

Committee of Experts on the Transport of Dangerous Goods and on the Globally Harmonized System of Classification and Labelling of Chemicals

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Sub-Committee of Experts on the Transport of Dangerous Goods

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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

Rigid packing, intermediate bulk containers (IBCs) and large packaging – Use of recycled plastics material

Transmitted by the International Confederation of Plastics Packagings Manufacturers (ICPP)

Introduction

1. Out of concern for natural resources and problems associated with disposal, today's society is placing increased emphasis on recycling and reuse in order to maintain global sustainability. Plastics, plastics packaging and the waste generated from it have become the centre of environmental agendas around the world. From voluntary industry commitments to setting of regulatory frameworks for quotas on recycled content there is multi-level action ongoing to provide for the use of recycled plastics as much as possible.
2. Recognizing the need and benefits of recycling plastic packaging materials, industry first began considering the recycling of plastic materials in plastic packagings for dangerous goods in the 1980s – first in the manufacture of packaging components that did not perform a containment function (e.g., IBC pallets). Later, on the basis of requirements included in UN Model Regulations in the 1990's, recycled material began to be used in plastic drums and jerricans through adoption of a definition of "recycled plastic materials" in 1.2.1 and provision for the use of recycled plastic material in the manufacture of plastic drums and jerricans (see 6.1.4.8.1). In adopting these requirements, the Subcommittee considered that use of recycled plastic materials should at first be strictly controlled but agreed that, as experience was gained, the need for these strict provisions could be re-evaluated.
3. Plastic drums (1H1, 1H2) and jerricans (3H1, 3H2) are explicitly authorized to be made from recycled plastic material. For certain packaging types, no explicit restrictions apply in so far as plastic reuse is concerned. These include plastic boxes (4H1, 4H2), bags (5H1, 5H2, 5H3 and 5H4), large packagings (50H). For rigid plastic IBCs and the inner receptacles of composite IBCs, the reuse of plastic material is explicitly forbidden (see 6.5.5.2.8, 6.5.5.4.9). For drums and jerricans, the current controls limit recycled plastic material to that derived from dangerous goods packagings, require batch testing of the resin material and testing of packagings manufactured from each batch. Experience in using recycled plastic materials shows that some of these controls may be modified given the high level of packaging reliability that has been demonstrated in using recycled plastic material.

4. Being challenged to come up with solutions for more circular use of plastics materials, industry – producers, converters, recyclers, users – are asked to identify regulatory restrictions hindering the use of recycled materials, while providing an equivalent level of safety and performance to that provided by packagings produced from virgin materials.

Findings from Experience in Use of Recycled Plastic Material

5. Considerable experience in the use of recycled plastic materials has been gained since requirements were first introduced in the UN Model Regulations. A summary describing the use of recycled plastics material in the United States on the basis of competent authority approvals is attached in the annex. Key findings are as follows:

- Experience under the existing provisions has validated the use of recycled plastic materials for the manufacture of UN certified plastic packagings;
- Testing of each batch of recycled resin has shown resin properties to be consistently within limits suitable for the construction of UN packagings; and
- Performance of UN packagings made from recycled resins has been shown to be consistent with that of packagings made from resin materials not previously used.

ICPP's Intention

6. As an industry leader in ensuring use of recycled plastics to the maximum extent and based on experience that has been gained, it is ICPP's intention to propose certain amendments to the UN Model Regulation provisions as they affect the use of recycled plastic material.

7. The full extent of such proposals will be included in specific future proposals to the Subcommittee over the course of this biennium. Briefly, ICPP envisions these proposals would:

- Expand the use of recycled plastic materials as defined in 1.2.1 to rigid plastics IBCs, and composite IBCs with plastics inner receptacles;
- Clarify the definition in 1.2.1 so that testing of batches of recycled resins ensures consistency with that of the design type manufactured from such recycled material as required under the quality assurance program under 6.1.1.4 or 6.5.4.1; and
- Amend the definition in 1.2.1 to align required testing of packagings manufactured using recycled plastic materials with that for packagings made from resin materials not previously used.

8. Even after such proposed changes, requirements for the careful control of recycled plastic material would be maintained as would the need for verification that each resin batch was within specification. As with all UN packagings, manufacture of recycled plastic packagings would be subject to a quality assurance procedure.

9. Pending the submission of its proposals to subsequent meetings, ICPP welcomes preliminary comments Subcommittee members may wish to provide.

Annex

Summary of Experience in the Use of Recycled Plastic Material in the United States

General

Beginning in 1997 three US manufacturers of plastic packagings have produced UN1H1 and UN1H2 plastic drums at the Packing Group II and Packing Group III performance levels from recycled plastic materials.

Only recycled plastic material meeting specified properties is used.

Manufacture is in accordance with US competent authority approvals that included controls in the UN Model Regulations for recycled plastic materials (see 1.2.1).

Controls

Only recycled plastic material from the grinding down of previously used plastic dangerous goods packagings is used and for quality control purposes only plastic packagings having contained certain specified materials are used.

The quality of recycled resins used is further ensured through close control of resin properties through melt flow index and density testing of resin samples.

Manufactured packagings tested in accordance with UN performance tests.

Experience

More than four million UN 1H1 and 1H2 drums were manufactured from recycled plastic materials between June 1, 2011 and August 31, 2015.

During that time, 2,393 melt flow tests and 2,393 density tests were conducted on approximately 36 million kilograms of recycled plastic materials demonstrating consistent compliance with established resin specifications.

Retesting in accordance with UN performance tests was done every 30 days and demonstrated that the drums consistently performed the same as drums of resins materials not previously used.

Recycled content plastic drums were successfully used in the transport of dangerous goods with no known reported incidents.

Conclusions

The combined effects of careful control of recycled resin quality, extensive testing and use of packagings in the dangerous goods transport environment, has validated the use of recycled plastic materials in the manufacture of dangerous goods packagings ensuring a high level of performance.

Consistency of resin property test results shows that through required limits on the source of recycled plastic materials and careful control, the required testing on each batch of recycled

resin material could be reduced to testing of only melt flow index without affecting resin quality.

Testing requirements for packagings made from recycled plastic materials can reasonably be aligned with those for packagings made from resin materials not previously used.

Progress under US Competent Authority Approvals

Based on the successful use of recycled plastic material, the controls applied to the use of recycled plastic materials were re-evaluated by the US competent authority with the approval of amended controls based on the experience gained. In particular, given that packagings manufactured from recycled plastic perform the same as packagings manufactured from resin not previously used, testing requirements for each batch of resin have been streamlined and UN performance testing requirements have been aligned with those for packagings made from resins not previously used.
