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Proposals for amendments to RID/ADR/AND: Pending issues

Paints and printing inks classified as environmentally hazardous mixtures (UN 3082 of Class 9) and the requirements for performance tests related to packaging of small quantities

Submitted by the European Council of the Paint, Printing Ink, and Artist's Colours Industry (CEPE)[*, **]

I. Introduction

1. As a result of a previous proposal by CEPE in September 2021 (document ECE/TRANS/WP.15/AC.1/2021/37, informal documents INF.26 and INF.46 (CEPE) as well as informal document INF.37 from Norway), a transitional measure was granted under RID/ADR for an exemption to the requirement for performance testing of packaging for certain paint products of UN 3082. With the support of several members of the Working Party on Dangerous Goods (WP.15), the Multilateral Agreement M343 proposed by Norway was introduced, valid from 18 October 2021 until 30 June 2023. Subsequently, 1.6.1.51 was inserted into RID/ADR 2023, and currently remains valid until 30 June 2025.

2. The current transitional measure specifically mentions three preservatives whose reclassification under the Fifteenth Adaptation to Technical Progress (ATP) of the EU Regulation on Classification, Labelling and Packaging of substances (CLP) (application date 1 March 2022) led to the identification of certain water-based paints and printing inks as environmentally hazardous (Class 9) mixtures (primarily due to the high 'M-factors' allocated to these substances). Preservatives are essential for the correct functioning and stabilisation of paints and printing inks, in particular to avoid spoilage of product due to contamination or during storage. Substitution of these preservatives is very difficult to impossible as the industry is not able to identify alternatives that would match the technical performance. Additional (re-)classifications of highly toxic substances under CLP are now

[*] A/78/6 (Sect.20), table 20.5.
[**] Circulated by the Intergovernmental Organisation for International Carriage by Rail (OTIF) under the symbol OTIF/RID/RC/2024/7.

foreseen which will result in further mixtures falling into this Class 9 situation, even though they contain very low levels (e.g. < 0.025%) of the substances in question. This includes consideration of the M-factors that are applied to the hazard classifications for e.g. preservatives (please refer to the Annex for further information on M-factors).

3. The continued absence of appropriate UN-approved plastic packaging required to carry these water-based paints and printing inks in quantities between 5 and 30 litres presents a very challenging situation for the global paints and printing inks sectors. There are specific essential requirements for the packaging of such products – in particular, the packaging must be able to be opened and safely resealed on multiple occasions, to allow tinting of water-based paints at point-of-sale locations (such as do-it-yourself stores) as well as repeated use of ink concentrates when preparing color-matched finished inks for printing facilities. In addition, certain paint and ink products and technologies are not compatible with coated metal packaging because they can react, leading to discoloration, more severe product tainting or potentially product decomposition (creating a hazardous situation).

4. CEPE is now requesting a modification and extension to the current RID/ADR transitional measure to address the continuing challenging situation – a lack of appropriate UN-approved plastic packaging and the need to address further substance harmonised (re-) classifications under the CLP legislation.

5. CEPE wishes to also align this situation under RID/ADR with the ongoing efforts at the level of the UN Sub-Committee of Experts on the Transport of Dangerous Goods. The World Coatings Council (WCC) has addressed this same issue through a series of proposals submitted to the last four sessions of the Sub-Committee (documents ST/SG/AC.10/C.3/2022/22 and ST/SG/AC.10/C.3/2022/56 and informal documents INF.11 of the sixty-second session and INF.15 of the sixty-third session).

II. Proposal

6. Amend 1.6.1.51 to read as follows (new text is underlined, deleted text is stricken through):

"1.6.1.51 Adhesives, paint and paint related materials, printing inks and printing ink related materials and resin solutions assigned to UN 3082 environmentally hazardous substance, liquid, n.o.s., PG III in accordance with 2.2.9.1.10.6 as a consequence of current and future Adaptations to Technical Progress (ATP) under the CLP Regulation (EC) No 1272/2008 ~~2.2.9.1.10.5~~ containing ~~0.025~~ up to 1 % ~~or more~~ of highly toxic substances which have an M-factor > 1

~~the following substances, on their own or in combination:~~

~~4,5-dichloro-2-octyl2H-isothiazol-3-one (DCOIT);~~

~~octhilinone (OIT); and~~

~~zinc pyrithione (ZnPT);~~

may be carried until 30 June 2027~~5~~ in steel, aluminium, other metal or plastic packagings, which do not meet the requirements of 4.1.1.3, when carried in quantities of 30 litres or less per packaging as follows:

(a) In palletized loads, a pallet box or unit load device, e.g. individual packagings placed or stacked and secured by strapping, shrink or stretch-wrapping or other suitable means to a pallet; or

(b) As inner packagings of a combination packagings with a maximum net mass of 40 kg."

III. Justification

7. The number of paint and printing ink products that fall under the environmentally hazardous substances of Class 9 continues to increase, due to new harmonised (re-)classifications of certain component highly toxic substances, in addition to those identified under the current transitional measure. These products are already being safely transported in quantities up to 30 litres, following current practices and procedures using packaging that does meet the requirements of 4.1.1.1 and 4.1.1.2. Thus, the packaging follows the guiding principle of the *Model Regulations* by limiting the potential risk to a possible minimum. The packaging requirements dictated by product technology and use necessitate the continued availability of a plastic packaging option, for which no UN-approved versions currently exist. Establishing the requirement to utilise UN-approved packaging would hamper the possibilities to transport said products.

8. Current discussions at the UN Sub-Committee level, and subsequent possible action (e.g. modification to the *Model Regulations*) are not scheduled to be completed prior to the expiration of the current RID/ADR transitional period (30 June 2025). An extension to the existing transitional measure in RID/ADR is therefore required to allow the on-going efforts through the Sub-Committee to be concluded (the intention is for this activity to be completed by the end of the current biennium i.e. by December 2024).

9. CEPE welcomes the upcoming discussion at the March 2024 session of the Joint Meeting as to the best way to proceed.

Annex

[English only]

Environmentally hazardous classification and M-factors

I. Introduction

1. In 2009/2010, the term "environmentally hazardous (aquatic environment)" was implemented in the transport of dangerous goods regulations. The criteria in the *Globally Harmonized System of Classification and Labelling of Chemicals (GHS)* is used in the *Model Regulations* to identify environmentally hazardous chemical (in particular hazardous to the aquatic environment) and to define the applicable transport conditions (e.g. packing requirements) to avoid or minimize their release into the environment.

2. There are two options to classify the environmental hazard in class 9 for substances and mixtures in packing group III:

(a) UN 3077 ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. or

(b) UN 3082 ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.

II. Criteria basics

3. The basic elements for classification of environmentally hazardous substances are:

(a) Acute aquatic toxicity;

(b) Chronic aquatic toxicity;

(c) Potential for or actual bioaccumulation;

(d) Degradation for organic chemicals.

4. The categories implemented for transport are Acute Category 1, Chronic Category 1 and 2. If one of these categories apply and the substance/mixture has not been assigned to hazard classes 1 to 8, it is classified as UN 3077/3082 environmentally hazardous in PG III.

5. If it meets the criteria for classes 1 to 8 and thus another packing applies based on these hazards, this packing group takes precedence and the environmentally hazard is adding to the existing classification.

6. The criteria for acute and chronic categories for substance:

Table 2.2.9.1.10.3.2: Classification scheme for substances hazardous to the aquatic environment

Classification categories			
Acute hazard (*see Note 1*)	**Long-term hazard** (*see Note 2*)		
	Adequate chronic toxicity data available		**Adequate chronic toxicity data not available** (*see Note 1*)
	Non-rapidly degradable substances (*see Note 3*)	**Rapidly degradable substances** (*see Note 3*)	
Category: Acute 1	**Category: Chronic 1**	**Category: Chronic 1**	**Category: Chronic 1**
$L(E)C_{50} \leq 1.00$	NOEC or $EC_x \leq 0.1$	NOEC or $EC_x \leq 0.01$	$L(E)C_{50} \leq 1.00$ and lack of rapid degradability and/or BCF ≥ 500 or, if absent log $K_{ow} \geq 4$
	Category: Chronic 2	**Category: Chronic 2**	**Category: Chronic 2**
	$0.1 <$ NOEC or $EC_x \leq 1$	$0.01 <$ NOEC or $EC_x \leq 0.1$	$1.00 < L(E)C_{50} \leq 10.0$ and lack of rapid degradability and/or BCF ≥ 500 or, if absent log $K_{ow} \geq 4$

III. Mixture classification

7. Mixture classification can be based on test results, bridging principles or summation method.

8. Mixture can only be tested on the aquatic toxicity data for fish, crustacea and algae/plants, degradability and bioaccumulation data are not possible for mixtures (or difficult to interpret the results) and therefore are only suitable for substances.

9. The summation method is used to determine the classification for mixtures (from the twenty-third revised edition of the *Model Regulations*):

Table 2.2.9.1.10.4.6.2.2: Classification of a mixture for acute hazards based on summation of the concentrations of classified ingredients

Sum of the concentrations (in %) of ingredients classified as:	Mixture classified as:
Acute 1 × M [a] ≥ 25 %	Acute 1

[a] *For explanation of the M factor, see 2.2.9.1.10.4.6.4.*

Table 2.2.9.1.10.4.6.3.3: Classification of a mixture for long-term hazards based on summation of the concentrations of classified ingredients

Sum of the concentrations (in %) of ingredients classified as:		Mixture classified as:
Chronic 1 × M [a]	≥ 25 %	Chronic 1
(M × 10 × Chronic 1) + Chronic 2	≥ 25 %	Chronic 2

[a] *For explanation of the M factor, see 2.2.9.1.10.4.6.4.*

10. The M-factor (Multiplication factor) is used for substances that are highly toxic to the environment and are based on harmonized classification or the self-classification of substances (based on manufacturer/supplier ecotoxicity information). The purpose of applying the M-factor is to give an increased weight to highly toxic substances when classifying a mixture.

11. The M-factor applies to acute and chronic category 1 and its eco-toxicity value:

Table 2.2.9.1.10.4.6.4: Multiplying factors for highly toxic ingredients of mixtures

Acute toxicity	M factor	Chronic toxicity	M factor	
L(E)C_{50} value		**NOEC value**	**NRD [a] ingredients**	**RD [b] ingredients**
0.1 < L(E)C_{50} ≤ 1	1	0.01 < NOEC ≤ 0.1	1	–
0.01 < L(E)C_{50} ≤ 0.1	10	0.001 < NOEC ≤ 0.01	10	1
0.001 < L(E)C_{50} ≤ 0.01	100	0.0001 < NOEC ≤ 0.001	100	10
0.0001 < L(E)C_{50} ≤ 0.001	1 000	0.00001 < NOEC ≤ 0.0001	1 000	100
0.00001 < L(E)C_{50} ≤ 0.0001	10 000	0.000001 < NOEC ≤ 0.00001	10 000	1 000
(continue in factor 10 intervals)		(continue in factor 10 intervals)		

[a] *Non-rapidly degradable.*
[b] *Rapidly degradable.*

12. This means that a substance with a high M-factor leads to a class 9 environmentally hazardous classification at very low concentrations of highly toxic substances in mixtures.

13. In 2.2.9.1.10.5 of RID/ADR, there is a reference to the CLP regulation that if no test data is available for the mixture, the mixture shall be classified as environmentally hazardous if it has been assigned to the categories aquatic acute 1, aquatic chronic 1 or 2.

IV. Examples for the application of the above formula

Example 1: A liquid paint mixture contains one environmentally hazardous substance in a concentration of **0.03 % assigned to Acute aquatic hazard category 1, M-factor is 100**

Calculation for UN 3082:

Sum of the concentration of ingredients classified as:	Mixture is classified as	Result
Acute 1 x M ≥ 25 %	Acute 1	0.03 x 100 = 3 = not classified

Mixture is not acute aquatic toxic and therefore **not environmentally hazardous**

Example 2: A liquid paint mixture contains one environmentally hazardous substance in a concentration of **0.03% assigned to Chronic hazard category 1, M-factor is 100**

Calculation for UN 3082:

Sum of the concentration of ingredients classified as:	Mixture is classified as	Result
Chronic 1 x M ≥ 25 %	Chronic 1	0.03 x 100 = 3 = not classified
(M x 10 x Chronic 1) + Chronic 2 ≥ 25 %	Chronic 2	(100 x 10 x 0.03) + 0 = 30 = **Classified**

Mixture is chronic aquatic toxic 2 and therefore also **environmentally hazardous – UN 3082**

Example 3: A liquid paint mixture contains one environmentally hazardous substance in a concentration of **0.03 % assigned to both Acute and Chronic hazard category 1, M-factor is 100 (acute) and 100 (chronic)**:

Note: *The preservative substance OIT – 2-octyl-2H-isothiazol-3-one (updated in fifteenth ATP of CLP) is one of the substances with this aquatic toxic classification.*

Calculation for UN 3082:

Sum of the concentration of ingredients classified as:	Mixture is classified as	Result
Acute 1 x M ≥ 25 %	Acute 1	0.03 x 100 = 3 = not classified

Sum of the concentration of ingredients classified as:	Mixture is classified as	Result
Chronic 1 x M ≥ 25 %	Chronic 1	0.03 x 100 = 3 = not classified
(M x 10 x Chronic 1) + Chronic 2 ≥ 25 %	Chronic 2	(100 x 10 x 0.03) + 0 = 30 = **Classified**

Mixture is chronic aquatic toxic 2 and therefore also **environmentally hazardous – UN 3082**

Example 4: A liquid paint mixture contains a **mixture of environmentally hazardous substances in:**

(a) **a concentration of 0.01 % assigned to both Acute and Chronic hazard category 1, M-factor is 100 (acute) and 100 (chronic)**

(b) **a concentration of 0.02 % assigned to Chronic hazard category 1, M-factor is 1000**

Sum of the concentration of ingredients classified as:	Mixture is classified as	Result
Acute 1 x M ≥ 25 %	Acute 1	0.01 x 100 = 1 = not classified

Sum of the concentration of ingredients classified as:	Mixture is classified as	Result
Chronic 1 x M ≥ 25 %	Chronic 1	Sub1(0.01 x 100) + Sub2(0.02x1000) = 21 = not classified
(M x 10 x Chronic 1) + Chronic 2 ≥ 25 %	Chronic 2	Sub1(100 x 10 x 0.01) + Sub2(1000x10x0.02) = 210 = **Classified**

Mixture is chronic aquatic toxic 2 and therefore also **environmentally hazardous – UN 3082**

Example 5: A liquid paint mixture contains one environmentally hazardous substance in a concentration of **2.75 % assigned to Chronic hazard category 1, M-factor is 1**

Calculation for UN 3082:

Sum of the concentration of ingredients classified as:	Mixture is classified as	Result
Chronic 1 x M ≥ 25 %	Chronic 1	2.75 x 1 = 2.75 = not classified
(M x 10 x Chronic 1) + Chronic 2 ≥ 25 %	Chronic 2	(1 x 10 x 2.75) + 0 = 27.5 = **Classified**

Mixture is chronic aquatic toxic 2 and therefore also **environmentally hazardous – UN 3082 and will be packaged in UN-approved packaging (would have to be supplied in metal UN-approved packaging)**

The proposal is to exempt mixture classified as UN 3082 but containing < 1 % of highly toxic to the environment substances (with M-factor >1) for UN-approved packaging.

Example	**Contain <1%**	**UN approved packaging under our proposal**
Example 2 UN 3082	0.03% Chronic cat. 1, M = 100	No (0.03 % < 1 % high toxic to environment substance)
Example 3 UN 3082	0.03% Acute cat. 1 (M = 100); Chronic cat. 1 (M = 100)	No (0.03 % < 1 % high toxic to environment substance)
Example 4 UN 3082	Substance 1: 0.01 % Acute cat. 1 (M = 100); Chronic cat. 1 (M = 100)	No (0.01 + 0.02%) = 0.03 % <1 % high toxic to environment substance)

	Substance 2: 0.02 % Chronic cat. 1 (M = 1000)	
Example 5 UN 3082	2.75 % Acute cat. 1 (M = 1); Chronic cat. 1 (M = 1)	Yes (2.75 % environmentally hazardous substance but not highly toxic (M=1))

V. Additional Remarks

14. When Class 9 environmentally hazardous classification was introduced (2009), there was only limited data available on substances (as well as M-factors). Over the years this has increased due to the proliferation of high M-factors.

15. High M-factors have led to the environmentally hazardous classification for a mixture at disproportionately low levels (e.g. 0.025 %) when compared to mixture classification for corrosive (5 %) or toxic (oral 33.3 % - dermal 3 0% - inhalation 5 %). UN 3077/3082 only exist in PG III (less danger) whereas corrosive and toxic have the full range of packing group (I severe, II medium, III less danger). The environmentally hazardous classification does not take precedence over classes 1 to 8 and is an additional hazard while corrosive and toxic are not. Thus, this classification has inadvertently become ‘over-prioritized’ through the link between *GHS* and the *Model Regulations*, due primarily to M-factors.

16. In transport classification for health hazards only acute toxic classification is taken into account and not chronic toxic, while for environmentally hazardous classification both acute and chronic (1 and 2) are seen as dangerous in transport.