



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

Sixty-third session

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Item 3 of the provisional agenda

Listing, classification and packing

Adequate UN entry for 2,4-Dichlorophenol with a possible solution for all chlorophenols

Transmitted by the expert from Germany*

Introduction

1. The United Nations Model Regulations subsume chlorophenolic substances under UN 2020 or UN 2021 CHLOROPHENOLS, division 6.1 in solid or liquid form with packing group III. The index of the UN Model Regulations and the International Maritime Dangerous Goods (IMDG) code include entries for Dichlorophenol with references to division 6.1 and the UN Numbers 2020, 2021. In addition, the index of the IMDG code also lists 2,4-Dichlorophenol with an assignment to division 6.1 under UN 2020.
2. However, 2,4-dichlorophenol (CAS-No. 120-83-2) has toxic as well as corrosive properties which both have to be considered for classification. In addition, other chlorophenols may as well have divergent or additional hazards, which are not addressed by UN 2020 and UN 2021.
3. The Editorial and Technical Group (E&T 32) at the International Maritime Organization considered document CCC 6/6/12 from Germany, proposing a new allocation of 2,4-Dichlorophenol to UN 2923 in the index of the IMDG Code since that substance does not only have toxic, but also corrosive properties. The discussion showed support and it was decided that Germany should submit an appropriate proposal to the Sub-Committee of Experts on the Transport of Dangerous Goods.
4. At the fifty-eighth session of the Sub-Committee, the expert from Germany submitted document ST/SG/AC.10/C.3/2021/3. It proposed adding new UN entries for chlorophenols not meeting the classification criteria for the class or division of the current UN entries identified in the Dangerous Goods List in Chapter 3.2 and which are therefore currently not transported properly according to their chemical and physical properties.
5. After taking into account the feedback received during and after that session, the expert from Germany submitted informal document INF.9 at the sixty-first session of the

* A/77/6 (Sect. 20), table 20.6



Sub-Committee. Most experts who took the floor supported the proposal and expressed a preference for Option 3, one delegation also found Option 1 acceptable.

6. In view of the numerous compounds of chlorophenols, the expert from Germany prepared the following updated proposal for the consideration of the Sub-Committee.

7. In addition, this working document is in support of Sustainable Development Goal 3: Good health and well-being of the 2030 Agenda for Sustainable Development by promoting the safe transport of chlorophenols.

Background

8. Chlorophenols are currently transported under UN 2020 or UN 2021 CHLOROPHENOLS, division 6.1 in solid or liquid form with packing group III:

UN No.	Name and description	Class or division	Subsidiary Hazard	UN packing group	Special Provisions	Limited and excepted quantities		Packagings and IBCs		Portable tanks and bulk containers	
								Packing instruction	Special packing provisions	Instructions	Special provisions
(1)	(2)	(3)	(4)	(5)	(6)	(7)		(8)	(9)	(10)	(11)
2020	CHLOROPHENOLS, SOLID	6.1		III	205	5 kg	E1	P002 IBC08 LP02	B3	T1	TP33
2021	CHLOROPHENOLS, LIQUID	6.1		III		5 L	E1	P001 IBC03 LP01		T4	TP1

9. 2,4-Dichlorophenol is expected to be transported under UN 2020 at the present time in all modes of transport.

10. 2,4-Dichlorophenol (CAS-No. 120-83-2) is classified as both, corrosive (Skin Corr. Cat. 1B) and toxic (Acute Tox. Cat. 3, dermal)¹ according to GHS criteria. According to the Model Regulations criteria the toxicological properties of 2,4-dichlorophenol should lead to an assignment to class 8, subsidiary hazard 6.1, packing group II.

11. The majority of the monochlorophenols and dichlorophenols exhibit these toxicological properties and should therefore take a similar classification in class 8, with or without subsidiary hazard 6.1, packing group II according to the Model Regulations criteria (see Annex 1 below).

12. UN 2020 and UN 2021 do not cover the corrosive properties and the required packing group for 2,4-dichlorophenol as well as for other mono- and dichlorophenols from Annex 1. Moreover, the transportation requirements corresponding to the hazards of these substances differ from those regulated within UN 2020 or UN 2021.

13. In general, the proper classification is the responsibility of the consignor (2.0.0.1 of the UN Model Regulations). When classifying and transporting chlorophenols as dangerous goods, possible corrosive properties as well as current toxicological information should be considered. A harmonized classification should be achieved for all modes of transport.

¹ Based on data from Directives on classification, labelling and packaging (CLP) Regulation No. 1272/2008, from the GESTIS database (www.dguv.de/ifa/stoffdatenbank from the Institute for Occupational Safety and Health of the German Social Accident Insurance) and from the ECHA database (echa.europa.eu from the European Chemicals Agency).

14. Of the 19 chlorophenols (phenols with only chlorine substituent/s), only pentachlorophenol (CAS-No. 87-86-5) has an individual entry under UN 3155 in the Dangerous Goods list. Like pentachlorophenol, pure chlorophenols, except 2-monochlorophenol, are solid at room temperature.

15. Not all chlorophenols are of equal importance for transport and not all chlorophenols are sufficiently documented in terms of the hazards they pose. In addition to the examples mentioned, there are numerous chlorophenols with other substituents that pose hazards differing from those regulated under UN 2020 or UN 2021 and for which the appropriate UN entry has to be chosen.

16. Chlorophenols are not the only chemical group subsuming substances with different physico-chemical hazards relevant for transport classification. Based on the problems that existed in the case of chlorosilanes (UN 2985-2988), there is already an example for a functioning practice of changing the UN entries for a chemical group in order to appropriately classify and differentiate substances of the same chemical group with different hazards in different combinations.

Proposal

17. Germany proposes a classification with an appropriate N.O.S. entry for chlorophenols not meeting classification criteria of UN 2020 and UN 2021.

Option 1

18. Considering that there are no specific entries by name for the various chlorophenols not meeting the classification criteria of the current entries of UN 2020 and UN 2021 (except pentachlorophenol) and the fact that other mono- and dichlorophenols would also be classified as corrosive (see Annex 1) the following amendments are proposed:

19. Amend the Dangerous Goods List in Chapter 3.2 as follows (new text is underlined):

UN No.	Name and description	Class or division	Subsidiary Hazard	UN packing group	Special Provisions	Limited and excepted quantities		Packagings and IBCs		Portable tanks and bulk containers	
								Packing instruction	Special packing provisions	Instructions	Special provisions
(1)	(2)	(3)	(4)	(5)	(6)	(7)		(8)	(9)	(10)	(11)
2020	CHLOROPHENOLS, SOLID	6.1		III	205 <u>XXX</u>	5 kg	E1	P002 IBC08 LP02	B3	T1	TP33
2021	CHLOROPHENOLS, LIQUID	6.1		III	<u>XXX</u>	5 L	E1	P001 IBC03 LP01		T4	TP1

20. Add a new special provision XXX in Chapter 3.3 of the Model Regulations to read as follows:

“XXX If the chemical or physical properties of a chlorophenol are such that the substance does not meet the classification criteria for the entries UN 2020 or UN 2021 but meets the criteria for any other or additional class or division or a diverging UN packing group, it shall be transported according to the appropriate N.O.S. entry.”

21. The new special provision would allow 2,4-Dichlorophenol to be transported appropriately under UN 2923 CORROSIVE SOLID, TOXIC N.O.S. class 8, subsidiary

hazard 6.1, packing group II in accordance with its chemical properties and the hazards it poses.

Required supplementary provisions for Option 1

22. Delete Dichlorophenol from the Alphabetical Index of the Model Regulations.
23. Amend the Alphabetical Index of the Model Regulations with 2,4-Dichlorophenol by introducing the following entry:

“2,4-Dichlorophenol Class: 8 UN No. 2923”

Option 2

24. In accordance with 2.0.0.2 of the Model Regulations amend the two existing UN entries of UN 2020 and UN 2021 and introduce two new UN numbers for chlorophenols in the Dangerous Goods List in Chapter 3.2 as follows (new text is underlined):

UN No.	Name and description	Class or division	Subsidiary Hazard	UN packing group	Special Provisions	Limited and excepted quantities		Packagings and IBCs		Portable tanks and bulk containers	
								Packing instruction	Special packing provisions	Instruc-tions	Special provisions
(1)	(2)	(3)	(4)	(5)	(6)	(7)		(8)	(9)	(10)	(11)
2020	CHLOROPHENOLS, <u>TOXIC, SOLID, N.O.S</u>	6.1		III	205	5 kg	E1	P002 IBC08 LP02	B3	T1	TP33
2021	CHLOROPHENOLS, <u>TOXIC, LIQUID, N.O.S</u>	6.1		III		5 L	E1	P001 IBC03 LP01		T4	TP1
<u>XXXX</u>	<u>CHLOROPHENOLS, CORROSIVE, TOXIC, SOLID, N.O.S</u>	<u>8</u>	<u>6.1</u>	<u>II</u>		<u>1 kg</u>	<u>E2</u>	<u>P002 IBC08</u>	<u>B2, B4</u>	<u>T3</u>	<u>TP33</u>
<u>XXXY</u>	<u>CHLOROPHENOLS, CORROSIVE, SOLID, N.O.S</u>	<u>8</u>		<u>II</u>		<u>1 kg</u>	<u>E2</u>	<u>P002 IBC08</u>	<u>B2, B4</u>	<u>T3</u>	<u>TP33</u>

25. UN XXXX would allow 2,4-Dichlorophenol to be transported appropriately in accordance with its chemical properties and the hazards it poses.

Required supplementary provisions for Option 2

26. Delete Dichlorophenol from the Alphabetical Index of the Model Regulations.
27. Amend the Alphabetical Index of the Model Regulations with 2,4-Dichlorophenol by introducing the following entry:

“2,4-Dichlorophenol Class: 8 UN No. XXXX.”

Annex 1

Classification of most mono- and dichlorophenols

Name	Cas-No.	Classification according to GHS Criteria*	Classification according to TDG criteria
2-Monochlorophenol	95-57-8	Skin Corr. Cat. 1	Class 8 PG ?
4-Monochlorophenol	106-48-9	Skin Corr. Cat. 1B	Class 8 PG II**
2,4-Dichlorophenol	120-83-2	Skin Corr. Cat. 1B, Acute Tox. Cat. 3 dermal	Class 8 (6.1) PG II
2,5-Dichlorophenol	583-78-8	Skin Corr. Cat. 1B	Class 8 PG II
2,6-Dichlorophenol	87-65-0	Skin Corr. Cat. 1B	Class 8 PG II
3,5-Dichlorophenol	591-35-5	Skin Corr. Cat. 1B, Acute Tox. Cat. 3 dermal	Class 8 (6.1) PG II
3,4-Dichlorophenol	95-77-2	Skin Corr. Cat. 1B, Acute Tox. Cat. 3 inhalative and maybe also dermal	Class 8 (6.1) PG II

*Based on data from the GESTIS database (www.dguv.de/ifa/stoffdatenbank from the Institute for Occupational Safety and/or Health of the German Social Accident Insurance) and/or from the ECHA database (echa.europa.eu from the European Chemicals Agency).

** According to WHO (1989. Chlorophenols other than pentachlorophenol. Environmental Health Criteria 93. Geneva, Switzerland: World Health Organization.) the substance is also classified as Class 6.1 PG III as subsidiary hazard.

Annex 2

Data sheet to be submitted to the United Nations for new or amended classification of substances

Submitted by Germany

Date 25.04.2022

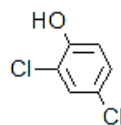
Supply all relevant information including sources of basic classification data. Data should relate to the product in the form to be transported. State test methods. Answer all questions - If necessary, state "not known" or "not applicable" - If data is not available in the form requested, provide what is available with details. Delete inappropriate words.

Section 1. SUBSTANCE IDENTITY

1.1 Chemical name: 2,4-Dichlorophenol

1.2 Chemical formula: $C_6H_4Cl_2O$

1.3 Other names/synonyms: 2,4-DCP



1.4.1 UN number:

1.4.2 CAS number: 120-83-2

1.5 Proposed classification for the Recommendations:

UN XXXX CHLOROPHENOLS, CORROSIVE, TOXIC, SOLID, N. O. S., CLASS 8 (6.1), PG II

1.5.1 proper shipping name (3.1.2¹) 2,4-DICHLOROPHENOL

1.5.2 class/division 8 subsidiary hazard(s): 6.1 packing group PG II

1.5.3 proposed special provisions, if any:

- Limited and excepted quantities: 1 kg, E2
- Special packing provisions: B2, B4
- Portable tanks and bulk containers:
 - Instructions: T3
 - Special provisions: TP33

1.5.4 proposed packing instruction(s): P002, IBC08

Section 2. PHYSICAL PROPERTIES

2.1 Melting point or range 42-45 °C

2.2 Boiling point or range 209-210 °C

2.3 Relative density at:

2.3.1 15 °C ____

2.3.2 20 °C 1,4 g*cm-3

2.3.3 50 °C ____

2.4 Vapour pressure at:

2.4.1 50 °C 0,13 kPa

2.4.2 65 °C ____ kPa

2.5 Viscosity at 20 °C² ____ m²/s

2.6 Solubility in water at 20 °C 4,5 g/100 ml

- 2.7 Physical state at 20°C (2.2.1.1¹) solid/liquid/gas²
- 2.8 Appearance at normal transport temperatures, including colour and odour: colourless crystals with a phenolic, medicinal odour
- 2.9 Other relevant physical properties: The substance is readily soluble in non-polar, organic solvents (hydrocarbons) as well as oils and fats. Solubility in methanol 10 g/100 ml, in ethanol 50 mg/ml.

Section 3. FLAMMABILITY

- 3.1 Flammable vapour
- 3.1.1 Flash point (2.3.3¹) 113 °C oc/cc
- 3.1.2 Is combustion sustained? (2.3.1.3¹) yes/no
- 3.2 Autoignition temperature ____ °C
- 3.3 Flammability range (LEL/UEL) ____ %
- 3.4 Is the substance a flammable solid? (2.4.2¹) yes/no
- 3.4.1 If yes, give details ____

Section 4. CHEMICAL PROPERTIES

- 4.1 Does the substance require inhibition/stabilization or other treatment such as nitrogen blanket to prevent hazardous reactivity? yes/no

If yes, state:

- 4.1.1 Inhibitor/stabilizer used ____
- 4.1.2 Alternative method ____
- 4.1.3 Time effective at 55 °C ____
- 4.1.4 Conditions rendering it ineffective ____
- 4.2 Is the substance an explosive according to paragraph 2.1.1.1? (2.1¹) yes/no
- 4.2.1 If yes, give details ____
- 4.3 Is the substance a desensitized explosive? (2.4.2.4¹) yes/no
- 4.3.1 If yes, give details ____
- 4.4 Is the substance a self-reactive substance? (2.4.1¹) yes/no

If yes, state:

- 4.4.1 exit box of flow chart ____

What is the self-accelerating decomposition temperature (SADT) for a 50 kg package? °C

Is the temperature control required? (2.4.2.3.4¹) yes/no

- 4.4.2 proposed control temperature for a 50 kg package ____ °C
- 4.4.3 proposed emergency temperature for a 50 kg package ____ °C
- 4.5 Is the substance pyrophoric? (2.4.3¹) yes/no

4.5.1 If yes, give details ____

- 4.6 Is the substance liable to self-heating? (2.4.3¹) yes/no

4.6.1 If yes, give details ____

- 4.7 Is the substance an organic peroxide (2.5.1¹) yes/no

If yes state:

4.7.1 exit box of flow chart ____

What is the self-accelerating decomposition temperature (SADT) for a 50 kg package?
____ °C

Is temperature control required? (2.5.3.4.1¹) yes/no

4.7.2 proposed control temperature for a 50 kg package ____ °C

4.7.3 proposed emergency temperature for a 50 kg package ____ °C

4.8 Does the substance in contact with water emit flammable gases? (2.4.4¹) yes/no

4.8.1 If yes, give details ____

4.9 Does the substance have oxidizing properties (2.5.1¹) yes/no

4.9.1 If yes, give details ____

4.10 Corrosivity (2.8¹) to:

4.10.1 mild steel ____ mm/year at ____ °C

4.10.2 aluminium ____ mm/year at ____ °C

4.10.3 other packaging materials (specify)

____ mm/year at ____ °C

____ mm/year at ____ °C

4.11 Other relevant chemical properties ____

Section 5. HARMFUL BIOLOGICAL EFFECTS

5.1 LD₅₀, oral (2.6.2.1.1¹) 1276 mg/kg bw to 1352 mg/kg bw

Animal species: Mouse_{m/f} (CD-1)

5.2 LD₅₀, dermal (2.6.2.1.2¹) 780 mg/kg bw Animal species: Rat_{m/f} (Sprague-Dawley)

5.3 LC₅₀, inhalation (2.6.2.1.3¹) ____ mg/litre Exposure time ____ hours

or ____ ml/m³ Animal species ____

5.4 Saturated vapour concentration at 20 °C (2.6.2.2.4.3¹) ____ ml/m³

5.5 Skin exposure (2.8¹) results Exposure time 15 minutes

Animal species: Rabbit

5.6 Other data ____

5.7 Human experience ____

Section 6. SUPPLEMENTARY INFORMATION

6.1 Recommended emergency action

6.1.1 Fire (include suitable and unsuitable extinguishing agents) ____

6.1.2 Spillage ____

6.2 Is it proposed to transport the substance in:

6.2.1 Bulk Containers (6.8¹) yes/no

6.2.2 Intermediate Bulk Containers (6.5¹)? yes/no

6.2.3 Portable tanks (6.7¹)? yes/no

If yes, give details in Sections 7, 8 and/or 9.

Section 7. BULK CONTAINERS (only complete if yes in 6.2.1)

7.1 Proposed type(s) ____

Section 8. INTERMEDIATE BULK CONTAINERS (IBCs) (only complete if yes in 6.2.2)

8.1 Proposed type(s) IBC08

Section 9. MULTIMODAL TANK TRANSPORT (only complete if yes in 6.2.3)

9.1 Description of proposed tank (including IMO tank type if known) T3

9.2 Minimum test pressure ____

9.3 Minimum shell thickness ____

9.4 Details of bottom openings, if any ____

9.5 Pressure relief arrangements ____

9.6 Degree of filling ____

9.7 Unsuitable construction materials ____
