



**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**

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Item 6 (b) of the provisional agenda

**Miscellaneous proposals for amendments to the Model Regulations
on the Transport of Dangerous Goods: packagings****Extending the use of plastic recycled materials to all plastic
packagings, plastic IBCs and plastic Large Packagings****Transmitted by the expert from Belgium*****Introduction on proposal 1**

1. At the fifty-sixth session of the Sub-Committee an amendment to 6.5.5.3.2 and 6.5.5.4.6 based on ST/SG/AC.10/C.3/2019/51 was adopted to clarify that the use of recycled plastics material for rigid plastic IBCs and for composite IBCs with plastic inner receptacle is not prohibited. The adopted amendments read as follows (relevant text is underlined):

“6.5.5.3.2 The body shall be manufactured from suitable plastics material of known specifications and be of adequate strength in relation to its capacity and its intended use. Except for recycled plastics material as defined in 1.2.1, no used material other than production residues or regrind from the same manufacturing process may be used. The material shall be adequately resistant to ageing and to degradation caused by the substance contained or, where relevant, by ultraviolet radiation. Low temperature performance shall be taken into account when appropriate. Any permeation of the substance contained shall not constitute a danger under normal conditions of carriage.

6.5.5.3.5 Deleted.

and

6.5.5.4.6 The inner receptacle shall be manufactured from suitable plastics material of known specification and be of adequate strength in relation to its capacity and its intended use. Except for recycled plastics material as defined in 1.2.1, no used material

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other than production residues or regrind from the same manufacturing process may be used. The material shall be adequately resistant to ageing and to degradation caused by the substance contained or, where relevant, by ultraviolet radiation. Low temperature performance shall be taken into account when appropriate. Any permeation of the substance contained shall not constitute a danger under normal conditions of carriage.

6.5.5.4.9 Deleted.”

2. Considering that packagings produced from recycled plastics material shall, in accordance with 6.1.3.6, be marked with the word “REC”, the same should apply for IBCs produced from recycled plastics material. It is therefore proposed to amend 6.5.2.1.2 as follows:

Proposal 1

3. Insert new 6.5.2.1.2 as follows (new text underlined):
“6.5.2.1.2 IBCs manufactured with recycled plastics material as defined in 1.2.1 shall be marked "REC". This mark shall be placed near the marks prescribed in 6.5.2.1.1.”
4. Renumber current 6.5.2.1.2 and 6.5.2.1.3 as 6.5.2.1.3 and 6.5.2.1.4 respectively.

Introduction on proposal 2

5. Currently, paragraph 6.5.5.2.8 clearly stipulates that the use of recycled plastics material is not allowed for the manufacturing of flexible IBCs (FIBCs).

“6.5.5.2.8 No material recovered from used receptacles shall be used in the manufacture of IBC bodies. Production residues or scrap from the same manufacturing process may, however, be used. Component parts such as fittings and pallet bases may also be used provided such components have not in any way been damaged in previous use.”

6. Although recycled plastics material is currently not authorized for FIBCs containing dangerous goods, the use of recycled plastics material, originating from used FIBCs, for the manufacturing of new FIBCs is in full progress for other applications. More than 380 million four-loop FIBCs (big bags) are sold worldwide every year. This equals an annual recycling potential of about 800,000 tons of material. Different members of the existing FIBC associations have developed the concept of “circular packaging” for big bags made from polypropylene fabric. Circular packaging offers an elaborate concept for a closed loop for big bags that begins with polypropylene granulate and leads back to regranulate polypropylene (rPP) through the process steps production, usage, recovery, and recycling. These rPP big bags show the same quality as big bags made from virgin material in terms of tensile strength, weight, and safety levels verified during prototype testing.

7. Based on the above mentioned arguments it is proposed to allow the use of recycled plastics material for the manufacturing of FIBCs in the Model Regulations. In line with proposal 1 these FIBCs shall also be marked with “REC”.

8. Additionally, it was found that the word “scrap” is only used in this particular paragraph, whereas in equivalent paragraphs the word “regrind” is used. As scrap will be reground before being used in the manufacturing process and, in order to simplify and harmonize terminology in the Model Regulations, it is also proposed to replace the word “scrap” with “regrind”.

Proposal 2

9. Amend paragraph 6.5.5.2.8 to read (new text underlined, deleted text ~~stricken through~~):

~~“6.5.5.2.8 No material recovered from used receptacles shall be used in the manufacture of IBC bodies. Production residues or scrap regrind from the same manufacturing process may, however, be used. Component parts such as fittings and pallet bases may also be used provided such components have not in any way been damaged in previous use. Recycled plastics material as defined in 1.2.1. may be used. The flexible IBC produced from recycled plastics material must be marked as specified in 6.5.2.1.2.”~~

Introduction on proposal 3

10. In line with proposal 2 and to harmonize the wording concerning the use of production residues or regrinds and the use of recycled plastics material it is proposed to slightly modify the amendments in 6.5.5.3.2 and 6.5.5.4.6 adopted during the fifty-sixth session to clarify which recycled plastics material can be used in the manufacturing of rigid plastic IBCs and composite IBCs with an inner plastic receptacle.

Proposal 3

11. Amend the accepted proposal on 6.5.5.3.2 based on ST/SG/AC.10/C.3/2019/51 as follows:

~~“6.5.5.3.2 The body shall be manufactured from suitable plastics material of known specifications and be of adequate strength in relation to its capacity and its intended use. Except for recycled plastics material as defined in 1.2.1, no used material other than~~ Production residues or regrind from the same manufacturing process may be used. The material shall be adequately resistant to ageing and to degradation caused by the substance contained or, where relevant, by ultraviolet radiation. Low temperature performance shall be taken into account when appropriate. Any permeation of the substance contained shall not constitute a danger under normal conditions of carriage. Recycled plastics material as defined in 1.2.1 may be used. The IBC produced from recycled plastics material must be marked as specified in paragraph 6.5.2.1.2.”

12. Amend the accepted proposal on 6.5.5.4.6 based on ST/SG/AC.10/C.3/2019/51 as follows:

~~“6.5.5.4.6 The inner receptacle shall be manufactured from suitable plastics material of known specifications and be of adequate strength in relation to its capacity and its intended use. Except for recycled plastics material as defined in 1.2.1, no used material other than~~ Production residues or regrind from the same manufacturing process may be used. The material shall be adequately resistant to ageing and to degradation caused by the substance contained or, where relevant, by ultraviolet radiation. Low temperature performance shall be taken into account when appropriate. Any permeation of the substance contained shall not constitute a danger under normal conditions of carriage. Recycled plastics material as defined in 1.2.1 may be used. The IBC produced from recycled plastics material must be marked as specified in paragraph 6.5.2.1.2.”

Introduction on proposal 4

13. Bearing in mind that recycled plastics material is already allowed for the manufacturing of plastic drums and jerricans containing either solids or liquids an extension to the use of recycled plastics material for the manufacturing of other types of plastic packagings (e.g. plastic boxes, plastic bags and large packagings) should be allowed. Liquids in plastic drums and in jerricans are in direct contact with the packaging. Here the compatibility of the product with the packaging material is an important factor. Solids within bags or solids/inner packaging within boxes will, however, less affect the behaviour of the packaging. For this reason, the use of recycled plastics material for those type of packagings is justified and therefore proposed.

14. The ADR regulations already allow the use of plastics recycled material for plastic boxes (see ADR 6.1.4.13.7). Experience in the use of recycled plastics material exists already for a long time in the field of non-dangerous goods packagings.

15. Moreover, international and national legislations impose more and more the use of recycled plastics material in the philosophy of circular economy.

Proposal 4

16. Modify 6.1.4.8.1 (plastic jerricans and drums) to read as follows:

“6.1.4.8.1 The packaging shall be manufactured from suitable plastics material and be of adequate strength in relation to its capacity and intended use. ~~Except for recycled plastics material as defined in 1.2.1, no used material other than~~ Production residues or regrind from the same manufacturing process may be used. The packaging ...”

17. Add at the end of 6.1.4.8.1 (Plastic jerricans and drums) as follows:

“Recycled plastics material as defined in 1.2.1 may be used. The packaging produced from recycled plastics material must be marked as specified in paragraph 6.1.3.6.”

18. Add at the end of 6.1.4.13.1 (Plastic boxes) as follows:

“Recycled plastics material as defined in 1.2.1 may be used. The packaging produced from recycled plastics material must be marked as specified in paragraph 6.1.3.6.”

19. Add at the end of 6.1.4.16.1 (Woven plastic bags) as follows:

“Recycled plastics material as defined in 1.2.1 may be used. The packaging produced from recycled plastics material must be marked as specified in paragraph 6.1.3.6.”

20. Add at the end of 6.1.4.17.1 (Plastic bags) as follows:

“Recycled plastics material as defined in 1.2.1 may be used. The packaging produced from recycled plastics material must be marked as specified in paragraph 6.1.3.6.”

Introduction on proposal 5

21. Based on the fact that the size of large packagings and the materials used for the manufacturing of large packagings are similar to the size of and the materials used for IBCs an alignment of the provisions for large packagings with the provisions for IBCs is suggested. Not only the use of production residues or regrind from the same manufacturing process but also the provisions for recycled plastics material should be authorised in a similar way as for IBCs. Therefore, it is proposed to modify Chapter 6.6 on Large packagings in accordance with Chapter 6.5 on IBCs.

Proposal 5

22. Insert a new paragraph 6.6.3.2 to read as follows:

“6.6.3.2 Large packagings manufactured with recycled plastics material as defined in 1.2.1 shall be marked "REC". This mark shall be placed near the marks prescribed in 6.6.3.1.”

23. Renumber current 6.6.3.2 and 6.6.3.3 as 6.6.3.3 and 6.6.3.4 respectively.

24. Insert new 6.6.4.2.2 to read as follows:

“6.6.4.2.2 For the construction of large packagings of types 51H production residues or regrind from the same manufacturing process may be used. Recycled plastics material as defined in 1.2.1 may be used. The large packaging produced from recycled material must be marked as specified in 6.6.3.2.”

25. Renumber the current 6.6.4.2.2 to 6.6.4.2.7 as 6.6.4.2.3 to 6.6.4.2.8 respectively.

26. In line with the amended text for rigid plastic IBCs (proposal 3), amend 6.6.4.3.1 as follows:

“6.6.4.3.1 The large packaging shall be manufactured from suitable plastics material of known specifications and be of adequate strength in relation to its capacity and its intended use. Production residues or regrind from the same manufacturing process may be used. The material shall be adequately resistant to ageing and to degradation caused by the substance contained or, where relevant, by ultraviolet radiation. Low temperature performance shall be taken into account when appropriate. Any permeation of the substance contained shall not constitute a danger under normal conditions of carriage. Recycled plastics material as defined in 1.2.1 may be used. The large packaging produced from recycled plastics material must be marked as specified in 6.6.3.2.”

Introduction on proposal 6

27. As more recycled plastics material streams are in the market and due to evolutions in the sorting technics, the selection processes and the different types of packagings manufactured from recycled plastics material we believe that the current definition of the recycled plastics material and the imposed conditions are very conservative. Additionally, the current referenced standard ISO 16103:2005 is very restrictive and steps are currently undertaken which will probably lead, to a review of the norm which will not only expand the types of recycled plastics material that can be used but which will also include well defined criteria to allow the use of recycled plastics material originating from mixed used household products. The origin of the packagings in this recycled plastics material stream is not any longer traceable and is therefore currently not allowed for the manufacturing of packagings for dangerous goods. However, ISO 16103:2005 imposes some valid restrictions concerning packagings which should be excluded from the recycling processes. To accommodate for the use of specific recycled plastics material and considering the different existing manufacturing processes, while guaranteeing the safe transport of dangerous goods, the following amendments are proposed to the definition of recycled plastics material.

Proposal 6

28. Amend in 1.2 the definition of recycled plastic material as follows:

“Recycled plastics material means material recovered from used industrial packagings that has been cleaned and prepared for processing into new packagings. The specific properties of the recycled material used for production of new packagings shall be assured and documented regularly as part of a quality assurance programme recognized by the competent authority. ~~The quality assurance programme shall include a record of proper pre-sorting and verification that each batch of recycled plastics material has the proper melt flow rate, density, and tensile strength, consistent with that of the design type manufactured from such recycled material.~~ This necessarily includes knowledge about the origin of the material from which the recycled plastics have been derived, as well as awareness of the prior contents of those packagings if those contents might reduce the capability of new packagings produced using that material.

Packagings which should be excluded from the recycling process are:

- Packagings having contained products which have affected the plastics material (e.g. certain highly oxidizing substances), making it unsuitable for reprocessing
- Packagings that have contained certain specific substances hazardous to health and safety and/or the environment, listed in Division 6.1 Toxic substances, Division 6.2 Infectious substances and Class 7 Radioactive material and all substances with toxic secondary risks
- Packagings that are more than 10 years old
- Packagings that show sign of deterioration, e.g. by the effect of UV radiation causing degradation
- Packagings produced from material that cannot be reprocessed (e.g. Cross-linked polyethylene)
- Packagings marked with the symbol “REC”

The quality assurance programme shall include a record of proper pre-sorting based on material code and verification that each batch of recycled plastics material has at least the proper melt flow rate and density consistent with that of the design type manufactured from such recycled material. Additional parameters such as and tensile yield strength, notched impact and/or other parameters depending on the packaging type and on the production processes (injection moulding, blow moulding, roto moulding, blow extrusion (films), flat extrusion (films)...) shall also be taken in consideration. These parameters shall also be consistent with that of the design type manufactured from such recycled material. Additional methods may be used to verify the recycled material is free from contamination, e.g.: analytical methods such as differential scanning calorimetry (DSC). In addition, the packaging manufacturer’s quality assurance programme under 6.1.1.4, 6.3.2.2, 6.5.4.1 and 6.6.1.2 shall include performance of the mechanical design type test in 6.1.5, 6.3.5, 6.5.6.2 and 6.6.5 on packagings manufactured from ~~each batch of~~ recycled plastics material. In this testing, stacking performance may be verified by appropriate dynamic compression testing rather than static load testing;

NOTE: ~~ISO 16103:2005 “Packaging – Transport packaging for dangerous goods – Recycled plastics material” provides additional guidance on procedures to be followed in approving the use of recycled plastics material.~~