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

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OPTIONS TO FACILITATE GLOBAL HARMONIZATION OF TRANSPORT OF DANGEROUS GOODS REGULATIONS WITH THE UN MODEL REGULATIONS

NOTE ON THE INFORMAL MEETING ON METHODS TO DEMONSTRATE CHEMICAL COMPATIBILITY OF PLASTICS PACKAGINGS AND IBCS

Transmitted by the expert from Germany and the International Confederation of Plastics Manufacturers (ICPP)

Reference is made to INF.37 reproducing an invitation by the expert from Germany and the International Confederation of Plastics Manufacturers (ICPP) for an Informal meeting on methods to demonstrate chemical compatibility of plastics packagings and IBCs scheduled on 5 July 2006.

This paper is to inform about the outcome of this meeting with participation from 13 experts representing 7 countries/associations.

The objective of the meeting was to compare the two regional approaches in Europe and the USA, - both based on the UN Model Regulations, but amended by different specific technical interpretations - and examine them for options of improvements for both approaches.

Both systems were presented in detail. A summary of the procedures applied in context with the design type testing and approval on one side and those to be followed by the users of packagings and IBCs is given in the following pages.

Questions of understanding and some discussion on the benefits of both approaches concluded the event. It was agreed to make the results of this meeting public and to keep the participants involved in any continued effort in this context.

European (ADR/RID) and US (CFR) schemes to demonstrate chemical compatibility of plastics packagings and IBCs

Design type qualification by performance testing of prototypes					
ADR/RID 6.1.5.2.5 – 6.1.5.2.8; 6.5.4.3.2 – 6.5.4.3.6			**CFR** §173.24(e)(ii) and Appendix B to this part		
Applicability: All packing groups and all types of plastics packagings and IBCs			Applicability: All types of plastics packagings and IBCs of packing group I		
For original filling liquids					
Pre-storage with original filling liquid(s) for					
	Time	Temp.	Method	Time	Temp °C
	6 month	ambient	1	180 days	18
			2[1]	28 days	50
			3[1]	14 days	60
For standard liquid(s)					
Pre-storage with standard liquid(s) for[2]			Not specified		
	Time	Temp. °C			
	21 days	40			
Performance oriented packaging tests					
Sample 1[3]					
Packagings	IBC	Filled with	Packagings	IBC	Filled with
Not required			Vibration		water

Packagings	IBC	Filled with
NA	Bottom lift	water
NA	Top lift	water
28 days stacking[4]		water
Leakproofness		air
Hydraulic Pressure[5]		water
Sample 2[6]		
Drop test		water/anti-freeze

Sample 3					
Packagings	IBC	Filled with	Packagings	IBC	Filled with
28 days 40°		original liquid or standard liquid	28 days 40°		water

[1] For the elevated temperature test a smaller container (~ 500 mL) of identical plastics material may be substituted
[2] Except for standard liquid water
[3] For packagings, 3 samples are required for each of the tests
[4] 24 hour test for UN 1H1, 1H2, 6HA1, 6HA2, 31HA1, 31HG1
[5] IBC test duration 10 minutes, nonbulk packagings test duration 30 minutes
[6] For packagings, 6 samples are required for the test
[7] For plastics drums and jerricans, composite packagings 6HH1, 6HH2 and composite IBC types 31H1, 31H2, 31HH1, and 31HH2

<table>
<tr><th colspan="4">Procedures for users to demonstrate compatibility for filling substances</th></tr>
<tr><th colspan="3">ADR/RID
4.1.1.19</th><th>CFR
§173.24(e)(ii) and Appendix B to this part</th></tr>
<tr><th colspan="4">Assignment of filling liquids different to the performance test substance</th></tr>
<tr><td colspan="3" rowspan="4">Repetition of the performance oriented packaging tests</td><td>Users may conduct compatibility testing[8] with the original filling liquid in small containers[9] constructed of the same materials as the packagings with respect to</td></tr>
<tr><td>B.5. weighing of mass change</td></tr>
<tr><td>B.6 Drop test</td></tr>
<tr><td>B.7a. Visual examination[10]</td></tr>
<tr><th colspan="4">Assignment of filling liquids to standard liquids without testing</th></tr>
<tr><td colspan="3">User may use the assimilation list which correlates 408 filling substances with standard liquids, 41 of them collective entries</td><td>No comparable procedures provided</td></tr>
<tr><td colspan="3">Users may apply the assimilation procedure which allows to assign filling substances to mixtures & solutions to standard liquids</td><td>No comparable procedures provided</td></tr>
<tr><th colspan="4">Assignment of filling liquids to standard liquids by comparative laboratory material tests</th></tr>
<tr><td>Damaging Effect</td><td>Representative standard liquid</td><td>Test Methods</td><td rowspan="8">Not applicable</td></tr>
<tr><td>Softening by swelling</td><td>White spirit</td><td>A: weighing of mass increase</td></tr>
<tr><td>Severe Stress Cracking</td><td>Wetting Solution</td><td>B: residual strength after pin impression test</td></tr>
<tr><td>Stress Cracking</td><td>Acetic acid</td><td>B: residual strength after pin impression test</td></tr>
<tr><td>Combination of softening, swelling and stress cracking</td><td>n-Butyl acetate saturated solution in wetting solution</td><td>A & B in sequence</td></tr>
<tr><td>Molecular degradation</td><td>Nitric acid 55%</td><td>MFR increase</td></tr>
<tr><td>No specific effect</td><td>Water</td><td>A or B</td></tr>
</table>

[8] Same prestorage conditions as for the performance oriented packaging tests
[9] At least three sample containers shall be used for each combination of hazardous material and size and design of container
[10] For permanent deformation due to vapour build-up or collapse of walls, deterioration, swelling crazing, cracking, excessive corrosion, oxidization, embrittlement, leakage, rupture or other defects likely to cause premature failure or hazardous condition.