

Committee of Experts on the Transport of Dangerous Goods and on the Globally Harmonized System of Classification and Labelling of Chemicals

Sub-Committee of Experts on the Transport of Dangerous Goods

21 November 2023

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Item 6 (c) of the provisional agenda

Portable tanks

Proposal for a new sub-chapter 6.9.4 “Provisions for the design, construction, inspection and testing of portable tanks with shells made of fibre-reinforced plastics (FRP) materials intended for the transportation of substances of class 2 (unrefrigerated liquefied gases)”

Submitted by the Government of the Russian Federation

I. General

1. The Committee of Experts on the Transport of Dangerous Goods and on the Globally Harmonized System of Classification and Labelling of Chemicals on its tenth session has been reported amendments to the twenty-first revised edition of the *Recommendations on the Transport of Dangerous Goods, Model Regulations* (ST/SG/AC.10/48/Add.1).

The amendments include a new chapter 6.9 “Requirements for the design, construction, inspection and testing of portable tanks with shells made of fibre reinforced plastics (FRP) materials” and the appropriate update of chapter 4.2 related to the chapter 6.9.

2. In recent decades, FRP has been widely used for the production of storage tanks for unrefrigerated liquefied gases corresponding to Class 2, including hydrogen.

The technologies of production of Type II-V storage tanks are filament winding or robotic winding. The reinforcing materials are carbon, glass or basalt fibres. Both thermosetting and thermoplastic polymers are used for production. Such structures are designed to withstand internal pressure up to 350 bar.

The international experience of production and operation of tanks for storage and transportation of unrefrigerated liquefied gases demonstrates the effectiveness and the absence of technological limitations of the use of FRP for manufacturing of UN portable tanks intended for transportation of Class 2 substances.

3. The Russian Federation believes that using FRP materials in the construction of the portable tanks for unrefrigerated liquefied gases corresponding to Class 2, including hydrogen will lead to increase their service life and a reduction of repair costs.

4. The Russian Federation has acquired certain experience in using FRP materials for the fabrication of the tanks and would like to initiate discussions on the development of the new sub-chapter 6.9.4 “Provisions for the design, construction, inspection and testing of portable tanks with shells made of fibre-reinforced plastics (FRP) materials intended for the transportation of substances of Class 2 (unrefrigerated liquefied gases)”.

II. Background

5. At its 54th session (27 November to 6 December 2017, report ST/SG/AC.10/C.3/108), the Sub-Committee considered, *inter alia*, requests by AEISG (document

ST/SG/AC.10/C.3/2018/99) and the Russian Federation (document ST/SG/AC.10/C.3/2018/91) to extend the scope of the work to cover transport of explosives and non-refrigerated liquefied gases in FRP tanks.

6. The Sub-Committee noted that the informal working group acknowledged the ability of FRP portable tanks to carry dangerous goods of Class 2, but noting the additional complexities involved in the transport of these goods it decided to prioritize and finalize work on the development of provisions for transport of goods of other classes in FRP portable tanks before addressing transport of gases.

7. The Russian Federation truly believes now it is the right time to develop requirements for design, construction, inspection and testing of fibre reinforced plastic (FRP) portable tanks to carry dangerous goods of Class 2.

8. The requirements for UN portable tanks suitable for the carriage of non-refrigerated liquefied gases of Class 2 (T50) shall include requirements to prevent gas permeation of the composite shell at high internal pressure.

9. Existing FRP materials do not meet the requirements for long-term transportation. Currently, metal liners (combined materials) are used to prevent gas permeability.

III. Actions requested

10. Considering the above, the Russian Federation would like to discuss further development of chapter 6.9 “Provisions for the design, construction, inspection and testing of portable tanks with shells made of fibre-reinforced plastics (FRP) materials intended for the transportation of substances of classes 3, 5.1, 6.1, 6.2, 8 and 9” in order to extend it to Class 2 transportation.

11. The Russian Federation invites the Sub-Committee to:

(a) Consider the development of the new sub-chapter 6.9.4 “Provisions for the design, construction, inspection and testing of portable tanks with shells made of fibre-reinforced plastics (FRP) materials intended for the transportation of substances of Class 2 (unrefrigerated liquefied gases)”;

(b) Invite all experts to contribute to the development of new sub-chapter 6.9.4 and invite the existing expert group currently dealing with FRP service equipment to proceed with the development of a new chapter sub-chapter 6.9.4 if so decided.
