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COMMITTEE OF EXPERTS ON THE  
TRANSPORT OF DANGEROUS GOODS

Sub-Committee of Experts on the  
Transport of Dangerous Goods  
(Sixteenth session,  
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MISCELLANEOUS DRAFT AMENDMENTS TO THE MODEL REGULATIONS  
ON THE TRANSPORT OF DANGEROUS GOODS

Packagings

Pressure relief devices for rigid plastics IBC's and composite IBC's  
with plastics inner receptacles

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

1. Introduction

The history of formation of the requirements for the construction and testing of rigid intermediate bulk containers as a relative young kind of dangerous goods container was determined by both

- experiences with packaging
- experiences with tanks (made of metal)

Particularly the knowledge about the behaviour of metal tanks has led to regulations for the metal IBC's which were the first type of rigid IBC's to be mentioned in the UN-recommendation and where a pressure relief device was provided. The device function is clearly set out in paragraph 6.5.3.1.7:

" ....be capable of releasing a sufficient amount of vapour in the event of fire engulfment to ensure that no rupture of the body will occur..."

As the metal IBC has a very low deformability in absence of pressure relief devices, the increase of pressure may quickly cause it to burst.

By analogy, the requirement for pressure relief devices was later extended both to rigid plastics IBC's and composite IBC's with plastics inner receptacles. The corresponding paragraphs are 6.5.3.3.6 and 6.5.3.4.10.

The necessity of pressure relief devices for use with plastics IBC's has not been proven neither by theory nor by experience.

## **2. Justification for the deletion of the specific requirement concerning pressure relief devices**

The behaviour of rigid plastics and composite IBC's is fundamentally different from that of metal IBC's in case of high temperature, e.g. fire:

- the plastics material (usually HDPE) of the inner receptacle is a poor heat conductor and the contents heat up much more slowly compared to a metal IBC;
- if the contents heat up, the plastics material of inner receptacle is deformed with the result of limiting the pressure increase inside the container;
- in case of direct contact with fire the plastics material melts (melting temperature 130°C-140°C) before a significant inner pressure may occur.

There is no risk of a plastics IBC without pressure relief device bursting under these conditions. This conclusion can be proven by the empirical knowledge about:

- i) fire tests with polyethylen containers (e.g. polyethylen fuel tanks in cars or heating oil storage tanks)
- ii) the use of rigid plastics IBC's and composite IBC's with plastics inner receptacles without relief devices with national approvals from competent authorities in several countries

Comment to i):

For safety reasons polyethylen-fuel tanks in cars have replaced metal tanks. Plastics fuel tanks have to pass a vehicle fire simulation test. The results show that plastics tanks do not burst.

Comment to ii):

Millions of rigid plastics IBC's and composite IBC's with plastics inner receptacles have been used without relief devices, particularly in France, Belgium and the Netherlands, with the approval of the competent authorities. No cases of rupture of inner receptacles were reported during this time.

## **3. Proposal**

Delete paragraphs 6.5.3.3.6 and 6.5.3.4.10.

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