

**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 2 (c) of the provisional agenda

Listing, classification and packing: miscellaneous

**UN 3170 Aluminium smelting by-products or aluminium
remelting by-products**

Transmitted by the experts from Norway and Spain

Introduction

1. There is a disagreement in the Model Regulations on the use of bulk containers for UN 3170 ALUMINIUM SMELTING BY-PRODUCTS or ALUMINIUM REMELTING BY-PRODUCTS under class 4.3. According to the dangerous goods list it may be carried as bulk in either sheeted (code BK1) or closed bulk containers (code BK2).

3170	ALUMINIUM SMELTING BY-PRODUCTS or ALUMINIUM REMELTING BY-PRODUCTS	4.3		II	244	500 g	E2	P410 IBC07	B2	T3 BK1 BK2	TP33
3170	ALUMINIUM SMELTING BY-PRODUCTS or ALUMINIUM REMELTING BY-PRODUCTS	4.3		III	223 244	1 kg	E1	P002 IBC08	B4	T1 BK1 BK2	TP33

2. However, according to subsection 4.3.2.2 (additional provisions for bulk goods of class 4.3) only closed bulk containers (code BK2) and flexible bulk containers (code BK3) may be used.

3. Looking at the international regulations for the different modes of transport, only closed bulk containers may be used for sea transport of UN 3170, whereas the RID and ADR regulations also permit closed or sheeted vehicles/wagons and containers.

4. Carrying UN 3170 in sheeted containers provides sufficient ventilation to the cargo; UN 3170 has been transported in sheeted containers safely and without incidents by the land transport modes until now, and it should therefore be retained as a possibility for safe carriage of aluminium smelting by-products.

Additional safety measures during transport

5. Additionally, there are some safety issues and precautionary measures with regard to transport of aluminium smelting by-products we would like to point out. We have considered recorded incidents and input from the aluminium producers in Norway and Spain about their handling of UN 3170 ALUMINIUM SMELTING BY-PRODUCTS or ALUMINIUM REMELTING BY-PRODUCTS with regard to the text for adoption in the 2015 revisions of ADR and RID (ref. document ECE/TRANS/WP.15/AC.1/2012/28). Two important topics may be highlighted:

- The importance of ventilation
- The importance of proper cooling before the start of transport

6. When in contact with water aluminium smelting by-products emit flammable gases as hydrogen and methane. Several toxic gases may contribute to about 1% of the total gas emission. The specific toxic gases are of course determined by the chemical composition of each bulk load, and its production may also depend on the grain size distribution of the load. Among the toxic gases that may be emitted is phosphine, a gas which may also ignite spontaneously. It should be taken into account that *some* gas emission can occur even for dry product. Ventilation is therefore the only effective preventive measure to avoid accumulation of gases up to hazardous levels.

7. The initial temperature of aluminium smelting by-products is almost 1000 °C and the most serious incidents when transporting UN 3170 ALUMINIUM SMELTING BY-PRODUCTS or ALUMINIM REMELTING BY-PRODUCTS relate to bulk loads running hot during transportation. According to the industry, proper cooling before shipment is considered the most important preventive measure against incidents during transportation. It appears that the incidents with overheating have been caused by insufficient cooling at the loading site. After loading the problem worsens, as the containment for transportation provides less ventilation and cooling. Moreover, water may condense on the inside walls of the containment due to the temperature difference with the surroundings, and thus fuel generation of gas and heat. According to the industry, development of smoke has been observed in transport units that have stopped moving, for example in port terminals, as the load is less ventilated than under movement.

Proposals

8. To address the problems highlighted in this text, the experts from Norway and Spain propose:

- Proposal A: to add in 4.3.2.2 the possibility to use BK1 for UN 3170, to eliminate the disagreement in the Model Regulations
- Proposal B: to introduce the requirement for proper ventilation for UN 3170 for BK1, BK2 and BK3 and
- Proposal C: to introduce the requirement for sufficient cooling before transportation for UN 3170

For each different topic different proposals are presented for discussion.

Proposal A Introduction of BK1 for UN 3170

Proposal A1

To add, at the end of 4.3.2.2:

“For UN 3170, sheeted bulk containers (BK1) may be used.”

Proposal A2

To add, at the beginning of 4.3.2.2:

“Unless otherwise provided in these Regulations,”

Proposal B Requirement for proper ventilation

Proposal B1

Making the present text from 4.3.1.16.2 requiring a vent applicable for all kind of bulk containers, eliminating 4.3.1.16.2, and including the same requisite for all kind of bulk containers:

~~4.3.1.16.2 A venting device shall be fitted if a dangerous accumulation of gases may develop within the flexible bulk container. The vent shall be so designed that the penetration of foreign substances is prevented under normal conditions of transport.~~

“4.3.1.17 If a dangerous accumulation of gases may develop within the bulk container, ventilation shall be ensured. Vents in closed containers shall be so designed that the penetration of water and foreign substances is prevented under normal conditions of

transport. Sheetings mounted on sheeted bulk containers shall provide ventilation and protection against water under normal conditions of transport.”

If this option is chosen, it could be deemed necessary as a consequential amendment to eliminate the numbering of 4.3.1.16.1 and include its text into 4.3.1.16.

Proposal B2:

Leaving 4.3.1.16.2 as it is and including this requisite into a special provision XXX, assigned to UN 3170 ALUMINIUM SMELTING BY-PRODUCTS or ALUMINIUM REMELTING BY-PRODUCTS:

“Special provision XXX: Ventilation shall be ensured. Vents in closed containers shall be so designed that the penetration of water and foreign substances is prevented under normal conditions of transport. Sheetings mounted on sheeted bulk containers shall provide ventilation and protection against water under normal conditions of transport.”

Proposal C Requirement for sufficient cooling

Proposal C

Including this condition into a special provision XXX, assigned to UN 3170 ALUMINIUM SMELTING BY-PRODUCTS or ALUMINIM REMELTING BY-PRODUCTS. If option B2 would be chosen, the same special provision could be used for both requirements:

“Special provision XXX: Before transport, the aluminium smelting by-products or aluminium remelting products have to be cooled till ambient temperature”
