

# UN/SCETDG/20/INF.31

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## COMMITTEE OF EXPERTS ON THE TRANSPORT OF DANGEROUS GOODS AND ON THE GLOBALLY HARMONIZED SYSTEM OF CLASSIFICATION AND LABELLING OF CHEMICALS

### Sub-Committee of Experts on the Transport of Dangerous Goods

(Twentieth session, 3 - 12 December 2001, agenda item 2)

#### ADDITIONAL PROVISIONS FOR THE TRANSPORT OF GASES

##### Packing Instruction P200 – LC50 data for toxic gases

(related to document ST/SG/AC.10/C.3/2001/31)

##### Transmitted by the expert from Germany

The expert from Germany would like to report on the work which has been done following the proposals of the expert from the United States of America in his document ST/SG/AC.10/C.3/2001/31. He will focus on the work which was done with reference to item no. 1 – Packing Instruction P200 - in this document:

- **Include LC50 data for all toxic gases in Packing Instruction P200**

In Tables 1 and 2 should be added in the column "LC<sub>50</sub> ml/m<sup>3</sup>" for all toxic generic or N.O.S. entries the following phrase:

"equal to or less than 5000 ml/m<sup>3</sup> (ppm)".

For UN 2600 "CARBON MONOXIDE AND HYDROGEN MIXTURE, COMPRESSED" should be added:

"between 3760 and 5000 ml/m<sup>3</sup> (ppm)"

In Table 2 there are some LC<sub>50</sub> data marked with an asterisk, which means that these LC<sub>50</sub> values are under review. Germany is of the opinion that there are no new aspects for a change of the values in ISO 10298:1995 - Determination of the toxicity of a gas or gas mixture -, and that the ISO values represent the state of the art.

A list of toxic gases and liquids with their LC<sub>50</sub> values according to UN P200, ISO 10298, GHM-PBI<sup>1</sup>) and CGA S-1.1-1994 (amended 1998) is shown in the annex to this paper.

- **In Packing Instruction P200, validate the filling ratio for all of the listed liquefied gases**

Activities for the validation of the filling ratios, which have been taken from the European transport regulations ADR and RID, have been started by CGA in cooperation with NIST; Germany has been informed by copies of the relevant e-mail letters.

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<sup>1</sup>) List of gaseous hazardous materials - poisonous by inhalation (GHM-PBI) (Rev/4) September 25, 2000

- **In P200, adjust filling ratios of pressure receptacles for highly toxic gases**

In Table 1 no entry has to be changed.

In Table 2 for the following highly toxic gases the Test pressure has to be changed into "200 bar":

|         |   |
|---------|---|
| UN 1067 | DINITROGEN TETROXIDE (NITROGEN DIOXIDE)       |
| UN 1069 | NITROSYL CHLORIDE                             |
| UN 1076 | PHOSGENE                                      |
| UN 1589 | CYANOGEN CHLORIDE, STABILIZED                 |
| UN 1975 | NITRIC OXIDE AND DINITROGEN TETROXIDE MIXTURE |
| UN 2188 | ARSINE  |
| UN 2194 | SELENIUM HEXAFLUORIDE                         |
| UN 2195 | TELLURIUM HEXAFLUORIDE                        |
| UN 2196 | TUNGSTEN HEXAFLUORIDE                         |
| UN 2202 | HYDROGEN SELENIDE, ANHYDROUS                  |
| UN 2418 | SULPHUR TETRAFLUORIDE                         |
| UN 2421 | NITROGEN TRIOXIDE                             |
| UN 2548 | CHLORINE PENTAFLUORIDE                        |
| UN 2676 | STIBINE                                       |
| UN 3057 | TRIFLUOROACETYL CHLORIDE                      |

In Table 3 - Substances not in class 2 - a similar change should be done only for

UN 1051      HYDROGEN CYANIDE, STABILIZED,

because of its high vapour pressure which is only slightly lower than that for the gases in class 2.

- **In P200, review the quantity limits for highly toxic gases**

This review has been discussed during the working group meeting in December 2000. The opinion of the majority of the working group was that by the limitation of the capacity of the pressure receptacles to 85 litres in conjunction with the limitation of the minimum test pressure to 200 bar a further reduction of the quantity limits for the highly toxic gases is not necessary.

## **Annex**

List of toxic gases with their LC<sub>50</sub> values according to UN P200, ISO 10298, GHM-PBI and CGA S-1.1-1994 (amended 1998)

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Toxic Gases according to UN P200, ISO 10298, GHM-PBI, and CGA S-1.1-1994 (amended 1998)

|      |  | UN P200 |       | ISO 10298  | GHM-PBI  | CGA      | Diff. |
|------|--|---------|-------|------------|----------|----------|-------|
| 1008 | BORON TRIFLUORIDE  | 2.3     | 387*  | t 387 ppm  | 806 ppm  | 387 ppm  | !!    |
| 1016 | CARBON MONOXIDE, COMPRESSED  | 2.3     | 3760  | t 3760 ppm | 3760 ppm | 3760 ppm |       |
| 1017 | CHLORINE   | 2.3     | 293   | t 293 ppm  | 293 ppm  | 293 ppm  |       |
| 1026 | CYANOGEN   | 2.3     | 350   | t 350 ppm  | 350 ppm  | 350 ppm  |       |
| 1040 | ETHYLENE OXIDE   | 2.3     | 2900* | t 2900 ppm | 4350 ppm | 4999 ppm | !!    |
| 1040 | ETHYLENE OXIDE WITH NITROGEN up to a total pressure of 1 MPa at 50°C | 2.3     | 2900* | t 2900 ppm | 4350 ppm | 4999 ppm | !!    |
| 1045 | FLUORINE, COMPRESSED   | 2.3     | 185   | vt 185 ppm | 185 ppm  | 185 ppm  |       |
| 1048 | HYDROGEN BROMIDE, ANHYDROUS  | 2.3     | 2860  | t 2860 ppm | 2860 ppm | 2860 ppm |       |
| 1050 | HYDROGEN CHLORIDE, ANHYDROUS   | 2.3     | 2810* | t 3120 ppm | 2810 ppm | 3120 ppm | !!    |
| 1051 | HYDROGEN CYANIDE, STABILIZED   | 6.1     | 140   | vt 140 ppm | 40 ppm   |          | !!    |
| 1052 | HYDROGEN FLUORIDE, ANHYDOUS  | 8       | 966*  | t 966 ppm  | 1300 ppm | 1276 ppm | !!    |
| 1053 | HYDROGEN SULPHIDE  | 2.3     | 712   | t 712 ppm  | 712 ppm  | 712 ppm  |       |
| 1062 | METHYL BROMIDE   | 2.3     | 850   | t 850 ppm  | 1007 ppm | 850 ppm  | !!    |
| 1064 | METHYL MERCAPTAN   | 2.3     | 1350  | t 1350 ppm | 1350 ppm |          |       |
| 1067 | DINITROGEN TETROXIDE (NITROGEN DIOXIDE)                              | 2.3     | 115   | vt 115 ppm | 115 ppm  | 115 ppm  |       |
| 1069 | NITROSYL CHLORIDE  | 2.3     | 35    | vt 35 ppm  |          | 115 ppm  | !!    |
| 1076 | PHOSGENE   | 2.3     | 5     | vt 5 ppm   | 5 ppm    | 5 ppm    |       |
| 1079 | SULPHUR DIOXIDE  | 2.3     | 2520  | t 2520 ppm | 2520 ppm | 2520 ppm |       |
| 1589 | CYANOGEN CHLORIDE, STABILIZED  | 2.3     | 80    | vt 80 ppm  | 80 ppm   | 80 ppm   |       |
| 1660 | NITRIC OXIDE, COMPRESSED   | 2.3     | 115   | vt 115 ppm | 115 ppm  | 115 ppm  |       |
| 1741 | BORON TRICHLORIDE  | 2.3     | 2541  | t 2541 ppm | 2541 ppm | 2541 ppm |       |
| 1745 | BROMINE PENTAFLUORIDE  | 5.1     | 25*   | vt 25 ppm  |          |          |       |
| 1746 | BROMINE TRIFLUORIDE  | 5.1     | 180   | vt 180 ppm | 50 ppm   |          | !!    |
| 1749 | CHLORINE TRIFLUORIDE   | 2.3     | 299   | t 299 ppm  | 299 ppm  | 299 ppm  |       |
| 1859 | SILICON TETRAFLUORIDE  | 2.3     | 450   | t 450 ppm  | 450 ppm  | 450 ppm  |       |
| 1911 | DIBORANE   | 2.3     | 80    | vt 80 ppm  | 80 ppm   | 80 ppm   |       |
| 2188 | ARSINE   | 2.3     | 20    | vt 20 ppm  | 20 ppm   | 20 ppm   |       |
| 2189 | DICHLOROSILANE   | 2.3     | 314   | t 314 ppm  | 314 ppm  | 314 ppm  |       |

t = toxic (200 ppm < LC50 <= 5000 ppm), vt = very toxic (LC50 <= 200 ppm)

|      |   |     | UN P200 |    | ISO 10298 | GHM-PBI   | CGA      | Diff. |
|------|---|-----|---------|----|-----------|-----------|----------|-------|
| 2190 | OXYGEN DIFLUORIDE, COMPRESSED   | 2.3 | 2.6     | vt | 2,6 ppm   | 2,6 ppm   | 2,6 ppm  |       |
| 2191 | SULPHURYL FLUORIDE  | 2.3 | 3020    | t  | 3020 ppm  | 3020 ppm  | 3020 ppm |       |
| 2192 | GERMANE [pyrophoric]  | 2.3 | 620*    | vt | 20 ppm    | 622 ppm   | 571 ppm  | !!    |
| 2194 | SELENIUM HEXAFLUORIDE   | 2.3 | 50      | vt | 50 ppm    | 50 ppm    |          |       |
| 2195 | TELLURIUM HEXAFLUORIDE  | 2.3 | 25      | vt | 25 ppm    | 25 ppm    |          |       |
| 2196 | TUNGSTEN HEXAFLUORIDE   | 2.3 | 160*    | vt | 160 ppm   | 217 ppm   | 210 ppm  | !!    |
| 2197 | HYDROGEN IODIDE, ANHYDROUS  | 2.3 | 2860    | t  | 2860 ppm  | 2860 ppm  | 2860 ppm |       |
| 2198 | PHOSPHORUS PENTAFLUORIDE  | 2.3 | 190*    | vt | 190 ppm   | 260 ppm   | 250 ppm  | !!    |
| 2199 | PHOSPHINE [pyrophoric]  | 2.3 | 20      | vt | 20 ppm    | 20 ppm    | 20 ppm   |       |
| 2202 | HYDROGEN SELENIDE, ANHYDROUS  | 2.3 | 2       | vt | 2 ppm     |           | 2 ppm    |       |
| 2204 | CARBONYL SULPHIDE   | 2.3 | 1700    | t  | 1700 ppm  | 1700 ppm  | 1715 ppm | !!    |
| 2417 | CARBONYL FLUORIDE   | 2.3 | 360     | t  | 360 ppm   | 360 ppm   | 360 ppm  |       |
| 2418 | SULPHUR TETRAFLUORIDE   | 2.3 | 40      | vt | 40 ppm    | 40 ppm    | 40 ppm   |       |
| 2420 | HEXAFLUOROACETONE   | 2.3 | 470     | t  | 470 ppm   | 470 ppm   | 470 ppm  |       |
| 2421 | NITROGEN TRIOXIDE   | 2.3 | 57*     | vt | 57 ppm    |           | 57 ppm   |       |
| 2495 | IODINE PENTAFLUORIDE  | 5.1 | 120     | vt | 120 ppm   |           |          |       |
| 2534 | METHYL CHLOROSILANE   | 2.3 | 600     | t  | 600 ppm   | 600 ppm   |          |       |
| 2548 | CHLORINE PENTAFLUORIDE  | 2.3 | 122     | vt | 122 ppm   | 122 ppm   | 122 ppm  |       |
| 2676 | STIBINE   | 2.3 | 20      | vt | 20 ppm    | 20 ppm    | 20 ppm   |       |
| 2901 | BROMINE CHLORIDE  | 2.3 | 290     | t  | 290 ppm   | 290 ppm   |          |       |
| 3057 | TRIFLUOROACETYL CHLORIDE  | 2.3 | 10*     | vt | 10 ppm    | <1000 ppm | 10 ppm   | !!    |
| 3083 | PERCHLORYL FLUORIDE   | 2.3 | 770     | t  | 770 ppm   | 770 ppm   | 770 ppm  |       |
| 3300 | ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURE with more than 87% ethylene oxide | 2.3 | >2900   | t  | 2901 ppm  |           |          |       |

t = toxic (200 ppm < LC50 <= 5000 ppm), vt = very toxic (LC50 <= 200 ppm)