COMMISSION IMPLEMENTING REGULATION (EU) 2025/2064

of 14 October 2025

amending Regulation (EU) No 321/2013 concerning the technical specification for interoperability relating to the 'rolling stock – freight wagons' subsystem of the rail system in the European Union ('WAG TSI')

(Text with EEA relevance)

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Directive (EU) 2016/797 of the European Parliament and of the Council of 11 May 2016 on the interoperability of the rail system within the European Union ([1]), and in particular Article 5(11) thereof,

Whereas:

(1) Commission Regulation (EU) No 321/2013 ([2]) lays down the technical specifications for interoperability relating to 'rolling stock – freight wagons' subsystem of the rail system in the Union ('WAG TSI').

(2) Commission Delegated Decision (EU) 2017/1474 ([3]) sets out specific objectives for the drafting, adoption and review of technical specifications for interoperability.

(3) Pursuant to Article 5(4) of Delegated Decision (EU) 2017/1474 the WAG TSI are to ensure consistency and avoid any overlap with the Regulations concerning the International Carriage of Dangerous Goods by Rail ([4]) ('RID') as regards technical requirements applicable to vehicles.

(4) To achieve that objective, the European Union Agency for Railways (ERA) identified technical requirements needing to be transferred from RID to TSI WAG as well as initiated a risk analysis to identify new requirements to be addressed.

(5) In order to harmonise the responsibilities and competences for vehicle authorisation, enhance transparency, improve the quality of the assessment and streamline administrative processes, those RID vehicle requirements should be transferred from RID to the WAG TSI. The assessments of the vehicle prior to authorisation should be performed by a notified body.

(6) Following several incidents due to a failure to properly secure semi-trailers to the pocket wagon carrying it, several actions to develop solutions ensuring the safe loading, safe transport and overall safe operation involving semi-trailers carried on pocket wagons were initiated. Newly developed technical requirements such as a new interoperability constituent 'device to secure semi-trailers on pocket wagons', values and procedures to assess the locking force, indicators showing the locking status, as well as the respective marking on the wagon, should be included in the WAG TSI.

([1]) OJ L 138, 26.5.2016, p. 44, ELI: http://data.europa.eu/eli/dir/2016/797/oj.

([2]) Commission Regulation (EU) No 321/2013 of 13 March 2013 concerning the technical specification for interoperability relating to the subsystem 'rolling stock – freight wagons' of the rail system in the European Union and repealing Decision 2006/861/EC (OJ L 104, 12.4.2013, p. 1, ELI: http://data.europa.eu/eli/reg/2013/321/oj).

([3]) Commission Delegated Decision (EU) 2017/1474 of 8 June 2017 supplementing Directive (EU) 2016/797 of the European Parliament and of the Council with regard to specific objectives for the drafting, adoption and review of technical specifications for interoperability (OJ L 210, 15.8.2017, p. 5, ELI: http://data.europa.eu/eli/dec_del/2017/1474/oj).

([4]) Convention concerning International Carriage by Rail of 9 May 1980, as amended by the Vilnius Protocol of 3 June 1999, Appendix C.

(7) To ensure safe operation in high crosswind scenarios, it is also necessary to verify the newly developed requirement relating to the vertical upward locking force for the existing and already authorised wagons. This measure was identified by the ERA impact assessment as the least impactful because in case of lack of verification of the locking force for existing wagons, the resulting impact would be the need to exchange the device to secure semitrailers and, if this is not possible, to use another vehicle for the transport of goods other than semi-trailers. The compliance should be marked on the vehicle easily visible for respective parties monitoring or supervising the retroactive application.

(8) As technologies specifically developed for freight rolling stock, such as the digital automatic coupling, provide different mechanical characteristics as well as digital functions, relating to freight monitoring but also to train protection and train control, it is essential that all requirements related to compatibility with trackside train detection equipment are complied with.The arrangements for integrating possible future requirements, such as the introduction of digital automatic coupling, to carry dangerous goods and equally non-dangerous goods with equivalent or higher safety level should therefore be laid down.

(9) Furthermore, the Swedish specific case related to hot axle box detectors was reduced in scope, which enhances common requirements at EU level and thus benefits the vehicle authorisation process.

(10) Under Delegated Decision (EU) 2017/1474, TSIs should indicate whether the conformity assessment bodies which were notified on the basis of a previous version of the TSI need to be re-notified, and whether a simplified notification process should be applied. The amendments introduced by this regulation do not require specific new competences for the conformity assessment and therefore no re-notification of the conformity assessment bodies for the purposes of Regulation (EU) No 321/2013 is necessary.

(11) The measures provided for in this Regulation are in accordance with the opinion of the Committee referred to in Article 51 of Directive (EU) 2016/797,

HAS ADOPTED THIS REGULATION:

Article 1

The Annex to Regulation (EU) No 321/2013 is amended in accordance with the Annex to this Regulation.

Article 2

The TSI amendments introduced by this Regulation do not require the re-notification of conformity assessment bodies that were notified on the basis of this TSI.

Article 3

This Regulation shall enter into force on the twentieth day following that of its publication in the *Official Journal of the European Union*.

This Regulation shall be binding in its entirety and directly applicable in all Member States.

Done at Brussels, 14 October 2025.

For the Commission
The President
Ursula VON DER LEYEN

ANNEX

The Annex to Regulation (EU) No 321/2013 is amended as follows:

(1) in point 2.2, the following point (d) is added:

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

(*) Directive 2008/68/EC of the European Parliament and of the Council of 24 September 2008 on the inland transport of dangerous goods (OJ L 260, 30.9.2008, p. 13, ELI: http://data.europa.eu/eli/dir/2008/68/oj).';

(2) in point 3, Table 1 'Basic parameters and their correspondence to the essential requirements', is amended as follows:

(a) the following rows 4.2.2.4.1 to 4.2.2.4.4 are inserted:

'4.2.2.4.1	Devices to secure semi-trailers – strength	1.1.1 1.1.3				
4.2.2.4.2	Devices to secure semi-trailers – locking force	1.1.1 1.1.3				
4.2.2.4.3	Devices to secure semi-trailers – indication	1.1.1 1.1.3				
4.2.2.4.4	Marking on the unit	1.1.1 1.1.3'				

(b) the following row 4.2.7 is added:

'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'				

(c) row 4.2.6.1.2.1 is replaced by the following:

'4.2.6.1.2.1	Fire safety Barriers and spark arresters	1.1.4		1.3.2	1.4.2'	

(3) the following point 4.2.2.4 is inserted:

'4.2.2.4. Securing of semi-trailers

This point applies to units equipped with devices to secure semi-trailers.

The conformity of devices to secure semi-trailers with the requirements of points 4.2.2.4.1, 4.2.2.4.2, and 4.2.2.4.3 shall be assessed as interoperability constituent pursuant to point 5.3.6 in accordance with point 6.1.2.7.

If the device to secure semi-trailers is not built as an independent component, the conformity of the devices to secure semi-trailers with the requirements of points 4.2.2.4.1, 4.2.2.4.2 and 4.2.2.4.3 may be assessed within the assessment of the subsystem, by applying point 6.1.2.7 as appropriate.

The conformity of the marking with the requirement of point 4.2.2.4.4 shall be assessed in accordance with the prescriptions set out in Section 2.4 of the ERA Technical Document referenced in Appendix D.2, Index [D].

4.2.2.4.1. Devices to secure semi-trailers – strength

Devices to secure semi-trailers shall hold semi-trailers in a safe position by withstanding the longitudinal, lateral and vertical downwards directed forces in accordance with the design operating state.

4.2.2.4.2. Devices to secure semi-trailers – locking force

Devices to secure semi-trailers shall lock semi-trailers in a safe position by withstanding the vertical upwards directed forces in accordance with the design operating state.

4.2.2.4.3. Devices to secure semi-trailers – indications

Devices to secure semi-trailers shall indicate reliably if the kingpin of the semi-trailer is correctly positioned and the semi-trailer is correctly locked.

The correct position of the kingpin of the semi-trailer and the locking of the semi-trailer shall be detected independently.

The indication shall be visible in any loading situation of the unit for the loading and checking staff.

4.2.2.4.4. Marking on the unit

The unit shall have a marking related to the device to secure semi-trailers on both sides for each device to secure semi-trailers, which contains:

— all information relevant for the safe use of the devices to secure semi-trailers by loading and checking staff,

— the compliance with point 4.2.2.4.2.';

(4) in point 4.2.3.5.3.4, fifth paragraph, the last sentence is replaced by the following:

'If this is not physically feasible, the DDAF shall indicate its status from at least one side and the other side of the wagon shall be marked in accordance with point 7.1.2(g).';

(5) point 4.2.6.1.2.1. is replaced by the following:

'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, the following requirements shall apply:

— fire barriers shall be installed between the identified potential fire sources (high risk components) and the carried load in all units,

— 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

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.';

(6) the following point 4.2.7 is inserted:

‘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.’;

(7) in point 4.8, first paragraph, the following indents are added:

‘— The compliance with wagon equipment requirement WE as set out in 7.1.2.2 of RID

— The compliance with 7.1.2.1.1 to 7.1.2.1.6 of RID’;

(8) the following point 5.3.6 is inserted:

‘5.3.6. Devices to secure semi-trailers

Devices to secure semi-trailers shall be designed and assessed for an area of use defined by:

— semi-trailers to which the device to secure semi-trailers is compatible,

— the unit to which the device to secure semi-trailers can be safely mounted.

Devices to secure semi-trailers shall comply with the requirements set out in points 4.2.2.4.1, 4.2.2.4.2 and 4.2.2.4.3. The conformity of devices to secure semi-trailers with those requirements shall be assessed at interoperability constituent level in accordance with point 6.1.2.7.’;

(9) in point 6.1.2, Table 9 ‘Modules to be applied for interoperability constituents’, the following row is inserted:

‘4.2.2.4.1, 4.2.2.4.2 and- 4.2.2.4.3	Devices to secure semi-trailers – strength, locking force and indications	X (*)	X	X	X (*)	X

(*) Modules CA1, CA2 or CH may be used only in the case of products placed on the market, and therefore developed, before 4 November 2025, provided that the manufacturer demonstrates to the NoBo that design review and type examination were performed for previous applications under comparable conditions, and are in conformity with the requirements of this TSI; this demonstration shall be documented, and is considered as providing the same level of proof as module CB or design examination according to module CH1.’;

(10) the following point 6.1.2.7 is inserted:

‘6.1.2.7. Device to secure semi-trailers

The conformity of devices to secure semi-trailers with the requirements of points 4.2.2.4.1, 4.2.2.4.2 and 5.3.6 of this Annex shall be assessed in accordance with the procedures in Sections 2.1 and 2.2 of the ERA Technical Document referenced in Appendix D.2, Index [D].

The conformity of devices to secure semi-trailers with the requirements of points 4.2.2.4.3 and 5.3.6 shall be assessed in accordance with the prescriptions in Section 2.3 of the ERA Technical Document referenced in Appendix D.2, Index [D].’;

(11) point 6.2.2.8.1 is replaced by the following:

‘6.2.2.8.1. Barriers and spark arresters

Barriers and spark arresters shall be tested in accordance with the specification referenced in Appendix D Index [19]. Steel sheets of at least 2 mm thickness and aluminium sheets of at least 5 mm thickness are deemed to comply with the integrity requirements without testing.’;

(12) point 6.2.2.8.2 is replaced by the following:

‘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/m^2.

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/m^2 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.

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].’;

(13) in point 7.1.2(d1), the second sentence is replaced by the following:

‘Compliance of the unit shall be demonstrated based on the technical document referred in Article 13 of CCS TSI and is checked by the notified body as part of EC verification.’;

(14) in point 7.1.2(g), the following paragraphs are added:

‘The compliance of the unit with the Wagon Equipment requirements (WE) as set out 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 equipment 1, 3, 2, 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';

(15) point 7.1.2(h) is amended as follows:

(a) in the text, the expression 'Figure 1' is replaced by the expression 'Figure 4';

(b) in the title of the figure, the expression 'Figure 1' is replaced by the expression 'Figure 4';

(16) the following point 7.2.2.5 is inserted:

'7.2.2.5. Rules for units in operation that are equipped with devices to secure semi-trailers.

Units in operation that are equipped with devices to secure semi-trailers shall be made to comply with the requirements in point 4.2.2.4.2 within a transitional period as set out in Table A.2 in Appendix A.

The conformity of devices to secure semi-trailers with the requirements in point 4.2.2.4.2 shall be assessed in accordance with the procedure in Section 2.2 of the ERA Technical Document referenced in Appendix D.2, Index [D].

The conformity shall be assessed:

(a) by keepers in respect of their vehicle fleets, once per combination of unit type and type of the device to secure semi-trailers. The keeper may delegate the assessment to the manufacturer of the devices to secure semi-trailers, or the entity in charge of maintenance assigned to its vehicles; or

(b) by manufacturers in respect of vehicles produced by them, once per combination of unit type and type of the device to secure semi-trailers. The evidence of conformity may then be provided to any keeper.

Each individual unit which corresponds to the positively assessed combination shall have an entry in its technical documentation which refers to the tests done and confirms that it complies with the requirements in point 4.2.2.4.2. The conformity with the requirements in point 4.2.2.4.2 shall also be included in the markings on the unit, in accordance with point 4.2.2.4.4.

An assessment by a notified body shall not be required.

Units in operation that are equipped with devices to secure semi-trailers shall be made to comply with the requirements in points 4.2.2.4.4 within a transitional period as set out in Table A.2.

The conformity of the marking of each individual unit shall be assessed in accordance with the prescriptions in Section 2.4 of the ERA Technical Document referenced in Appendix D.2, Index [D]. The conformity shall be assessed by the keeper. The keeper may delegate the assessment to the entity in charge of maintenance assigned to its units.

Each individual unit which has been positively assessed shall have an entry in its technical documentation which confirms that it complies with the requirements in point 4.2.2.4.4.

An assessment by a notified body shall not be required.';

(17) in point 7.3.2.2 referring to the specific case Sweden, Table 12 is replaced by the following:

'Table 12

Target and prohibitive zone for units intended to be operated in Sweden

Y_{TA} [mm]	W_{TA} [mm]	L_{TA} [mm]	Y_{PZ} [mm]	W_{PZ} [mm]	L_{PZ} [mm]
905 ± 20	≥ 40	whole	905	≥ 100	≥ 500 '

(18) Appendix A is replaced by the following:

'Appendix A

Changes of requirements and transition regimes

In accordance with point 7.2.3.1.2, Table A.1 and Table A.2 reference the changes, compared with the TSI as amended by Implementing Regulation (EU) 2020/387, that require an assessment.

Changes with a generic transition regime of 7 years

Changes with a generic transition regime affect projects in design phase. Those changes are relevant to determine the applicability of requirements of the certification framework of a project, based on its initial assessment framework. Projects in production phase and units in operation are not affected by those changes.

Table A.1

Transition regime of 7 years

TSI point(s)	TSI point(s) in previous TSI	Explanation of the TSI change	Date of application
4.2.2.3 Second paragraph	New requirement	Inclusion of a requirement on the securing devices	28 September 2030
4.2.3.5.3 Derailment detection and prevention function	No point	Inclusion of requirements for the derailment detection and prevention function	28 September 2030
4.2.4.3.2.1 Service brake	4.2.4.3.2.1 Service brake	Evolution of the specification referenced in Appendix D.1, Indexes [16] and [17]	28 September 2030
4.2.4.3.2.2 Parking brake	4.2.4.3.2.2 Parking brake	Evolution of the specification referenced in Appendix D.1 Index [17]	28 September 2030
4.2.4.3.2.2 Parking brake	4.2.4.3.2.2 Parking brake	Change in the calculation of the parking brake parameters	28 September 2030
6.2.2.8.1 Testing of barriers and spark arresters	6.2.2.8.1 Testing of barriers	Evolution of the specification referenced in Appendix D.1 Index [19]	28 September 2030
7.1.2 (h) Marking of the parking brake	7.1.2 (h) Marking of the parking brake	Change in the required marking	28 September 2030
Point 9 of Appendix C	Point 9 of Appendix C	Evolution of the specification referenced in Appendix D.1, Indexes [38], [39], [46], [48], [49], [58]	28 September 2030
Points referring to Appendix H and Appendix D.2 Index [B]	New requirement	Inclusion of requirements on the codification of units intended to be used in combined transport	28 September 2030

TSI point(s)	TSI point(s) in previous TSI	Explanation of the TSI change	Date of application
Points referring to Appendix D.2 Index [A] except to point 3.2.2	Points referring to ERA/ERTMS/033281 V4 except to point 3.2.2	ERA/ERTMS/033281 V5 replaces ERA/ERTMS/033281 V4, main changes concern frequency management for interference current limits and closure of open points	28 September 2030

Changes with a specific transition regime:

Changes with a specific transition regime affect projects in design phase, projects in production phase and units in operation. Those changes are relevant to determine the applicability of requirements of the certification framework of a project, based on its initial assessment framework. They are also relevant to determine the need for retrofit.

Table A.2

Specific transition regime

TSI point(s)	TSI points(s) in previous TSI	Explanation on TSI change	Transition regime			
			Design phase not started	Design phase started	Production phase	Units in operation
Points referring to point 3.2.2 Appendix D.2 Index [A]	Points referring to point 3.2.2 of ERA/ERTMS/033281 V4	ERA/ERTMS/033281 V5 replaces ERA/ERTMS/033281 V4	Transition regime is laid down in Table B1 in Appendix B to the CCS TSI			
Points referring to point 4.2.2.4.1	Not applicable	Devices to secure semi-trailers – strength (longitudinal, lateral and vertical downwards)	Directly applicable	4 November 2026	4 November 2026	Not applicable
Points referring to point 4.2.2.4.2	Not applicable	Devices to secure semi-trailers – locking force (vertical upwards directed)	Directly applicable	4 November 2026	4 November 2026	4 May 2027
Points referring to point 4.2.2.4.3	Not applicable	Devices to secure semi-trailers – indications	Directly applicable	4 November 2026	4 November 2026	Not applicable
Points referring to point 4.2.2.4.4	Not applicable	Marking related to devices to secure semi-trailers	Directly applicable	4 November 2026	4 November 2026	4 May 2027
4.2.6.1.2.1.2	Not applicable new point	Spark arrestors mandatory for certain wagon categories	Directly applicable	1 January 2027	Not applicable	Not applicable

TSI point(s)	TSI points(s) in previous TSI	Explanation on TSI change	Transition regime			
			Design phase not started	Design phase started	Production phase	Units in operation
4.2.7	Not applicable new point	Transfer of wagon requirement from RID to TSI	1 January 2027	1 January 2027	1 January 2033	Not applicable
7.1.2 (g)	Not applicable new point	Transfer of wagon requirement from RID to TSI	1 January 2027	1 January 2027	1 January 2033	Not applicable'

(19) in Appendix D, point D.1, the table is amended as follows:

(a) the following row [1.6] is inserted:

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

(b) row [2.2] is deleted;

(c) row [2.3] is replaced by the following:

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

(d) row [19.1]. is replaced by the following:

'[19.1]	Barriers and spark arresters	6.2.2.8.1	4 to 12'

(e) the following rows [32.2] and [32.3] are inserted:

'[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'

(20) in Appendix D, point D.2, table, the following rows are added:

‘[D]	ERA Technical Document on the procedures to demonstrate compliance with the requirements in point 4.2.2.4 of the WAG TSI on securing semi-trailers ERA/TD-2025/SECURING OF SEMI TRAILERS version 1.0 (released on 11.9.2025)		
[D.1]	Prescriptions for marking	4.2.2.4.4	Section 2.4
[D.2]	Conformity assessment regarding securing semi-trailers	6.1.2.7	Sections 2.1, 2.2, and 2.3.
[E]	ERA Technical Document on spark arresters ERA/TD-2024/Spark Arresters version 1.1 (released on 5.12.2024)		
[E.1]	Spark arresters	4.2.6.1.2.1	Sections 2.1, 2.2, 2.3’

(21) Appendix F, Table F.1 ‘Assessment assigned to the production phases’, is amended as follows:

(a) the following rows are inserted:

‘Device to secure semi-trailers – strength	4.2.2.4.1	X	X	n.a.	6.1.2.7
Device to secure semi-trailers – locking force	4.2.2.4.2	X	X	n.a.	6.1.2.7
Device to secure semi-trailers – indications	4.2.2.4.3	X	X	n.a.	6.1.2.7
Marking on the unit	4.2.2.4.4	X	X	n.a.	—’

(b) the following rows are added:

‘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.’	

(22) the following Appendix I is added:

'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 read in conjunction with RID.

Dangerous goods are defined in point 1.2.1 of RID.

Wagon in the context of this Appendix shall be understood as "wagon" as defined in point 1.2.1 of RID, which is the equivalent for "unit" in this TSI.

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

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

Requirements to comply with relevant provisions of RID

(A) ***Requirements to comply with point 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:

(1) whether the maximum working pressure of the tank has been superimposed on the load cases;

(2) the operating temperature range of the shell;

(3) the minimum wall thickness of the shell in accordance with points 6.8.2.1 and 6.8.3.1 of RID.

(B) ***Requirements to comply with point 7.1.2.1.2 of RID***

Wagon equipment

The wagon shall be fitted with spark arresters as defined in ERA Technical Document ERA/TD-2024/Spark Arresters version 1.1.

The conformity assessment procedure is set out in point 6.2.2.8.1 of this TSI. This point covers the requirements for WE 6 in accordance with the provisions of RID.

(C) ***Requirements to comply with point 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 in the first paragraph of this point are defined in Directive 1999/92/EC of the European Parliament and of the Council (*).

The level of protection corresponding to the selected equipment group and equipment category is set out in Directive 2014/34/EU of the European Parliament and of the Council (**). The level of protection for which the wagon is assessed shall be reported in the wagon's technical file.

(D) ***Requirements to comply with point 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 as to withstand the impact of collisions that produce stresses exceeding those that occur during normal operating conditions as set out in the specification referenced in Appendix D Index [1].

Construction requirement

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 shall 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 shall be fitted with devices limiting the impact of collision. Those 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 Union Internationale des Chemins de fer (UIC) end coupling system

Minimum dynamic energy capacity: 70 kJ per buffer.

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

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

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

Minimum dynamic energy capacity: 140 kJ per coupler.

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

D.2

Wagons for which code WE 2 is required shall be fitted with devices limiting the impact of collision. Those 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.

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 shall be deemed to be met by fitting Category AX buffers as set out 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 point 7.1.2.1.5 of RID***

Wagon equipment

The fulfilment of Section E.1 or E.2 of this point shall cover the requirements for WE 3 in accordance with the provisions of RID.

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:

(1) withstands a vertical force (upwards or downwards) of 150 kN;

(2) 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;

(3) does not increase the overhang for fixing the wagon equipment by more than 20 mm;

(4) 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 covered);

(5) is located above every buffer;

(6) 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:

(1) be at least as wide as the distance defined by the outside edge of the buffer heads;

(2) cover the width of the tank.

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

(1) two thirds of the tank diameter;

(2) at least 900 mm, provided that in addition the protective shield is 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 shall provide presumption of conformity.

Reference steel means a steel with a tensile strength of 370 N/mm² and an elongation at fracture of 27 %.

Mild steel means a steel with a tensile strength between 360 N/mm² and 490 N/mm² and an elongation at fracture in % not less than:

$$\frac{10\,000}{(\text{tensile strength in N/mm}^2)}$$

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

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

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 minimised.

E.2.2 – Wagons using central coupling other than central end automatic coupler not meeting the requirements of 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 1 100 mm, measured from the top edge of the headstock, the couplers shall be fitted with anti-creep devices to prevent unintentional uncoupling and the protective shield shall be at least 1 200 mm wide over the entire height of the shield.

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

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

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

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 minimised.

(F) ***Requirements to comply with point 7.1.2.1.6 of RID***

Wagon equipment

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

F.1

Compliance with points 4.2.3.5.3.3 or 4.2.3.5.3.4 of this TSI shall be deemed sufficient to meet WE 4 requirements.

F.2

Compliance with point 4.2.3.5.3.2 of this TSI shall be deemed sufficient to meet WE 5 requirements.

(*) 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) (OJ L 23, 28.1.2000, p. 57, ELI: http://data.europa.eu/eli/dir/1999/92/oj).

(**) 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 (OJ L 96, 29.3.2014, p. 309, ELI: http://data.europa.eu/eli/dir/2014/34/oj).'.