



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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Item 3 of the provisional agenda

Listing, classification and packing

Proposal to amend SP 366, making it also adjust to Gallium contained in manufactured articles

Transmitted by the expert from China*

Introduction

1. Mercury is a silvery white metal, which is a corrosive substance with the subsidiary hazard of toxicity. It is assigned to the entry UN 2809 in the Dangerous Goods List of the UN Model Regulations. At its thirty-eighth session in 2010, the Sub-Committee of Experts on the Transport of Dangerous Goods adopted a new entry UN 3506, Mercury contained in manufactured articles, and the related special provision SP 366, so that mercury-containing articles meeting the requirements in SP 366 are not subject to the UN Model Regulations.

2. Considering the harm of mercury, as well as its compounds, on human health and the environment, the Council of the United Nations Environment Programme (UNEP) adopted the *Minamata Convention on Mercury* in 2013 to reduce mercury emissions. Since the convention came into effect in August 2017, the production, import and export of mercury-containing products have been greatly restricted. In order to comply with the convention, the world is actively looking for substitutes to mercury-containing products.

3. Gallium is a silvery white metal, corrosive to some other metals. The entry for gallium in the UN Model Regulations is UN 2803, which shares the same limited quantities (LQ), excepted quantities (EQ) and packing instruction P800 with UN 2809, mercury. Gallium has a relatively low melting point, and some gallium-based alloys are liquid at room temperature, so it is regarded as an ideal substitute for mercury in some fields. Compared with articles containing mercury, those containing gallium are much more environmentally friendly and less hazardous. Even in the event of accidental release, liquid metallic gallium will be quickly oxidized into solid state in the air, instead of volatilizing and polluting the environment. At the present, products such as mercury-free gallium thermometers and gallium UV lamps have been widely used all over the world, especially in Europe and North America. It can be predicted that, in the future, gallium-containing substitutes for mercury-containing products should have broader applications. However, unlike SP 366 for mercury-containing articles, there is currently no exemption to any gallium-containing articles in the UN Model

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

Regulations. This increases the difficulty of transportation of gallium-containing products and, to some degree, discourages the development of these substitutes for mercury-containing products, which is contrary to the philosophy of *Minamata Convention*.

4. It is stated in special provision A69 of the International Civil Aviation Organization (ICAO) Technical Instructions for the Safe Transport of Dangerous Goods by Air that “The following are not subject to these Regulations when carried as cargo: ... (b) articles other than lamps, each containing not more than 100 mg of mercury, gallium or inert gas and packaged so that the quantity of mercury, gallium or inert gas per package is 1 g or less.” Exemption has already been given to some gallium-containing articles in air transport.

5. Therefore, the experts from China consider it reasonable to make gallium-containing articles which meet certain requirements not subject to the UN Model Regulations, just as those mercury-containing products meeting the requirements in SP 366. The experts from China suggest that the current SP 366 should be modified and applied to gallium or gallium contained in manufactured articles.

6. First, it needs to be determined to which entry the modified special provision should apply. As to whether it is necessary to create a new entry “gallium contained in manufactured articles”, the experts from China give three options in the below proposal 1 for discussion. The proposed amendments to SP 366 are listed in proposal 2. Since it is noted that the exemption requirement for the air transport listed in current SP 366 of the UN Model Regulations is inconsistent with that in the Technical Instruction, the experts from China propose to discuss whether it is necessary to also introduce the relevant text in special provision A69 of the ICAO Technical Instruction into the Model Regulations as a requirement for air transport.

Proposal 1

7. Three options are provided to discuss whether the new entry “gallium contained in manufactured articles” should be introduced (new text in **bold underlined** font, deleted text in ~~strike through~~):

Option 1

8. In the Dangerous Goods List of Chapter 3.2 add a new entry for “gallium contained in manufactured articles” as follows, introducing SP 366 as modified to this new entry:

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
<u>35XX</u>	<u>GALLIUM CONTAINED IN MANUFACTURED ARTICLES</u>	<u>8</u>			<u>366</u>	<u>5kg</u>	<u>E0</u>	<u>P003</u>	<u>PP90</u> <u>PP41</u>		

9. In packing instruction P003, add special packaging provision PP41 and amend special packaging provision PP90 as follows:

P003	PACKING INSTRUCTION	P003
...		
<p style="text-align: center;">Special packing provisions:</p> <p style="text-align: center;">...</p> <p>PP41 For UN 35XX, when it is necessary to transport gallium contained in manufactured articles at low temperatures in order to maintain it in a completely solid state, the above packagings may be overpacked in a strong, water-resistant outer packaging which contains dry ice or other means of refrigeration. If a refrigerant is used, all of the above materials used in the packaging of gallium contained in manufactured articles shall be chemically and physically resistant to the refrigerant and shall have impact resistance at the low temperatures of the refrigerant employed. If dry ice is used, the outer packaging shall permit the release of carbon dioxide gas.</p> <p>PP90 For UN 3506 and UN 35XX, sealed inner liners or bags of strong leak-proof and puncture resistant material impervious to mercury or gallium which will prevent escape of the substance from the package irrespective of the position or the orientation of the package shall be used. For air transport additional requirements may apply.</p> <p style="text-align: center;">...</p>		

10. Amend special provision 365 and apply to UN 2803 as follows:

“**365** For manufactured instruments and articles containing mercury **or gallium**, see UN 3506 **or UN 35XX**.”

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 packaging provisions	Instructions	Special provisions
2803	GALLIUM	8		III	365	5kg	E0	P800	PP41	T1	TP33

Option 2

11. In the Dangerous Goods List of Chapter 3.2 add a new entry to UN 2803 as follows (introducing SP 366 as modified):

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 packaging provisions	Instructions	Special provisions
2803	GALLIUM CONTAINED IN MANUFACTURED ARTICLES	8			366	5kg	E0	P003	PP90 PP41		

12. In packing instruction P003, add special packaging provision PP41 and amend special packaging provision PP90 as follows:

P003	PACKING INSTRUCTION	P003
...		
<p>Special packing provisions: ...</p> <p>PP41 For UN 2803, when it is necessary to transport Gallium contained in manufactured articles at low temperatures in order to maintain it in a completely solid state, the above packagings may be overpacked in a strong, water-resistant outer packaging which contains dry ice or other means of refrigeration. If a refrigerant is used, all of the above materials used in the packaging of gallium contained in manufactured articles shall be chemically and physically resistant to the refrigerant and shall have impact resistance at the low temperatures of the refrigerant employed. If dry ice is used, the outer packaging shall permit the release of carbon dioxide gas.</p> <p>PP90 For UN 3506 and UN 2803, sealed inner liners or bags of strong leak-proof and puncture resistant material impervious to mercury or gallium which will prevent escape of the substance from the package irrespective of the position or the orientation of the package shall be used. For air transport additional requirements may apply.</p> <p>...</p>		

13. In packing instruction P800 amend the application scope as follows:

P800	PACKING INSTRUCTION	P800
This instruction applies to GALLIUM of UN Nos. 2803 and UN No. 2809.		
The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3 are met:		
(1) ...		
...		

Option 3

14. In the Dangerous Goods List of Chapter 3.2 amend UN 2803 as follows, inserting a reference to SP 366 as modified:

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 packaging provisions	Instructions	Special provisions
2803	GALLIUM	8		III	366	5kg	E0	P800	PP41	T1	TP33

Proposal 2

15. Special provision 366 should be modified, so that it can be applied to gallium or gallium contained in manufactured articles. Two proposals are provided to discuss if it is necessary to introduce relevant text of the Technical Instructions into the UN Model Regulations:

Option 1

16. In SP 366, add gallium as follows:

“366 For land and sea transport, manufactured instruments and articles containing not more than 1 kg of mercury **or gallium** are not subject to these Regulations. For air transport, articles containing not more than 15 g of mercury **or gallium** are not subject to these Regulations.”

Option 2

17. Add gallium to the first sentence of SP 366 for land and sea transport, and insert in a second sentence relevant provisions for air transport on machinery, apparatus and articles containing mercury or gallium in line with special provision A69 of the ICAO Technical Instructions as follows:

“366 For land and sea transport, manufactured instruments and articles containing not more than 1 kg of mercury **or gallium** are not subject to these Regulations.

For air transport, **the following are not subject to these Regulations:**

(a) articles other than lamps, each containing a total quantity of not more than 15 g of mercury or gallium, if they are installed as an integral part of a machine or apparatus and so fitted that shock or impact damage, leading to leakage of mercury or gallium, is unlikely to occur under normal conditions of transport;

(b) articles other than lamps, each containing not more than 100 mg of mercury, gallium or inert gas and packaged so that the quantity of mercury, gallium or inert gas per package is 1 g or less ~~are not subject to these Regulations.”~~
