



**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****Fifty-seventh session**

Geneva, 30 November-8 December 2020

Item 3 of the provisional agenda

Listing, classification and packing**Request for a new UN number for cobalt dihydroxide powder****Transmitted by the Responsible Packaging Management Association of
Southern Africa (RPMASA) and the International Confederation of
Plastic Packaging Manufacturers (ICPP)*****Revision****Introduction and background**

1. At the fifty-fifth session RPMASA introduced in informal document INF.24 a new challenge experienced for packaging and transport of cobalt dihydroxide, through the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)¹ regulation requirement for comprehensive GHS testing which had resulted in the drastic change to the transport classification from Class 9, UN 3077 ENVIRONMENTALLY HAZARDOUS SOLID, N.O.S. packing group (PG) III, to Class 6.1 TOXIC SOLID, BY INHALATION, Category 1, and PG I for which there was currently no UN number.
2. This presented a serious challenge as thousands of tonnes of cobalt dihydroxide in various forms have been transported safely over the past forty years as UN 3077 ENVIRONMENTALLY HAZARDOUS SOLID, N.O.S. (contains cobalt dihydroxide) Class 9, in flexible IBCs of PG III. The cobalt dihydroxide ranged from crude material from the mines in Africa to refined material in Europe and other parts of the developed world, by multi-modal means in flexible IBCs, with no recorded accidents, incidents or health issues.
3. A new UN number assigning flexible IBCs, with an appropriate packing instruction and special conditions was requested, as flexible IBCs had not previously been assigned to PG I.

* 2020 (A/74/6 (Sect.20) and Supplementary, Subprogramme 2).

¹ Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006. (Official Journal of the European Union, L396).



The challenge/problem and subsequent actions taken

4. Concern was expressed that through increasing harmonisation with the GHS this could be the first of other fine powders to be impacted by GHS and REACH, thus a solution was needed to ensure continued transport and trade of such goods, especially those that exhibit no other physical hazards, and hence are not too dangerous to transport.
5. Testing by the Cobalt Institute in accordance with OECD Test Guideline 436 as per REACH resulted in the new classification. Particle size testing confirmed that the very fine refined material fell into the respirable range of < 10 µm, but that the coarser crude materials did not.
6. It was agreed that the coarse and pasty materials which do not emit dust, pose no hazard to inhalation, and thus fall outside of the respirable range, so could continue to be shipped in flexible IBCs PG III as UN 3077 ENVIRONMENTALLY HAZARDOUS, SOLID, N.O.S.

Discussion

7. A lunch time work group discussion was convened on 4 July 2019 during the fifty-fifth session of the Sub-Committee to discuss possibilities for a short-term and long-term solution to this challenge. It was agreed to form an intersessional correspondence group, to progress this and to report back at the December 2019 session. Notes on the discussion were circulated to interested parties.
8. Intersessional discussions by email and teleconference resulted in RPMASA presenting informal document INF.19 at the fifty-sixth session in December 2019, with a lunch time discussion group on Thursday 5 December.
9. Outcomes of the lunchtime session were reported in informal document INF.54 of the fifty-sixth session in December 2019. These included, agreement to use lined flexible IBC's (FIBCs) of 13H3 or 13H4 that passed the PG I testing, and that RPMASA progress discussion further with the intersessional correspondence group to present a formal proposal to the fifty-seventh session of the Sub-Committee for approval.
10. Comments received in February 2020 were included in a new draft which was circulated for discussion during a group teleconference on 4 March 2020. The notes of the meeting were circulated as informal document INF.5.
11. Discussion focussed on the use of special provision (SP) 354 which had only previously been used for liquids and vapours, as well as on the most appropriate packing instruction for PG I and wording for a special packing provision "Bx".
12. It was agreed that:
 - (a) Only one UN number UN 35XX was needed for COBALT DIHYDROXIDE POWDER, containing > 10 % respirable particles, as PG I.
 - (b) The Cobalt Institute would engage with members to ascertain further data on physical attributes of the powder, as well as data on mixtures containing cobalt dihydroxide as to correct assignment of class and packing group.
 - (c) Applicability of SP354 to solids and powders should be investigated.
 - (d) IBC07 is more appropriate than IBC08 as currently assigned to other PG I substances.
 - (e) It is not necessary to include "inorganic" in the proper shipping name as cobalt dihydroxide is inorganic, nor include "toxic by inhalation" if > 10 % "respirable particles" is included in the proper shipping name, as these are repetitions.
 - (f) The definitions of "respirable and toxic by inhalation" should be reviewed for more precise definition for solids/powders which could be included in Chapter 1.2.

13. An entry should be included in the Guiding Principles to provide for future issues related to greater harmonisation with the GHS.

14. With the postponement of the fifty-seventh session due to COVID-19 measures, discussions continued on the online workspace provided by the secretariat, and at a virtual meeting on 1 July, to find consensus on the outstanding issues. Notes were placed on the workspace (see informal document INF.20).

15. The Cobalt Institute reported at the virtual discussion (as requested during the 4 March 2020 Teleconference) on key physical attributes which would impact on the behaviour of any release of this material, for expert consideration, as follows:

Cobalt dihydroxide powder has a very different risk profile to Class 6.1 liquid vapours:

- $\text{Co}(\text{OH})_2$ has zero vapour pressure;
- Relative density is 3.6 g/cm^3 – heavy, so does not remain in air for extended time;
- Hygroscopic – takes up water and tends to ‘clump together’ on exposure to air;
- The airborne fraction of bulk material has a low respirability, only 0.8% is modelled to deposit;
- in pulmonary (deep lung) region.

These attributes show a very different, and very low potential for inhalation toxicity by humans whether in transport or operational exposure, to the REACH test for rats where the test material is introduced in a positive air flow! It also supports the facts that this material has been safely transported for *over 40 years in unlined FIBCs* with no reported health effects.

16. The main outcomes (see informal document INF.20) of the virtual discussion included:

- The proposed proper shipping name shall be amended to state $\geq 10\%$ respirable particles, rather than $> 10\%$ and to qualify that material with $< 10\%$ respirable particles remain as UN 3077 ENVIRONMENTALLY HAZARDOUS, SOLID, N.O.S.;
- Special Provision 354 should not be assigned as this requires further deliberation by the Sub-Committee as to if it applies to solids, or only to liquids;
- The Sub-Committee should give further consideration to the definition of “respirable”;
- Special packing provisions – it was agreed to use new special packing provision “Bx”, but the assignment of B1 was divided although several experts felt that this was not necessary because of the history of safe transport, use of lined bags tested to PG I, and new information on the physical attributes of the substance;
- Additional wording to the Guiding Principles under 4.2 Table for the assignment of IBC’s.

17. One expert proposed adding wording in to Chapters 4 and 6 to state that *no egress* of dust should be allowed on testing but others felt that to add specific wording to the test criteria or to add a different set of pass fail criteria for an IBC based on the product packed is not appropriate, or in line with the Guiding Principles, as it could lead to a proliferation of requests for exemptions. It was reminded that UN testing is generic, and performance based, with no testing done to an absolute, which would be difficult to define and with the new knowledge of the physical attributes of this substance not necessary.

Proposal

18. The Sub-Committee is invited to consider the proposal for a new UN number to be allocated for refined cobalt dihydroxide, classified as toxic by inhalation, Class 6.1 and PG I,

with the specific Packing Instructions and Special Provisions as shown in the table below for “COBALT DIHYDROXIDE POWDER, containing ≥ 10 % respirable particles.”

Chapter 3.2 Dangerous Goods List

19. Insert a new entry in the list of dangerous goods, as follows:

UN No.	Name and description	Class or division	Subsidiary risk	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	COBALT DIHYDROXIDE POWDER, containing ≥ 10 % respirable particles	6.1		I	SPxxx	0	E5	P002 IBC07	[B1] Bx	T6	TP33

Chapter 3.3 Special provisions

20. Add a new special provision to qualify that material with < 10 % respirable particles as follows:

“SPXXX Solids with less than < 10 % respirable particles do not classify as Class 6.1, and will continue to be transported as UN3077 Class 9, PGIII ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (contains cobalt dihydroxide).”.

Chapter 4.1.4 Packing instructions

4.1.4.2 For IBC07, insert a new special packing provision “Bx” to read as follows:

“**Bx** UN 35XX may be transported in lined flexible IBCs (13H3 or 13H4)”

21. In Chapter 3.2, B1 is placed in square brackets, for the Sub-Committee to decide if necessary, considering the unique properties and physical attributes of the substance, assignment of 13H3 or 13H4 i.e. lined FIBCs that have passed PG I testing and the proven safe transport for over 40 years in PG III unlined bags with an excellent safety record of no recorded incidents of health issues.

Note: ADR does not assign B1 and transport of small quantities in large containers is not a sustainable, practical or economic option.

Guiding Principles

22. It is proposed to introduce a new wording into Parts 2 and 4.2 of the Guiding Principles, as follows:

Part 2

23. It is proposed to add wording at the end to inform, and provide guidance for future packaging assignment issues related to increasing harmonisation with the GHS, as follows:

“The basis of the classifications described above used testing methods and criteria appropriate to the period when they were developed. However, with the emergence of GHS and other chemical registrations such as REACH, new test methods and methods of assessment may result in the reclassification of certain substances.

When such evidence is presented to the Sub-Committee, they may decide that the existing entry provides sufficient safety in transport and that no material change is

required (an SP may be added to the entry to acknowledge the alternative data and confirm the DG list entry).

Where the Sub-Committee agree that a new or amended entry is appropriate, then the Sub-Committee may take into account previous experience with the packing and transport safety record for that substance. Such considerations may result in the allocation of packaging, IBC and tank instructions not strictly in accordance with Part 4 of these Guiding Principles.”.

Part 4.2

24. It is proposed to add wording in Class 6.1, and after the Table for IBC Packing Instruction assignments, as follows:

Add a new line in Table 4.2, Class 6.1, under solids without subsidiary risk, PG I for a second * entry as refer to note at end of table for * UN 35XX COBALT DIHYDROXIDE POWDER, containing $\geq 10\%$ respirable particles.

Add after the Table - Note

“* For this new entry UN35XX COBALT DIHYDROXIDE POWDER, containing $\geq 10\%$ respirable powders, CLASS 6.1 and PG I, an exemption was agreed to allow and assign IBC 07 for transport in FIBCs of 13H3 OR 13H4. This was based on the fact that cobalt dihydroxide powder has no other transport hazards and had been transported safely in unlined FIBCs of PG III for more than 40 years as non-hazardous and then UN 3077 until full GHS Classification was required under REACH Registration, which lead to reclassification of this substance as toxic by inhalation, which created a change from UN 3077 Class 9, packing group III to Class 6.1, packing group I.

Based on the long standing experience of transporting cobalt dihydroxide powder in unlined FIBCs with no recorded incidents or health issues, it was agreed to create a new entry for cobalt dihydroxide powder with $\geq 10\%$ respirable particles, to allow its continued transport in lined FIBCs of 13H3 of 13H4, that meet the test criteria for packing group I.”.
