International Civil Aviation Organization

WORKING PAPER

DGP-WG/08-WP/2
25/8/08

DANGEROUS GOODS PANEL (DGP)
MEETING OF THE WORKING GROUP OF THE WHOLE

The Hague, 3 to 7 November 2008

Agenda Item 2: Development of recommendations for amendments to the *Technical Instructions for the Safe Transport of Dangerous Goods by Air* (Doc 9284) for incorporation in the 2011/2012 Edition
2.3 Part 3 — Dangerous Goods List, Special Provisions and Limited and Excepted Quantities
2.4: Part 4 — Packing Instructions

PACKING INSTRUCTIONS FOR CHLOROSILANES

(Presented by D. Brennan)

SUMMARY

This working paper proposes the introduction of specific packing instructions for chlorosilanes to align with the provisions of the UN Model Regulations

Action by the DGP-WG is in paragraph 2.

1. INTRODUCTION

1.1 The UN Subcommittee at the 29th meeting agreed to proposals submitted by the International Council of Chemical Associations (ICCA) to adopt a specific packing instruction for all chlorosilane entries in the Dangerous Goods List (working paper ST/SG/AC.10/C.3/2006/11).

1.2 The changes to the 15th revised edition of the UN Model Regulations resulting from the ICCA paper have not been adopted into the *Technical Instructions for the Safe Transport of Dangerous Goods by Air* (Doc 9284) and as a consequence the quantity and packing provisions in the Technical Instructions are, in some instances, less restrictive than those in the UN Model Regulations and the regulations for other modes of transport. In addition, there are a number of entries shown in the Technical Instructions that permit the use of limited quantity packagings whereas in the Model Regulations there is no limited quantity allowance for any of these entries.

1.3 The proposals contained in this working paper introduce new packing instructions in Class 3, Division 6.1 and Class 8 that align with the provisions of UN P010, with resultant amendment to Table 3-1 for the applicable UN numbers.

2. ACTION BY THE DGP-WG

2.1 The DGP-WG is invited to assign all chlorosilanes in Class 3 to a new packing instruction 3xx as follows:

Packing Instruction 3xx

Passenger and cargo aircraft for Chlorosilanes

General requirements

Part 4, Chapter 1 requirements must be met, including:

1) **Compatibility requirements**

— Substances must be compatible with their packagings as required by 4;1.1.3.
— Metal packagings must be corrosion resistant or be protected against corrosion.

2) **Closure requirements**

— Closures must meet the requirements of 4;1.1.4.

COMBINATION PACKAGINGS						**SINGLE PACKAGINGS**	
UN number	*Inner packaging (see 6;3.2)*	*Net quantity per inner packaging — passenger*	*Net quantity per inner packaging — cargo*	*Total quantity per package — passenger*	*Total quantity per package — cargo*	*Passenger*	*Cargo*
UN 1162, UN 1196, UN 1250, UN 1298, UN 1305, UN 2985	Glass	1.0 L	1.0 L	1.0 L	5.0 L	No	5.0 L
	Plastic	Forbidden	Forbidden				
	Steel	1.0 L	5.0 L				

OUTER PACKAGINGS OF COMBINATION PACKAGINGS

Boxes	*Drums*
Fibreboard (4G)	Fibre (1G)
Natural wood (4C1, 4C2)	Plastic (1H2)
Plastic (4H1, 4H2)	Plywood (1D)
Plywood (4D)	Steel (1A2)
Reconstituted wood (4F)	
Steel (4A)	

SINGLE PACKAGINGS FOR CARGO AIRCRAFT ONLY

Composites	*Drums*	*Jerricans*
Plastic receptacle in steel drum (6HA1)	Steel (1A1)	Steel (3A1)

2.2 The DGP-WG is invited to assign all chlorosilanes in Division 6.1 to a new packing instruction 6xx as follows:

Packing Instruction 6xx

Passenger and cargo aircraft for Chlorosilanes

General requirements

Part 4, Chapter 1 requirements must be met, including:

1) **Compatibility requirements**

— Substances must be compatible with their packagings as required by 4;1.1.3.
— Metal packagings must be corrosion resistant or be protected against corrosion.

2) **Closure requirements**

— Closures must meet the requirements of 4;1.1.4.

COMBINATION PACKAGINGS						**SINGLE PACKAGINGS**	
UN number	*Inner packaging (see 6;3.2)*	*Net quantity per inner packaging — passenger*	*Net quantity per inner packaging — cargo*	*Total quantity per package — passenger*	*Total quantity per package — cargo*	*Passenger*	*Cargo*
UN 3361, UN 3362	Glass	1.0 L	1.0 L	1.0 L	30.0 L	No	30.0 L
	Plastic	Forbidden	Forbidden				
	Steel	1.0 L	5.0 L				

OUTER PACKAGINGS OF COMBINATION PACKAGINGS

Boxes	*Drums*
Fibreboard (4G)	Fibre (1G)
Natural wood (4C1, 4C2)	Plastic (1H2)
Plastic (4H1, 4H2)	Plywood (1D)
Plywood (4D)	Steel (1A2)
Reconstituted wood (4F)	
Steel (4A)	

SINGLE PACKAGINGS FOR CARGO AIRCRAFT ONLY

Composites	*Drums*	*Jerricans*
Plastic receptacle in steel drum (6HA1)	Steel (1A1)	Steel (3A1)

2.3 The DGP is also invited to consider if the entries for UN 1818, 2434, 2437, 2986 & 2987 should be aligned with the other chlorosilane entries in Class 8 and be restricted to cargo aircraft only with Special provision A1 assigned.

2.4 The DGP is also invited to assign all chlorosilanes in Class 8 to a new packing instruction 8xx as follows:

Packing Instruction 8xx

Cargo aircraft only for Chlorosilanes

General requirements

Part 4, Chapter 1 requirements must be met, including:

1) **Compatibility requirements**

— Substances must be compatible with their packagings as required by 4;1.1.3.
— Metal packagings must be corrosion resistant or be protected against corrosion.

2) **Closure requirements**

— Closures must meet the requirements of 4;1.1.4.

COMBINATION PACKAGINGS				**SINGLE PACKAGINGS**
UN number	*Inner packaging (see 6;3.2)*	*Net quantity per inner packaging — cargo*	*Total quantity per package — cargo*	*Cargo*
UN 1724, UN 1728, UN 1747, UN 1753, UN 1762, UN 1763, UN 1766, UN 1767, UN 1769, UN 1771, UN 1781, UN 1784, UN 1799, UN 1800, UN 1801, UN 1804, UN 1816, UN 1818, UN 2434, UN 2437, UN 2986, UN 2987	Glass	1.0 L	30.0 L	30.0 L
	Plastic	Forbidden		
	Steel	5.0 L		

OUTER PACKAGINGS OF COMBINATION PACKAGINGS

Boxes	*Drums*
Fibreboard (4G)	Fibre (1G)
Natural wood (4C1, 4C2)	Plastic (1H2)
Plastic (4H1, 4H2)	Plywood (1D)
Plywood (4D)	Steel (1A2)
Reconstituted wood (4F)	
Steel (4A)	

SINGLE PACKAGINGS FOR CARGO AIRCRAFT ONLY

Composites	*Drums*	*Jerricans*
Plastic receptacle in steel drum (6HA1)	Steel (1A1)	Steel (3A1)

2.5 If the proposals above have been adopted then the consequential amendments to the entries in Table 3-1 for the applicable UN numbers are as shown:

Name	UN No.	Class or division	Sub-sidiary risk	Labels	State variations	Special provisions	UN packing group	Passenger aircraft		Cargo aircraft	
								Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
1	2	3	4	5	6	7	8	9	10	11	12
Allyltrichlorosilane stabilized	1724	8	3	Corrosive & Liquid flammable		A1	II	FORBIDDEN		~~813~~ 8xx	30 L
Amyltrichlorosilane	1728	8	3	Corrosive & Liquid flammable		A1	II	FORBIDDEN		~~813~~ 8xx	30 L
Butyltrichlorosilane	1747	8	3	Corrosive & Liquid flammable		A1	II	FORBIDDEN		~~813~~ 8xx	30 L
Chlorophenyltrichlorosilane	1753	8	3	Corrosive & Liquid flammable		A1	II	FORBIDDEN		~~813~~ 8xx	30 L
Chlorosilanes, corrosive, n.o.s.	2987	8		Corrosive		A1	II	~~808~~ FORBIDDEN	~~1 L~~	~~812~~ 8xx	30 L
Chlorosilanes, corrosive, flammable, n.o.s.	2986	8	3	Corrosive & Liquid flammable		A1	II	~~808~~ FORBIDDEN	~~1 L~~	~~812~~ 8xx	30 L
Chlorosilanes, flammable, corrosive, n.o.s.	2985	3	8	Liquid flammable & Corrosive			II	~~305~~ 3xx	1 L	~~307~~ 3xx	5 L
Chlorosilanes, toxic, corrosive, n.o.s.	3361	6.1	8	Toxic & Corrosive			II	~~609~~ 6xx	1 L	~~611~~ 6xx	30 L
Chlorosilanes, toxic, corrosive, flammable, n.o.s.	3362	6.1	3 8	Toxic & Liquid flammable & Corrosive			II	~~609~~ 6xx	1 L	~~611~~ 6xx	30 L
Cyclohexenyltrichlorosilane	1762	8		Corrosive		A1	II	FORBIDDEN		~~813~~ 8xx	30 L
Cyclohexltrichlorosilane	1763	8		Corrosive		A1	II	FORBIDDEN		~~813~~ 8xx	30 L
Dibenzylchlorosilane	2434	8		Corrosive		A1	II	~~808~~ FORBIDDEN ~~Y808~~	~~1 L~~ ~~0.5 L~~	~~812~~ 8xx	30 L
Dichlorophenyltrichlorosilane	1766	8		Corrosive		A1	II	FORBIDDEN		~~813~~ 8xx	30 L
Diethyldichlorosilane	1767	8	3	Corrosive & Liquid flammable		A1	II	FORBIDDEN		~~813~~ 8xx	30 L
Dimethyldichlorosilane	1162	3	8	Liquid flammable & Corrosive			II	~~305~~ 3xx	1 L	~~307~~ 3xx	5 L
Diphenyldichlorosilane	1769	8		Corrosive		A1	II	FORBIDDEN		~~813~~ 8xx	30 L
Dodecyltrichlorosilane	1771	8		Corrosive		A1	II	FORBIDDEN		~~813~~ 8xx	30 L
Ethylphenyldichlorosilane	2435	8		Corrosive		A1	II	FORBIDDEN		~~813~~ 8xx	30 L
Ethyltrichlorosilane	1196	3	8	Liquid flammable & Corrosive			II	~~306~~ 3xx	1 L	~~304~~ 3xx	5 L
Hexadecyltrichlorosilane	1781	8		Corrosive		A1	II	FORBIDDEN		~~813~~ 8xx	30 L
Hexyltrichlorosilane	1784	8		Corrosive		A1	II	FORBIDDEN		~~813~~ 8xx	30 L
Methylphenyldichlorosilane	2437	8		Corrosive		A1	II	~~808~~ FORBIDDEN	~~1 L~~	~~812~~ 8xx	30 L
Methyltrichlorosilane	1196	3	8	Liquid flammable & Corrosive			II	~~306~~ 3xx	1 L	~~304~~ 3xx	5 L
Nonyltrichlorosilane	1799	8		Corrosive		A1	II	FORBIDDEN		~~813~~ 8xx	30 L
Octadecyltrichlorosilane	1800	8		Corrosive		A1	II	FORBIDDEN		~~813~~ 8xx	30 L
Octyltrichlorosilane	1801	8		Corrosive		A1	II	FORBIDDEN		~~813~~ 8xx	30 L
Phenyltrichlorosilane	1804	8		Corrosive		A1	II	FORBIDDEN		~~813~~ 8xx	30 L

Name	UN No.	Class or division	Sub-sidiary risk	Labels	State varia-tions	Special provi-sions	UN packing group	Passenger aircraft		Cargo aircraft	
								Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
1	2	3	4	5	6	7	8	9	10	11	12
Propyltrichlorosilane	1816	8	3	Corrosive & Liquid flammable		A1	II	FORBIDDEN		~~813~~ 8xx	30 L
Silicon tetrachloride	1818	8		Corrosive		A1	II	~~808~~ FORBIDDEN ~~Y808~~	~~1 L~~ ~~0.5 L~~	~~812~~ 8xx	30 L
Trimethylchlorosilane	1298	3	8	Liquid flammable & Corrosive			II	~~306~~ 3xx	1 L	~~304~~ 3xx	5 L
Vinyltrichlorosilane	1305	3	8	Liquid flammable & Corrosive			II	~~306~~ 3xx	1 L	~~304~~ 3xx	5 L

— END —