**ICS 13.100**
**C52**

# GBZ

GBZ 2.1-2007

# ! " # $ % & ' ( ) * + , -

# . / $ % & '

1 H J

G

K L M N O P Q R S T K L

U I V W X V Y Z [ S \ ] ^ _ \ ` a b c d e f g h i e j k l j

m K L n

2 G H o p X

q p X ? W r s t o u v W r w x y z { o p X | } ~ • L v T " p X

D E w x ~ y z { o p X D E K L

GBZ 1 M N O

GBZ 159 ? e f G H

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3

899d

3.1 occupa-p aG260 TET 652956 Tf40.32 0 Td(Av.)Tj/TT4 1;156 Tf16.88 0 T[(n\ TT5 .5 T10.7

3.4 work site

V Y R # S i u R X

3.5 chemical hazards

>

3.6 total dust

7 % i i
e Q A f

3.7 aerodynamic diameter $d_{ae}$

! 2 U [ [ Q R ?
j

3.8  respirable dust

e H L

| | | | | | |
|---|---|---|---|---|---|
| 2<br>3 | 4 5 6 | 7 5 6 | . / 5 8 3<br>(CAS N | OELs 0 mg/m$^3$ 1 | |

| 2 3 | 4 5 6 | 7 5 6 | . / 5 8 3 (CAS No.) | OELs 0 mg/m³ 1 | | | 9 : |
|---|---|---|---|---|---|---|---|
| | | | | MAC | PC-TWA | PC-STEL | |
| 72. | 1,1- 9 5 -1- X % * P | 1,1-Dichloro-1-nitroethane | 594-72-9 | - | 12 | - | - |
| 73. | 1,3- 9 5 < = | 1,3-Dichloropropanol | 96-23-1 | - | 5 | - | |
| 74. | 1,2- 9 5 < P | 1,2-Dichloropropane | 78-87-5 | - | 350 | 500 | - |
| 75. | 1,3- 9 5 < : | 1,3-Dichloropropene | 542-75-6 | - | 4 | - | G2B |
| 76. | 9 5 9 [ - P | Dichlorodifluoromethane | 75-71-8 | - | 5000 | - | - |
| 77. | 9 5 - P | Dichloromethane | 75-09-2 | - | 200 | - | G2B |
| 78. | 9 5 * f | Dichloroacetylene | 7572-29-4 | 0.4 | - | - | - |
| 79. | 1,2- 9 5 * P | 1,2-Dichloroethane | 107-06-2 | - | 7 | 15 | G2B |
| 80. | 1,2- 9 5 * : | 1,2-Dichloroethylene | 540-59-0 | - | 800 | - | - |
| 81. | 9 g D 8 | Diglycidyl ether | 2238-07-5 | - | 0.5 | - | - |
| 82. | 9 X % 6 ( J T Y \ ) | ohe | 59-59-5 | - | | | |

0.5 (o)6j /TT0 9.48 96 36.24 • Td (o)Tj /TT0 9.9



82. ( J T 9 X % 6

| 2 3 | 4 5 6 | 7 5 6 | . / 5 8 3 (CAS No.) | OELs 0 mg/m³ 1 | | | 9 : |
|---|---|---|---|---|---|---|---|
| | | | | MAC | PC-TWA | PC-STEL | |
| 96. | 9 Y * , - 6 . TDI | Toluene-2,4 -diisocyanate TDI | 584-84-9 | - | 0.1 | 0.2 | G2B |
| 97. | 9 l m , 9 @ % j | Dibutyltin dilaurate | 77-58-7 | - | 0.1 | 0.2 | |
| 98. | n 9 V O<br>o F 9 n p<br>n q 9 r | Vanadium and compounds,as V<br>Vanadium pentoxide fume dust<br>Ferrovanadium alloy dust | 7440-62-6 V | -<br>- | 0.05<br>1 | -<br>- | -<br>- |
| 99. | i | Phenol | 108-95-2 | - | 10 | - | |
| 100. | s t | Furan | 110-00-9 | - | 0.5 | - | G2B |
| 101. | [ u F O | Hydrogen fluoride, as F | 7664-39-3 | 2 | - | - | - |
| 102. | [ ( m v [ u )( F O ) | Fluorides(except HF) , as F | | - | 2 | - | - |
| 103. | w 9 Zr O | Zirconium and compounds, as Zr | 7440-67-7 Zr | - | 5 | 10 | - |
| 104. | x 9 Cd O | Cadmium and compounds, as Cd | 7440-43-9 Cd | - | 0.01 | 0.02 | G1 |
| 105. | y-r z y S | Mercury metal vapor | 7439-97-6 | - | 0.02 | 0.04 | |
| 106. | y- { y 9 ( Hg O ) | Mercury organic compounds, as Hg | | - | 0.01 | 0.03 | |
| 107. | \| F Co O | Cobalt and oxides, as Co | 7440-48-4 Co | - | 0.05 | 0.1 | G2B |
| 108. | } | Phosgene | 75-44-5 | 0.5 | - | - | - |
| 109. | ~ • P | Decaborane | 17702-41-9 | - | 0.25 | 0.75 | |
| 110. | t F 6 - A | Benzoyl peroxide | 94-36-0 | - | 5 | - | - |
| 111. | t F u | Hydrogen peroxide | 7722-84-1 | - | 1.5 | - | - |
| 112. | c _ 7 | Cyclohexylamine | 108-91-8 | - | 10 | 20 | - |
| 113. | c _ = | Cyclohexanol | 108-93-0 | - | 100 | - | |
| 114. | c _ > | Cyclohexanone | 108-94-1 | - | 50 | - | |
| 115. | c _ P | Cyclohexane | 110-82-7 | - | 250 | - | - |
| 116. | c F < P | Propylene Oxide | 75-56-9 | - | 5 | - | G2B |
| 117. | c F 5 < P | Epichlorohydrin | 106-89-8 | - | 1 | 2 | G2A |
| 118. | c F * P | Ethylene oxide | 75-21-8 | - | 2 | - | G1 |
| 119. | 6 5 | Yellow phosphorus | 7723-14-0 | - | 0.05 | 0.1 | - |



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| 2<br>3 | 4 5 6 | 7 5 6 . / 5 8 3<br>(CAS No.) | MAC | PC-TWA | | PC-STEL | 9 : |
|---|---|---|---|---|---|---|---|
| | _ 9 = | Hexylene glycol | 107-41-5 | - | - | - | |

| 2 3 | 4 5 6 | 7 5 6 | . / 5 8 3 (CAS No.) | OELs 0 mg/m³ 1 | | | 9 : |
|---|---|---|---|---|---|---|---|
| | | | | MAC | PC-TWA | PC-STEL | |
| 177. | 5 6 | Chlorobenzene | 108-90-7 | - | 50 | - | - |
| 178. | 5 < > | Chloroacetone | 78-95-5 | 4 | - | - | |
| 179. | 5 < : | Allyl chloride | 107-05-1 | - | 2 | 4 | - |
| 180. | $-5 @ 9 : | Chloroprene | 126-99-8 | - | 4 | - | G2B |

| 2 3 | 4 5 6 | 7 5 6 | . / 5 8 3 (CAS No.) | OELs 0 mg/m$^3$ 1 | | | 9 : |
|---|---|---|---|---|---|---|---|
| | | | | MAC | PC-TWA | PC-STEL | |
| 201. | ? 9 Mo 0 | Molybdeum and compounds, as Mo | 7439-98-7 Mo | | | | |
| | ? m 8 9 | Molybdeum and insoluble compounds | | - | 6 | - | - |
| | 7 8 9 | soluble compounds | | - | 4 | - | - |
| 202. | 5 | Demeton | 8065-48-3 | - | 0.05 | - | |
| 203. | 1 | Naphthalene | 91-20-3 | - | 50 | 75 | G2B |
| 204. | 2-1 i | 2-Naphthol | 2814-77-9 | - | 0.25 | 0.5 | - |
| 205. | 1 P | Decalin | 91-17-8 | - | 60 | - | - |
| 206. | @ | Urea | 57-13-6 | - | 5 | 10 | - |
| 207. | A > { 9 ( Ni 0) | Nickel and inorganic compounds, as Ni | | | | | |
| | r z A B 8 A 9 | Nickel metal and insoluble compounds | 7440-02-0 Ni | - | 1 | - | G2B |
| | 7 8 A 9 | Soluble nickel compounds | | - | 0.5 | - | - |
| 208. | C 9 Be 0 | Beryllium and compounds, as Be | 7440-41 Tc (c)Tj0 Tc (8 ( )Tj0.0307 Tc (a))Tj0 Tc 96 16.08 Td(7440)Tj-0.15(8 ( )Tj0.035 | | | | |

| 2 3 | 4 5 6 | 7 5 6 | . / 5 8 3 (CAS No.) | OELs 0 mg/m³ 1 | | | 9 : |
|---|---|---|---|---|---|---|---|
| | | | | MAC | PC-TWA | PC-STEL | |
| 215. | u F I | Cesium hydroxide | 21351-79-1 | - | 2 | - | - |
| 216. | * $ J | Calcium cyanamide | 156-62-7 | - | 1 | 3 | - |
| 217. | * u CN O | Hydrogen cyanide,as CN | 74-90-8 | 1 | - | - | |
| 218. | * CN O | Cyanides, as CN | 460-19-5 (CN) | 1 | - | - | |
| 219. | * d A . | Fenvalerate | 51630-58-1 | - | 0.05 | - | |
| 220. | J [ Y @ : | Perfluoroisobutylene | 382-21-8 | 0.08 | - | - | - |
| 221. | K P | Nonane | 111-84-2 | - | 500 | - | - |
| 222. | 8 L M D | Solvent gasolines | | - | 300 | - | - |
| 223. | N , ? @ . | n-Butyl lactate | 138-22-7 | - | 25 | - | - |
| 224. | - % X % 7 O P . | Cyclonite (RDX) | 121-82-4 | - | 1.5 | - | |
| 225. | [ 5 | Chlorine trifluoride | 7790-91-2 | 0.4 | - | - | - |
| 226. | [ • | Boron trifluoride | 7637-07-2 | 3 | - | - | - |
| 227. | [ - % [ , . | Trifluoromethyl hypofluorite | | 0.2 | - | - | - |
| 228. | - 6 5 , . | Tricresyl phosphate | 1330-78-5 | - | 0.3 | - | |
| 229. | 1,2,3- 5 < P | 1,2,3-Trichloropropane | 96-18-4 | - | 60 | - | G2A |
| 230. | 5 5 | Phosphorus trichloride | 7719-12-2 | - | 1 | 2 | - |
| 231. | 5 - P | Trichloromethane | 67-66-3 | - | 20 | - | G2B |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | OELs 0 mg/m³ 1 | | | |
| 2<br>3 | 4 5 6 | 7 5 6 | . / 5 8 3<br>(CAS No.) | MAC | PC-TWA | PC-STEL | 9 : |



) 0 2 27.2 41832 Tc ( )Tj 0 Tc6Q B 00.397-2 Tc Tc (C)Tj

| 2 3 | 4 5 6 | 7 5 6 | . / 5 8 3 (CAS No.) | OELs 0 mg/m³ 1 | | | 9 : |
|---|---|---|---|---|---|---|---|
| | | | | MAC | PC-TWA | PC-STEL | |
| | g | Copper dust | | - | 1 | - | - |
| | g p | Copper fume | | - | 0.2 | - | - |
| 265. | h m 8 9 W O | Tungsten and insoluble compounds, as W | 7440-33-7 W | | | | |

| 2<br>3 | 4 5 6 | 7 5 6 | . / 5 8 3<br>(CAS No.) | OELs 0 mg/m³ 1 | | |
|---|---|---|---|---|---|---|
| | | | | PC-TWA | PC-STEL | 9 |
| 286. | _ - P | Methyl bromide | 74-83-9 | | | |
| 287. | _ * A . | Deltamethrin | 52918-63-5 | | | |
| 288. | F J | Calcium oxide | 1305-78-8 | | | |

| 2 3 | 4 5 6 | 7 5 6 | . / 5 8 3 (CAS No.) | OELs 0 mg/m³ 1 | | | 9 : |
|---|---|---|---|---|---|---|---|
| | | | | MAC | PC-TWA | PC-STEL | |
| 312. | * , < . | Propyl acetate | 109-60-4 | - | 200 | 300 | - |
| 313. | * , @ . | Butyl acetate | 123-86-4 | - | 200 | 300 | - |
| 314. | * , - . | Methyl acetate | 79-20-9 | - | 200 | 500 | - |
| 315. | * , d . J T Y \ | Amyl acetate (all isomers) | 628-63-7 | - | 100 | 200 | - |
| 316. | * , * : . | Vinyl acetate | 108-05-4 | - | 10 | 15 | G2B |
| 317. | * , * . | | | | | | |

| 2 3 | 4 5 6 | 7 5 6 | . / 5 8 3 (CAS No.) | OELs 0 mg/m³ 1 | | | 9 : |
|---|---|---|---|---|---|---|---|
| | | | | MAC | PC-TWA | PC-STEL | |
| G2B 7 % Q d ! & 7 ' % ( ) e ! & | | | Possibly carcinogenic to humans | | | | |

4.2 ? [
? [ ! 2
! 2 ? [

| 2 3 | 4 5 6 | 7 5 6 | . / 5 8 3 0 CAS No. 1 | PC-TWA(mg/m³) | | 9 : |
|---|---|---|---|---|---|---|
| | | | | ; < | = < | |
| 1. | * + ; | Dolomite dust | | 8 | 4 | - |
| 2. | , - . | Fiberglass reinforced plastic dust | | 3 | - | - |
| 3. | / | Tea dust | | 2 | - | - |
| 4. | 0 $SiO_2$ * 1 O | Precipitated silica dust | 112926-00-8 | 5 | - | - |
| 5. | a ; | Marble dust | 1317-65-3 | 8 | 4 | - |
| 6. | 2 3 p | Welding fume | | 4 | - | G2B |
| 7. | 9 F 4 | Titanium dioxide dust | 13463-67-7 | 8 | - | - |
| 8. | 5 ; | Zeolite dust | | 5 | - | - |
| 9. | i 1 6 . | Phenolic aldehyde resin dust | | 6 | - | - |
| 10. | ( ( 7 8 $SiO_2$ v ' <10%) | Grain dust(free $SiO_2$<10%) | | 4 | - | - |
| 11. | ` 9 ; | Wollastonite dust | 13983-17-0 | 5 | - | - |
| 12. | ` : ; 7 8 $SiO_2$ v ' <10% | Diatomite dust(free $SiO_2$<10%) | 61790-53-2 | 6 | - | - |
| 13. | < ; 7 8 $SiO_2$ v ' <10% | Talc dust (free $SiO_2$<10%) | 14807-96-6 | 3 | 1 | - |
| 14. | 1 | Active carbon dust | 64365-11-3 | 5 | - | - |
| 15. | b < : | Polypropylene dust | | 5 | - | - |
| 16. | b < : + j z | Polyacrylonitrile fiber dust | | 2 | - | - |
| 17. | b 5 * : | Polyvinyl chloride (PVC) dust | 9002-86-2 | 5 | - | - |
| 18. | b * : | Polyethylene dust | 9002-88-4 | 5 | - | - |
| | = | Aluminum dust | | | | |
| 19. | = r z = 9 r F = | Metal 84 re f 188.88 277.2 0.48 15.84 re f 323.28 277.2 0.48 15.84 re f 395.28 2.08 re f BT /TT0 9. | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 24. | B b $SiO_2$ | Condensed silica dust | | 1.5 | 0.5 | - |
| 25. | C D ; | Bentonite dust | 1302-78-9 | 6 | - | - |
| 26. | E | Fur dust | | 8 | - | - |
| 27. | Q F , - j z | Man-made vitreous fiber | | | | |
| | , - @ | Fibrous glass dust | | 3 | - | - |
| | G H @ | Slag wool dust | | 3 | - | - |
| | I @ | Rock wool dust | | 3 | - | - |
| 28. | J K L | Mulberry silk dust | | 8 | - | - |
| 29. | M N O | Grinding wheel dust | | 8 | - | - |
| 30. | ; P | Gypsum dust | 10101-41-4 | 8 | 4 | - |
| 31. | ; 9 ; | Limestone dust | 1317-65-3 | 8 | 4 | - |
| 32. | ; @ ; @ v ' p 10% | Asbestos Asbestos p 10% | | | | |
| | | dust | 1332-21-4 | 0.8 | - | G1 |
| | j z | Asbestos fibre | | 0.8f/ml | - | |

| 2 3 | 4 5 6 | 7 5 6 | . / 5 8 3 0 CAS No. 1 | OELs | | | 9 : |
|---|---|---|---|---|---|---|---|
| | | | | MAC | PC-TWA | PC-STEL | |
| 1 | * c K d | Beauveria bassiana | | 6&10$^7$( d /m$^3$) | - | - | - |
| 2 | 1 0 e 2 f * g | Subtilisins | 1395-21-7 9014-01-1 | - | 15 ng/m$^3$ | 30 ng/m$^3$ | |

5 >, ? @

~ PC-STEL ] t h

Q 9 PC-TWA N x PC-TWA 2

PC-TWA a i x PC-TWA 1.5~3 ( ! 4)

A 4 . / B C >, ? @ D PC-TWA E F G

| PC-TWA mg/m$^3$ | a |
|---|---|
| T 1 | 3 |
| 1 | 2.5 |
| 10~ | 2.0 |
| j 100 | 1.5 |

6

f GBZ 159 ? e f G H

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