



**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****Sixtieth session**

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Item 3 of the provisional agenda

Listing, classification and packing**Fire suppression devices that contain a pyrotechnic material****Submitted by the Council On Safe Transportation of Hazardous
Articles (COSTHA)*****Introduction**

1. In response to multiple discussions, beginning in the fifty-fifth session of the Sub-Committee and the work presented by France and the Explosives Working Group, we are respectfully submitting this proposal for a new entry to the dangerous goods table for fire suppression dispersing devices. With the ever-increasing number of these devices being transported as cargo and used within the transport sector, it is important to have a consistent method of classification and handling. These devices directly support life and safety of passengers and operators of vehicles as well as inhabitants and property in facilities around the world.

2. Numerous working documents and informal documents have been submitted expressing the need for a method to safely transport fire suppression dispersing devices in a consistent manner across the global dangerous goods safety system. These devices are becoming more and more common as fire extinguishing solutions for buses, trains, trucks, vessels, planes as well as stationary and storage facilities due to their ability to extinguish fires without destroying the surrounding environment. Previous submissions on this topic include documents:

- ST/SG/AC.10/C.3/2019/61
- UN/SCETDG/56/INF.28
- UN/SCETDG/56/INF.51
- ST/SG/AC.10/C.3/2020/25
- UN/SCETDG/59/INF.3
- UN/SCETDG/59/INF.32

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

Comments

3. As discussed in previous submissions, the fire suppression dispersing devices have a negligible risk associated with their transport as cargo. These devices typically operate on the actuation of pyrotechnic substance that burns slowly and disperses aerosols or other particles that extinguish fires, including fires related to lithium battery thermal runaway. Many countries have provided exceptions and classifications that are not recognized by others, which causes difficulty and confusion within the global transport chain.

4. To date, the following countries have acted upon exception or classification requests:

Competent Authority	Action	Result
United States of America	Granted regulatory waiver	Authorizing the transport of fire suppression dispersing devices as Class 9, including on Cargo Air
France	Granted classification approval	Authorizes fire suppression dispersing devices as: UN 3268, Safety Devices, Class 9
Netherlands	Fire suppression dispersing device found to be not regulated by the ADR	The Netherlands determined that the mixture in the unit was not a pyrotechnic mixture since the effect was aerosol formation. The aerosol emitted included alkali and alkaline metals that worked to extinguish fires.
China	Granted classification approval	Authorizes fire suppression dispersing devices as: UN 3268, Safety Devices, Class 9
Germany (BAM)	Granted classification approval	Authorizes fire suppression dispersing devices as: UN 3268, Safety Devices, Class 9
Russian Federation	Granted classification approval	Authorizes fire suppression dispersing devices as: UN 3335, Aviation regulated solid, n.o.s.

5. When initially developed, many of these devices were primarily used in automotive applications (cars, buses, trains, vessels, etc.) and in this case many competent authorities agreed that these devices fully meet the conditions to be assign to UN 3268. However, due to the safety and effectiveness of these devices, they are utilized more frequently in building fire protection systems. The use in buildings and other stationary applications has led to confusion as to whether devices classified as UN 3268 must always be used in vehicles or not.

6. These types of fire suppression dispersal devices are currently in use in many different vehicle types, including military vehicles, Eurostar trains, naval vessels, etc. Their use in these applications is based upon the significant advantages they provide:

- High level of reliability and effectiveness
- Compact size and light weight
- Minimal maintenance costs or requirements
- Proven to be durable to varying temperatures, vibration, impact, humidity, etc.
- Low cost for purchase and installation
- Proven to be very effective against lithium battery fires.

7. These devices are extremely effective at suppressing lithium battery fires and are therefore being used with greater frequency in battery energy storage systems (BESS), cloud computing centres and charging facilities, for instance electric bike and scooter charge facilities. When used in freight containers that are fitted with racks of batteries and transported as UN 3536, Lithium Battery Installed in Cargo Transport Unit; they are not subject to the transport regulations according to special provision 389: “*Dangerous goods necessary for the safe and proper operation of the cargo transport unit (e.g., fire extinguishing systems and air conditioning systems), shall be properly secured to or installed in the cargo transport unit and are not otherwise subject to these Regulations.*” Packaging manufacturers are considering installing the fire suppression devices as an added safety feature in packages used to transport lithium batteries and especially for transporting damaged or defective batteries. Lastly, COSTHA is aware of several battery-powered vehicle manufacturers that are considering utilizing these devices for added safety, as this is the best solution for extinguishing lithium battery fires used in electric vehicles.

8. Millions of these devices have been safely shipped as cargo under the approvals and exceptions listed above, either as Class 9 or unregulated. The design of these devices is robust and intended to extinguish fires. These devices do not propagate and if involved in a fire in transport, could actuate and aid emergency response efforts by extinguishing the external fire source.

9. In previous discussions, concerns have been expressed about the toxicity of aerosols emitted by these devices. There is a proven testing regime utilized by the United States Environmental Protection Agency (USEPA) as part of their Significant New Alternatives Program (SNAP) through which USEPA performs an assessment on fire extinguishing media and classifies into either of the following outcomes:

(a) Suitable for un-occupied spaces (This is an environmental approval: Aerosols can be far superior to most other agent because there is no ozone depletion, negligible global warming effects and almost no lifetime in the atmosphere.), or

(b) Suitable for occupied spaces (This is a health and safety approval based on independent medical testing: Brief human exposure to aerosols has been found to be acceptable; this is far preferable to breathing the products of combustion of a fire or other fire suppression methods such as halon or oxygen displacement.).

10. Another concern expressed by experts was the desire for manufacturing standards for fire suppression dispersing devices. There are now international and regional standards on the manufacture and deployment of these devices. Standard *ISO 15779: "Condensed aerosol fire extinguishing systems – Requirements and test methods for components and system design, installation and maintenance – General requirements"* provides requirements that evaluate the durability, toxicity and overall risk of these devices. The American National Standards Institute has a similar set of standards for these devices: *ANSI/CAN/UL/ULC – 2775:2019 – Standard for Fixed Condensed Aerosol Fire Extinguishing Units*.

11. COSTHA contends that there is sufficient understanding of the minimal risk in transport and benefit to safety that these devices should be granted a new entry in the Dangerous Goods List, consistent with:

(a) The same principles as UN 3268:

i. It is a device that benefits safety, therefore it is acceptable to grant some flexibility (i.e., class 9). Applications that do not benefit safety should not be included.

ii. It shall meet the same conditions when tested in accordance with test series 6(c) of part I of the Manual of Test and Criteria, with no explosion of the device, no fragmentation of the device casing or pressure receptacle, and no projection hazard nor thermal effect that would significantly hinder firefighting or emergency response efforts in the immediate vicinity. The phrase "significantly hinder firefighting or emergency response efforts in the immediate vicinity" would include the premise that the dispersed substance must be non-toxic.

12. The introduction of a new entry would prevent confusion and expansion of the regulatory structure already in place for UN 3268.

Proposal

13. It is proposed that a new entry be added in the Dangerous Goods List as follows:

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	
								Packing instruction	Special packing provisions	Instructions	Special provisions
35XX	<u>Fire Suppression Dispersing Devices</u>	9			XYZ	0	EO	P003			

14. In 3.3.1 add a new special provision XYZ to read as follows:

“XYZ Fire Suppression Dispersing Devices are intended to provide a safety benefit based upon their ability to extinguish flames when actuated. The devices may be either electrically activated, manually actuated, or thermally activated and shall be designed to prevent inadvertent activation either by shipping the actuation component separately (e.g., thermally activated head, and the main unit are shipped separately) or by ensuring that the electrically initiated devices are not electrically connected and there is a secondary means of protection to prevent activation. Devices may contain dangerous goods of Division 1.4, if they have been tested in accordance with Test Series 6(c) of Part 1 of the Manual of Tests and Criteria, with no explosion of the device, no fragmentation of device casing or pressure receptacle, and no projection hazard nor thermal effect which would significantly hinder firefighting or emergency response efforts in the immediate. The dispersant shall be deemed safe for occupied areas and be in compliance with standard ISO 15779 or UL 2775.

This entry does not apply to “SAFETY DEVICES, electrically initiated” described in special provision 280 (UN 3268).”

15. The entry name in the index should be amended as follows:

Name and description	Class	UN Number
<u>Fire Suppression Dispersing devices</u>	9	35XX

16. In 3.3.1 amend special provision 280 by adding the following language at the end:

“This entry does not apply to life saving appliances described in special provision 296 (UN Nos. 2990 and 3072) and *Fire Suppression Dispersing devices (UN No.35XX)*.”