

# UN/SCETDG/44/INF.18/Add.1

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## **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**

**18 November 2013**

### **Forty-fourth session**

Geneva, 25 November – 4 December 2013

Item 5 (g) of the provisional agenda

### **Miscellaneous proposals for amendments to the Model Regulations on the Transport of Dangerous Goods: packagings**

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## **Leakproofness testing procedures**

**Transmitted by expert from Sweden**

### **Additional information**

Sweden has received further data which should be considered together with UN/SCETDG/44/INF.18, see tables and detailed answers on the following pages.

## Summary - Leakproofness testing procedures

Country/NGO <sup>*)</sup>	1. IBCs Before 1 <sup>st</sup> use (paragraph 6.5.4.4)					
	a) Metal		b) Composite		c) Rigid plastics	
	kPa	Time	kPa	Time	kPa	Time
ICCR	-	-	2-20	?	2-20	?
Note: Mainly pressure diff. test. Test times and pressures vary for production testing.						
<b>Metal Packaging Industry (SSCA)</b>	20	10 min	-	-	-	-
Note: All IBCs. Water bath/liquid soap, Helium tests, as specified in BAM GGR 002.						
*) NGO = Non-governmental organization						

Country/NGO <sup>*)</sup>	2. IBCs Periodic inspection (paragraph 6.5.4.4)					
	a) Metal		b) Composite		c) Rigid plastics	
	kPa	Time	kPa	Time	kPa	Time
ICCR	3-20	?	3-20		?	
Note: Leakproofness tests vary from country to country. Some have rigorous inspection requirements while others have less stringent inspection rules.						
<b>Metal Packaging Industry (SSCA)</b>	20	10 min	-	-	-	-
Note: All IBCs. Liquid soap, as specified in ADR 6.1 ff.						
*) NGO = Non-governmental organization						

<b>3. Packagings Before 1<sup>st</sup> use</b> (paragraph 6.1.1.3)				
<b>Country/NGO<sup>*)</sup></b>	a) Metal		b) Plastics	
	kPa	Time	kPa	Time
<b>ICCR</b>				
Note: Leakproofness testing vary widely based on packaging style, manner of construction and the variety of alternate testing processes approved by CA.				
<b>Metal Packaging Industry (EMPAC)</b>	2-65	0.4-20 sec	-	-
Note: All packagings. Pressure diff. test/vacuum tests.				
<b>Metal Packaging Industry (ICDM )</b>	16-40	2-20 sec		
Note: All packagings. Pressure diff. test and other tests.				
*) NGO = Non-governmental organization				

<b>4. Packagings Reconditioned</b> (paragraph 6.1.1.3)				
<b>Country/NGO<sup>*)</sup></b>	a) metal		b) plastics	
	kPa	Time	kPa	Time
<b>ICCR</b>	-	-	-	-
<b>Metal Packaging Industry (EMPAC, ICDM and SSCA)</b>	-	-	-	-
*) NGO = Non-governmental organization				

<b>5. Authorization and qualifications</b>					
	<b>IBCs</b>		<b>Packagings</b>		
	a) Before 1 <sup>st</sup> use	b) Periodic inspection	c) Before 1 <sup>st</sup> use	d) Reconditioning	e) Repair (added by Germany (BAM) and UK)
<b>Country/NGO<sup>*)</sup></b>	Who / Requirements	Who / Requirements	Who / Requirements	Who / Requirements	Who / Requirements
<b>ICCR</b>	-	Primarily IBC reprocessors/ Different in different countries. Some countries require initial training, periodic retraining while others require both annual training and testing.	-	-	<i>Pressure diff. test regardless of the packing material.</i>
<b>Metal Packaging Industry (SSCA)</b>	In Germany: Competent person according to BAM GGR 001	In Germany: Inspection houses according to BAM GGR 002	-	-	-
*) NGO = Non-governmental organization					

## Annex 1

### Leakproofness testing procedures –Detailed responses

#### Questions on leakproofness testing procedures requested by the Swedish UN Expert

#### Prepared by: International Confederation of Container Reconditioners

**November 10, 2013**

1. Which testing procedures are used for the leakproofness test carried out on the below mentioned IBCs before their first use (e.g. test pressures, how long is the test pressure held, description of the test in the production line, if a statistical sample of IBCs is tested or all)?

- (a) Metal IBCs
- (b) Composite IBCs
- (c) Rigid plastic IBCs

2. Based upon responses from ICCR members representing Japanese, North American and European IBC reprocessor, it is our understanding that most companies in the business use pressure differential as the leakproofness test for composite IBCs and other rigid IBCs. In the design testing phase, the seams and joints are generally coated with soapy water or an oil-based solution. However, other equally effective procedures are or may be authorized by the relevant competent authority.

3. Test pressures and test times for the design phase also vary, depending on regulations established by the competent authority. Similarly, test times and pressures vary for production testing from 2 kPa to 20 kPa. Several countries recognize the benefits of statistical quality assurance processes used in conjunction with leakproofness testing, while others have authorized leakproofness testing processes that require testing alone for suitable time periods. In all cases, ICCR found that leakproofness testing procedures used by reconditioners is conducted in accordance with requirements established or authorized by the competent authority.

4. ICCR takes this opportunity to point out that for decades millions of new and reprocessed IBCs have been sold globally for use with dangerous goods. The transport safety history of these packagings is outstanding. This fact suggests that variances in leakproofness testing procedures is not a transportation safety issue.

5. Which testing procedures are used for the leakproofness test carried out on the below mentioned IBCs every two and a half years (the periodic inspection) (e.g. test pressures, how long is the test pressure held, is a statistical sample of IBCs tested or all)?

- (a) Metal IBCs
- (b) Composite IBCs
- (c) Rigid plastic IBCs

6. According to responses gathered by ICCR, the leakproofness test and inspection processes performed on composite and other IBCs vary from country to country. Some countries have established rigorous inspection requirements coupled

with a relatively high (e.g. 20 kPa) leakproofness test, while others have adopted less stringent inspection rules and lower test pressure requirements (e.g. 3 kPa). In addition, the period of time the leakproofness test must be conducted varies around the world.

7. Which testing procedures are used for the leakproofness test carried out on the below mentioned packagings before their first use (e.g. test pressures, how long is the test pressure held, description of the test in the production line, if a statistical sample of packagings is tested or all)?

- (a) Metal packagings
- (b) Plastic packagings

8. ICCR has limited its answer to this question to intermediate bulk containers. For other packagings leakproofness testing options vary widely based on packaging style (e.g. open head/tight head), manner of construction (e.g. material/thickness) and the variety of alternate testing processes approved by the competent authority (e.g. helium/air pressure).

9. ICCR found that IBC reprocessors use the pressure differential test almost exclusively. As noted in earlier responses, the amount of pressure and time used to test the IBC depends on a range of factors. However, in all cases, tests are performed in accordance with existing competent authority authorizations.

10. Which testing procedures are used for the leakproofness test carried out on the below mentioned packagings after they have been reconditioned (e.g. test pressures, how long is the test pressure held, description of the test in the production line, is a statistical sample of packagings tested or all)?

- (a) Metal packagings
- (b) Plastics packagings

11. ICCR members all perform a leakproofness or leaktightness test on IBCs as a standard part of the production process. Leakproofness tests performed on, for example, repaired composite IBCs, are done using pressure differential, regardless of the packaging material (i.e. metal/plastic/ composite). However, as noted in other comments, the test pressures used for the test vary from nation to nation as does the testing period. We are not aware of cases where statistical sampling alone is authorized in lieu of the leakproofness test itself.

12. Who is authorized to perform leakproofness tests on packagings and IBCs? Which proficiency requirements (e.g. training, exam, accreditation, etc.) are in force in national legislation for the persons carrying out the tests in the below mentioned cases?

- (a) Before IBCs are first used
- (b) Every 2.5 years
- (c) Before packagings are first used
- (d) Reconditioning of packagings

13. ICCR variance in the test requirements by country for each of the options cited above. With regard to design type testing, while many countries required IBCs to be design tested by an accredited laboratory, others have created a self-certification option. For example, it is our understanding the most European nations require initial design type tests to be performed by a national laboratory. Whereas in the United States, design type testing can be undertaken by a “third-party” laboratory or by the packaging producer. However, the U.S. also requires the design to be retested at least once every year after the initial design test while the packaging remains in production. Many European countries, we understand, do not

require the design to be tested again, but rather rely upon approved quality assurance programs to ensure the continued efficacy of the design.

14. With regard to the two and a half year inspection and production testing for IBCs, these activities are conducted primarily (but not exclusively) by IBC reproducers. In these settings, numerous professionals may be authorized to carry out these tasks. Some countries require initial training periodic re-training of personnel who perform this task. Other countries require both annual training and testing for this purpose.

15. ICCR thanks Sweden for the opportunity to answer these questions and would be pleased to provide additional information to Sweden or the Subcommittee at a later date.

**Leakproofness Testing Survey**

**Answers for the Metal Packaging Industry**

*(EMPAC (light gauge metal packaging), ICDM (Steel Drums) and SSCA (Metal IBC))*

1. Which testing procedures are used for the leakproofness test carried out on the below

*mentioned IBCs before their first use (e.g. test pressures, how long is the test pressure held,*

*description of the test in the production line, if a statistical sample of IBCs is tested or all)?*

Association **SSCA**

**Type of Packaging** Metal-IBC

UN Code 11A, 21A, 31A, 11B, 31B

**Leakproofness Testing**

Test Pressure (*bar*) 0.2

Test Duration (*min*) 10

Test Method Water bath/ liquid soap, Helium Tester, as spec. In BAM GGR 002

100% or sample 100 %

2. Which testing procedures are used for the leakproofness test carried out on the below

*mentioned IBCs every two and a half years (the periodic inspection) (e.g. test pressures, how long is*

*the test pressure held, is a statistical sample of IBCs tested or all)?*

Association **SSCA**

**Type of Packaging** Metal-IBC

UN Code 11A, 21A, 31A, 11B, 31B

**Periodic Inspection**

Test Pressure (*bar*) 0.2

Test Duration (*min*) 10

Test Method liquid soap, as specified in ADR 6.1 ff.

100% or sample? 100%

**Leakproofness Testing Survey**

3. Which testing procedures are used for the leakproofness test carried out on the below

*mentioned packagings before their first use (e.g. test pressures, how long is the test pressure held,*

*description of the test in the production line, if a statistical sample of packagings is tested or all)?*

Association **EMPAC ICDM**

**Type of Packaging** Light Gauge Metal

Packaging



Steel Drum

UN Code 1A1, 1A2, 3A1 1A1, 1A2

Material Steel (Tinplate) Steel (cold rolled etc.)

### **Leakproofness Testing**

In-Line 1

Test Pressure 2 (*bar*) 0.02 – 0.65 0.16 – 0.4

Test Duration (*sec*) 0.4 – 20 2 - 20

Test Method Differential pressure/

vacuum tester ...

Differential pressure

and others

100% or sample? 100% 100%

Off-Line

Test Pressure (*bar*) 0.08 – 0.25

Test Duration (*min*) 5 – 15

Test Method water bath Water bath, Helium

Tester,

100% or sample? Sample (e.g. 10 units/

hour ...)

Sample e.g. with

change of packaging

type/ approval

*4. Which testing procedures are used for the leakproofness test carried out on the below*

*mentioned packagings after they have been reconditioned (e.g. test pressures, how long is the test*

*pressure held, description of the test in the production line, is a statistical sample of packagings tested*

*or all) ?*

Our members are producers of new packaging therefore we are not competent to answer this

question.

1 .) For light gauge Metal packaging higher test pressures would lead to permanent deformation therefore this would be a destructive test method

and cannot be done as a 100% test.

2 Test parameters are depending among other criteria on type and volume of packaging as well as material thickness

### **Leakproofness Testing Survey**

*5. Who is authorized to perform leakproofness tests on packagings and IBCs? Which proficiency*

*requirements (e.g. training, exam, accreditation, etc.) are in force in national legislation for the persons*

*carrying out the tests in the below mentioned cases?*

Association **SSCA**

**Type of Packaging** Metal-IBC

UN Code 11A, 21A, 31A, 11B, 31B

**Who is authorised ...**

Before first use In Germany: Competent person according to BAM GGR 001

Periodic inspection In Germany: Inspektionsstelle n.

BAM GGR 002

Niko Tessin for EMPAC, ICDM and SSCA, November 2013

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