



## DEPARTMENT OF LABOR

### Occupational Safety and Health Administration

#### 29 CFR Part 1910

[Docket No. OSHA-2019-0001]

RIN 1218-AC93

#### Hazard Communication Standard; Corrections

**AGENCY:** Occupational Safety and Health Administration (OSHA), Labor.

**ACTION:** Final rule; correction and technical amendment.

**SUMMARY:** OSHA is correcting several inadvertent errors in its Hazard Communication Standard (HCS). Most errors relate to the HCS final rule published in the *Federal Register* on May 20, 2024. On October 9, 2024, the agency issued a corrections notification and technical amendment to correct errors in that final rule which the agency believed could lead to confusion during the classification process or errors on labels and Safety Data Sheets (SDSs) if not expeditiously corrected. Following publication of the October 9, 2024 corrections notification and technical amendment, OSHA continued its review of the regulatory text and identified additional minor and typographical errors in the regulatory text and appendices to the HCS. OSHA is issuing this correction document to address these additional minor errors. OSHA is also making one technical amendment to an appendix of the HCS unrelated to the May 20, 2024 final rule.

**DATES:** The corrections in this document are effective [INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]. The incorporation by reference of certain material listed in this rule was approved by the Director of the Federal Register as of July 19, 2024.

**FOR FURTHER INFORMATION CONTACT:**

*For Press inquiries:* Mr. Frank Meilinger, Director, OSHA Office of Communications, U.S. Department of Labor; telephone: (202) 693-1999; email: [meilinger.francis2@dol.gov](mailto:meilinger.francis2@dol.gov).

*For General and technical information:* Tiffany DeFoe, Director, Office of Chemical Hazards, Metals, Directorate of Standards and Guidance, OSHA, Room N-3718, U.S. Department of Labor, 200 Constitution Avenue NW., Washington, DC 20210; email [defoe.tiffany@dol.gov](mailto:defoe.tiffany@dol.gov).

## **SUPPLEMENTARY INFORMATION:**

### **I. Overview**

On May 20, 2024, OSHA published a final rule updating and revising its Hazard Communication Standard (HCS) (89 FR 44144). The final rule became effective on July 19, 2024. On October 9, 2024, the agency issued a corrections notification and technical amendment to correct errors in that final rule which the agency believed could lead to confusion during the classification process or errors on labels and Safety Data Sheets (SDSs) if not expeditiously corrected (89 FR 81829). Following publication of the October 9, 2024 corrections notification and technical amendment, OSHA continued its review of the final rule and identified additional minor and typographical errors in the regulatory text and appendices to the HCS. OSHA is issuing this correction document to address these additional minor errors which occur in paragraphs (c) and (d) of the regulatory text and in Appendices A, B, C, D, and F. These corrections reflect the agency's intent for the provisions of the final rule as explained in the preamble to the final rule. Some of these corrections are explained in the following discussion, and the table provided at the end of this section summarizes all the corrections included in this document.

Four of the corrections are to paragraph (c) of the regulatory text and one of the corrections is to paragraph (d) of the regulatory text. These corrections add the heading

“Definitions” to the beginning of paragraph (c), add “chemicals under pressure” to the definition of “Physical hazard,” correct the formatting of the text of “area” in the definition of “Work area” to match the formatting for other terms, and correct the definition for “Liquid”, which inadvertently did not include the conversion of 14.69 PSI for all references to vapor pressure. OSHA is also adding the heading “Hazard Classification” to paragraph (d), which was inadvertently omitted from the 2024 final rule.

The remainder of the errors corrected in this document are in the Appendices. For instance, in Appendix A, OSHA is correcting the reference within Figure A.1.1 which currently reads “apply formula in A.1.3.6.3” to “apply formula in A.1.3.6.4” to cross reference the correct paragraph. OSHA is also deleting elements that are in the GHS which were inadvertently included in the final rule but are not appropriate for OSHA’s standard. These include statements such as “which can be used by those authorities requiring more than one designation for corrosivity” and “where sub-categorization is not required by a competent authority or” in paragraph A.2.2(a) and references to tables that do not appear in the HCS. OSHA is correcting figures A.6.1, A.7.1(a), A.7.1(b) and A.8.1, which were inadvertently altered in the final rule, and is replacing these figures with the versions of the figures included in the February 16, 2021 notice of proposed rulemaking (86 FR 9576). The agency received no comments on the proposed changes for Figure A.7.1(b) and intended to adopt them in the final rule. OSHA did not propose changes for the other figures.

In Appendix B, OSHA is correcting several errors in spelling and numbering in tables and text, as well as errors in the designations of several footnotes in Appendix B. In addition, OSHA is updating Note 2 for both Table B.3.1 and B.3.2 to follow the same format, to add “including their labeling elements” to be consistent with the GHS, and to correct cross references to other portions of Appendix B which were inadvertently

omitted or numbered incorrectly. OSHA is also updating a footnote in each of Tables B.2.1, B.5.1, B.6.1 and B.7.1 by adding “chemicals under pressure.” This will align these footnotes with the text in Note 2 of Table B.3.2 regarding how chemicals under pressure should be classified.

In Appendix C, OSHA is correcting minor formatting errors in several places, such as italicizing, bolding, or un-bolding font and removing slashes that were inadvertently included. Additionally, OSHA is adding “Chemicals Under Pressure” to Figure C.1. This was inadvertently omitted from the list of hazard classes associated with the Gas Cylinder hazard symbol. OSHA is also updating the text of C.2.4.6 to use the updated version of the example precautionary statement. OSHA is also making a number of corrections related to Table C.4.16, including adding the precautionary statement “In case of fire: Use ... to extinguish” and its associated explanatory note to the “Response” column of Chemical Under Pressure (Hazard Category 1 and 2). The latter change will accomplish OSHA’s stated intention to align with the GHS Rev. 8 (89 FR 44324). In Table C.4.19, OSHA is removing the phrase “Chemical manufacturer, importer, or distributor to specify applicable ignition source(s),” which it inadvertently failed to delete in this table after updating the precautionary statement to include all ignition sources (see 89 FR 44336). The agency is also adding the words “and large quantities” in C.4.30, which were inadvertently omitted from the Hazard Category 4 Response precautionary statement.

In Appendix D, OSHA is correcting typographical errors in Section 2 and Section 7. Also in Appendix D, OSHA is correcting the Section 2(a) cross-reference from (d)(1)(i) to (d)(1). This correction ensures that Appendix D clearly conveys the requirements for providing the hazard classification of a chemical in Section 2. As OSHA noted in the preamble to the 2024 final rule, the agency intended to require hazards associated with chemicals as shipped and hazards associated with a change in the

chemical's physical form to be presented in Section 2(a), and hazards created by a chemical reaction to be presented in Section 2(c) (89 FR 44344). Finally, OSHA is removing the phrases "methods specified under" and "and then listed on the SDS" from the note to Table D.1 to align that language with the footnote in Appendix B as OSHA stated it would in the HCS 2024 final rule (89 FR 44350).

OSHA is also making one technical amendment unrelated to the 2024 final rule. In Appendix F, the agency is revising the first sentence of the section titled "Responses Are in One Sex or Both Sexes" to use the term "sex-specific tumors" rather than "gender-specific tumors." A complete list of changes can be found below.

The following standards appear in the amendatory text of this document and were previously approved for the locations in which they appear: ADR 2019, ASTM D 4359-90, ASTM D 240-02, ISO 13943, NFPA 30B.

### **Correction of Publication**

The following table contains a complete list of the corrections being made in this corrections notification and technical amendment to the Hazard Communication Standard final rule as it appeared at 89 FR 44144, unless otherwise noted, and provides a summary of each correction. The changes are listed by the *Federal Register* page number on which they can be found.

<b>Page No.</b>	<b>Standard</b>	<b>Correction or technical amendment</b>
On p. 44356	§ 1910.1200, paragraph (c)	Add the paragraph (c) heading "Definitions." before the definition for Article.
On p. 44357	§ 1910.1200, paragraph (c)	Update the definition of liquid to include the PSI conversion (14.69 PSI) with the first reference to the value 101.3 kPa.
On p. 44357	§ 1910.1200, paragraph (c)	Update the definition of "Physical hazard" to include "chemicals under pressure".

Page No.	Standard	Correction or technical amendment
On p. 44357	§ 1910.1200, paragraph (c)	Italicize the term “Work area”.
On p. 44357	§ 1910.1200, paragraph (d)	Add the heading “Hazard classification.” to paragraph (d).
On p. 44363	§ 1910.1200, Appendix A, Figure A.1.1	Change “Apply formula in A.1.3.6.2.3” to “Apply formula in A.1.3.6.2.4”.
On p. 44364	§ 1910.1200, Appendix A, A.2.2(a)	Delete “which can be used by those authorities requiring more than one designation for corrosivity” in the first paragraph and “where sub-categorization is not required by a competent authority or” in the second paragraph.
On p. 44365	§ 1910.1200, Appendix A, A.2.2.3.3.1	Delete “based on the criteria in Table A.2.6” at the end of the paragraph.
On p. 44365	§ 1910.1200, Appendix A, A.2.2.3.4.1	Delete “based on the criteria in Table A.2.7” at the end of the paragraph.
On p. 44376	§ 1910.1200, Appendix A, Figure A.6.1	Replace Figure A.6.1 with the version published in the February 16, 2021 NPRM (86 FR 9745-9746). <sup>1</sup>
On p. 44377	§ 1910.1200, Appendix A, Figure A.7.1(a)	Replace Figure A.7.1(a) with the version published in the February 16, 2021 NPRM (86 FR 9747).
On p. 44377-44378	§ 1910.1200, Appendix A, Figure A.7.1(b)	Replace Figure A.7.1(b) with the version proposed in the February 16, 2021 NPRM (86 FR 9577).
On p. 44380	§ 1910.1200, Appendix A, Figure A.8.1	Replace Figure A.8.1 with the version published in the February 16, 2021 NPRM (86 FR 9750).
On p. 44386	§ 1910.1200, Appendix A, Table A.10.1	In the criteria section, change the unit on “ $\leq 20.5 \text{ mm}_2/\text{s}$ ” to “ $\leq 20.5 \text{ mm}^2/\text{s}$ ”.
On p. 44387	§ 1910.1200, Appendix B, Table B.2.1	Change the Note 1 from “Aerosols should not be classified as flammable gases.” to “Aerosols and chemicals under pressure should not be classified as flammable gases.”

<sup>1</sup> Note that OSHA is also correcting the formatting of figures A.6.1, A.7.1(a), A.7.1(b), and A.8.1 as they appeared in the 2021 NPRM.

Page No.	Standard	Correction or technical amendment
On p. 44388	§ 1910.1200, Appendix B, Table B.3.1	Change Note 2 from “Aerosols do not fall additionally within the scope of flammable gases, gases under pressure, flammable liquids, or flammable solids. However, depending on their contents, aerosols may fall within the scope of other hazard classes.” to now read “Aerosols do not fall additionally within the scope of B.2 (flammable gases), B.3.2 (chemicals under pressure), B.5 (gases under pressure), B.6 (flammable liquids), or B.7 (flammable solids). However, depending on their contents, aerosols may fall within the scope of other hazard classes, including their labeling elements.”
On p. 44388	§ 1910.1200, Appendix B, Table B.3.2	Change Note 2 from “Chemicals under pressure do not fall additionally within the scope of section B.3.1 (aerosols), B.2.2 (flammable gases), B.2.5 (gases under pressure), B.2.6 (flammable liquids) and B.2.7 (flammable solids). Depending on their contents, chemicals under pressure may however fall within the scope of other hazard classes, including their labelling elements.” to now read “Chemicals under pressure do not fall additionally within the scope of B.2 (flammable gases), B.3.1 (aerosols), B.5 (gases under pressure), B.6 (flammable liquids) and B.7 (flammable solids). Depending on their contents, chemicals under pressure may however fall within the scope of other hazard classes, including their labeling elements.”.
On p. 44389	§ 1910.1200, Appendix B, B.3.3.3	Change “see ASTM D240” to “see ASTM D240-02”.

Page No.	Standard	Correction or technical amendment
On p. 44389	§ 1910.1200, Appendix B, Table B.5.1	<p>In the “Group” column, change “Liquedfied gas” to “Liquefied gas”</p> <p>In the “Criteria” column, change “inder” to “under” in the first line</p> <p>In the “Criteria” column, change “inder” to “under” in the third line</p> <p>In the “Criteria” column, change “disinction” to “distinction” in the fourth line</p> <p>In the “Criteria” column, change “termperatures” to “temperatures” in line 3 and “termperature” to “temperature” in line 6</p> <p>Change the Note from “Aerosols should not be classified as gases under pressure. See Appendix B.3 of this section.” to “Aerosols and chemicals under pressure should not be classified as gases under pressure. See Appendix B.3 of this section.”</p>
On p. 44389	§ 1910.1200, Appendix B, Table B.6.1	Change the Note from “Aerosols should not be classified as flammable liquids. See Appendix B.3 of this section.” to “Aerosols and chemicals under pressure should not be classified as flammable liquids. See Appendix B.3 of this section.”
On p. 44390	§ 1910.1200, Appendix B, Table B.7.1	Change Note 2 from “Aerosols should not be classified as flammable solids. See Appendix B.3.” to “Aerosols and chemicals under pressure should not be classified as flammable solids. See Appendix B.3 of this section.”
On p. 44390, 44394	§ 1910.1200, Appendix B, Footnotes	Redesignate Appendix B footnotes 9, 10, and 11 as footnotes 1, 2, and 3, respectively.
On p. 44395	§ 1910.1200, Appendix C, Figure C.1	In column 2 row 4, add “Chemicals Under Pressure” to the list of hazard classes associated with the Gas Cylinder hazard symbol.
On. p. 44396	§ 1910.1200, Appendix C, C.2.4.6	Replace C.2.4.6 to now read “C.2.4.6 Precautionary statements may be combined or consolidated to save label space and improve readability. For example, “Keep cool” and “Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.” can be combined to read “Keep cool and away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.””

Page No.	Standard	Correction or technical amendment
On p. 44415	§ 1910.1200, Appendix C, C.4.10	Under the Prevention column for the no designated number hazard category (Effects on or Via Lactation), remove the slash “/” from “Avoid contact during pregnancy and /while nursing” in the fifth line.
On p. 44423	§ 1910.1200, Appendix C, C.4.14	For Hazard category Divisions 1.1, 1.2, and 1.3, in the Prevention column, remove the “/” from “Ground and /bond container and receiving equipment.” in line eight.
On p. 44424	§ 1910.1200, Appendix C, C.4.14	For Hazard category Division 1.4, in the Prevention column, remove the “/” from “Ground and /bond container and receiving equipment.” in line four.
On p. 44425	§ 1910.1200, Appendix C, C.4.14	For Hazard category Division 1.5, in the Prevention column, remove the “/” from “Ground and /bond container and receiving equipment.” in line ten.
On p. 44425	§ 1910.1200, Appendix C, C.4.14	For Hazard category Divisions 1.1, 1.2, and 1.3, in the Storage column remove the ellipsis from the middle of the precautionary statement “Store...in accordance with...” in line 1 so that it now reads “Store in accordance with...”.
On p. 44424	§ 1910.1200, Appendix C, C.4.14	For Hazard category Division 1.4, in the Storage column remove the ellipsis from the middle of the precautionary statement “Store...in accordance with...” in line 1 so that it now reads “Store in accordance with...”.
On p. 44431-44433	§ 1910.1200, Appendix C, C.4.16	Under the Prevention column, remove “/” in all locations in all C.4.16 tables.
On p. 44433-44434	§ 1910.1200, Appendix C, C.4.16	Revise the tables for Chemical Under Pressure in C.4.16 to align with GHS Revision 8 hazard statements. For Category 1, revise hazard statement to read: “Extremely flammable chemical under pressure. May explode if heated.” For Category 2, revise hazard statement to read: “Flammable chemical under pressure. May explode if heated.” For Category 3, revise hazard statement to read: “Chemical under pressure: may explode if heated.”

Page No.	Standard	Correction or technical amendment
On p. 44433	§ 1910.1200, Appendix C, C.4.16	<p>For Chemical Under Pressure Hazard Category 1 and Hazard Category 2, in the Response column, add:</p> <p><b>“In case of fire: Use ... to extinguish.</b>  <i>-if water increases risk.</i>      . . . Chemical manufacturer, importer, or distributor to specify appropriate media.”</p> <p>In the Response column, bold the font for <b>“In case of leakage, eliminate all ignition sources.”</b> and <b>“Stop leak if safe to do so.”</b></p>
On p. 44434	§ 1910.1200, Appendix C, C.4.16	<p>For Chemicals Under Pressure Hazard Category 3:</p> <p>In the Response column, bold the font for <b>“Stop leak if safe to do so.”</b></p>
On p. 44438	§ 1910.1200, Appendix C, C.4.19	<p>For Hazard category 1, 2 and 3:</p> <p>Under the Prevention column, delete “Chemical manufacturer, importer, or distributor to specify applicable ignition source(s).” in the third line.</p> <p>Under the Prevention column, remove the “/” from “Ground /and bond container and receiving equipment.”</p> <p>Under the Prevention column, bold the font in the statement “Use non-sparking tools.”</p> <p>Under the Response column, remove the “/” from “[or shower].”</p> <p>Under the Response column, remove the slash “/” from “/importer”.</p>
On p. 44440	§ 1910.1200, Appendix C, C.4.20	<p>For Hazard category 1 and 2, under the Prevention column, remove the “/” from “Ground and /bond container and receiving equipment.”</p>
On p. 44442	§ 1910.1200, Appendix C, C.4.21	<p>For Hazard category Type B, under the Storage column remove the bold font on “if temperature control is required” and italicize the font for “if temperature control is required (see Appendix B.2.3) or if otherwise deemed necessary”.</p>
On p. 44442	§ 1910.1200, Appendix C, C.4.21	<p>For Hazard category Type B, in the Prevention column remove the “/” from “/sparks” and “/open flames”.</p>

Page No.	Standard	Correction or technical amendment
On p. 44443	§ 1910.1200, Appendix C, C.4.21	For Hazard category Type C- F, in the Prevention column remove the “/” from “/sparks” and “/open flames”.
On p. 44446	§ 1910.1200, Appendix C, C.4.24	In the Storage column, remove the “/” from “stacks/” in the first line.
On p. 44458	§ 1910.1200, Appendix C, C.4.30	For Hazard category 4, under the response column add the phrase <b>“and large quantities”</b> after <b>“In case of major fire”</b> .
On p. 44459	§ 1910.1200, Appendix D, Table D.1, Section 2	<p>In the Subheadings Column:</p> <p>In paragraph (a) of section 2 (Hazard Identification), change “(a) Classification of the chemical in accordance with paragraph (d)(1)(i) of § 1910.1200;” to read as “(a) Classification of the chemical in accordance with paragraph (d)(1) of § 1910.1200, except for classification under paragraph (d)(1)(ii).”</p> <p>In paragraph (c) of section 2 (Hazard Identification), change “(c) Hazards classified under paragraph (d)(1)(ii) of § 1910.12000;” to read as “(c) Hazards classified under paragraph (d)(1)(ii) of § 1910.1200;”.</p>
On p. 44460	§ 1910.1200, Appendix D, Table D.1, Section 7	In the Headings column, add the “dagger” (†) symbol after “7. Handling and Storage” to correspond with the note at the end of Appendix D.
On p. 44461	§ 1910.1200 Appendix D, Table D.1, Note	In the Note at the end of Table D.1, remove the phrases “methods specified under” and “and then listed on the SDS” from the first sentence.
77 FR 17886	§ 1910.1200, Appendix F, <i>Responses Are in One Sex or Both Sexes</i>	Change “gender-specific tumors” to “sex-specific tumors” in “Any case of gender-specific tumors should be evaluated in light of the total tumorigenic response to the substance observed at other sites (multi-site responses or incidence above background) in determining the carcinogenic potential of the substance.”

## II. Exemption From Notice-and-Comment Procedures

OSHA has determined that these corrections are not subject to the procedures for public notice and comment specified in Section 4 of the Administrative Procedures Act (5 U.S.C. 553) or Section 6(b) of the Occupational Safety and Health Act of 1970 (29 U.S.C. 655(b)). This rulemaking only corrects errors of a minor, mainly typographical

nature and makes technical amendments that do not affect or change any existing rights or obligations, and no stakeholder is likely to object to these changes. Therefore, OSHA has determined that there is good cause that public notice and comment are unnecessary within the meaning of 5 U.S.C. 553(b)(4)(B), 29 U.S.C. 655(b), and 29 CFR 1911.5. For the same reasons, the Agency finds good cause under 5 U.S.C. 553(d)(3) to make the amendment effective upon publication.

### **III. Authority and Signature**

David Keeling, Assistant Secretary of Labor for Occupational Safety and Health, authorized the preparation of this document. It is issued under the authority of sections 4, 6, and 8 of the Occupational Safety and Health Act of 1970 (29 U.S.C. 653, 655, 657); 5 U.S.C. 553; Section 304, Clean Air Act Amendments of 1990 (Pub. L. 101-549, reprinted at 29 U.S.C.A. 655 Note); Section 41, Longshore and Harbor Workers' Compensation Act (33 U.S.C. 941); Section 107, Contract Work Hours and Safety Standards Act (40 U.S.C. 3704); Section 1031, Housing and Community Development Act of 1992 (42 U.S.C. 4853); Section 126, Superfund Amendments and Reauthorization Act of 1986, as amended (reprinted at 29 U.S.C.A. 655 Note); Secretary of Labor's Order No. 07-2025 (90 FR 27878); and 29 CFR part 1911.

#### **List of Subjects in 29 CFR Part 1910**

Chemicals, Diseases, Explosives, Flammable materials, Gases, Hazardous substances, Incorporation by reference, Labeling, Occupational safety and health, Safety, Signs and symbols.

Signed at Washington, DC, on January 5, 2026.

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**David Keeling,**  
*Assistant Secretary of Labor for Occupational Safety and Health.*

Accordingly, 29 CFR part 1910 is corrected by making the following correcting amendments:

## **PART 1910—OCCUPATIONAL SAFETY AND HEALTH STANDARDS**

1. The authority citation for part 1910 is revised to read as follows:

**Authority:** 33 U.S.C. 941; 29 U.S.C. 653, 655, 657; Secretary of Labor's Order No. 12-71 (36 FR 8754); 8-76 (41 FR 25059), 9-83 (48 FR 35736), 1-90 (55 FR 9033), 6-96 (62 FR 111), 3-2000 (65 FR 50017), 5-2002 (67 FR 65008), 5-2007 (72 FR 31160), 4-2010 (75 FR 55355), 1-2012 (77 FR 3912), 08-2020 (85 FR 58393), or 07-2025 (90 FR 27878); 29 CFR part 1911; and 5 U.S.C. 553, as applicable.

2. Amend § 1910.6 by revising paragraph (h) introductory text and paragraph (h)(27) to read as follows:

### **§ 1910.6 Incorporation by reference.**

\* \* \* \* \*

(h) ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428–2959; phone: (610) 832–9585; email: *service@astm.org*; website: *www.astm.org*.

\* \* \* \* \*

(27) ASTM D4359-90 (Reapproved 2019), Standard Test Method for Determining Whether a Material is a Liquid or a Solid, approved July 1, 2019, IBR approved for § 1910.1200.

\* \* \* \* \*

3. Amend § 1910.1200 as follows:

- a. In paragraph (c):

- i. Add a heading to the paragraph.
- ii. Revise the definitions of “Liquid,” “Physical hazard,” and “Work area”.

- b. Add a heading to paragraph (d).

- c. In appendix A:
  - i. Revise and republish Figure A.1.1.
  - ii. Revise paragraphs A.2.2, A.2.2.3.3.1, and A.2.2.3.4.1.
  - iii. Revise and republish Figures A.6.1, A.7.1(a), A.7.1.(b), and A.8.1 and Table A.10.1.
- d. In appendix B:
  - i. Revise and republish Tables B.2.1, B.3.1, and B.3.2.
  - ii. Revise paragraph B.3.3.3.
  - iii. Revise and republish Tables B.5.1 and B.6.1.
  - iv. In section B.6.3, in the second paragraph, redesignate footnote 9 as footnote 1.
  - v. Revise and republish Table B.7.1.
  - vi. In section B.17.1, in the definition of “Desensitized explosives,” redesignate footnotes 10 and 11 as footnotes 2 and 3.
- e. In appendix C:
  - i. Revise and republish Figure C.1.
  - ii. Revise paragraph C.2.4.6.
  - iii. Revise and republish Tables C.4.10, C.4.14, C.4.16, C.4.19, C.4.20, C.4.21, C.4.24, and C.4.30.
- f. Revise and republish appendix D.
- g. In appendix F, revise *Responses Are in One Sex or Both Sexes.*

The revisions read as follows:

**§ 1910.1200 Hazard communication.**

\* \* \* \* \*

**(c) Definitions. \* \* \***

*Liquid* means a substance or mixture which at 122° F (50 °C) has a vapor pressure of not more than 43.51 PSI (300 kPa (3 bar)), which is not completely gaseous at 68°F (20°C)

and at a standard pressure of 14.69 PSI (101.3 kPa), and which has a melting point or initial melting point of 68 °F (20°C) or less at a standard pressure of 14.69 PSI (101.3 kPa). Either ASTM D 4359-90 (R2019) (incorporated by reference, see §1910.6); or the test for determining fluidity ( penetrometer test) prescribed in section 2.3.4 of ADR 2019 (incorporated by reference, see §1910.6) can establish whether a viscous substance or mixture is a liquid if a specific melting point cannot be determined.

\* \* \* \* \*

*Physical hazard* means a chemical that is classified as posing one of the following hazardous effects: explosive, flammable (gases, liquids, or solids); aerosols; chemical under pressure; oxidizer (gases, liquids, or solids); self-reactive; pyrophoric (liquid or solid); self-heating; organic peroxide; corrosive to metal; gas under pressure; in contact with water emits flammable gas; or desensitized explosive. The criteria for determining whether a chemical is classified as a physical hazard are detailed in appendix B to this section.

\* \* \* \* \*

*Work area* means a room or defined space in a workplace where hazardous chemicals are produced or used, and where employees are present.

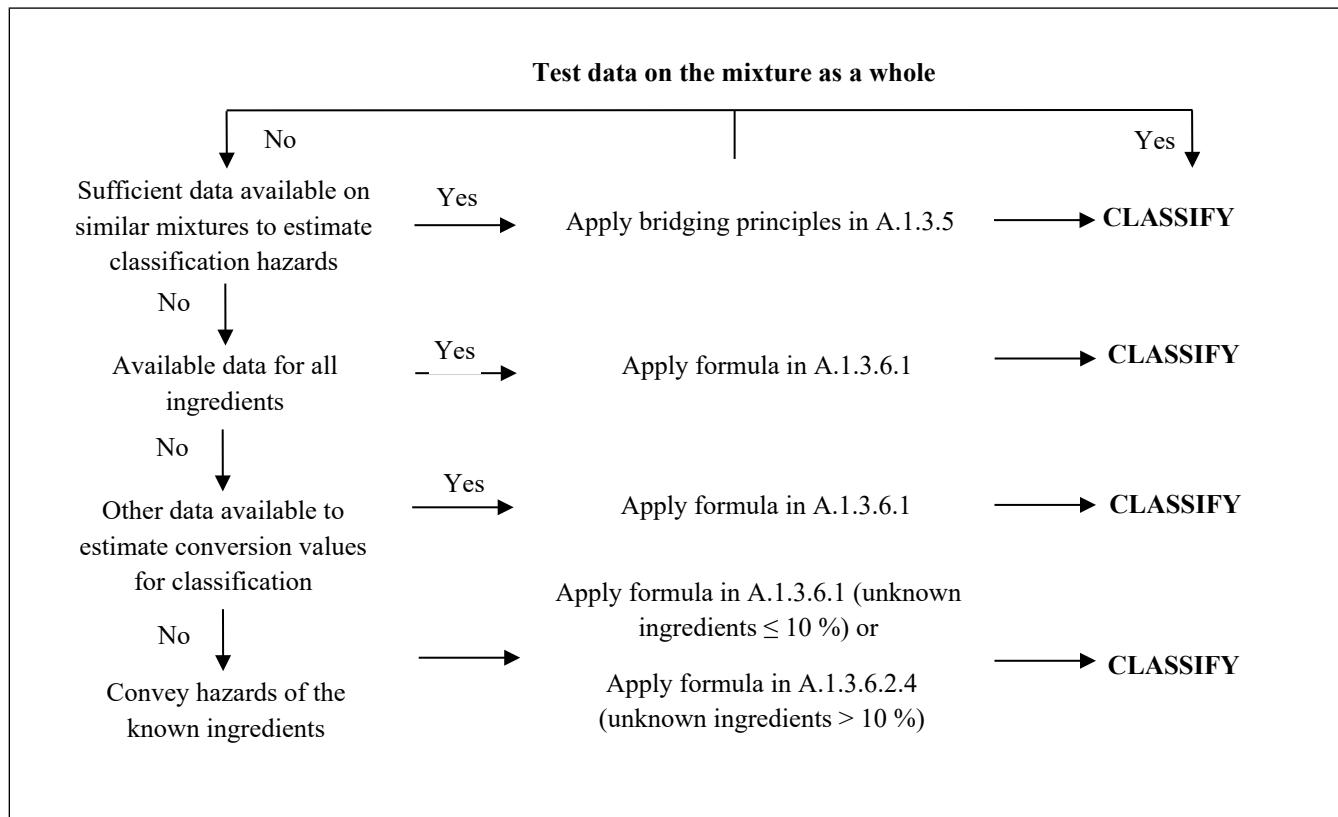
\* \* \* \* \*

(d) *Hazard classification.* \* \* \*

## Appendix A to § 1910.1200 Health Hazard Criteria (Mandatory)

\* \* \* \* \*

**Figure A.1.1: Tiered approach to classification of mixtures for acute toxicity**



\* \* \* \* \*

### *A.2.2 Classification Criteria for Substances*

Substances shall be allocated to one of the following categories within this hazard class:

(a) Category 1 (skin corrosion)

This category may be further divided into up to three sub-categories (1A, 1B, and 1C).

Corrosive substances should be classified in Category 1 where data are not sufficient for sub-categorization.

When data are sufficient, substances may be classified in one of the three sub-categories 1A, 1B, or 1C.

(b) Category 2 (skin irritation)

\* \* \* \* \*

A.2.2.3.3.1 Where tests have been undertaken in accordance with OECD Test Guidelines (TGs) 430, 431, or 435, a substance is classified for skin corrosion in category 1 (and, where possible and required into sub-categories 1A, 1B, or 1C).

\* \* \* \* \*

A.2.2.3.4.1 Where a conclusion of corrosivity can be excluded and where tests have been undertaken in accordance with OECD Test Guideline 439, a substance is classified for skin irritation in category 2.

\* \* \* \* \*

## Figure A.6.1: Hazard categories for carcinogens

<b>CATEGORY 1:</b>	<b>Known or presumed human carcinogens</b>
	<p>The classification of a substance as a Category 1 carcinogen is done on the basis of epidemiological and/or animal data. This classification is further distinguished on the basis of whether the evidence for classification is largely from human data (Category 1A) or from animal data (Category 1B):</p>
<b>Category 1A:</b>	<b>Known to have carcinogenic potential for humans. Classification in this category is largely based on human evidence.</b>
<b>Category 1B:</b>	<b>Presumed to have carcinogenic potential for humans. Classification in this category is largely based on animal evidence.</b>
	<p>The classification of a substance in Category 1A and 1B is based on strength of evidence together with weight of evidence considerations (See paragraph A.6.2.5). Such evidence may be derived from:</p> <ul style="list-style-type: none"><li>- human studies that establish a causal relationship between human exposure to a substance and the development of cancer (known human carcinogen); or</li><li>- animal experiments for which there is sufficient evidence to demonstrate animal carcinogenicity (presumed human carcinogen).</li></ul> <p>In addition, on a case by case basis, scientific judgment may warrant a decision of presumed human carcinogenicity derived from studies showing limited evidence of carcinogenicity in humans together with limited evidence of carcinogenicity in experimental animals.</p>
<b>CATEGORY 2:</b>	<b>Suspected human carcinogens</b>
	<p>The classification of a substance in Category 2 is done on the basis of evidence obtained from human and/or animal studies, but which is not sufficiently convincing to place the substance in Category 1A or B. This classification is based on strength of evidence together with weight of evidence considerations (See paragraph A.6.2.5). Such evidence may be from either limited evidence of carcinogenicity in human studies or from limited evidence of carcinogenicity in animal studies.</p>
<b>Other considerations:</b>	Where the weight of evidence for the carcinogenicity of a substance does not meet the above criteria, any positive study conducted in accordance with established scientific principles, and which reports statistically significant findings regarding the carcinogenic potential of the substance, must be noted on the safety data sheet.

\* \* \* \* \*

### Figure A.7.1(a): Hazard categories for reproductive toxicants

<b>CATEGORY 1:</b>	<b>Known or presumed human reproductive toxicant</b>
Substance shall be classified in Category 1 for reproductive toxicity when they are known to have produced an adverse effect on sexual function and fertility or on development in humans or when there is evidence from animal studies, possibly supplemented with other information, to provide a strong presumption that the substance has the capacity to interfere with reproduction in humans. The classification of a substance is further distinguished on the basis of whether the evidence for classification is primarily from human data (Category 1A) or from animal data (Category 1B).	
<b>Category 1A:</b>	<b>Known human reproductive toxicant</b>
	The classification of a substance in this category is largely based on evidence from humans.
<b>Category 1B:</b>	<b>Presumed human reproductive toxicant</b>
	The classification of a substance in this category is largely based on evidence from experimental animals. Data from animal studies shall provide sufficient evidence of an adverse effect on sexual function and fertility or on development in the absence of other toxic effects, or if occurring together with other toxic effects the adverse effect on reproduction is considered not to be a secondary non-specific consequence of other toxic effects. However, when there is mechanistic information that raises doubt about the relevance of the effect for humans, classification in Category 2 may be more appropriate.
<b>CATEGORY 2:</b>	<b>Suspected human reproductive toxicant</b>
	Substances shall be classified in Category 2 for reproductive toxicity when there is some evidence from humans or experimental animals, possibly supplemented with other information, of an adverse effect on sexual function and fertility, or on development, in the absence of other toxic effects, or if occurring together with other toxic effects the adverse effect on reproduction is considered not to be a secondary non-specific consequence of the other toxic effects, and where the evidence is not sufficiently convincing to place the substance in Category 1. For instance, deficiencies in the study may make the quality of evidence less convincing, and in view of this, Category 2 would be the more appropriate classification.

### Figure A.7.1(b): Hazard category for effects on or via lactation

<b>EFFECTS ON OR VIA LACTATION</b>
<p><b>Effects on or via lactation</b> shall be classified in a separate single category. Chemicals that are absorbed by women and have been shown to interfere with lactation or that may be present (including metabolites) in breast milk in amounts sufficient to cause concern for the health of a breastfed child, shall be classified to indicate this property. Classification for effects via lactation shall be assigned on the basis of:</p> <ul style="list-style-type: none"><li>(a) Absorption, metabolism, distribution and excretion studies that indicate the likelihood the substance would be present in potentially toxic levels in breast milk; and/or</li><li>(b) results of one or two generation studies in animals which provide clear evidence of adverse effect in the offspring due to transfer in the milk or adverse effect on the quality of the milk; and/or</li><li>(c) human evidence indicating a hazard to babies during the lactation period.</li></ul>

\* \* \* \*

### Figure A.8.1: Hazard categories for specific target organ toxicity following single exposure

**CATEGORY 1:** Substances that have produced significant toxicity in humans, or that, on the basis of evidence from studies in experimental animals can be presumed to have the potential to produce significant toxicity in humans following single exposure

Substances are classified in Category 1 for STOT-SE on the basis of:

- (a) Reliable and good quality evidence from human cases or epidemiological studies; or
- (b) observations from appropriate studies in experimental animals in which significant and/or severe toxic effects of relevance to human health were produced at generally low exposure concentrations. Guidance dose/concentration values are provided below (See A.8.2.1.9) to be used as part of weight-of-evidence evaluation.

**CATEGORY 2:** Substances that, on the basis of evidence from studies in experimental animals, can be presumed to have the potential to be harmful to human health following single exposure

Substances are classified in Category 2 for STOT-SE on the basis of observations from appropriate studies in experimental animals in which significant toxic effects, of relevance to human health, were produced at generally moderate exposure concentrations. Guidance dose/concentration values are provided below (See A.8.2.1.9) in order to help in classification.

In exceptional cases, human evidence can also be used to place a substance in Category 2 (See A.8.2.1.6).

**CATEGORY 3:** Transient target organ effects

There are target organ effects for which a substance does not meet the criteria to be classified in Categories 1 or 2 indicated above. These are effects which adversely alter human function for a short duration after exposure and from which humans may recover in a reasonable period without leaving significant alteration of structure or function. This category only includes narcotic effects and respiratory tract irritation. Substances are classified specifically for these effects as discussed in A.8.2.2.

*Note:* The primary target organ/system shall be identified where possible, and where this is not possible, the substance shall be identified as a general toxicant. The data shall be evaluated and, where possible, shall not include secondary effects (e.g., a hepatotoxicant can produce secondary effects in the nervous or gastro-intestinal systems).

\* \* \* \* \*

**Table A.10.1: Criteria for aspiration toxicity**

Category	Criteria
<b>Category 1:</b> Chemicals known to cause human aspiration toxicity hazards or to be regarded as if they cause human aspiration toxicity hazard	<p>A substance shall be classified in Category 1:</p> <ul style="list-style-type: none"> <li>(a) If reliable and good quality human evidence indicates that it causes aspiration toxicity (See note); or</li> <li>(b) If it is a hydrocarbon and has a kinematic viscosity <math>\leq 20.5 \text{ mm}^2/\text{s}</math>, measured at <math>40^\circ \text{ C}</math>.</li> </ul>

*Note:* Examples of substances included in Category 1 are certain hydrocarbons, turpentine and pine oil.

\* \* \* \* \*

## Appendix B to §1910.1200 – Physical Hazard Criteria (Mandatory)

\* \* \* \* \*

**Table B.2.1: Criteria for flammable gases**

Category	Criteria
----------	----------

	Flammable gas	Gases, which at 20 °C (68 °F) and a standard pressure of 101.3 kPa (14.7 psi): (a) are ignitable when in a mixture of 13% or less by volume in air; or (b) have a flammable range with air of at least 12 percentage points regardless of the lower flammability limit, unless data show they meet the criteria for Category 1B.
1A	Pyrophoric gas	Flammable gases that ignite spontaneously in air at a temperature of 54 °C (130 °F) or below.
Chemically unstable gas	A	Flammable gases which are chemically unstable at 20 °C (68 °F) and a standard pressure of 101.3 kPa (14.7 psi).
	B	Flammable gases which are chemically unstable at a temperature greater than 20 °C (68 °F) and/or a pressure greater than 101.3 kPa (14.7 psi).
1B	Flammable gas	Gases which meet the flammability criteria for Category 1A, but which are not pyrophoric, nor chemically unstable, and which have at least either: (a) a lower flammability limit of more than 6% by volume in air; or (b) a fundamental burning velocity of less than 10 cm/s.
2	Flammable gas	Gases, other than those of Category 1A or 1B, which, at 20 °C (68 °F) and a standard pressure of 101.3 kPa (14.7 psi), have a flammable range while mixed in air.

NOTE 1: *Aerosols and chemicals under pressure should not be classified as flammable gases. See B.3.*

NOTE 2: *In the absence of data allowing classification into Category 1B, a flammable gas that meets the criteria for Category 1A shall be classified by default in Category 1A.*

NOTE 3: *Spontaneous ignition for pyrophoric gases is not always immediate, and there may be a delay.*

NOTE 4: *In the absence of data on its pyrophoricity, a flammable gas mixture shall be classified as a pyrophoric gas if it contains more than 1% (by volume) of pyrophoric component(s).*

\* \* \* \* \*

**Table B.3.1: Criteria for aerosols**

Category	Criteria
1	Contains $\geq 85\%$ flammable components and the chemical heat of combustion is $\geq 30 \text{ kJ/g}$ ; or For spray aerosols, in the ignition distance test, ignition occurs at a distance $\geq 75 \text{ cm}$ (29.5 in), or For foam aerosols, in the aerosol foam flammability test The flame height is $\geq 20 \text{ cm}$ (7.87 in) and the flame duration $\geq 2 \text{ s}$ ; or The flame height is $\geq 4 \text{ cm}$ (1.57 in) and the flame duration $\geq 7 \text{ s}$
2	Contains $> 1\%$ flammable components, or the heat of combustion is $\geq 20 \text{ kJ/g}$ ; and for spray aerosols, in the ignition distance test, ignition occurs at a distance $\geq 15 \text{ cm}$ (5.9 in), or in the enclosed space ignition test, the Time equivalent is $\leq 300 \text{ s/m}^3$ ; or Deflagration density is $\leq 300 \text{ g/m}^3$ For foam aerosols, in the aerosol foam flammability test, the flame height is $\geq 4 \text{ cm}$ and the flame duration is $\geq 2 \text{ s}$ and it does not meet the criteria for Category 1
3	The chemical does not meet the criteria for Categories 1 and 2; or The chemical contains $\leq 1\%$ flammable components (by mass) and has a heat of combustion $< 20 \text{ kJ/g}$ .

NOTE 1: Flammable components do not include pyrophoric, self-heating or water-reactive chemicals.

NOTE 2: Aerosols do not fall additionally within the scope of B.2 (flammable gases), B.3.2 (chemicals under pressure), B.5 (gases under pressure), B.6 (flammable liquids), or B.7 (flammable solids). However, depending on their contents, aerosols may fall within the scope of other hazard classes, including their labeling elements.

*NOTE 3: Aerosols containing more than 1% flammable components or with a heat of combustion of at least 20 kJ/g, which are not submitted to the flammability classification procedures in this Appendix shall be classified as Category 1.*

\* \* \* \* \*

**Table B.3.2: Criteria for chemicals under pressure**

Category	Criteria
<b>1</b>	Any chemical under pressure that: (a) contains $\geq 85\%$ flammable components (by mass); and (b) has a heat of combustion of $\geq 20\text{ kJ/g}$ .
<b>2</b>	Any chemical under pressure that: (a) contains $> 1\%$ flammable components (by mass); and (b) has a heat of combustion $< 20\text{ kJ/g}$ ; or that: (a) contains $< 85\%$ flammable components (by mass); and (b) has a heat of combustion $\geq 20\text{ kJ/g}$ .
<b>3</b>	Any chemical under pressure that: (a) contains $\leq 1\%$ flammable components (by mass); and (b) has a heat of combustion of $< 20\text{ kJ/g}$ .

*Note 1: The flammable components in a chemical under pressure do not include pyrophoric, self-heating or water-reactive, substances and mixtures because such components are not allowed in chemicals under pressure in accordance with the UN Model Regulations.*

*Note 2: Chemicals under pressure do not fall additionally within the scope of B.2 (flammable gases), B.3.1 (aerosols), B.5 (gases under pressure), B.6 (flammable liquids) and B.7 (flammable solids). Depending on their contents, chemicals under pressure may however fall within the scope of other hazard classes, including their labeling elements.*

\* \* \* \* \*

B.3.3.3 The chemical heats of combustion shall be found in literature, calculated or determined by tests: (see ASTM D 240-02; Sections 86.1 to 86.3 of ISO 13943; and NFPA 30B (incorporated by reference, see § 1910.6)).

\* \* \* \* \*

**Table B.5.1: Criteria for gases under pressure**

Group	Criteria
Compressed gas	A gas which when under pressure is entirely gaseous at -50°C (-58°F), including all gases with a critical temperature <sup>1</sup> ≤ -50°C (-58°F).
Liquefied gas	A gas which when under pressure, is partially liquid at temperatures above -50°C (-58°F). A distinction is made between: (a) High pressure liquefied gas: a gas with a critical temperature <sup>1</sup> between -50°C (-58°F) and +65°C (149°F); and (b) Low pressure liquefied gas: a gas with a critical temperature <sup>1</sup> above +65°C (149°F).
Refrigerated liquefied gas	A gas which is made partially liquid because of its low temperature.
Dissolved gas	A gas which when under pressure is dissolved in a liquid phase solvent.

*(1) The critical temperature is the temperature above which a pure gas cannot be liquefied, regardless of the degree of compression.*

*Note: Aerosols and chemicals under pressure should not be classified as gases under pressure. See Appendix B.3 of this section.*

\* \* \* \* \*

**Table B.6.1: Criteria for flammable liquids**

Category	Criteria
1	Flash point < 23°C (73.4°F) and initial boiling point ≤ 35°C (95°F)
2	Flash point < 23°C (73.4°F) and initial boiling point > 35°C (95°F)
3	Flash point ≥ 23°C (73.4°F) and ≤ 60°C (140°F)
4	Flash point > 60°C (140°F) and ≤ 93°C (199.4°F)

*NOTE: Aerosols and chemicals under pressure should not be classified as flammable liquids. See Appendix B.3 of this section.*

\* \* \* \* \*

**Table B.7.1: Criteria for flammable solids**

Category	Criteria
1	Burning rate test: Chemicals other than metal powders: a) Wetted zone does not stop fire; and b) Burning time < 45 s or burning rate > 2.2 mm/s  Metal powders: burning time ≤ 5 min
2	Burning rate test: Chemicals other than metal powders: a) Wetted zone stops the fire for at least 4 min; and b) Burning time < 45 s or burning rate > 2.2 mm/s Metal powders: burning time > 5 min and ≤ 10 min

*NOTE 1: Classification of solid chemicals shall be based on tests performed on the chemical as presented. If, for example, for the purposes of supply or transport, the same chemical is to be presented in a physical form different from that which was tested and which is considered likely to materially alter its performance in a classification test, classification must be based on testing of the chemical in the new form.*

*NOTE 2: Aerosols and chemicals under pressure should not be classified as flammable solids. See Appendix B.3.*

\* \* \* \* \*

**APPENDIX C TO §1910.1200 – ALLOCATION OF LABEL  
ELEMENTS**

(Mandatory)

\* \* \* \* \*

**Figure C.1 – Hazard Symbols and Classes**

Flame	Flame Over Circle	Exclamation Mark	Exploding Bomb
 <p>Flammables Self Reactives Pyrophorics Self-heating Emits Flammable Gas Organic Peroxides Desensitized Explosives</p>	 <p>Oxidizers</p>	 <p>Irritant Dermal Sensitizer Acute Toxicity(harmful) Narcotic Effects Respiratory Tract Irritation HNOC (non-mandatory)</p>	 <p>Explosives Self Reactives Organic Peroxides</p>
<p>Corrosion</p>  <p>Corrosives</p>	 <p>Gases Under Pressure Chemicals Under Pressure</p>	 <p>Health Hazard</p> <p>Carcinogen Respiratory Sensitizer Reproductive Toxicity Target Organ Toxicity Mutagenicity Aspiration Toxicity</p>	 <p>Skull and Crossbones</p> <p>Acute Toxicity (severe)</p>

\* \* \* \* \*

C.2.4.6 Precautionary statements may be combined or consolidated to save label space and improve readability. For example, “Keep cool” and “Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.” can be combined to read “Keep cool and away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.”

\* \* \* \* \*

**C.4.10 REPRODUCTIVE TOXICITY**  
**(Classified in Accordance with Appendix A.7 of this section)**

**Pictogram**  
 Health hazard



Hazard category	Signal word	Hazard statement
1A and 1B	Danger	May damage fertility or the unborn child <...> <<...>>
2	Warning	Suspected of damaging fertility or the unborn child <...> <<...>> <i>&lt; &gt; (state specific effect if known)</i> <i>&lt;&lt;...&gt;&gt; (state route of exposure if no other routes of exposure cause the hazard)</i>

Precautionary statements			
Prevention	Response	Storage	Disposal
<b>Obtain special instructions before use.</b>	<b>If exposed or concerned: Get medical advice/attention.</b>	Store locked up.	<b>Dispose of contents/container to...</b> ... in accordance with local/regional/national/international regulations (to be specified).
<b>Do not handle until all safety precautions have been read and understood.</b>	Chemical manufacturer, importer, or distributor to select medical advice or attention as appropriate.		Chemical manufacturer, importer, or distributor to specify whether disposal requirements apply to contents, container, or both.
<b>Wear protective gloves/protective clothing/eye protection/face protection/ ...</b>			
Chemical manufacturer, importer, or distributor to specify the appropriate personal protective equipment.			

**C.4.10 REPRODUCTIVE TOXICITY (CONTINUED)**  
(Classified in Accordance with Appendix A.7 of this section)  
(EFFECTS ON OR VIA LACTATION)

**Pictogram**  
*No Pictogram*

Hazard category	Signal word	Hazard statement
<i>No designated number</i>	<i>No signal word</i>	May cause harm to breast-fed children

(See Table A.7.1 in Appendix A.7)

Precautionary statements			
Prevention	Response	Storage	Disposal
<b>Obtain special instructions before use.</b> <b>Do not breathe dusts or mists.</b> - <i>if inhalable particles of dusts or mists may occur during use.</i> <b>Avoid contact during pregnancy and while nursing.</b> <b>Wash ... thoroughly after handling.</b> ... Chemical manufacturer, importer, or distributor to specify parts of the body to be washed after handling. <b>Do not eat, drink or smoke when using this product.</b>	<b>If exposed or concerned: Get medical advice/attention.</b>  Chemical manufacturer, importer, or distributor to select medical advice or attention as appropriate.		

\* \* \* \*

**C.4.14 EXPLOSIVES**  
**(Classified in Accordance with Appendix B.1 of this section)**

Hazard category	Signal word	Hazard statement
Unstable explosive	Danger	Unstable explosive

**Pictogram**  
Exploding bomb



Precautionary statements			
Prevention	Response	Storage	Disposal
<p><b>Obtain special instructions before use.</b></p> <p><b>Do not subject to grinding/shock/friction/...</b>  <i>– if the explosive is mechanically sensitive.</i></p> <p>...Chemical manufacturer, importer, or distributor to specify applicable rough handling.</p> <p><b>Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...</b>  Chemical manufacturer, importer, or distributor to specify the appropriate personal protective equipment.</p>	<p><b>In case of fire: Explosion risk. Evacuate area.</b></p> <p><b>DO NOT fight fire when fire reaches explosives.</b></p>	<p><b>Store in accordance with...</b></p> <p>...Chemical manufacturer, importer, or distributor to specify local/regional/ national/international regulations as applicable.</p>	<p><b>Refer to manufacturer, importer, or distributor... for information on disposal, recovery, or recycling.</b></p> <p>... Manufacturer, importer, or distributor to specify appropriate source of information, in accordance with local/regional/national/ international regulations as applicable.</p>

**C.4.14 EXPLOSIVES (CONTINUED)**  
**(Classified in Accordance with Appendix B.1 of this section)**

Hazard category	Signal word	Hazard statement	Pictogram Exploding bomb
Division 1.1	Danger	Explosive; mass explosion hazard	
Division 1.2	Danger	Explosive; severe projection hazard	
Division 1.3	Danger	Explosive; fire, blast or projection	
Precautionary statements			
Prevention	Response	Storage	Disposal
<b>Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.</b>	<b>In case of fire:</b> Explosion risk. Evacuate area.	<b>Store</b> in accordance with... ... Chemical manufacturer, importer, or distributor to specify local/regional/national/international regulations as applicable.	Refer to manufacturer, importer, or distributor...for information on disposal, recovery, or recycling.
<b>Keep wetted with...</b>  <i>for substances and mixtures which are wetted, diluted, dissolved or suspended with aphlegmatizer in order to reduce or suppress their explosive properties (desensitized explosives).</i>	<b>DO NOT fight fire when fire reaches explosives.</b>		... Manufacturer, importer, or distributor to specify appropriate source of information, in accordance with local/regional/national/international regulations as applicable.
<b>Keep only in original packaging.</b>			
<b>Ground and bond container and receiving equipment.</b> <i>if the explosive is electrostatically sensitive.</i>			
<b>Do not subject to grinding/shock.../friction.</b> <i>if the explosive is mechanically sensitive.</i> ...Chemical manufacturer, importer, or distributor to specify applicable rough handling.			
<b>Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/....</b> Chemical manufacturer, importer, or distributor to specify the appropriate personal protective equipment.			

*Note: Unpackaged explosives or explosives repacked in packagings other than the original or similar packaging shall have the label elements assigned to Division 1.1 unless the hazard is shown to correspond to one of the hazard categories in Appendix B.1 of this section, in which case the corresponding symbol, signal word and/or the hazard statement shall be assigned.*

**C.4.14 EXPLOSIVES (CONTINUED)**  
**(Classified in Accordance with Appendix B.1 of this section)**

Pictogram  
Exploding bomb<sup>1</sup>



Hazard category	Signal word	Hazard statement
Division 1.4	Warning	Fire or projection hazard

Precautionary statements <sup>1</sup>			
Prevention	Response	Storage	Disposal
<b>Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.</b>	<b>In case of fire: Explosion risk. Evacuate area. Do NOT fight fire when fire reaches explosives.</b> - except for explosives of division 1.4 (compatibility group S) in transport packaging.	<b>Store in accordance with...</b> ...Chemical manufacturer, importer, or distributor to specify local/regional/national/international regulations as applicable.	<b>Refer to manufacturer, importer, or distributor... for information on disposal, recovery, or recycling.</b>
<b>Keep only in original packaging.</b>	<b>In case of fire: Evacuate area. Fight fire remotely due to the risk of explosion.</b>		... Manufacturer, importer, or distributor to specify appropriate source of information, in accordance with local/regional/national/international regulations as applicable.
<b>Ground and bond container and receiving equipment.</b> - if the explosive is electrostatically sensitive.	<b>- for explosives of division 1.4 (compatibility group S) in transport packaging.</b>		
<b>Do not subject to grinding/shock/.../friction.</b> - if the explosive is mechanically sensitive.			
...Chemical manufacturer, importer, or distributor to specify applicable roughhandling.			
<b>Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...</b>			
Chemical manufacturer, importer, or distributor to specify the appropriate personal protective equipment.			

*Note: Unpackaged explosives or explosives repacked in packagings other than the original or similar packaging shall have the label elements assigned to Division 1.1 unless the hazard is shown to correspond to one of the hazard categories in Appendix B.1 of this section, in which case the corresponding symbol, signal word and/or the hazard statement shall be assigned.<sup>1</sup>*

<sup>1</sup> Except no pictogram is required for explosives that are 1.4S small arms ammunition and components thereof. Labels for 1.4S small arms ammunition and components shall include appropriate precautionary statements.

**C.4.14 EXPLOSIVES (CONTINUED)**  
**(Classified in Accordance with Appendix B.1 of this section)**

**Pictogram**  
 No Pictogram

Hazard category	Signal word	Hazard statement
Division 1.5	Danger	May mass explode in fire

Precautionary statements			
Prevention	Response	Storage	Disposal
<b>Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. - No smoking.</b> <b>Keep wetted with...</b> <i>-for substances and mixtures which are wetted, diluted, dissolved or suspended with a phlegmatizer in order to reduce or suppress their explosive properties (desensitized explosives).</i> ... Chemical manufacturer, importer, or distributor to specify appropriate material.	<b>In case of fire: Explosion risk. Evacuate area.</b> <b>DO NOT fight fire when fire reaches explosives.</b>	<b>Store in accordance with...</b> ... Chemical manufacturer, importer, or distributor to specify local/regional/national/international regulations as applicable.	<b>Refer to manufacturer, importer, or distributor... for information on disposal, recovery, or recycling.</b> ... Manufacturer, distributor, or importer to specify appropriate source of information, in accordance with local/regional/national/international regulations as applicable
<b>Keep only in original packaging.</b> <b>Ground and bond container and receiving equipment.</b> <i>if the explosive is electrostatically sensitive.</i>			
<b>Do not subject to grinding/shock/.../friction.</b> <i>-if the explosive is mechanically sensitive.</i> ... Chemical manufacturer, importer, or distributor to specify applicable rough handling.			
<b>Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...</b> Chemical manufacturer, importer, or distributor to specify the appropriate personal protective equipment.			

*Note: Unpackaged explosives or explosives repacked in packagings other than the original or similar packaging shall have the label elements assigned to Division 1.1 unless the hazard is shown to correspond to one of the hazard categories in Appendix B.1 of this section, in which case the corresponding symbol, signal word and/or the hazard statement shall be assigned.*

**C.4.14 EXPLOSIVES (CONTINUED)**  
**(Classified in Accordance with Appendix B.1 of this section)**

**Pictogram**  
 No Pictogram

Hazard category	Signal word	Hazard statement
Division 1.6	No signal word	No hazard statement

Precautionary statements			
Prevention	Response	Storage	Disposal
None assigned	None assigned	None assigned	None assigned

*Note: Unpackaged explosives or explosives repacked in packagings other than the original or similar packaging shall have the label elements assigned to Division 1.1 unless the hazard is shown to correspond to one of the hazard categories in Appendix B.1 of this section, in which case the corresponding symbol, signal word and/or the hazard statement shall be assigned.*

\* \* \* \* \*

**C.4.16 AEROSOLS**  
**(Classified in Accordance with Appendix B.3 of this section)**

**Pictogram**  
 Flame



Hazard category	Signal word	Hazard statement
1	Danger	Extremely flammable aerosol Pressurized container: may burst if heated.
2	Warning	Flammable aerosol Pressurized container: may burst if heated.

Precautionary statements			
Prevention	Response	Storage	Disposal
<p>Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.</p> <p>Do not spray on an open flame or other ignition source.</p> <p>Do not pierce or burn, even after use.</p>		<p>Protect from sunlight. Do not expose to temperatures exceeding 122 °F (50 °C).</p>	

**C.4.16 AEROSOLS**  
**(Classified in Accordance with Appendix B.3.1 of this section)**

Hazard category	Signal word	Hazard statement	Pictogram <i>No symbol</i>
3	Warning	Pressurized container: may burst if heated.	

Precautionary statements			
Prevention	Response	Storage	Disposal
Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.  Do not pierce or burn, even after use.		Protect from sunlight. Do not expose to temperatures exceeding 122°F (50 °C).	

**C.4.16 CHEMICAL UNDER PRESSURE**  
**(Classified in Accordance with Appendix B.3.2 of this section)**

			<b>Pictogram</b> Gas cylinder Flame
<b>Hazard category</b>	<b>Signal word</b>	<b>Hazard statement</b>	
1	Danger	Extremely flammable chemical under pressure May explode if heated.	 
2	Warning	Flammable chemical under pressure May explode if heated.	
<b>Precautionary statements</b>			
Prevention	Response	Storage	Disposal
<b>Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.</b>  <b>Do not spray on an open flame or other ignition source.</b>	<b>In case of leakage, eliminate all ignition sources.</b>  <b>Stop leak if safe to do so.</b>  <b>In case of fire: Use ... to extinguish.”</b> <i>-if water increases risk.</i>  ... Chemical manufacturer, importer, or distributor to specify appropriate media.	<b>Protect from sunlight. Store in a well-ventilated place.</b>	

**C.4.16 CHEMICAL UNDER PRESSURE**  
**(Classified in Accordance with Appendix B.3 of this section)**

**Pictogram**  
 Gas cylinder



Hazard category	Signal word	Hazard statement
3	Warning	Chemical under pressure: may explode if heated.

Precautionary statements			
Prevention	Response	Storage	Disposal
<b>Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.</b>	Stop leak if safe to do so.	<b>Protect from sunlight. Store in a well-ventilated place.</b>	

\* \* \* \* \*

**C.4.19 FLAMMABLE LIQUIDS**  
(Classified in Accordance with Appendix B.6 of this section)

Pictogram  
Flame



Hazard category	Signal word	Hazard statement
1	Danger	Extremely flammable liquid and vapor
2	Danger	Highly flammable liquid and vapor
3	Warning	Flammable liquid and vapor

Precautionary statements			
Prevention	Response	Storage	Disposal
<p><b>Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.</b></p> <p><b>Keep container tightly closed.</b> - if the liquid is volatile and may generate an explosive atmosphere.</p> <p><b>Ground and bond container and receiving equipment.</b> - if the liquid is volatile and may generate an explosive atmosphere.</p> <p><b>Use explosion-proof [electrical/ventilating/lighting/.../] equipment.</b> - if the liquid is volatile and may generate an explosive atmosphere - text in square brackets may be used to specify specific electrical,</p>	<p><b>If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].</b> - text in square brackets to be included where the chemical manufacturer, importer, or distributor considers it appropriate for the specific chemical.</p> <p><b>In case of fire: Use ... to extinguish.</b> - if water increases risk. ... Chemical manufacturer, importer, or distributor to specify appropriate</p>	<p><b>Store in a well-ventilated place. Keep cool.</b> - for flammable liquids Category 1 and other flammable liquids that are volatile and may generate an explosive atmosphere.</p>	<p><b>Dispose of contents/container to...</b> ... in accordance with local/regional/national/international regulations (to be specified).</p> <p>Chemical manufacturer, importer, or distributor to specify whether disposal requirements apply to contents, container, or both.</p>

<p>ventilating, lighting, or other equipment if necessary and as appropriate. Chemical manufacturer, importer, or distributor to specify other equipment.</p> <p><b>Use non-sparking tools.</b> - if the liquid is volatile and may generate an explosive atmosphere and if the minimum ignition energy is very low. (This applies to substances and mixtures where the minimum ignition energy is &lt;0.1mJ, e.g., carbon disulfide).</p> <p><b>Take action to prevent static discharge.</b> - if the liquid is volatile and may generate an explosive atmosphere.</p> <p><b>Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...</b> Chemical manufacturer, importer, or distributor to specify the appropriate personal protective equipment.</p>	media.		
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**C.4.19 FLAMMABLE LIQUIDS (CONTINUED)**  
**(Classified in Accordance with Appendix B.6 of this section)**

**Pictogram**  
No Pictogram

Hazard category	Signal word	Hazard statement	
4	Warning	Combustible liquid	
Precautionary statements			
Prevention	Response	Storage	Disposal
Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. -No smoking.	<b>In case of fire:</b> Use ... to extinguish. - if water increases risk.  ... Chemical manufacturer, importer, or distributor to specify appropriate media.	Store in a well-ventilated place. - for flammable liquids Category 1 and other flammable liquids that are volatile and may generate an explosive atmosphere.	Dispose of contents/container to... in accordance with local/regional/national/international regulations (to be specified).  Chemical manufacturer, importer, or distributor to specify whether disposal requirements apply to contents, container or both.
Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...  Chemical manufacturer, importer, or distributor to specify the appropriate personal protective equipment.			

**C.4.20 FLAMMABLE SOLIDS**  
**(Classified in Accordance with Appendix B.7 of this section)**

<b>Pictogram</b>
Flame



Hazard category	Signal word	Hazard statement
1	Danger	Flammable solid
2	Warning	Flammable solid

Precautionary statements			
Prevention	Response	Storage	Disposal
<p><b>Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. –No smoking.</b></p> <p><b>Ground and bond container and receiving equipment.</b>  <i>- if the solid is electrostatically sensitive.</i></p> <p><b>Use explosion-proof [electrical/ventilating/ lighting/...] equipment.</b>  <i>if dust clouds can occur.</i>  <i>- text in square brackets may be used to specify specific electrical, ventilating, lighting or other equipment if necessary and as appropriate.</i></p> <p><b>Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...</b></p> <p>Chemical manufacturer, importer, or distributor to specify the appropriate personal protective equipment.</p>	<p><b>In case of fire: Use ... to extinguish</b>  <i>-if water increases risk.</i></p> <p>... Chemical manufacturer, importer, or distributor to specify appropriate media.</p>		

**C.4.21 SELF-REACTIVE SUBSTANCES AND MIXTURES**  
**(Classified in Accordance with Appendix B.8 of this section)**

<b>Pictogram</b> Exploding bomb
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<b>Hazard category</b>	<b>Signal word</b>	<b>Hazard statement</b>
Type A	Danger	Heating may cause an explosion



Precautionary statements			
Prevention	Response	Storage	Disposal
<p><b>Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. -No smoking.</b></p> <p><b>Keep only in original packaging.</b></p> <p><b>Keep cool.</b>  <i>- may be omitted if storage temperatures are listed on the label.</i></p> <p><b>Ground and bond container and receiving equipment.</b>  <i>- if electrostatically sensitive and able to generate an explosive atmosphere.</i></p> <p><b>Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...</b>            Chemical manufacturer, importer, or distributor to specify the appropriate personal protective equipment.</p>	<p><b>In case of fire: Explosion risk. Evacuate area. DO NOT fight fire when fire reaches explosives.</b></p>	<p><b>Store in a well-ventilated place.</b>  <i>- except for temperature controlled self-reactive substances and mixtures or organic peroxides because condensation and consequent freezing may take place.</i></p> <p><b>Store at temperatures not exceeding ...°F (°C).</b>  <i>... Chemical manufacturer, importer, or distributor to specify temperature using applicable temperature scale.            - if temperature control is required (see Appendix B.2.3) or if otherwise deemed necessary.</i></p> <p><b>Store separately.</b></p>	<p><b>Dispose of contents/containerto...</b>  <i>... in accordance with local/regional/national/international regulations (to be specified). Chemical manufacturer, importer, or distributor to specify whether disposal requirements apply to contents, container, or both.</i></p>

**C.4.21 SELF-REACTIVE SUBSTANCES AND MIXTURES (CONTINUED)**  
 (Classified in Accordance with Appendix B.8 of this section)

**Pictogram**  
 Exploding bomb and flame



Hazard category	Signal word	Hazard statement
Type B	Danger	Heating may cause a fire or explosion

Precautionary statements			
Prevention	Response	Storage	Disposal
<b>Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.</b>  <b>Keep only in original packaging.</b>  <b>Keep cool.</b> <i>- may be omitted if storage temperatures are listed on the label.</i>  <b>Ground and bond container and receiving equipment.</b> <i>- if electrostatically sensitive and able to generate an explosive atmosphere.</i> <b>Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...</b> Chemical manufacturer, importer, or distributor to specify the appropriate personal protective equipment.	<b>In case of fire: Evacuate area. Fight fire remotely due to the risk of explosion. [Use ... to extinguish].</b> <i>text in square brackets to be included if water increases risk.</i> ... Chemical manufacturer, importer, or distributor to specify appropriate media.	<b>Store in a well-ventilated place.</b> <i>- except for temperature controlled self-reactive substances and mixtures or organic peroxides because condensation and consequent freezing may take place.</i>  <b>Store at temperatures not exceeding ...°F (°C).</b> <i>- if temperature control is required (see Appendix B.2.3) or if otherwise deemed necessary.</i>  ... Chemical manufacturer, importer, or distributor to specify temperature using applicable temperature scale.	<b>Dispose of contents/container to...</b> <i>...in accordance with local/regional/national/international regulations (to be specified).</i>  Chemical manufacturer, importer, or distributor to specify whether disposal requirements apply to contents, container, or both.
		<b>Store separately.</b>	

**C.4.21 SELF-REACTIVE SUBSTANCES AND MIXTURES(CONTINUED)**  
**(Classified in Accordance with Appendix B.8 of this section)**

Hazard category	Signal word	Hazard statement	Pictogram Flame
Type C	Danger	Heating may cause a fire	
Type D	Danger	Heating may cause a fire	
Type E	Warning	Heating may cause a fire	
Type F	Warning	Heating may cause a fire	

Precautionary statements			
Prevention	Response	Storage	Disposal
<b>Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. - No smoking.</b>	<b>In case of fire: Use ... to extinguish -if water increases risk.</b> ... Chemical manufacturer, importer, or distributor to specify appropriate media.	<b>Store in a well-ventilated place.</b> <i>except for temperature controlled self-reactive substances and mixtures or organic peroxides because condensation and consequent freezing may take place.</i>	<b>Dispose of contents/container to...</b> ... in accordance with local/regional/national/international regulations (to be specified). Chemical manufacturer, importer, or distributor to specify whether disposal requirements apply to contents, container or both.
<b>Keep only in original packaging.</b>			
<b>Keep cool.</b> - may be omitted if storage temperatures are listed on the label.		<b>Store at temperatures not exceeding ...°F (°C).</b> - if temperature control is required (see Appendix B.2.3) or if otherwise deemed necessary. ... Chemical manufacturer, importer, or distributor to specify temperature using applicable temperature scale.	
<b>Ground and bond container and receiving equipment.</b> - if electrostatically sensitive and able to generate an explosive atmosphere.		<b>Store separately.</b>	
<b>Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...</b> Chemical manufacturer, importer, or distributor to specify the appropriate personal protective equipment.			

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**C.4.24 SELF-HEATING SUBSTANCES AND MIXTURES**  
**(Classified in Accordance with Appendix B.11 of this section)**

**Pictogram**  
 Flame



Hazard category	Signal word	Hazard statement
1	Danger	Self-heating; may catch fire
2	Warning	Self-heating in large quantities; may catch fire

Precautionary statements			
Prevention	Response	Storage	Disposal
<p><b>Keep cool.</b>  <i>- may be omitted if storage temperatures are listed on the label.</i></p> <p><b>Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...</b></p> <p>Chemical manufacturer, importer, or distributor to specify the appropriate personal protective equipment.</p>		<p><b>Maintain air gap between stacks or pallets.</b></p> <p><b>Protect from sunlight.</b></p> <p><b>Store bulk masses greater than ... kg/...lbs at temperatures not exceeding ...°F (°C).</b>  ... Chemical manufacturer, importer, or distributor to specify mass and temperature using applicable scale.</p> <p><b>Store separately.</b></p>	

\* \* \* \* \*

**C.4.30 DESENSITIZED EXPLOSIVES**  
**(Classified in Accordance with Appendix B.17 of this section)**

**Pictogram**  
 Flame



Hazard category	Signal word	Hazard statement
1	Danger	Fire, blast or projection hazard; increased risk of explosion if desensitizing agent is reduced.
2	Danger	Fire or projection hazard; increased risk of explosion if desensitizing agent is reduced.
3	Warning	Fire or projection hazard; increased risk of explosion if desensitizing agent is reduced.

Precautionary statements			
Prevention	Response	Storage	Disposal
<p><b>Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.</b></p> <p><b>Avoid heating under confinement or reduction of the desensitizing agent.</b></p> <p><b>Keep wetted with...</b> ...Chemical manufacturer, importer or distributor to specify appropriate material.</p> <p><b>Keep container tightly closed.</b></p> <p><b>Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...</b> Chemical manufacturer, importer or distributor to specify the appropriate personal protective equipment.</p>	<p><b>In case of fire: Evacuate area. Fight fire remotely due to the risk of explosion.</b></p>	<p><b>Store in accordance with...</b> ... Chemical manufacturer, importer, or distributor to specify local/regional/national/ international regulations as applicable.</p>	<p><b>Dispose of contents/container to...</b> ...in accordance with local/regional/national/ international regulations (to be specified). Chemical manufacturer, importer, or distributor to specify whether disposal requirements apply to contents, container or both.</p>

**C.4.30 DESENSITIZED EXPLOSIVES**  
**(Classified in Accordance with Appendix B.17 of this section)**

<b>Pictogram</b>
Flame

<b>Hazard category</b>	<b>Signal word</b>	<b>Hazard Statement</b>
4	Warning	Fire hazard; increased risk of explosion if desensitizing agent is reduced.



Precautionary Statements			
<b>Prevention</b>	<b>Response</b>	<b>Storage</b>	<b>Disposal</b>
<p><b>Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.</b></p> <p><b>Avoid heating under confinement or reduction of the desensitizing agent.</b></p> <p><b>Keep wetted with...</b> ... Chemical manufacturer, importer, or distributor to specify appropriate material.</p> <p><b>Keep container tightly closed.</b></p> <p><b>Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/....</b> Chemical manufacturer, importer, or distributor to specify the appropriate personal protective equipment.</p>	<p><b>In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion.</b></p>	<p><b>Store in accordance with...</b> ... Chemical manufacturer, importer, or distributor to specify local/regional/national/international regulations as applicable.</p>	<p><b>Dispose of contents/container to...</b> ...in accordance with local/regional/national/international regulations (to be specified).</p> <p>Chemical manufacturer, importer, or distributor to specify whether disposal requirements apply to contents, container, or both.</p>

\* \* \* \* \*

## Appendix D to §1910.1200 Safety Data Sheet (Mandatory)

A safety data sheet (SDS) shall include the information specified in Table D.1 under the section number and heading indicated for sections 1-11 and 16. While each section of the SDS must contain all of the specified information, preparers of safety data sheets are not required to present the information in any particular order within each section. If no relevant information is found for any given subheading within a section, the SDS shall clearly indicate that no applicable information is available. Sections 12-15 may be included in the SDS, but are not mandatory.

**Table D.1. Minimum Information for an SDS**

	<b>Headings</b>	<b>Subheadings</b>
<b>1.</b>	<b>Identification</b>	<ul style="list-style-type: none"> <li>(a) Product identifier used on the label;</li> <li>(b) Other means of identification;</li> <li>(c) Recommended use of the chemical and restrictions on use;</li> <li>(d) Name, U.S. address, and U.S. telephone number of the chemical manufacturer, importer, or other responsible party;</li> <li>(e) Emergency phone number.</li> </ul>
<b>2.</b>	<b>Hazard identification</b>	<ul style="list-style-type: none"> <li>(a) Classification of the chemical in accordance with paragraph (d)(1) of §1910.1200, except for classification under paragraph (d)(1)(ii).</li> <li>(b) Signal word, hazard statement(s), symbol(s) and precautionary statement(s) in accordance with paragraph (f) of §1910.1200. (Hazard symbols may be provided as graphical reproductions in black and white or the name of the symbol, e.g., flame, skull and crossbones);</li> <li>(c) Hazards classified under paragraph (d)(1)(ii) of § 1910.1200.</li> <li>(d) Describe any hazards not otherwise classified that have been identified during the classification process;</li> <li>(e) Where an ingredient with unknown acute toxicity is used in a mixture at a concentration <math>\geq 1\%</math> and the mixture is not classified based on testing of the mixture as a whole, a statement that X% of the mixture consists of ingredient(s) of unknown acute toxicity is required.</li> </ul>
<b>3.</b>	<b>Composition/information on ingredients</b>	<p>Except as provided for in paragraph (i) of §1910.1200 on trade secrets:</p> <p><b>For Substances</b></p> <ul style="list-style-type: none"> <li>(a) Chemical name;</li> <li>(b) Common name and synonyms;</li> <li>(c) CAS number and other unique identifiers;</li> <li>(d) Impurities and stabilizing additives (constituents) which are themselves classified and which contribute to the classification of the substance.</li> </ul> <p><b>For Mixtures</b></p> <p>In addition to the information required for substances:</p> <ul style="list-style-type: none"> <li>(a) The chemical name, CAS number or other unique identifier, and concentration (exact percentage) or concentration ranges of all ingredients which are classified as health hazards in accordance with paragraph (d) of §1910.1200 and <ul style="list-style-type: none"> <li>(1) are present above their cut-off/concentration limits; or</li> <li>(2) present a health risk below the cut-off/concentration limits.</li> </ul> <p><i>Note: When CAS number is not available or claimed as a trade secret, the preparer must indicate the source of unique identifier.</i></p> <li>(b) The concentration (exact percentage) shall be specified unless a trade secret claim is made in accordance with paragraph (i) of §1910.1200, when there is batch-to-batch variability in the production of a mixture, or for a group of substantially similar mixtures (See A.0.5.1.2) with similar chemical composition. In these cases, concentration ranges may be used.</li> </li></ul>

		<p><b>For All Chemicals Where a Trade Secret is Claimed</b></p> <p>Where a trade secret is claimed in accordance with paragraph (i) of §1910.1200, a statement that the specific chemical identity, and/or concentration (exact or range) of the composition has been withheld as a trade secret is required. When the concentration or concentration range is withheld as a trade secret, the prescribed concentration ranges used in §1910.1200(i)(1)(iv) – (vi) must be used.</p>
4.	<b>First-aid measures</b>	<ul style="list-style-type: none"> <li>(a) Description of necessary measures, subdivided according to the different routes of exposure, <i>i.e.</i>, inhalation, skin and eye contact, and ingestion;</li> <li>(b) Most important symptoms/effects, acute and delayed.</li> <li>(c) Indication of immediate medical attention and special treatment needed, if necessary.</li> </ul>
5.	<b>Fire-fighting measures</b>	<ul style="list-style-type: none"> <li>(a) Suitable (and unsuitable) extinguishing media.</li> <li>(b) Specific hazards arising from the chemical (<i>e.g.</i>, nature of any hazardous combustion products).</li> <li>(c) Special protective equipment and precautions for fire-fighters.</li> </ul>
6.	<b>Accidental release measures</b>	<ul style="list-style-type: none"> <li>(a) Personal precautions, protective equipment, and emergency procedures.</li> <li>(b) Methods and materials for containment and cleaning up.</li> </ul>
7.	<b>Handling and storage†</b>	<ul style="list-style-type: none"> <li>(a) Precautions for safe handling.</li> <li>(b) Conditions for safe storage, including any incompatibilities.</li> </ul>
8.	<b>Exposure controls/personal protection</b>	<ul style="list-style-type: none"> <li>(a) For all ingredients or constituents listed in Section 3, the OSHA permissible exposure limit (PEL), American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV), and any other exposure limit or range used or recommended by the chemical manufacturer, importer, or employer preparing the safety data sheet, where available.</li> <li>(b) Appropriate engineering controls.</li> <li>(c) Individual protection measures, such as personal protective equipment.</li> </ul>

9.	<b>Physical and chemical properties †</b>	<ul style="list-style-type: none"> <li>(a) Physical state</li> <li>(b) Color</li> <li>(c) Odor (includes odor threshold)</li> <li>(d) Melting point/freezing point</li> <li>(e) Boiling point (or initial boiling point or boiling range)</li> <li>(f) Flammability</li> <li>(g) Lower and upper explosion limit/flammability limit</li> <li>(h) Flash point</li> <li>(i) Auto-ignition temperature</li> <li>(j) Decomposition temperature</li> <li>(k) pH</li> <li>(l) Kinematic viscosity</li> <li>(m) Solubility</li> <li>(n) Partition coefficient n-octanol/water (log value)</li> <li>(o) Vapor pressure (includes evaporation rate)</li> <li>(p) Density and/or relative density</li> <li>(q) Relative vapor density</li> <li>(r) Particle characteristics</li> </ul>
10.	<b>Stability and reactivity</b>	<ul style="list-style-type: none"> <li>(a) Reactivity;</li> <li>(b) Chemical stability;</li> <li>(c) Possibility of hazardous reactions, including those associated with foreseeable emergencies;</li> <li>(d) Conditions to avoid (e.g., static discharge, shock, or vibration);</li> <li>(e) Incompatible materials;</li> <li>(f) Hazardous decomposition products.</li> </ul>
11.	<b>Toxicological information</b>	<p>Description of the various toxicological (health) effects and the available data used to identify those effects, including:</p> <ul style="list-style-type: none"> <li>(a) Information on the likely routes of exposure (inhalation, ingestion, skin, and eye contact);</li> <li>(b) Symptoms related to the physical, chemical, and toxicological characteristics;</li> <li>(c) Delayed and immediate effects and also chronic effects from short- and long-term exposure;</li> <li>(d) Numerical measures of toxicity (such as acute toxicity estimates);</li> <li>(e) Interactive effects; information on interactions should be included if relevant and readily available;</li> <li>(f) Whether the hazardous chemical is listed in the National Toxicology Program (NTP) Report on Carcinogens (latest edition) or has been found to be a potential carcinogen in the International Agency for Research on Cancer (IARC) Monographs (latest edition), or by OSHA.</li> <li>(g) When specific chemical data or information is not available, the preparer must indicate if alternative information is used and the method used to derive the information (e.g., where the preparer is using information from a class of chemicals rather than the exact chemical in question and using SAR to derive the toxicological information)</li> </ul>

12.	<b>Ecological information (Non-mandatory)</b>	(a) Ecotoxicity (aquatic and terrestrial, where available); (b) Persistence and degradability; (c) Bioaccumulative potential; (d) Mobility in soil; (e) Other adverse effects (such as hazardous to the ozone layer).
13.	<b>Disposal considerations(Non-mandatory)</b>	Description of waste residues and information on their safe handling and methods of disposal, including the disposal of any contaminated packaging.
14.	<b>Transport information (Non-mandatory)</b>	(a) UN number; (b) UN proper shipping name; (c) Transport hazard class(es); (d) Packing group, if applicable; (e) Environmental hazards (e.g., Marine pollutant (Yes/No)); (f) Transport in bulk (according to IMO instruments); (g) Special precautions which a user needs to be aware of, or needs to comply with, in connection with transport or conveyance either within or outside their premises.
15.	<b>Regulatory information(Non-mandatory)</b>	Safety, health and environmental regulations specific for the product in question.
16.	<b>Other information, including date of preparation or last revision</b>	The date of preparation of the SDS or the last change to it.

*†Note: To determine the appropriate flammable liquid storage container size and type, the boiling point shall be determined by § 1910.106 (a)(5). In addition, the manufacturer, importer, and distributor shall clearly note in sections 7 and 9 of the SDS if an alternate calculation was used for storage purposes and the classification for storage differs from the classification listed in section 2 of the SDS.*

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## **Appendix F to § 1910.1200—Guidance for Hazard Classifications Re: Carcinogenicity**

### **(Non-Mandatory)**

\* \* \* \* \*

#### *Responses Are in One Sex or Both Sexes*

Any case of sex-specific tumors should be evaluated in light of the total tumorigenic response to the substance observed at other sites (multi-site responses or incidence above background) in determining the carcinogenic potential of the substance.

If tumors are seen only in one sex of an animal species, the mode of action should be carefully evaluated to see if the response is consistent with the postulated mode of action. Effects seen only in one sex in a test species may be less convincing than effects seen in both sexes, unless there is a clear patho-physiological difference consistent with the mode of action to explain the single sex response.

\* \* \* \* \*

