

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

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Sub-Committee of Experts on the Transport of Dangerous Goods

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Geneva, 1–9 December 2014

Item 2 (b) of the provisional agenda

Recommendations made by the Sub-Committee on its forty-third, forty-fourth and forty-fifth sessions and pending issues: listing, classification and packing

Classification of polymerizing substances

Transmitted by the experts from Germany and the United States of America and by the Dangerous Goods Advisory Council (DGAC)

Proposal

- (a) Insert the following new definition in 1.2.1:

“Self-accelerating polymerization temperature (SAPT) is defined as the lowest temperature at which polymerization may occur with a substance in the packaging as offered for transport. The SAPT shall be determined in accordance with the test procedures established for the self-accelerating decomposition temperature for self-reactive substances in accordance with the Manual of Tests and Criteria.”

- (b) Insert a new 2.2.4 to read:

“Gases not accepted for transport

Chemically unstable substances of Class 2 shall not be accepted for transport unless the necessary precautions have been taken to prevent the possibility of a dangerous decomposition or polymerization under normal conditions of transport or unless transported in accordance with P 200 (r), as applicable. For the precautions necessary to prevent polymerization, see special provision XXX. To this end particular care shall be taken to ensure that receptacles and tanks do not contain any substances liable to promote these reactions.”

- (c) Insert a new 2.3.5 to read:

“Substances not accepted for transport

Chemically unstable substances of Class 3 shall not be accepted for transport unless the necessary precautions have been taken to prevent the possibility of a dangerous decomposition or polymerization under normal conditions of transport. For the precautions necessary to prevent polymerization, see special provision XXX. To this end particular care shall be taken to ensure that receptacles and tanks do not contain any substances liable to promote these reactions.”

(d) Revise 2.4.1.1 (a) to read:

(a) Division 4.1 *Flammable solids*

Solids which, under conditions encountered in transport, are readily combustible or may cause or contribute to fire through friction; self-reactive substances and polymerizing substances which are liable to undergo a strongly exothermic reaction; solid desensitized explosives which may explode if not diluted sufficiently;

(e) Revise 2.4.1.2 to read:

“(c) Polymerizing substances (Division 4.1);

(~~e~~ d) Pyrophoric solids (Division 4.2);

(~~d~~ e) Pyrophoric liquids (Division 4.2);

(~~e~~ f) Self-heating substances (Division 4.2); and

(~~f~~ g) Substances which, in contact with water, emit flammable gases (Division 4.3).”

(f) Insert a new 2.4.2.5 to read:

“2.4.2.5 Division 4.1 Polymerizing substances and mixtures (stabilized)

2.4.2.5.1 *Definitions and properties*

Polymerizing substances are substances which, without stabilization, are liable to undergo a strongly exothermic reaction resulting in the formation of larger molecules or resulting in the formation of polymers under conditions normally encountered in transport. Such substances are considered to be polymerizing substances of Division 4.1 when:

(a) Their self-accelerating polymerization temperature (SAPT) is 75°C or less under the conditions (with or without chemical stabilization as offered for transport) and in the packaging, IBC or portable tank in which the substance or mixture is to be transported;

(b) They exhibit a heat of reaction of more than 300 J/g; and

(c) They do not meet any other criteria for inclusion in Classes 1-8.

A mixture meeting the criteria of a polymerizing substance shall be classified as a polymerizing substance of Division 4.1.

2.4.2.5.2 Polymerizing substances are subject to temperature control in transport if their self-accelerating polymerization temperature (SAPT) is:

(a) When offered for transport in a packaging or IBC, 50°C or less in the packaging or IBC in which the substance is to be transported; or

(b) When offered for transport in a portable tank, 45°C or less in the portable tank in which the substance is to be transported.

2.4.2.5.3 Polymerizing substances that also meet the criteria of 2.9.3 shall be consigned under the appropriate polymerizing substance entry.”

- (g) Insert a new 2.6.2.5 to read:

“Substances not accepted for transport

Chemically unstable substances of Division 6.1 shall not be accepted for transport unless the necessary precautions have been taken to prevent the possibility of a dangerous decomposition or polymerization under normal conditions of transport. For the precautions necessary to prevent polymerization, see special provision XXX. To this end particular care shall be taken to ensure that receptacles and tanks do not contain any substances liable to promote these reactions.”

- (h) Insert a new 2.8.3 to read:

“Substances not accepted for transport

Chemically unstable substances of Class 8 shall not be accepted for transport unless the necessary precautions have been taken to prevent the possibility of a dangerous decomposition or polymerization under normal conditions of transport. For the precautions necessary to prevent polymerization, see special provision XXX. To this end particular care shall be taken to ensure that receptacles and tanks do not contain any substances liable to promote these reactions.”

- (i) Revise the last sentence in 3.1.2.6 (a) to read:

“When temperature control is used to stabilize such substances to prevent the development of any dangerous excess pressure or the evolution of excessive heat, or when chemical stabilization is used in combination with temperature control, then:

- (a) For liquids and solids where the SAPT (measured without or with inhibitor, when chemical stabilization is applied) is less than or equal to that prescribed in 2.4.4.5.2, special provision XXX and the provisions of 7.1.6 apply.
- (b) For gases: the conditions of transport shall be approved by the competent authority.”

- (j) Insert the following four new entries into the Dangerous Goods List in Chapter 3.2:

(1)	(2)	(3)	(4)	(5)	(6)	(7a)	(7b)	(8)	(9)	(10)	(11)
AAAA	POLYMERIZING SUBSTANCE, SOLID, STABILIZED, N.O.S.	4.1		III	274 XXX	0	E0	P002 IBC07	PPaa Bc	T7	TP4 TP6 TP33
BBBB	POLYMERIZING SUBSTANCE, LIQUID, STABILIZED, N.O.S.	4.1		III	274 XXX	0	E0	P001 IBC03	PPbb Bd	T7	TP4 TP6
CCCC	POLYMERIZING SUBSTANCE, SOLID, TEMPERATURE CONTROLLED, N.O.S.	4.1		III	274 XXX	0	E0	P002 IBC07	PPaa Bc	T7	TP4 TP6 TP33
DDDD	POLYMERIZING SUBSTANCE, LIQUID, TEMPERATURE CONTROLLED, N.O.S.	4.1		III	274 XXX	0	E0	P001 IBC03	PPbb Bd	T7	TP4 TP6

(k) **In the Dangerous Goods List in Chapter 3.2:**

Insert special provision “XXX” in column (6) for the following entries:

UN 1010, UN 1051, UN 1060, UN 1081, UN 1082, UN 1085, UN 1086, UN 1087, UN 1092, UN 1093, UN 1143, UN 1185, UN 1218, UN 1246, UN 1247, UN 1251, UN 1301, UN 1302, UN 1303, UN 1304, UN 1545, UN 1589, UN 1614, UN 1724, UN 1829, UN 1860, UN 1917, UN 1919, UN 1921, UN 1991, UN 2055, UN 2200, UN 2218, UN 2227, UN 2251, UN 2277, UN 2283, UN 2383, UN 2348, UN 2352, UN 2396, UN 2452, UN 2521, UN 2527, UN 2531, UN 2607, UN 2618, UN 2838, UN 3022, UN 3073 and UN 3079.

(l) In Chapter 3.3, insert new special provision “XXX” to read:

“XXX When substances are stabilized by temperature control, the provisions of 7.1.6 apply. When chemical stabilization is employed, the person offering the package, IBC or tank for transport shall ensure that the level of stabilization is sufficient to prevent the substance in the package, IBC or tank from dangerous polymerization at a bulk mean temperature of 50°C, or, in the case of a portable tank, 45°C. Where chemical stabilization becomes ineffective at lower temperatures within the anticipated duration of transport, temperature control is required. In making this determination factors to be taken into consideration include, but are not limited to, the capacity and geometry of the package, IBC or tank and the effect of any insulation present, the temperature of the substance when offered for transport, the duration of the journey and the ambient temperature conditions typically encountered in the journey (considering also the season of year), the effectiveness and other properties of the stabilizer employed, applicable operational controls imposed by regulation (e.g. requirements to protect from sources of heat, including other cargo carried at a temperature above ambient) and any other relevant factors.

(m) In the packing instructions in 4.1.4.1 –

i. For packing instruction P001, add a new Special Packing Provision “Pbb” to read:

“Pbb For UN Nos. BBBB and DDDD, packagings shall be designed and constructed to permit the release of gas or vapour to prevent a

- build-up of pressure that could rupture the packagings in the event of loss of stabilization.”
- ii. For packing instruction P002, add a new Special Packing Provision “Paa” to read:
- “Paa For UN Nos. AAAA and CCCC, packagings shall be designed and constructed to permit the release of gas or vapour to prevent a build-up of pressure that could rupture the packagings in the event of loss of stabilization.”
- (n) In the IBC packing instructions in 4.1.4.2 -
- i. For packing instruction IBC03, add a new Special Packing Provision “Bd” to read:
- “Bd For UN Nos. BBBB and DDDD, IBCs shall be designed and constructed to permit the release of gas or vapour to prevent a build-up of pressure that could rupture the IBCs in the event of loss of stabilization.”
- ii. For packing instruction IBC07, add a new Special Packing Provision “Bc” to read:
- “Bc For UN Nos. AAAA and CCCC, IBCs shall be designed and constructed to permit the release of gas or vapour to prevent a build-up of pressure that could rupture the IBCs in the event of loss of stabilization.”
- (o) Revise 7.1.6.1 to read:
- “These provisions apply to the transport of substances for which:
- (a) The proper shipping name as indicated in column 2 of the dangerous goods list or according to 3.1.2.6 contains the word “STABILIZED” and
- (b) The SADT or the SAPT* determined for the substance (with or without chemical stabilization) as offered for transport is:
- i. 50 °C or less for packages and IBCs; or
- ii. 45 °C or less for portable tanks.
- * Footnote: The self-accelerating polymerization temperature (SAPT) shall be determined in accordance with the Manual of Tests and Criteria. The SADT tests in Section 28, Series H as appropriate may be equally applied to determine a self-accelerating polymerization temperature.”
- (p) Revise 7.1.6.2 to read:
- “The provisions of 7.1.5.3.1.1 to 7.1.5.3.1.3 and 7.1.5.3.2 apply to substances meeting the criteria (a) and (b) in 7.1.6.1, except that the term ‘SADT’ as used in these paragraphs is understood to include also “SAPT” when the substance concerned reacts by polymerization.”
- (q) Delete 7.1.6.4, and renumber existing 7.1.6.5 accordingly.