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Moving Europe towards a sustainable and safe railway system without frontiers.

RECOMMENDATION ERA 1175-2am1
OF
THE EUROPEAN UNION AGENCY FOR RAILWAYS

on

Transfer of requirements from RID to TSI WAG, amending it to add requirements on spark arresters and WE marking

Annex 1 – TSI WAG

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The Agency recommends the amendments in the annex of Technical specification for interoperability for the 'rolling stock — wagons' subsystem to the Commission Regulation (EU) No 321/2013 of 13 March 2013 concerning the technical specification for interoperability relating to the subsystem rolling stock as follows:

1. The following text shall be added at the end of point 2.2:

   '(d) 'RID': Regulations concerning the International Carriage of Dangerous Goods by Rail, as defined in Article 2 (2) of Directive 2008/68/EC.'

2. The following row shall be added at the end of Table 1:

4.2.7	Specific requirements for wagons in the scope of Chapter 7.1 of RID	1.1.1 1.1.3 1.1.4				

3. In point 4.2.3.5.3.4, the sentence 'in accordance with the specification referenced in Appendix D Index [2]' shall be replaced with 'as defined in point 7.1.2(g)'

4. The point 4.2.6.1.2.1 shall be replaced by the text below:

   '4.2.6.1.2.1 Barriers and spark arresters

   4.2.6.1.2.1.1 Requirements applicable to barriers and spark arresters

   In order to limit the effects of fire,

   - fire barriers shall be installed between the identified potential fire sources (high risk components) and the carried load in all units and
   - Spark arresters shall comply with the requirements specified in the technical document referenced in Appendix D.2 Index [E].

   Fire barriers and spark arresters shall have an integrity of at least 15 minutes.

   The demonstration of conformity for barriers and spark arresters is described in point 6.2.2.8.1.

   4.2.6.1.2.1.2 Specific requirements for spark arresters

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The following units fitted with tread brakes shall be equipped with spark arresters:

- Units with floors made of materials not listed in point 6.2.2.8.2.3,
- Flat units without flooring,
- Flat units with gaps in the flooring to house the wheels.'

5. The following point shall be added after point 4.2.6.3:

'4.2.7 Specific requirements for wagons in the scope of Chapter 7.1 of RID

Wagons in the scope of Chapter 7.1 of RID shall fulfil the requirements set out in Appendix I.'

6. The following text shall be added in point 4.8 'Parameters to be recorded in the technical file and European register of authorised types of vehicles' below 'Description of the signal informing of a derailment or a precursor to a derailment and its transmission for units fitted with DDF or DPF.'

- 'The compliance with wagon equipment requirement WE as defined in 7.1.2.2 of RID
- The compliance with 7.1.2.1.1 to 7.1.2.1.6 of RID'

7. Point 6.2.2.8.2. shall be replaced by the text below:

'6.2.2.8.2 Materials

6.2.2.8.2.1 Test

Testing of the materials ignitability and flame spread properties shall be performed in accordance with the specification referenced in Appendix D Index [20] for which the limit value shall be CFE ≥ 18 kW/m2.

For rubber parts of bogies, the testing shall be performed in accordance with the specification referenced in Appendix D Index [23] for which the limit value shall be MARHE ≤ 90 kW/m2 under the test conditions set out in the specification referenced in Appendix D Index [22].

6.2.2.8.2.2 Components exempted from testing

Wheelsets, coated or uncoated are deemed to comply with the required ignitability and flame spread properties without testing.

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6.2.2.8.2.3 Materials exempted from testing

The following materials are deemed to comply with the required ignitability and flame spread properties without testing:

- metals and alloys with inorganic coatings (such as, but not limited to: galvanised coating, anodic coating, chromate film, phosphate conversion coating),
- metals and alloys with an organic coating with a nominal thickness less than 0,3 mm (such as, but not limited to paints, plastic coating, asphaltic coating),
- metals and alloys with a combined inorganic and organic coating of which the nominal thickness of the organic layer is less than 0,3 mm,
- glass, stoneware, ceramic and natural stone products,
- materials that meet the requirements of category C-s3, d2 or higher in accordance with the specification referenced in Appendix D Index [21].'

8. The following text shall be added below 7.1.2 (g):

'The compliance of the unit with the Wagon Equipment requirements (WE) as defined in Appendix I shall be marked on both sides of the unit as depicted in figure 3, even if the unit is not intended for the transport of dangerous goods:

Figure 3:
marking of the unit with wagon equipment. In this example, the wagon is fitted with wagon equipments 1,3,4 and 6.

The letters shall be of the same font type as the GE marking. The size of the letters shall be at least 100 mm high. The outer measures of the frame shall be at least 275 mm wide and 140 mm high, the frame shall be 7 mm thick.

The marking shall be located on the right hand side of the area containing the European Vehicle Number and the TEN marking'

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9. In point 7.1.2 (h), the text 'Figure 1' shall be replaced by 'Figure 4' two times.

10. The following rows shall be added in the Table A.2 of Appendix A:

TSI point(s)	TSI points(s) in previous TSI	Explanation on TSI change	Transition regime		
			Design phase started	Production phase	units in operation
4.2.6.1.2.6.2	Not applicable new point	Spark arresters	1st Jan 2027 (or date of e.i.f. of RID 2027)	Not applicable	Not applicable
4.2.7	Not applicable new point	Transfer of wagon requirements from RID to TSI	1st Jan 2027 (or date of e.i.f. of RID 2027)	Not applicable	Not applicable
7.1.2(g)	Not applicable new point	Transfer of wagon requirements from RID to TSI – specific marking	1st Jan 2027 (or date of e.i.f. of RID 2027)	Not applicable	Not applicable

11. The following appendix shall be added after Appendix H:

'Appendix I – Specific requirements for wagons intended for transport of dangerous goods

This Appendix applies to units in the scope of Chapter 7.1 of RID and is intended to be considered in conjunction with RID.

Dangerous goods are defined in 1.2.1 of RID.

Wagon in the context of this appendix should be understood as 'wagon' as defined in 1.2.1 of RID, which is the equivalent for 'unit' of this TSI.

Tank, tank-wagon and battery-wagon are specific wagons defined in 1.2.1 of RID.

Requirements B, D, E and F include the additional requirements to comply with Wagon Equipment (WE) set out in 7.1.2.2 of RID.

Requirements to comply with relevant provisions of RID

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A) Requirements to comply with 7.1.2.1.1 of RID

In addition to the requirements set out in point 4.2.2.2 of this TSI, the load cases to be considered in the assessment of the strength of the tank and its fixing to the wagon shall consider the following:

- Whether the maximum working pressure of the tank has been superimposed on the load cases
- The operating temperature range of the shell, and
- The minimum wall thickness of the shell in accordance with RID 6.8.2.1 and 6.8.3.1.

B) Requirements to comply with 7.1.2.1.2 of RID

Wagon Equipment

This point covers the requirements for WE 6 in accordance with the provisions of RID.

Wagons for which code WE6 is required shall be fitted with spark arresters as defined in 4.2.6.1.2.1.1 of this TSI.

C) Requirements to comply with 7.1.2.1.3 of RID

Any wagon intended to be used in potentially explosive atmospheres shall comply with a suitable level of protection which depends on the zones where such wagon is intended to be used.

The zones referred to above are defined in Directive 1999/92/EC[1].

The level of protection corresponding to the selected equipment group and equipment category is set out in Directive 2014/34/EU[2]. The level of protection for which the wagon is assessed shall be reported in the wagon's technical file.

D) Requirements to comply with 7.1.2.1.4 of RID

Tank-wagons intended for the carriage of dangerous goods shall be built and equipped in such a way that the impact of collisions that produce stresses exceeding those that occur during normal operating conditions as defined in the specification referenced in Appendix D Index [1].

Construction requirement

[1] Directive 1999/92/EC of the European Parliament and of the Council of 16 December 1999 on minimum requirements for improving the safety and health protection of workers potentially at risk from explosive atmospheres (15th individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC) - Official Journal L 023 , 28/01/2000 P. 0057 - 0064

[2] Directive 2014/34/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to equipment and protective systems intended for use in potentially explosive atmospheres (recast) - OJ L 96, 29.3.2014, p. 309–356

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The minimum distance between the headstock plane and the most protruding point at the shell extremity on tank-wagons shall be at least 300 mm.

This requirement does not apply to tank-wagons equipped with a central end automatic coupler in accordance with point E.1.2 of this appendix.

Wagon equipment

This point covers the requirements for WE 1 (D.1) and WE 2 (D.2) in accordance with the provisions of RID.

D.1

Wagons for which code WE 1 is required[3] shall be fitted with devices limiting the impact of collision. These devices shall be capable of absorbing energy by means of elastic deformation of defined components of the subframe.

The minimum elastic deformation for which the wagon has been assessed shall be recorded in the technical file.

The dynamic energy capacity and assessment procedure depend on the coupler type as specified below:

D.1.1. - Wagons fitted with manual UIC end coupling system

Minimum dynamic energy capacity: 70 kJ per buffer.

The requirements of this special provision are deemed to be met by fitting Category C buffers as defined in the specification referenced in Appendix D Index [32].

This provision does not apply to wagons fitted with absorption elements in accordance with D.2.1.

D.1.2 - Wagons fitted with a central end automatic coupler

Minimum dynamic energy capacity: 140 kJ per coupler.

This provision does not apply to wagons fitted with absorption elements in accordance with D.2.2.

D.2

Wagons for which code WE 2 is required shall be fitted with devices limiting the impact of collision. These devices shall be capable of absorbing energy by means of elastic or plastic deformation of defined components of the subframe or by means of a similar procedure (e.g. crash elements).

Both the minimum elastic and plastic deformation capacity for which the wagon has been assessed shall be recorded in the technical file.

[3] These are tank-wagons intended to carry gases

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The total energy absorption capacity and assessment procedure depend on the coupler type as specified below:

D.2.1. - Wagons fitted with manual UIC end coupling system

Minimum dynamic energy capacity: 30 kJ per buffer.

Minimum total energy absorption capacity (reversible and irreversible): 400 kJ per buffer.

The requirements of this special provision are deemed to be met by fitting Category AX buffers as defined in the specification referenced in Appendix D Index [32].

D.2.2 - Wagons fitted with a central end automatic coupler

Minimum dynamic energy capacity: 75 kJ per coupler.

Minimum total energy absorption capacity (reversible and irreversible): 675 kJ per coupler.

E) Requirements to comply with 7.1.2.1.5 of RID

Wagon equipment

The fulfilment of section E.1 or E.2 below covers requirements for WE 3 in accordance with the provisions of RID.[4]

E.1 - Prevention of wagon overriding

E.1.1 - Wagons fitted with manual UIC coupling system

The wagon shall be protected against the overriding of buffers by equipment that:

- withstands a vertical force (upwards or downwards) of 150 kN;
- is designed and assessed in such a way that it can prevent the overriding even if the wagon equipment is fitted on only one of the colliding wagons;
- does not increase the overhang for fixing the wagon equipment by more than 20 mm;
- has a width that is at least as big as the width of the buffer head (except for the wagon equipment to protect against the overriding of buffers located above the left-hand footboard, which shall be tangent to the free space for the shunter, although the maximum width of the buffer must be

[4] If the tank of the tank-wagon fulfils TE25 b) or TE25 c) of RID, WE.3 is not mandatory. The provisions of the tank are covered by RID and therefore they are outside of the scope of this TSI.

covered);

- is located above every buffer;
- is built in such a way that the risk of penetration of the tank end is not increased in the event of a shock.

E.1.2 - Wagons using a central end automatic coupler

It shall be demonstrated that the central end automatic coupler prevents overriding by remaining in a coupled position and by remaining fixed to the coupled wagons when one side of the coupler is subject to a vertical force of 150 kN transmitted by the wagon upward and downward while the other part of the coupler is maintained in a fixed position.

If this requirement cannot be met, then the consequences of overriding shall be limited by fitting a protective shield at each end of the wagon in accordance with the specification set out in point E.2.2.

E.2 - Wagon equipment limiting the impact from an overriding wagon on the substances being carried when overriding occurs

E.2.1 - Wagons using manual UIC end coupling system

The wagon shall be equipped with a protective shield at each end of the wagon to limit the consequence of overriding buffers.

The width of the protective shield shall:

- be at least as wide as the distance defined by the outside edge of the buffer heads and
- cover the width of the tank.

The height of the protective shield, measured from the top edge of the headstock, shall cover

- either two thirds of the tank diameter or
- at least 900 mm and shall in addition be equipped at the top edge with an arresting device for climbing buffers.

A protective shield made of mild steel or reference steel with a minimum wall thickness of 6 mm provides presumption of conformity.

Reference steel means a steel with a tensile strength of 370 N/mm^2 and an elongation at fracture of 27%.

Mild steel means a steel with a tensile strength between 360 N/mm^2 and 490 N/mm^2 and an elongation at fracture in % not less than:

$$\frac{10000}{(\text{tensile strength in N/mm}^2)}$$

If other materials are used, the equivalent thickness shall be calculated in accordance with the following formula:

$$\text{equivalent thickness} = 6\frac{464}{\sqrt[3]{(\text{Rm1 A1})^2}}$$

Where Rm1 is the tensile strength of the intended material and A1 is the elongation at fracture of the intended material.

The values of Rm1 and A1 to be used shall be the specified minimum values in the standards defining the material properties.

The protective shield shall be shaped and attached in such a way that the possibility of the tank ends being penetrated by the protective shield itself is minimized.

E.2.2 - Wagons using central coupling other than central end automatic coupler not fulfilling the point E.1.2.

The wagon shall be equipped with a protective shield at each end of the wagon.

In this case, the protective shield shall cover the tank end to a height of at least 1100 mm, measured from the top edge of the headstock, the couplers shall be fitted with anticreep devices to prevent unintentional uncoupling and the protective shield shall be at least 1200 mm wide over the entire height of the shield.

A protective shield made of mild steel or reference steel as defined in E.2.1 with a wall thickness of 12 mm provides presumption of conformity.

If other materials are used, the equivalent thickness shall be calculated in accordance with the following formula:

$$\text{equivalent thickness} = 12\frac{464}{\sqrt[3]{(\text{Rm1 A1})^2}}$$

Where Rm1 is the tensile strength of the intended material and A1 is the elongation fracture of the intended material.

The values of Rm1 and A1 to be used shall be the specified minimum values in the standards defining the

material properties.

The protective shield shall be shaped and attached in such a way that the possibility of the tank ends being penetrated by the protective shield itself is minimized.

F) Requirements to comply with 7.1.2.1.6 of RID

Wagon equipment

This section covers requirements for WE 4 and WE 5 in accordance with RID provisions.

F.1

Compliance with point 4.2.3.5.3.3 or 4.2.3.5.3.4 of this TSI is deemed sufficient to meet WE 4 requirements.

F.2

Compliance with point 4.2.3.5.3.2 of this TSI is deemed sufficient to meet WE 5 requirements.'

12. The Following row shall be added in the Table of Appendix D below index [1.5]:

[1.6]	Normal operating conditions	Appendix I, point D	Clause 8

13. Index [2.2] in the table of appendix D shall be deleted.

14. Index [2.3] of table D shall be replaced by the following:

[2.3]	Applicable markings	7.1.2 (g)	All points except 4.5.25(b) and 4.5.35

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15. The following row shall be added in the Table of Appendix D below index [1.6]:

[32.2]	Category C buffers	Appendix I, point D.1.2	4 (except 4.3), 5, 6 (except 6.2.2.3, Annex E.4 and Annex I)
[32.3]	Category AX buffers	Appendix I, point D.2.1	4 (except 4.3), 5, 6 (except 6.2.2.3 and E.4) and 7

16. The following row shall be added at the end of the Table 'D.2 Technical documents (available on ERA website)' of Appendix D :

[E]	*ERA Technical Document on requirements on Spark Arresters for freight wagons fitted with tread brakes* *ERA/TD-2024/Spark Arresters version 1.1 (released on 5.12.2024)*		
[E.1]	Requirements for spark arresters	4.2.6.1.2.1.2	whole document

17. The following row shall be added at the end of the Table F.1. of Appendix F:

Specific requirements for wagons in the scope of Chapter 7.1 of RID	4.2.7				
Appendix I	A to F	X	X	n.a.	