.	Methyl isocyanate- Skin	0.02	0.05	-	-
81.	Naphthalene	10	50	15	75
82.	Nickel carbonyl (as Ni)	0.05	0.35	-	-
83.	Nitric acid	2	5	4	10
84.	Nitric oxide	25	30	-	-
85.	Nitrobenzene-Skin	1	5	-	-
86.	Nitrogen dioxide	3	6	5	10
87.	Oil mist, mineral	-	5	-	10
88.	Ozone	0.8	0.2	0.3	0.6
89.	Parathion-Skin	-	0.1	-	-
90.	Phenol- Skin	5	19	-	-

91.	Phorate (Thimet)- Skm	-	0.05	-	0.2
92.	Phosgene (Carbonyi chloride)	0.1	0.4	-	-
93.	Phosphine	0.3	0.4	1	1
94.	Phosphoric acid	-	1	-	3
95.	Phosphorus (yellow)	-	0.1	-	-
96.	Phosphorus pentachloride	0.1	1	-	-
97.	Phosphorus trichloride	0.2	1.5	0.5	3
98.	Pierie acid – Skin	-	0.1	-	0.3
99.	Pyridine	5	15	-	-
100.	Silane(silicon tetrahudride) 5	7	-	-	-
101.	Sodium hydroxide- C	-	2	-	-
102.	Styrene, monomer (Phenylethylene)	50	215	100	425
103.	Sulpher dioxide	2	5	5	10
104.	Sulpher hexafluoride	1000	6000	-	-
105.	Sulphuric acid	-	1	-	-
106.	Tetraethyl lead (as Pb)-Skin	-	0.1	-	-
107.	Tolune (Toluol)	100	375	150	560
108.	0-Toluidine-Skin(S.C)	2	9	-	-
109.	Tributvi phoshate	0.2	2.5	-	-
110.	Trichloroethylene	50	270	200	1080
111.	Uranium , natural (as U)	-	0.2	-	0.6
112.	Vinyl chloride (H.C)	5	10	-	-
113.	Welding fumes	-	5	-	-
114.	Xylene (0-,m-p-isomers)	100	435	150	655
115.	Zinc oxide (i) Fume (ii) Dust (Total dust)	 - -	 5.0 10	 - -	 10 -
116.	Ziroconium compounds (as Zr)	-	5	-	10

Ppm: Parts of vapour or gas per million parts of contaminated air by volume at 25C and 760 mm of Hg.

Mg/m: milligram of substance per cubic metre of air.

***** Not more than 4 times a day with atleast 60 min. intervals between successive exposures.

****** $mg/m^3 = \frac{\text{Molecular weight}}{24.45} \times ppm$

G denotes Ceiling Limit.

Skin denotes potential contribution to the overall exposure by the coetaneous route including mucous membranes and eye.

S.C. denotes Suspected Human Carcinogen.

H.C. denotes Confirmed Human Carcinogen.

Substance	**Permissible time-weighted average concentration (TWA) (8 Hrs.)**
Silica, SiO	
(a) Crystalline (i) Quartz	
1. In terms of dust count	$\frac{10600}{\% \text{ Quartz} = 10}$ m ppem
2. In terms of respirable dust	$\frac{10}{\% \text{ Respirable Quartz} + 2}$ mg/ m^3
3. In terms of total dust	$\frac{30}{}$ mg/ m^3

		% Quartz+ 3
(ii)	Cristobalite	Half the limits given against quartz
(iii)	Tridmite	Half the limits given against quartz.
(iv)	Silica fused	Same limits as for quartz.
(v)	Tripoli	Same limits as in formula in item (2) given against quartz
(b)	Amorphous Silicates	10 mg/m³, Total dust
	Asbestos (h.C.)	*2 fibres/ml, greater than 5 m in length and less than 3 m in the breadth ratio equal to or greater Than 5 m in breadth ratio equal to or greater than 3:1
	Portland Cement	10 mg/m³, Total dust containing less than 1% quartz.
	Coal Dust	2 mg/m³, respirable dust fraction containing less than 5% quartz.

mmpcm: Million particles per cubic meter of air, based on impinger samples countes by light- field techniques.

* As determined by the membrane filter method at 400- 450 x magnification (4 mm objectives) phase contrast illumination.

* Respirable Dust:

Fraction passing a size-selector with the following characteristics:

Aerodynamic Diameter (m) (unit density sphere)	% passing selector
<2	90
2.5	75
3.5	50

5.0	25
10	00