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

Fortieth session

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Item 2 (a) of the provisional agenda
Listing, classification and packaging: Proposals of amendments to the list of dangerous goods of Chapter 3.2

Proposal for a new UN number and special provision for a new type of confetti-shooters

Transmitted by the expert from Germany

Background

1. At the thirty-eighth session the Expert from Germany presented document ST/SG/AC.10/C.3/2010/64 giving reasoning and proposing to introduce a new UN number for confetti-shooters to be transported as dangerous articles. Following the discussion and comments given the Expert from Germany asked delegations to send written comments and offered to submit a revised proposal for a future meeting.

2. Comments from the Expert from the United Kingdom were received in December 2010 and from the Expert from Switzerland in February 2011. Experts in Germany have checked the comments made and would like to present the following answers.

3. Consideration of comments from UK:

A: General Comments

4. Do we need a new UN number? Can we really justify a new UN number for these consumer items? These are consumer goods that we can all buy and they will surely be covered by consumer legislation so is all this testing needed? UN 3164 applies now and is quite wide in its application or would a second SP for UN 3164 be adequate?

> **Answer**: It is surely correct that confetti-shooters at the end of the transport chain will end up as consumer products. But during transport they are presenting pressure hazards and pose a risk of fragmentation so they are to be considered as dangerous articles for transport.

5. Basically they may be compared to pyrotechnic articles, but without any pyrotechnic component included they cannot be assigned to class 1. As such the test series for class 1 articles do not apply. Such articles therefore need to be assigned to class 2.

6. Containing either UN 1002 Air, compressed or UN 1066 Nitrogen, compressed, the small pressure receptacle would be subject the requirements for usual standardised pressure receptacles of chapter 6.2. But the small pressure receptacle does not and cannot fulfil such

requirements as a special mechanism is needed for functioning as shooter. Furthermore each small pressure receptacle of such a shooter is fixed into one cylindrically shaped strong fibreboard tube together with non-dangerous material to be pushed out by the shooter after release. So assignment to UN numbers 1002 or 1066 is not possible.

7. Furthermore such articles cannot be assigned to UN 3164 „Articles, pressurized, pneumatic“ or UN 3150 „Devices, small, hydrocarbon gas powered“ either.

8. UN 3150 is not applicable as a confetti-shooters contains Air or Nitrogen, compressed; also the fibreboard containment cannot be regarded as a packaging as the small pressure receptacle and the fibreboard cylinder form a unit which is produced, handled, stored, transported and used as such.

9. UN 3164 has be regarded in conjunction with SP 283; this entry deals with articles, containing gas, **intended to function as shock absorbers or pneumatic springs** designing this entry to big size and high pressure articles for industrial use, subject to very concrete and stringent provisions. Confetti-shooters on the other hand are of very small size, of relatively low pressure (<= 22 bar) and for consumer use. The requirements of SP 283 are not suitable and would be over demanding if applied to confetti-shooters. Furthermore when transporting dangerous articles of UN 3164, people involved in transport and enforcement and rescue forces are expecting large and robust articles containing high pressure gases and transported unpacked. But such small confetti-shooters are not large, not robust, provide relatively low gas pressure and need to be transported in packaged form.

10. Therefore creating a new and specific UN number for confetti-shooters is appropriate and would be best suitable to ensure safe transport of such articles without applying over-imposing and inadequate requirements.

B: Specific comments on the text

11. Proper shipping name:

(a) Is the proposed proper shipping name clear? ‘Articles containing pressurized receptacles’ could refer to e.g. breathing apparatus or even Life-saving appliances, self-inflating (UN 2990). How is it different from UN 3164 Articles, pressurized, pneumatic or hydraulic (containing non-flammable gas)?

Answer: The differences to articles covered by UN 3164 and SP 283 have already been explained. To further precise the proper shipping name, it is suggested to amend this to read:

“UN XXXX ARTICLES, CONTAINING SMALL GAS RECEPTACLES with non-flammable gas.

12. Proposed Special Provision 3XX

(a) 3XX It can be argued in general terms that SP 283 covers confetti-shooters and that this proposed SP is not necessary.

Answer: SP 283 covers specific gas-shock-absorber and pneumatic springs with working pressure up to 280 bar and not fitted with an opening device. Meanwhile confetti-shooters present a combination of a small pressure receptacle with a special opening mechanism intended to open the article as such and the receptacle in one step. So confetti-shooters are quite different from articles covered by SP 283.

(b) 3XX (a) Why limit it to these named gases? Why not other 2.2 gases? For example UN 3164 just says non flammable gases.

Answer: As confetti-shooters are intended for consumer use, the gases should be restricted to gases easy to handle by private individuals and not posing an unusual risk. CO^2 for example while subject to immediately release from 25 bar to atmospheric pressure at 20°C would be freezing to sublimation point and partly be released as CO^2-ice or -snow. This would pose additional risks to private individuals while using the article. Oxidizing gases could be reacting dangerously with the confetti-paper and the fiberboard of the shooter. As usual, the new entry for such shooters should be limited to the gases necessary to function without imposing any additional risk.

(c) 3xx (b) uses the phrase 'gas space capacity' copied from SP 283. but in this instance the term 'water capacity' should be used as with all definitions of pressure receptacles.

Answer: Agreed.

(d) 3xx (d) In the second sentence of (d) the meaning of the terms 'usual activator, slewable ring and bottom part' are unclear, except in the context of the particular design shown. We suggest deleting this sentence.

Answer: Deleting this sentence could create additional hazards and reduce safety of the article. For example during transport packagings could be damaged and shooters could be unintentionally released creating risks to other packagings as well as to people.

Proposed amendment:

"(d) Each article shall be manufactured in such a way that unintentional firing or release is avoided under normal conditions of handling, packing, transport and use. This may be fulfilled by an additional locking device linked to the usual activator."

(e) 3xx (e) Paragraph (e) should be expressed more generally. We suggest two alternatives for this paragraph:

Either: "The article shall be constructed in such a way that all parts are contained within it even during malfunctioning or foreseeable faults of component parts."

Or: "Each article shall be manufactured in such a way as to prevent the pressure receptacle from rocketing backwards through the bottom of the article and preventing the metal clack or fragments of the pressure receptacle from catapulting during the activation of the article;"

Answer: The expert from Germany welcomes and would prefer the second version.

Additional Question: What is a clack?

Answer: Instead of metal clack the term 'metal flap' should be used.

(f) 3xx (f) Are there not contradictions between 'no fragments' and allowing fragmentation?

Answer: No, as this paragraph deals with the fragmentation of the metal of the pressure receptacle, not with the fragmentation of the total article.

(g) 3xx (g) and (h) A general point; why are tests for class 1 articles being suggested for gases? Paragraphs (g) and (h) allow the tests to be 'similar to'. How much may one depart from the specified tests? In paragraph 'g' it is stated that the article should not rocket more than 10 meters yet in paragraph 5 it mentions 5 meters. In the proposal at 3XX (g) it requires a fire test to prove that the "article will

not fragment" but then goes on to say "and that the "articles or fragments do not rocket more than 10 meters?

Answer: There might be a slight misunderstanding of the sense of such tests (see also general comments); confetti-shooters are articles presenting hazards comparable to pyrotechnic articles by using a gas as propellant. Therefore the Expert from Germany is confident that such texts are helpful and necessary to determine and limit the hazard of such articles.

Paragraph 5 of the backround is presenting test results (5m), but the safety related requirement in (g) calls for <10 m, so there should not be any contradiction included.

But it is correct to replace 'the article will not fragment' by 'the pressure receptacle will not fragment…"

(h) Paragraph 2 requires data for the competent authority; the regulations don't ask for this now for UN 3164 ARTICLES, PRESSURIZED PNEUMATIC or HYDRAULIC (containing non-flammable gas) which would include shock absorbers. These are perhaps more dangerous than confetti shooters but SP283 does not require information to be sent to the competent authority; it just says that a consignor must do testing and be prepared to show that in a fire they will fail safely.

Answer: There are quite a number of differences between articles covered by UN 3164 and confetti-shooters, as already explained. Furthermore articles like shock absorbers are subject to other technical safety legislation as they are intended to be build in e.g. machinery equipment, cars, trucks, which for such specific products are requiring very high resistance to pressure and functioning so that compared to usual cylinders for the same gases; those existing requirements are the reasoning for the specific requirements in SP 283, letter a) to e). Such articles at the end of the transport chain will be used by professional workers. Additionally they have to be manufactured to a quality assurance standard acceptable to the competent authority. Therefore the authority is involved in the acceptance procedure and is getting information on each type.

As this is not the case for confetti-shooters, which are manufactured in very high quantity mostly by small and medium size enterprises, it is proposed to submit data to the competent authority only on request to render enforcement possible and create a possibility to backtrack in case of non-compliance. This is thought to be less demanding than imposing a quality assurance standard acceptable to the competent authority, which by the way would include some kind of verification and monitoring by that authority.

(i) Paragraph 3 is a limited quantity provision and needs to be addressed through Chapter 3.4.

Answer: That is basically correct, but would complicate regulations without giving additional benefit. There are other existing SP including provisions for limited quantities like SP 190, 342. The advantage of keeping such provisions in SP 3xx is to concentrate all applicable provisions for confetti-shooters in one place.

13. Consideration of comments from Switzerland:

(a) SP 3XX (a): There is no safety justification to limit this application to compressed air or nitrogen. The gas should be a compressed gas of division 2.2 asphyxiant (not oxidizing!).

Answer: See answer to a similar comment from UK. Confetti-shooters are very specific products for application by private individuals. So it is highly unlikely that

any other gas than air, compressed or nitrogen, compressed is used as to avoid any unwanted effect to un-skilled users. An extension to other gases is neither necessary nor wanted by industry.

(b) 3xx (e): "...fragments of the pressure receptacle can catapult during activation of the article". It is not clear to us what your perception of the risk is. Don't you think that requirements (c) and (f) make this case highly improbable? We suggest to delete this part of the sentence.

Answer: This is addressing two different risks:

- fragmentation of metal parts or splinters during release of the shooter (intentional as well as unintentional),

- fragmentation of the small gas receptacles inside the shooter (unintentional e.g. in case of fire, accidents or incidents).

(c) 3xx (f): We understand that this provision applies to hydraulic and not pneumatic burst tests. This needs to be clarified.

Answer: This addresses, as can be seen in the introduction of document AT/AG/AC.10/C.3/2010/64 and in the test report attached to it, the material of the inner pressure receptacle in a pneumatic burst test.

(d) 3xx (g): Fire test of series 6 (b) is justified for class 1 articles and you performed it to assess the risks of this type of article. Is it really necessary to carry out such a test for each new design type? Would it not be sufficient to require that the test should demonstrate that in a fire heat melts the plastic lock thus relieving the internal pressure of the gas receptacle. We suggest to read:

" The design type of the article shall be subjected to a fire test ~~(similar to UN test 6 (b))~~. It shall be demonstrated that the article relieves its pressure by means of a fire degradable seal or other pressure relief device~~. in such a way that the article will not fragment and that the article or fragments do not rocket more than 10 metres~~."

Answer: Following this proposed amendment would lead to a significant decrease in safety as the distance fragments are flying and non-fragmentation of the inner pressure receptacle are an important factor of safety for such articles. This is similar to articles like spring devices under pressure or airbag inflators.

(e) 3xx (2) We suggest to add a provision according to SP 283 which reads:

"Each article shall be manufactured in accordance with a quality assurance system acceptable to the competent authority".

Answer: See answer to a similar suggestion by UK. In our view requiring a mandatory quality assurance standard to be applied by the manufacturer and to be monitored by the competent authority would be overestimating the risks posed by such small confetti-shooters. Pressure and size are quite less and small compared to articles covered by SP 283, additionally confetti-shooters need to be transported in packaged for and are not suitable for transport unpacked.

(f) 3xx (1): We suggest to clarify the provision by adding the underlined words: Articles conforming to the requirements in (1) and (2) are not subject to other provisions of these Regulations if packed according to P 003 in packagings not exceeding 30 kg gross mass.”

Answer: Agreed.

14. The Expert from Germany is very grateful to the comments received and would like to thank Switzerland and the United Kingdom. The comments were very helpful to develop the proposal. The revised proposal can be found as annex to this informal document.

15. The Sub Committee is invited to discuss the issue. Based on the result the Experts from Germany is willing to submit a formal proposal to the next session.

Annex

Revised Proposal (amended text is underlined)

1. Create a new entry (UN 3XXX) in Class 2:

(a) Add a new entry to the Dangerous Goods List, as follows:

UN No.	Name and description	Class or division	Subsi-diary risk	UN Packing group	Special provi-sions	Limited and excepted quantities		Packagings and IBCs		Portable tanks and bulk containers	
								Packing instructions	Special packing provisions	Instruc-tions	Special provisions
(1)	(2)	(3)	(4)	(5)	(6)	(7a)	(7b)	(8)	(9)	(10)	(11)
3XXX	**ARTICLES, CONTAINING SMALL GAS RECEPTACLES with non-flammable gas**	2.2			3XX	0	E0	P003			

(b) Add a new Special Provision 3XX in Chapter 3.3 to read:

"**3XX** (1) Articles, containing small pressure receptacles, intended to function as confetti-shooters, shall meet the following requirements:

(a) The pressure receptacle shall be filled with compressed air or nitrogen only;

(b) The water capacity of the pressure receptacle shall not exceed 0.5 litres and the charge pressure shall not exceed 25 bar;

(c) The minimum burst pressure of the pressure receptacle shall be at least four times the charge pressure of the gas at 20 °C;

(d) Each article shall be manufactured in such a way that unintentional firing or release is avoided under normal conditions of handling, packing, transport and use. This may be fulfilled by an additional locking device linked to the usual activator (e.g. slewable ring or bottom part);

(e) Each article shall be manufactured in such a way as to prevent the pressure receptacle from rocketing backwards through the bottom of the article and preventing the metal flap or fragments of the pressure receptacle from catapulting during activation of the article;

(f) Each pressurised receptacle shall be manufactured from material which will not fragment upon rupture;

(g) The design type of the article shall be subjected to a fire test (similar to UN test 6 (b)). It shall be demonstrated that the article relieves its pressure by means of a fire degradable seal or other pressure relief device, in such a way that the pressure receptacle will not fragment and that the article or fragments do not rocket more than 10 metres; and

(h) The design type of the article shall be subjected to a single package test (similar to UN test 6 (d)). There shall be no hazardous effects outside the package from accidental activation of one article or initiation of the contents. Evidence of hazardous effects outside the package includes the disruption of the package, metal fragments or receptacles which pass through the packaging.

2. The manufacturer shall produce technical documentation of the design type, manufacture as well as the tests and their results. He shall apply procedures to ensure that shooters produced in series are made of good quality, conform to the design type and are able to meet the requirements in (1). He shall provide such information to the Competent Authority on request.

3. Articles conforming to the requirements in (1) and (2) are not subject to other provisions of these Regulations if packed according to P 003 in packagings not exceeding 30 kg gross mass.”.

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