

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

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Other business

Aerosols (UN 1950) – Plastic aerosols

Transmitted by the expert from the European Aerosol Federation (FEA)

1. FEA has proposed to the European Commission Services to adapt to technical progress the Aerosol Dispensers Directive 75/324/EEC.
2. In agreement with the European Commission Services, FEA is willing to make the experts on the transport of dangerous goods aware of this information.
3. The annex to this informal document contains the FEA proposal made to the European Commission Services.
4. FEA also intends to address the issue in the different transport of dangerous goods regulations.
5. For practical reasons these legislative procedures cannot fully take place in parallel.

Annex

New requirements for plastic aerosols

During the previous comitology procedure, FEA announced its work on plastic aerosols which has now been finalised.

The general approach has been to apply the same requirements to plastic and metal aerosols, and additionally to apply some new requirements for plastic aerosols where justified due to the specific properties of plastic materials.

The Aerosol Dispensers Directive (ADD) 75/324/EEC currently restricts the maximum allowed total capacity of plastic aerosols (220ml for plastic aerosol dispensers which cannot splinter on bursting and 150ml for those which may splinter on bursting) and provides specific filling requirements.

Different requirements exist in the legislation related to the transport of dangerous goods, which currently accepts plastic aerosol containers up to 500 ml (ICAO *Technical Instructions* and ADR) and up to 1000 ml (U.S. CFR49 Chapter I and Canada draft CGSB-43.123-2009).

The British standard BS 5597:1991 *Specification for non-refillable plastic aerosol dispensers up to 1000 ml capacity* is also used as a reference.

Testing of plastic aerosols is a 2-step approach (as for metal aerosols). Firstly there are some tests concerning the (empty) container itself, and secondly the (filled) aerosol dispenser itself.

FEA revised existing data and carried out several complementary tests mainly on PEN containers (capacity of 210 and 350ml) which are already commercially available on the U.S. market.

Tests to check thermal behaviour were carried out. Different flammable formulations in plastic aerosols (PEN) were tested and have shown no incremental hazard compared to behaviour of metal aerosols.

General requirements applying to metal aerosols also apply to plastic aerosols.

Drop test provisions were considered according to the state-of-the-art for plastic containers (non-aerosol) as described in ADR and ISO 16104.

To summarise, plastic aerosols should meet the same requirements as metal aerosols and additionally:

- Plastic aerosols need to be adequately resistant to ageing and to degradation caused by external environment factors;
- Plastic aerosol dispensers must not splinter on bursting;
- Plastic aerosols must not break or leak if the filled aerosols are dropped from a height of 1.8 m onto a concrete floor after storage at different low and high temperatures (-18, 40 and 55°C).

FEA has already drafted a FEA standard to help companies during their development phase.

FEA proposes that the wording of the Annex to ADD should be amended as follows:

1.2 Test pressure

"Test pressure" means the pressure to which an unfilled aerosol dispenser container may be subjected for 25 seconds without any leakage being caused or, in the case of metal or plastic containers, any visible or permanent distortion except as allowed under 6.1.1.2. and 6.1.1.3.

2.1.3 There must be no possibility that the mechanical resistance of the aerosol dispenser can be impaired by the action of the substances contained in it or by external environment factors (e.g. temperature, temperature cycle fatigue, and natural UV radiation), even during prolonged storage.

5. Special provisions applying to plastic aerosol dispensers

5.1. Plastic aerosol dispensers must not splinter on bursting.

5.2. Capacity

The total capacity of these containers may not exceed 1 000 ml.

5.3. Test pressure of the container

(a) For containers filled at a pressure of less than 6,7 bars at 50°C, the test pressure must be equal to at least 10 bars.

(b) For containers filled at a pressure equal to or greater than 6,7 bars at 50° C, the test pressure must be 50 % higher than the internal pressure at 50°C.

5.4. Filling

At 50°C, the pressure in the aerosol dispenser must not exceed 12 bar.

However, if the aerosol container does not contain a gas or mixture of gases having a flammable range with air at 20°C and a standard pressure of 1,013 bar, the maximum allowable pressure at 50°C is 15 bar.

5.5. Drop test

The plastic container should be so designed that the container must not break or leak if the filled aerosol dispenser is dropped from a height of 1,8 m onto a concrete floor.

Three groups of 25 filled containers shall be used for these tests. Prior to the drop test, one group must be conditioned at -18°C or lower for not less than 24 hours, the second group at 40°C for not less than 3 months and the third group at 55°C for not less than 6 hours. Each plastic aerosol dispenser will be dropped, individually, at required temperature, in free fall.

6. TESTS

6.1. Test requirements to be guaranteed by the person responsible for marketing

6.1.1. *Hydraulic test on empty containers*

6.1.1.1. Metal, glass or plastic aerosol dispensers must be able to withstand a hydraulic pressure test as laid down in 3.1.1, 4.1.3, 4.2.2 and 5.3.

6.1.1.2. Metal containers showing assymmetrical or major distortions or other similar faults shall be rejected. A slight symmetrical distortion of the base or one affecting the profile of the upper casing shall be allowed provided that the container passes the bursting test.

6.1.1.3. Plastic containers showing asymmetrical or major distortions or other similar faults shall be rejected. A slight symmetrical distortion shall be allowed provided that the container passes the bursting test.

6.1.2. Bursting test for empty metal containers and plastic containers

The person responsible for marketing must ensure that the bursting pressure of containers is at least 20 % higher than the test pressure laid down.

6.1.3. Dropping test for protected glass containers and plastic containers

The manufacturer must ensure that the containers satisfy the test requirements laid down in 4.1.2 and 5.5.

As the numbering of paragraphs is changed for plastic aerosols, Article 1 to the ADD must also reflect this change as follows:

Article 1

This Directive shall apply to aerosol dispensers as defined in Article 2, with the exception of those with a maximum capacity of less than 50 ml, and those with a maximum capacity greater than that specified in points 3.1, 4.1.1, 4.2.1, ~~5.1~~ and 5.2 respectively of the Annex to this Directive.
