



**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****Sixty-first session**

Geneva, 28 November-6 December 2022

Item 6 (c) of the provisional agenda

**Miscellaneous proposals for amendments to the Model Regulations
on the Transport of Dangerous Goods: portable tanks****Transport of certain ALKALI METAL DISPERSIONS (UN
1391) and ALKALI METAL DISPERSIONS,
FLAMMABLE (UN 3482) in portable tanks****Transmitted by the expert from the United States of America*****Introduction**

1. As the global demand for lithium increases particularly given the potential use in energy storage applications, the need has arisen for the international transport of alkali metals and alkaline earth metals dispersions (slurries comprised of metal powder and hydrocarbon solvent) in portable tanks. Technological innovations allow alkali metals incorporated in liquid dispersions to be seamlessly incorporated into manufacturing processes and directly printed onto components such as lithium battery anodes. This proposal supports sustainable development goal 7, “ensure access to affordable, reliable, sustainable and modern energy for all”. Specifically, the proposal supports target 7.a to “enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology”.

2. At the sixtieth session an informal document INF.13 (sixtieth session) was submitted proposing to add a special provision to the entries for ALKALI METAL DISPERSIONS or ALKALINE EARTH METAL DISPERSIONS (UN 1391) and ALKALI METAL DISPERSIONS, FLAMMABLE or ALKALINE EARTH METAL DISPERSIONS, FLAMMABLE (UN 3482) to authorize the transport of lithium dispersions in UN portable tanks.

3. The proposal received general support; however, some experts expressed an interest in expanding the authorization to all possible alkali metal and alkaline earth metal dispersions. This document proposes to authorize the transport of certain dispersions transported as ALKALI METAL DISPERSIONS (UN 1391) and ALKALI METAL DISPERSIONS, FLAMMABLE (UN 3482) in UN portable tanks that conform to tank

* A/75/6 (Sect.20), para. 20.51

instruction T13 and special provisions TP1 and TP7 through amendments to the applicable dangerous goods list entries.

Discussion

4. The ALKALI METAL DISPERSIONS (UN 1391) and ALKALI METAL DISPERSIONS, FLAMMABLE (UN 3482) entries in the Dangerous Goods List both reference special provision 182 and 183 in Column 6, which state that the “group of alkali metals includes lithium, sodium, potassium, rubidium, and caesium” and that the “group of alkaline earth metals includes magnesium, calcium, strontium and barium”.

5. The Guiding Principles for the Model Regulations indicate that liquid Division 4.3 substances of Packing Group I are in principle considered suitable for the transport in portable tanks conforming to portable tank instruction “T9” or “T13” (for N.O.S.). Likewise, solid Division 4.3 substances of Packing Group I are considered suitable for transport in portable tanks conforming to portable tank instruction “T9”.

6. In examining the possible expansion of authorization to other alkali metals and alkaline earth metals in dispersions it is useful to review existing authorizations for transporting the pure substances in portable tanks. Of the eight metals in these families, six are authorized in UN portable tanks when transported as pure substances.

<u>Pure substance</u>	<u>Authorized in UN portable tanks (Model Regulations)</u>
Lithium, UN 1415, 4.3	T9, TP7, TP33
Sodium, UN 1428, 4.3	T9, TP7, TP33
Potassium, UN 2257, 4.1	T9, TP7, TP33
Rubidium, UN 1423, 4.3	No
Caesium, UN 1407, 4.3	No
Magnesium, UN 1869, 4.1	T1, TP33
Calcium UN 1401, 4.3	T3, TP33
Strontium (no specific UN number pure substance offered as UN 1393)	T3, TP33
Barium UN 1400, 4.3	T3, TP33

7. The two metals not authorized for transport in portable tanks as pure substances are rubidium and caesium. These substances are the most reactive of the alkali metal family and therefore the highest hazard if they encounter air. Production of hydrogen gas and heat is a likely outcome if the tank loses containment. Since these metals are not currently authorized in portable tanks as pure substances, and noting the higher reactivity of these two substances, this paper is not proposing to authorize transport of caesium or rubidium in dispersions in UN portable tanks.

8. During discussion of the informal document at the sixtieth session additional questions were raised concerning the assignment of TP2 instead of TP1 and if T9 should be assigned instead of T13. TP1 was selected because it is for liquid substances with vapor pressures ≤ 175 kPa at 65 °C. Tank code T13 is proposed instead of T9 because T13 requires a higher test pressure (increased strength) and prohibits bottom outlets. These safety features are enhancements over the T9 portable tank instruction and selected based on the similarity of these listings to N.O.S. entries that are traditionally assigned T13 (e.g., there are various metal dispersions authorized).

Proposal

9. In 3.2 Dangerous Goods List columns amend the entries for UN 1391 and UN 3482 and insert in 4.2.5.3 a new portable tank special provision XYZ as follows (new text is underlined>):

UN No.	Name and description	Class or division	Subsidiary hazard	UN packing group	Special provisions	Limited and excepted quantities		Packagings and IBCs		Portable tanks and bulk containers	
						(7a)	(7b)	Packing instruction	Special packing provisions	Instructions	Special provisions
(1)	(2)	(3)	(4)	(5)	(6)	(7a)	(7b)	(8)	(9)	(10)	(11)
1391	ALKALI METAL DISPERSION or ALKALINE EARTH METAL DISPERSION	4.3		I	182 183	0	E0	P402		<u>T13</u>	<u>TP1</u> <u>TP7</u> <u>TPXYZ</u>
3482	ALKALI METAL DISPERSION, FLAMMABLE or ALKALINE EARTH METAL DISPERSION, FLAMMABLE	4.3	3	I	182 183	0	E0	P402		<u>T13</u>	<u>TP1</u> <u>TP7</u> <u>TPXYZ</u>

TPXYZ Portable tanks are not authorized for the transport of caesium or rubidium dispersions.