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Working Party on the Transport of Dangerous Goods

Joint Meeting of the RID Safety Committee and the  
Working Party on the Transport of Dangerous Goods  
(Bern, 7-11 March 2005)

**NEW PROPOSALS FOR AMENDMENTS TO RID/ADR/ADN**

**Harmonization of the requirements for orange-coloured plate marking  
in accordance with section 5.3.2 of RID/ADR**

**Proposal by the Government of Germany\***

The secretariat has received from the Central Office for International Carriage by Rail (OCTI) the proposal reproduced below.

**SUMMARY**

***Executive summary:***

The aim of this proposal is to harmonize the requirements currently applicable in section 5.3.2 of RID/ADR, insofar as there is no need to take particular features specific to a transport mode into account.

***Decision to be taken:***

Adoption of the amendments proposed for section 5.3.2 of RID/ADR.

***Related documents:*** -

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\* Circulated by the Central Office for International Carriage by Rail (OCTI) under the symbol OCTI/RID/GT-III/2005/27.

## **Introduction**

The existing requirements for the orange-coloured plate marking in accordance with section 5.3.2 of RID/ADR reflect the results of the difference in the development of these requirements in rail and road transport. It was not possible to effect the necessary alignment of these requirements in the context of the restructuring of RID and ADR for lack of time. It was agreed at the time that this harmonization of differing texts in RID/ADR should only be carried out in a second stage, along with the elimination of divergences and gaps.

This proposal is therefore the follow-up to this process. Its aim is basically to harmonize the partially differing requirements for road and rail on the basis of the existing requirements, insofar as there is no need to take particular features specific to a transport mode into account. In bringing the texts into line, some requirements of ADR have been included in RID. In addition, drafting and material changes have been made for practical reasons.

## **Proposals**

Section 5.3.2 should be replaced by the text set out in proposal 1. In order to give a better overall picture, the texts of the requirements of RID and ADR are separated and the parts of the text that have been modified or are new appear in italics and/or in bold and underlined. In some places, references to the former texts are placed in square brackets.

Another step in harmonizing these texts could be to standardize the terms “orange-coloured plate marking” and “orange-coloured plate”. Proposal 1 still uses the existing RID/ADR wording. The terms “orange-coloured plate marking” and “orange-coloured plate” appear each time in bold in square brackets. The Government of Germany proposes that existing RID terminology (“orange-coloured marking”) should be brought into line with ADR terminology (“orange-coloured plate marking”) as a generic term covering both the “orange-coloured plate” with or without the hazard identification number and the United Nations number and the alternatives permitted in 5.3.2.2.1 for tank-containers, MEGCs and portable tanks.

A new sub-section 1.6.1.x (see proposal 2) must also be included in the transitional measures of Chapter 1.6 of RID/ADR.

Proposal 3 contains a proposal to extend the period of engulfment in fire referred to in 5.3.2.2.2 (and if necessary in 5.3.2.1.8) from 15 to 30 minutes.

Proposal 4 contains a reference to the fact that standards now exist for the use of reflectorized materials.

**Proposal 1****ADR****5.3.2 [Orange-coloured plate marking]****5.3.2.1 General [orange-coloured plate marking] provisions**

5.3.2.1.1 Transport units carrying dangerous goods shall display two rectangular reflectorized [orange-coloured plates] conforming to 5.3.2.2.1, set in a vertical plane. They shall be affixed one at the front and the other at the rear of the transport unit, both perpendicular to the longitudinal axis of the transport unit. They shall be clearly visible.

**5.3.2.1.2** When a hazard identification number is indicated in Column (20) of table A of Chapter 3.2, tank-vehicles, battery vehicles or transport units having one or more tanks carrying dangerous goods shall in addition display on the sides of each tank, each tank compartment or each element of battery vehicles, clearly visible and parallel to the longitudinal axis of the vehicle, [orange-coloured plates] identical with those

**RID****5.3.2 [Orange-coloured marking]****5.3.2.1 General [orange-coloured marking] provisions**

5.3.2.1.1 A rectangular [orange-coloured marking] conforming to 5.3.2.2.1, **and so as to be clearly visible**, shall be affixed on each side of a

- tank wagon
- battery wagon
- wagon with demountable tank
- tank-container
- MEGC
- portable tank
- wagon for carriage in bulk
- small or large container for carriage in bulk
- wagon and container carrying packaged radioactive material with a single UN number under exclusive use and no other dangerous goods

used for the carriage of goods for which a hazard identification number is given in column (20) of Table A of Chapter 3.2.

This [marking] may also be affixed on both sides of wagon loads made up of packages containing one and the same substance.

**5.3.2.1.2** These [orange-coloured plates] shall bear the hazard identification number and the UN number, in accordance with 5.3.2.2.2, prescribed in column (20) of Table A of Chapter 3.2 for the substance carried.

**[5.3.2.1.3 (former)]** When a number of different substances are carried in a tank wagon, battery-wagon, wagon with demountable tank, tank-container, MEGC or portable tank in separate tanks or separate

prescribed in 5.3.2.1.1. These [orange-coloured plates] shall bear the hazard identification number and the UN number prescribed respectively in Columns (20) and (1) of Table A of Chapter 3.2 for each of the substances carried in the tank, in a compartment of the tank or in an element of a battery vehicle.

**5.3.2.1.3** For tank-vehicles or transport units having one or more tanks carrying substances with UN Nos. 1202, 1203 or 1223, or aviation fuel classed under UN Nos. 1268 or 1863, but no other dangerous substance, the [orange-coloured plates] prescribed in 5.3.2.1.2 need not be affixed if the [plates] affixed to the front and rear in accordance with 5.3.2.1.1 bear the hazard identification number and the UN number prescribed for the most hazardous substance carried, i.e. the substance with the lowest flash-point.

**5.3.2.1.4** When a hazard identification number is indicated in Column (20) of Table A of Chapter 3.2, transport units and containers carrying dangerous solid substances in bulk or packaged radioactive material with a single UN number under exclusive use and no other dangerous goods shall in addition display on the sides of each transport unit or container, clearly visible and parallel to the longitudinal axis of the vehicle, [orange-coloured plates] identical with those prescribed in 5.3.2.1.1. These [orange-coloured plates] shall bear the hazard identification number and the UN number prescribed respectively in Columns (20) and (1) of Table A of Chapter 3.2 for each of the substances carried in bulk in the transport unit or in the container or for the packaged radioactive material carried under exclusive use in the transport unit or in the container.

**5.3.2.1.5** (*reserved*)

**5.3.2.1.6** For transport units carrying only one substance, the [orange-coloured plates] prescribed in 5.3.2.1.2 and 5.3.2.1.4 shall not

compartments of the same tank, the consignor shall affix the [orange-coloured marking] as required in 5.3.2.1.1, bearing the appropriate numbers, on each side of the tanks or tank compartments, parallel to the longitudinal axis of the wagon, tank-container or portable tank and so as to be clearly visible.

**5.3.2.1.3** (*reserved*)

**5.3.2.1.4** (*reserved*)

**5.3.2.1.5** (*reserved*)

**5.3.2.1.6** (*reserved*)

be necessary provided that [those] displayed at the front and rear in accordance with 5.3.2.1.1 bear the hazard identification number and the UN number prescribed respectively in Columns (20) and (1) of Table A of Chapter 3.2.

**5.3.2.1.7** The requirements of 5.3.2.1.1 to 5.3.2.1.4 are also applicable to empty

- fixed tanks,
- *battery-vehicles*,
- demountable tanks,
- tank-containers,
- MEGCs or
- portable tanks, uncleaned and not degassed or decontaminated and empty vehicles and empty containers for carriage in bulk, uncleaned or not decontaminated.

5.3.2.1.8 [Orange-coloured plates] which do not relate to dangerous goods carried, or residues thereof, shall be removed or covered. If [plates] are covered, the covering shall be total and remain effective after 15 minutes' engulfment in fire.

**5.3.2.2** *Specifications for the [orange-coloured plates]*

**5.3.2.2.1** The [orange-coloured plates] shall be reflectorized and shall be of 40 cm base and 30 cm high; they shall have a black border 15 mm wide.

The material used shall be weather-resistant and ensure durable marking.

**5.3.2.1.7** [5.3.2.1.4 (1st sentence) former]

The requirements of 5.3.2.1.1. to 5.3.2.1.4 shall be valid also for empty

- tank wagons,
- battery-wagons,
- wagons with demountable tanks,
- tank-containers,
- MEGCs or
- portable tanks which have not been cleaned, degassed or decontaminated, and for empty wagons, large containers and small containers for bulk goods which have not been cleaned or decontaminated.

**5.3.2.1.8** [Orange-coloured markings] which do not relate to dangerous goods carried, or residues thereof, shall be removed or covered. If the [markings] are covered, the covering shall be total and remain effective after 15 minutes' engulfment in fire.

**5.3.2.3** *Specifications for the [orange-coloured markings]*

**5.3.2.2.1** The [orange-coloured plates] may be reflectorized and shall be of 40 cm base and 30 cm high; they shall have a black border 15 mm wide.

The material used shall be weather-resistant and ensure durable marking.

The [orange-coloured plates] may be separated in their middle with a black horizontal line of 15 mm thickness.

If the size and construction of the vehicle are such that the available surface area is insufficient to affix these [orange-coloured plates], their dimensions may be reduced to 300 mm for the base, 120 mm for the height and 10 mm for the black border.

[5.3.2.1.5 former] For containers carrying dangerous solid substances in bulk and for tank-containers, MEGCs and portable tanks, the [plates] prescribed in 5.3.2.1.2 and 5.3.2.1.4 may be replaced by a self-adhesive sheet, by paint or by any other equivalent process, provided the material used for this purpose is weather-resistant and ensures durable marking. In this case, the provisions of the last sentence *but one* of 5.3.2.2.2, concerning resistance to fire, shall not apply.

NOTE: The colour of the [orange plates] in conditions of normal use should have chromaticity coordinates lying within the area on the chromaticity diagram formed by joining the following coordinates:

<i>Chromaticity coordinates of points at the corners of the area on the chromaticity diagram</i>				
<i>x</i>	0.52	0.52	0.578	0.618
<i>y</i>	0.38	0.40	0.422	0.38

<i>Chromaticity coordinates of points at the corners of the area on the chromaticity diagram</i>				
<i>X</i>	0.52	0.52	0.578	0.618
<i>y</i>	0.38	0.40	0.422	0.38

Luminance factor of reflectorized colour:  
 $\beta > 0.12$ .

Reference centre E, standard illuminant C,  
normal incidence 45°, viewed at 0°.

*Co-efficient of reflex luminous intensity at an angle of illumination of 5°, viewed at 0.2°: not less than [20 candelas per lux per m2].\**

*For containers carrying dangerous solid substances in bulk and for tank-containers, MEGCs and portable tanks, the [markings] prescribed in 5.3.2.1.2 and 5.3.2.1.4 may be replaced by a self-adhesive sheet, by paint or by any other equivalent process, provided the material used for this purpose is weather-resistant and ensures durable marking. In this case, the provisions of the last sentence but one of 5.3.2.2.2, concerning resistance to fire, shall not apply.*

NOTE. The orange colour of the [marking], in conditions of normal use, should have chromaticity coordinates lying within the area on the chromaticity diagram formed by joining the following coordinates:

Luminance factor of non-reflectorized colour:  
 $\beta \geq 0.22$ .

Luminance factor of reflectorized colour:  
 $\beta > 0.12$ .

Reference centre E, Standard Illuminant C,  
normal incidence 45° and viewed at 0°.

\* In ADR in German these parameters are set out in a formula.

5.3.2.2.2 The hazard identification number and the UN number shall consist of black digits 100 mm high and of 15 mm stroke thickness. The hazard identification number shall be inscribed in the upper part of the [plate] and the UN number in the lower part; they shall be separated by a horizontal black line, 15 mm in stroke width, extending from side to side of the [plate] at mid-height (see 5.3.2.2.3).

The hazard identification number and the UN number shall be indelible and shall remain legible after 15 minutes' engulfment in fire. The [plate] shall not become detached from its mount in the event of a fire of this duration.

**5.3.2.2.3 Example of [orange-coloured plate] with hazard identification number and UN number.**

(Illustration as in ADR 2005)

5.3.2.2.4 The permitted tolerances for dimensions specified in this sub-section are  $\pm 10\%$ .

Co-efficient of reflex luminous intensity at an angle of illumination of 5°, viewed at 0.2°: not less than [20 candelas per lux per m<sup>2</sup>].\*

\* In ADR in German these parameters are set out in a formula.

5.3.2.2.2 The hazard identification number and the UN number shall consist of black digits 100 mm high and of 15 mm stroke thickness. The hazard identification number shall be inscribed in the upper part of the [marking] and the UN number in the lower part; they shall be separated by a horizontal black line, 15 mm in stroke width, extending from side to side of the [marking] at mid-height (see 5.3.2.2.3).

The hazard identification number and the UN number shall be indelible and shall remain legible after 15 minutes' engulfment in fire. The [marking] shall not become detached from its mount in the event of a fire of this duration.

**5.3.2.2.3 Example of [orange-coloured plate] with hazard identification number and UN number.**

(Illustration as in RID 2005)

5.3.2.2.4 The permitted tolerances for dimensions specified in this sub-section are  $\pm 10\%$ .

## Proposal 2

If this proposal is adopted, a new transitional measure should be included in section 1.6.1:

“1.6.1.x Existing [orange-coloured plates] which meet the requirements of section 5.3.2 applicable up to 31 December 2006 may continue to be used.”

### **Proposal 3**

The Government of Germany also proposes to consider the engulfment in fire referred to in 5.3.2.2.2. For tactical considerations with regard to fire-fighting an increase to 30 minutes should be recommended.

In this context, consideration should also be given to whether provision should be made for 30 minutes' engulfment in fire for the covering of plates according to 5.3.2.1.8.

### **Proposal 4**

Attention is also drawn to the fact that standards now exist for the use of reflectorized materials. For this reason the Joint Meeting's working group on standards should be given the responsibility of incorporating these standards into the NOTE in 5.3.2.2.1.

### **Justification**

#### Proposal 1

5.3.2.1.1: The requirement, currently only found in ADR, that the orange-coloured plate marking should be clearly visible has also been included in RID.

The existing text of 5.3.2.1.3 of RID has been added to 5.3.2.1.2, since this ensures that the systematic rules for displaying the orange-coloured plate marking are in the same place in RID and ADR.

The existing text of 5.3.2.1.5 of ADR has been added to 5.3.2.2.1 in order to be systematic. The same wording has also been included in RID. The existing 5.3.2.1.5 is reserved for the time being. The chronological numbering could, if necessary, be adapted accordingly.

The existing rule contained in 5.3.2.1.4 of RID (first sentence) has been added to 5.3.2.1.7, since in this case also similarly-worded rules are in the same place in RID and ADR.

5.3.2.1.8: The requirements of ADR concerning the removal or covering of orange-coloured plates and their effectiveness after 15 minutes' engulfment in fire have been included in RID. The second sentence of 5.3.2.1.4 of RID can also therefore be deleted.

5.3.2.2.1, first paragraph: In RID, the use of a reflectorized model of the orange-coloured marking/plate should be permitted as an "optional provision" so as not to hold back technological development. In ADR, the requirement of reflectorized plates is already binding.

5.3.2.2.1, second paragraph: The requirement that the material used for self-adhesive sheets, paint or any other equivalent process should be weather-resistant and durable should apply generally in the future to orange-coloured marking/plates in RID and ADR.

5.3.2.2.1, last paragraph before the NOTE: The requirements of ADR concerning the use of self-adhesive sheets, paint or any other equivalent process for containers for carriage in bulk, tank-containers, MEGCs and portable tanks have been included in RID. The existing possibility

of using self-adhesive sheets for tank wagons, however, is therefore eliminated. On the basis of the experience of a whole series of accidents in Germany, it has transpired that the use of self-adhesive sheets cannot ensure adequate information in the event of accidents.

5.3.2.2.2, second paragraph: The ADR requirements concerning the legibility of hazard identification numbers and UN numbers after 15 minutes' engulfment in fire have also been included in RID. Particularly in accidents with tank wagons, it is common for a fire to start, resulting in the destruction of the orange-coloured marking or the illegibility of the hazard identification numbers or UN numbers.

For purposes of clarification, provision has also been made to ensure that the orange-coloured plate does not become detached from its mount in the event of 15 minutes' engulfment in fire.

#### Proposal 2

A new transitional measure is proposed for ADR and RID for the application of new rules.

#### Proposal 3

The extension of the duration of the fire to 30 minutes is in keeping with the requirements of the fire brigade.

#### Proposal 4

The values given in the NOTE to 5.3.2.2.1 are no longer consonant with the current state of technology. In the meantime standards had been adopted internationally for reflectorized materials (e.g. PAS 1024 of August 2003 and PAS 1038 of May 2004).

**Safety:** The current level of safety is improved by increased harmonization and a clearer presentation of ADR and RID requirements. This is also important with regard to multimodal traffic.

The result of the new requirement of the legibility of hazard identification numbers and UN numbers after 15 minutes' engulfment in fire is also improved safety for RID. The use of self-adhesive sheets, paint or any other equivalent process has been restricted on the basis of experience acquired in accidents with tank wagons.

**Feasibility:** No problem, since renovation complying with the new requirements may be carried out during test periods, time spent in workshops, etc.

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