

REFORMATTING OF THE PACKING INSTRUCTIONS (ICAO)

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Issue

The packing instructions in the International Civil Aviation Organization (ICAO)'s *Technical Instructions for the Safe Transport of Dangerous Goods by Air* (Doc 9284) (TIs) have been the subject of an extensive review by the ICAO Dangerous Goods Panel (DGP), which resulted in proposed revisions to their design and content.

Through this document the ICAO DGP is initiating public consultation prior to considering the inclusion of the revised Instructions into the 2009-2010 edition of the ICAO TIs.

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Background

In the mid 1990's the UN Committee of Experts on the Transport of Dangerous Goods (UNCOE) decided to review packing instructions for all modes of transport in an effort to standardize their appearance, enhance their 'user friendliness' and address technical inconsistencies. As a result of that exercise new packing instructions were published in the UN TDG Model Regulations in 1998 and subsequently incorporated into the IMDG Code, RID and ADR.

It was recognized early on by the UNCOE that these new packing instructions would not be suitable for air transport given the unique environmental characteristics of air transport, e.g. pressure, extreme fluctuations in temperature, etc., and the separate per package quantity limits that apply for passenger aircraft and cargo only aircraft. However, both the UNCOE and the ICAO DGP recognized the benefit of comparing the revised UN Packing Instructions with those in the ICAO TIs to adopt common provisions wherever possible.

Background

This review provided the DGP with an opportunity to take advantage of the lessons learned by the UNCOE in their exercise, as well as to:

- Improve the presentation of packaging requirements to enhance user friendliness;
- Separate the passenger aircraft instructions from the cargo aircraft instructions;
- Rationalize the determination of quantities and types of packagings;
- Remove unnecessary or unjustifiable packaging restrictions;
- Improve the grouping of substances assigned to specific packing instructions;
- Minimize the number of particular packing requirements (PPR); and
- Improve harmonization with the UN packing instructions.

The proposed packing instructions (see Appendix A) that resulted from this exercise are based on a rationalized system that facilitates the allocation of new dangerous goods to specific packing instructions based on their characteristics, i.e. subsidiary risk, packing group, specific properties, etc. and ensures consistency in packaging and quantity limit assignments for dangerous goods with the same characteristics. They are based on the 2007/2008 edition of the Technical Instructions.

New Look

Proposed Packing Instructions

With a view to facilitating both the understanding and application of the dangerous goods packaging requirements of the ICAO TIs, the proposed packing instructions consolidate all relevant packaging information into one easily understandable Table.

Example

CLASS 3 CARGO AIRCRAFT 30CL

<u>Packing Instruction</u>	<u>Packing Group</u>	<u>Inner Packaging</u>	<u>Inner Packaging Quantity</u>	<u>Outer Quantity</u>
30CLA	I	GLASS (IP.1)	<u>1.0 L</u>	<u>2.5 L</u>
		PLASTIC (IP 2)	FORBIDDEN	
		METAL (IP 3)	<u>2.5 L</u>	
30CLB	I	GLASS (IP.1)	<u>1.0 L</u>	<u>30.0 L</u>
		PLASTIC (IP 2)	FORBIDDEN	
		METAL (IP 3)	<u>5.0 L</u>	
30CLC	II	GLASS (IP.1)	<u>1.0 L</u>	<u>5.0 L</u>
		PLASTIC (IP 2)	<u>1.0 L</u>	
		METAL (IP 3)	<u>1.0 L</u>	
30CLD	II	GLASS (IP.1)	<u>2.5 L</u>	<u>5.0 L</u>
		PLASTIC (IP 2)	<u>2.5 L</u>	
		METAL (IP 3)	<u>5.0 L</u>	
30CLE	II	GLASS (IP.1)	<u>2.5 L</u>	<u>60.0 L</u>
		PLASTIC (IP 2)	<u>5.0 L</u>	

Example - continued

CLASS 3 CARGO AIRCRAFT 30CL

<u>Packing Instruction</u>	<u>Packing Group</u>	<u>Inner Packaging</u>	<u>Inner Packaging Quantity</u>	<u>Outer Quantity</u>
		METAL (IP 3)	<u>10.0 L</u>	
30CLF	III	GLASS (IP.1)	<u>5.0 L</u>	<u>60.0 L</u>
		PLASTIC (IP 2)	<u>10.0 L</u>	
		METAL (IP 3)	<u>25.0 L</u>	
30CLG	III	GLASS (IP.1)	<u>5.0 L</u>	<u>220.0 L</u>
		PLASTIC (IP 2)	<u>10.0 L</u>	
		METAL (IP 3)	<u>25.0 L</u>	

Example – Additional Packaging Requirements

- THE GENERAL PACKING REQUIREMENTS OF PART 4, CHAPTER 1 MUST BE MET.
- SUBSTANCES MUST BE COMPATIBLE WITH THEIR PACKAGINGS AS REQUIRED BY 4; 1.1.3.

PG I

- SINGLE PACKAGINGS ARE PERMITTED.
- PLASTIC INNER PACKAGINGS NOT PERMITTED.
- GLASS OR METAL INNER PACKAGINGS MUST BE PACKED WITH ABSORBENT MATERIAL AND PLACED IN A LEAKPROOF RIGID RECEPTACLE BEFORE PLACING IN OUTER PACKAGINGS.
- METAL PACKAGINGS MUST BE CORROSION-RESISTANT OR WITH PROTECTION AGAINST CORROSION FOR SUBSTANCES WITH A CLASS 8 SUBRISK.

Example – Additional Packaging Requirements

PG II

- SINGLE PACKAGINGS ARE PERMITTED.
- GLASS INNER PACKAGINGS MUST BE PACKED WITH ABSORBENT MATERIAL AND PLACED IN A LINER, PLASTIC BAG, OR OTHER EQUALLY EFFECTIVE MEANS OF INTERMEDIATE LEAKPROOF CONTAINMENT.
- FOR COMBINATION PACKAGES, PLASTIC AND METAL INNER PACKAGINGS MUST BE PLACED IN A LEAKPROOF LINER, PLASTIC BAG, OR OTHER EQUALLY EFFECTIVE MEANS OF INTERMEDIATE LEAKPROOF CONTAINMENT.

PG III

- SINGLE PACKAGINGS ARE PERMITTED.
- FOR COMBINATION PACKAGES, ALL INNER PACKAGINGS MUST BE PLACED IN A PLASTIC BAG OR OTHER EQUALLY EFFECTIVE MEANS OF PROTECTION.
- PACKAGINGS MUST MEET THE LEVEL II PERFORMANCE STANDARDS.

Example - Outer Containers for Combination Packagings

<u>BOXES</u>	<u>DRUMS</u>	<u>JERRICANS</u>
ALUMINUM (4B)	ALUMINUM (1B2)	ALUMINUM (3B2)
FIBREBOARD (4G)	FIBRE (1G)	PLASTIC (3H2)
PLYWOOD (4D)	PLASTIC (1H2)	STEEL (3A2)
RECONSTITUTED WOOD (4F)	PLYWOOD (1D)	
SOLID PLASTIC (4H2)	STEEL (1A2)	
STEEL (4A)		
WOODEN (4C1, 4C2)		

Example – Single Packagings for PG I, PG II and PG III

<u>COMPOSITES</u> <u>(PLASTIC)</u>	<u>CYLINDERS</u>	<u>DRUMS</u>	<u>JERRICANS</u>
ALL	Must meet requirements of 4;2.7	ALUMINUM (1B1)	PLASTIC (3H1)
		PLASTIC (1H1)	STEEL (3A1)
		STEEL (1A1)	

Alpha-numeric Designator of each Packing Instruction

Each Table is assigned a unique alpha-numeric designator that can be used to identify the packing instruction and provide useful information about the consignment to which it applies.

These alpha-numeric designators are divided into four components.

30	C	L	A
↓	↓	↓	↓
#1	#2	#3	#4

Alpha-numeric Designator of each Packing Instruction

Component # 1

Provides information about the Class and Division of the dangerous goods to which the packing instruction applies. The first two digits indicate the class and division of dangerous goods, e.g. 41 indicates the dangerous goods are flammable solids (Division 4.1). If there is no division, such as in the case of Class 3, then the number '0' will be shown as the second digit.

Alpha-numeric Designator of each Packing Instruction

Component # 2

Provides information about the type of aircraft, whether the dangerous goods are in Limited Quantities or whether they have unique characteristics requiring a unique packing instruction. There are four possible letters: P, C, Y or X

P = Passenger

C = Cargo

Y = Limited Quantity

X = Special Substances or Articles (Footnotes 1 & 2)

(Footnote 1: Some substances and articles do not fit into the general characteristics of their Class or Division, e.g., batteries, ammunition, oxygen generators, etc. These substances and articles have been allocated their own unique packing instruction.)

(Footnote 2: Where an X is shown a statement indicating whether the dangerous goods can be transported in passenger and/or cargo aircraft is found in the content of the packing instruction.)

Alpha-numeric Designator of each Packing Instruction

Component # 3

Provides information as to the physical state of the dangerous goods. There are two possible letters: L or S

L = Liquid

S = Solid

Alpha-numeric Designator of each Packing Instruction

Component # 4

Provides information as to the appropriate category within the proposed packing instruction. Categories are assigned to distinguish between packing groups and outer packaging quantity limits. There are seven possible letters: A, B, C, D, E, F, G

Packing instructions for Special substances or articles will be assigned a sequential number beginning with 01 following the X, instead of a Category letter, e.g. 80X01

Example – Special Goods

CLASS 3 SPECIAL SUBSTANCES

<u>SUBSTANCE</u>	<u>Inner Packaging</u>	<u>Inner Packaging Quantity</u>	<u>Packing Instruction</u>	<u>Outer Quantity</u>
POLYESTER RESIN KIT UN3269 PG II & III	<u>SEE PI</u>	<u>SEE PI</u>	30X01 30XY01	<u>SEE PI</u>
FUEL CELL CARTRIDGES UN3473	<u>SEE PI</u>	<u>SEE PI</u>	30X02	<u>SEE PI</u>
NITROGLYCERIN SOLUTION IN ALCOHOL WITH NOT MORE THAN 1% NITROGLYCERIN UN1204 PG II <i>AND</i> NITROGLYCERIN SOLUTION IN ALCOHOL WITH 5% OR LESS BUT MORE THAN 1% NITROGLYCERIN UN3064 PG II	<u>SEE PI</u>	<u>SEE PI</u>	30X03	<u>SEE PI</u>
AIRCRAFT HYDRAULIC POWER UNIT FUEL TANK (CONTAINING A MIXTURE OF ANHYDROUS HYDRAZINE AND METHYL HYDRAZINE) UN3165 PG I	<u>SEE PI</u>	<u>SEE PI</u>	30X04	<u>SEE PI</u>
MERCAPTAN MIXTURE, LIQUID, FLAMMABLE, TOXIC, N.O.S UN1228 PG II & III	<u>SEE PI</u>	<u>SEE PI</u>	30X05 30YX05	<u>SEE PI</u>

Proposed_Table 3-1

Name	UN No.	Class or division	Subsidiary risk	Labels	State variations	Special provisions	UN packing group	Limited quantities	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	13
n-Amylene	1108	3					I	Forbidden	30PLB	1 L	30CLB	30 L
n-Butylamine	1125	3	8				II	30YLA	30PLC	1 L	30CLD	5 L
1-Bromobutane	1126	3					II	30YLB	30PLD	5 L	30CLD	60 L
Potassium chlorate, aqueous solution	2427	5.1					II	51YLA	51PLA	1 L	51CLB	5 L
Oxidizing solid, n.o.s.*	1479	5.1					I	Forbidden	51PSA	1 kg	51CSA	15 kg
Water-reactive solid, corrosive, n.o.s.*	3131	4.3	8				II	43YSA	43PSA	15 kg	43CSC	50 kg

Proposed_Table 3-1

- Columns 1 to 8 will remain the same.
- Column 9 will display the new alpha-numeric packing instruction designator or restriction for Limited Quantities
- Column 10 will display the new alpha-numeric packing instruction designator or restriction for Passenger Aircraft
- Column 11 will display the Maximum net quantity per package for Passenger Aircraft
- Column 12 will display the new alpha-numeric packing instruction designator or restriction for Cargo Aircraft
- Column 13 will display the Maximum net quantity per package for Cargo Aircraft

Technical Decisions Taken During Review

The decisions taken on the design of the packing instructions satisfy the objectives to 'improve the presentation of the packaging requirements to enhance user friendliness' and 'separate the passenger aircraft instructions from the cargo aircraft instructions' the ICAO DGP still needed to address the other objectives, including the need to rationalize the prescribed

1. quantity limits,
2. types of packagings permitted, and
3. packaging restrictions.

Quantity Limits

Quantity Limits, Inner Packaging

When the inner quantities were analyzed, inconsistencies were found between substances with similar properties and risks. A systematic review was done of the characteristics of similar dangerous goods and a determination taken to eliminate inconsistencies while maintaining safety.

Quantity Limits, Outer Packaging

The maximum net quantity per outer packaging is not changed from that shown in the 2007/2008 ICAO TIs.

Types of Packagings

Changes to Single and Combination Packagings

Several new types of single packagings and outer packagings for combination packagings have been added to selected packing instructions. These additions are due to the introduction of new coatings, packaging materials and expanded use of some packagings (e.g., cylinders). Some types of inner packagings are prescribed with more generic terms leaving the user to determine the compatibility of the material being packaged with the packaging material. Most of the text relating to compatibility has been moved to the general packing requirements (see 4:1).

Additional Packaging Requirements

Particular Packaging Requirements

Particular Packaging Requirements (PPR) originated when the ICAO DGP assigned certain dangerous goods to packing instructions and added additional packaging requirements to address the specific characteristics of the substance or article. This approach led to duplication and inconsistency of application for substances with similar properties, which resulted in PIs with numerous footnotes. This in turn meant more checking for shippers or operators, leading to a greater opportunity for error.

‘Additional Packaging Requirements’ have been assigned on a systematic basis. The majority of these are existing requirements; however, some replace the current PPR’s and address the issue of duplication and inconsistency. The Additional Packaging Requirements are identified in Appendix B. **Particular attention should be paid to the requirements for absorbent material and the use of intermediate packagings. Some of the ‘Additional Packaging Requirements’ might be more restrictive than in the past but are needed to guarantee safety and to assure a consistent and logical approach.**

Example - Additional Packaging Requirements

PASSENGER AIRCRAFT LIQUIDS PG I

- SUBSTANCES OF CLASSES 4 OR 5 ARE NOT PERMITTED.
- SINGLE PACKAGINGS ARE NOT PERMITTED FOR SUBSTANCES OF CLASSES 3, 6 OR 8.
- PLASTIC PACKAGINGS ARE NOT PERMITTED FOR SUBSTANCES OF CLASS 3.
- GLASS, PLASTIC OR METAL INNER PACKAGINGS MUST BE PACKED WITH ABSORBENT MATERIAL AND PLACED IN A RIGID LEAKPROOF RECEPTACLE BEFORE PACKING IN OUTER PACKAGINGS.
- METAL PACKAGINGS MUST BE CORROSION-RESISTANT OR WITH PROTECTION AGAINST CORROSION FOR SUBSTANCES OF CLASS 8 OR SUBSTANCES WITH A CLASS 8 SUBSIDIARY RISK.
- SUBSTANCES OF CLASS 8 ARE PERMITTED IN GLASS INNER PACKAGINGS ONLY IF THE SUBSTANCE IS FREE FROM HYDROFLUORIC ACID.

Example - Additional Packaging Requirements

PASSENGER AIRCRAFT LIQUIDS PG II

- SINGLE PACKAGINGS ARE NOT PERMITTED FOR SUBSTANCES OF CLASSES 3, 4, 5, 6 OR 8.
- GLASS INNER PACKAGINGS MUST BE PACKED WITH ABSORBENT MATERIAL AND PLACED IN A LEAKPROOF LINER, PLASTIC BAG OR OTHER EQUALLY EFFECTIVE MEANS OF INTERMEDIATE LEAKPROOF CONTAINMENT.
- PLASTIC AND METAL INNER PACKAGINGS MUST BE PLACED IN A LEAKPROOF LINER, PLASTIC BAG OR OTHER EQUALLY EFFECTIVE MEANS OF INTERMEDIATE LEAKPROOF CONTAINMENT.
- METAL PACKAGINGS MUST BE CORROSION-RESISTANT OR WITH PROTECTION AGAINST CORROSION FOR SUBSTANCES OF CLASS 8 AND FOR SUBSTANCES OF CLASSES 3 OR 5 WITH A CLASS 8 SUBSIDIARY RISK.
- SUBSTANCES OF CLASS 8 ARE PERMITTED IN GLASS INNER PACKAGINGS ONLY IF THE SUBSTANCE IS FREE FROM HYDROFLUORIC ACID.

Example - Additional Packaging Requirements

PASSENGER AIRCRAFT LIQUIDS PG III

- SINGLE PACKAGINGS ARE NOT PERMITTED FOR SUBSTANCES OF CLASSES 5 OR 8.
- SINGLE PACKAGINGS ARE PERMITTED FOR SUBSTANCES OF CLASSES 3, 4 OR 6.
- PACKAGINGS FOR SUBSTANCES OF CLASSES 3, 4 OR 5 MUST MEET THE PACKING GROUP II PERFORMANCE REQUIREMENTS.
- FOR COMBINATION PACKAGES, ALL INNER PACKAGINGS MUST BE PLACED IN A PLASTIC BAG OR OTHER EQUALLY EFFECTIVE MEANS OF PROTECTION.
- METAL PACKAGINGS MUST BE CORROSION-RESISTANT OR WITH PROTECTION AGAINST CORROSION FOR SUBSTANCES OF CLASS 8
- SUBSTANCES OF CLASS 8 ARE PERMITTED IN GLASS INNER PACKAGINGS ONLY IF THE SUBSTANCE IS FREE FROM HYDROFLUORIC ACID.

Additional Packaging Requirements

Limited Quantities - Included in the 'Additional Packaging Requirements' for Limited Quantities is reference to requirements that are applicable to all limited quantities packagings such as the pressure differential capability requirement, drop test requirements, etc. These are included to provide information that currently is in several different locations in the ICAO TIs and is not readily apparent.

Detailed Analysis

Tables have been developed to summarize the packing instructions. They are titled and numbered as indicated below.

Blank cells in the tables indicate there is not an allowable quantity for this material. The reason they are left blank is to facilitate the identification of inconsistencies.

Detailed Analysis

Appendix C – This appendix is set up in the Categories that the packing instructions were developed. The following tables are included:

1. A summary of the packing instruction numbers by class and packing group with the included subrisks shown and some category notes in the far column to show which types of special substances are included.
2. *Limited Quantities Liquids* – A summary of the information in all of the packing instructions for liquids authorized as limited quantities.
3. *Passenger Aircraft Liquids* – A summary of the information for the packing instructions for all liquids authorized on passenger aircraft.
4. *Cargo Aircraft Liquids* – A summary of the information for the packing instructions for all liquids authorized on cargo aircraft.
5. *Limited Quantities Solids* – A summary of the information in all of the packing instructions for solids authorized as limited quantities.
6. *Passenger Aircraft Solids* – A summary of the information for the packing instructions for all solids authorized on passenger aircraft.
7. *Cargo Aircraft Solids* – A summary of the information for the packing instructions for all solids authorized on cargo aircraft.

Example – Appendix C

LIQUIDS

LIMITED QUANTITY SUMMARY

CLASS 3					CLASS 4.2	CLASS 4.3	CLASS 5.1					CLASS 6.1				CLASS 8					
PI	PG	PKG TYPE	INNER QTY	OUTER QTY	PI	PI	PI	PG	PKG TYPE	INNER QTY	OUTER QTY	PI	PG	PKG TYPE	INNER QTY	OUTER QTY	PI	PG	PKG TYPE	INNER QTY	OUTER QTY
PACKING GROUP II																					
30YLA	II	IP.1	0.5	0.5	FORBIDDEN	FORBIDDEN	51YLA	II	IP.1	0.1	0.5	61YLA	II	IP.1	0.1	0.5	80YLA	II	IP.1	0.1	0.5
		IP.2	0.5	0.5					IP.2	0.1	0.5			IP.2	0.1	0.5			IP.2	0.1	0.5
		IP.3	0.5	0.5					IP.3	0.1	0.5			IP.3	0.1	0.5			IP.3	0.1	0.5
30YLB	II	IP.1	0.5	1								61YLB	II	IP.1	0.1	1					
		IP.2	0.5	1										IP.2	0.1	1					
		IP.3	0.5	1										IP.3	0.1	1					
PACKING GROUP III																					
30YLC	III	IP.1	1	1			51YLB	III	IP.1	0.5	1						80YLB	III	IP.1	0.5	1
		IP.2	1	1					IP.2	0.5	1								IP.2	0.5	1
		IP.3	1	1					IP.3	0.5	1								IP.3	0.5	1
30YLD	III	IP.1	1	2								61YLC	III	IP.1	0.5	2					
		IP.2	1	2										IP.2	0.5	2					
		IP.3	1	2										IP.3	0.5	2					
30YLE	III	IP.1	2.5	10																	
		IP.2	5	10																	
		IP.3	5	10																	

Detailed Analysis

Appendix D – This appendix contains 9 tables. These apply to liquids.

1. A summary of packing instruction information for liquids with quantities for Ltd Qty, PAX, and CAO, all in one table.
2. A summary of the inner quantities from the above table.
3. A summary of the outer quantities from the above table.
4. Class 3 individually.
5. Class 4.2 individually.
6. Class 4.3 individually.
7. Class 5.1 individually.
8. Class 6.1 individually.
9. Class 8 individually.

Example – Appendix D/CLASS 3 SUMMARY

LQ				PAX				CAO			
PI	PG	INNER QTY	OUTER QTY	PI	PG	INNER QTY	OUTER QTY	PI	PG	INNER QTY	OUTER QTY
PACKING GROUP I											
FORBIDDEN	I	F	F	30PLA	I	0.5	0.5	30CLA	I	1	2.5
						F	0.5			F	2.5
						0.5	0.5			2.5	2.5
				30PLB	I	0.5	1	30CLB	I	1	30
						F				F	30
						1	1			5	30
PACKING GROUP II											
30YLA	II	0.5	0.5	30PLC	II	1	1	30CLC	II	1	5
		0.5	0.5			1	1			1	5
		0.5	0.5			1	1			1	5
30YLB	II	0.5	1	30PLD	II	1	5	30CLD	II	2.5	5
		0.5	1			5	5			2.5	5
		0.5	1			5	5			5	5
								30CLE	II	2.5	60
										5	60
										10	60
PACKING GROUP III											
30YLC	III	1	1	30PLE	III	2.5	5	30CLF	III	5	60
		1	1			5	5			10	60
		1	1			5	5			25	60
30YLD	III	1	2	30PLF	III	2.5	60	30CLG	III	5	220
		1	2			10	60			10	220
		1	2			10	60			25	220
30YLE	III	2.5	10								
		5	10								
		5	10								

Detailed Analysis

Appendix E – This appendix contains a 9 tables. These apply to solids.

1. A summary of packing instruction information for solids for Ltd Qty.
2. A summary of the PAX information for solids.
3. A summary of the CAO information for solids.
4. Class 4.1 individually.
5. Class 4.2 individually.
6. Class 4.3 individually.
7. Class 5.1 individually.
8. Class 6.1 individually.
9. Class 8 individually.

Example – Appendix E/CLASS 4.1 SUMMARY

LQ				PAX				CAO			
PI	PG	INNER QTY	OUTER QTY	PI	PG	INNER QTY	OUTER QTY	PI	PG	INNER QTY	OUTER QTY
PACKING GROUP I											
FORBIDDEN	I	F	F	FORBIDDEN	I	F	F	FORBIDDEN	I	F	F
PACKING GROUP II											
41YSA	II	0.5	1	41PSA	II	1	15	41CSA	II	2.5	50
		0.5	1			2.5	15			5	50
		0.5	1			2.5	15			5	50
		0.5	1			1	15			2.5	50
41YSB	II	0.5	5								
		0.5	5								
		0.5	5								
		0.5	5								
PACKING GROUP III											
41YSC	III	1	5	41PSB	III	5	25	41CSB	III	5	100
		1	5			10	25			10	100
		1	5			10	25			10	100
		1	5			5	25			5	100
41YSD	III	1	10								
		1	10								
		1	10								
		1	10								

Detailed Analysis

Appendix F – This Appendix contains the inner and outer quantities for liquids. This contains 3 tables.

1. The inner and outer quantities for liquid limited quantities.
2. The inner and outer quantities for liquid PAX.
3. The inner and outer quantities for liquid CAO.

Appendix G – This Appendix contains the inner and outer quantities for solids. This contains 3 tables.

1. The inner and outer quantities for solid limited quantities.
2. The inner and outer quantities for solid PAX.
3. The inner and outer quantities for solid CAO.

These appendices set out the underlying principles applied to the review exercise and will assist in the detailed evaluation of the decisions taken by the ICAO DGP. They will also help to focus on particular interests, e.g., the transport:

- a. of a single substance, or
- b. by passenger aircraft of class 3 materials.

Example – Appendix F

LIQUIDS SUMMARY PASSENGER AIRCRAFT INNER AND OUTER QUANTITY

		INNER					
TYPE	3 PAX INNER QTY	4.2 PAX INNER QTY	4.3 PAX INNER QTY	5.1 PAX INNER QTY	6.1 PAX INNER QTY	8 PAX INNER QTY	
PACKING GROUP I							
IP.1	0.5	F	F	F	0.5	0.5	
IP.2	F	F	F	F	0.5	0.5	
IP.3	0.5	F	F	F	1	0.5	
IP.1	0.5	F	F	F	0.5		
IP.2	F	F	F	F	0.5		
IP.3	1	F	F	F	1		
PACKING GROUP II							
IP.1	1	1	1	1	1	1	
IP.2	1	1	1	1	1	1	
IP.3	1	1	1	1	1	1	
IP.1	1				1		
IP.2	5				1		
IP.3	5				2.5		
PACKING GROUP III							
IP.1	2.5	2.5	2.5	2.5	2.5	2.5	
IP.2	5	2.5	2.5	2.5	2.5	2.5	
IP.3	5	5	5	2.5	5	5	
IP.1	2.5						
IP.2	10						
IP.3	10						
		OUTER					
	3 PAX OUTER QTY	4.2 PAX OUTER QTY	4.3 PAX OUTER QTY	5.1 PAX OUTER QTY	6.1 PAX OUTER QTY	8 PAX OUTER QTY	
PACKING GROUP I							
I	0.5	F	F	F	0.5	0.5	
I	1				1		
PACKING GROUP II							
II	1	1	1	1	1	1	
II	5				5		
PACKING GROUP III							
III	5	5	5	2.5	60	5	
III	60						

How Proposed Packing Instructions Affect the Transport of Specific Dangerous Goods

To determine how the proposed packing instructions affects the dangerous goods you offer or transport see Appendix H. The database in this Appendix lists all of the substances included in the reformatted packing instructions by:

- UN number
- Proper Shipping Name
- Class
- Subsidiary Risk
- Packing Group
- Old Limited Quantity Packing Instruction Number
- New Limited Quantity Packing Instruction Number
- Outer Quantity Limit for Limited Quantity
- Old Passenger Aircraft Packing Instruction Number
- New Passenger Aircraft Packing Instruction Number
- Outer Quantity Limitation
- Old Cargo Aircraft Packing Instruction Number
- New Cargo Aircraft Packing Instruction Number and Outer Quantity Limitation

Example – Appendix H/Dangerous Goods List

UN Number	Proper Shipping Name	Class / Div	Sub Risk	PG	Ltd. Qty PI	New Ltd Qty	Net Qty	Pax PI	New Pax PI	Net Qty	CAO PI	New CAO PI	Net Qty
1088	Acetal	3		II	Y305	30YLB	1.0 L	305	30PLD	5.0 L	307	30CLE	60.0 L
1089	Acetaldehyde	3		I	F	F	F	F	F	F	304	30CLB	30.0 L
1090	Acetone	3		II	Y305	30YLB	1.0 L	305	30PLD	5.0 L	307	30CLE	60.0 L
1091	Acetone oils	3		II	Y305	30YLB	1.0 L	305	30PLD	5.0 L	307	30CLE	60.0 L
1093	Acrylonitrile, stabilized	3	6.1	I	F	F	F	F	F	F	303	30CLB	30.0 L
1099	Allyl bromide	3	6.1	I	F	F	F	F	F	F	303	30CLB	30.0 L
1100	Allyl chloride	3	6.1	I	F	F	F	F	F	F	303	30CLB	30.0 L
1104	Amyl acetates	3		III	Y309	30YLE	10.0 L	309	30PLF	60.0 L	310	30CLG	220.0 L
1105	Pentanols	3		II	Y305	30YLB	1.0 L	305	30PLD	5.0 L	307	30CLE	60.0 L
1105	Pentanols	3		III	Y309	30YLE	10.0 L	309	30PLF	60.0 L	310	30CLG	220.0 L
1106	Amylamine	3	8	II	Y305	30YLA	0.5 L	305	30PLC	1.0 L	307	30CLD	5.0 L
1106	Amylamine	3	8	III	Y309	30YLC	1.0 L	309	30PLE	5.0 L	310	30CLF	60.0 L
1107	Amyl chloride	3		II	Y305	30YLB	1.0 L	305	30PLD	5.0 L	307	30CLE	60.0 L
1108	1-Pentene	3		I	F	F	F	302	30PLB	1.0 L	303	30CLB	30.0 L
1108	n-Amylene	3		I	F	F	F	302	30PLB	1.0 L	303	30CLB	30.0 L
1109	Amyl formates	3		III	Y309	30YLE	10.0 L	309	30PLF	60.0 L	310	30CLG	220.0 L
1110	n-Amyl methyl ketone	3		III	Y309	30YLE	10.0 L	309	30PLF	60.0 L	310	30CLG	220.0 L
1111	Amyl mercaptan	3		II	Y306	30YLB	1.0 L	306	30PLC	1.0 L	308	30CLD	5.0 L
1112	Amyl nitrate	3		III	Y309	30YLE	10.0 L	309	30PLF	60.0 L	310	30CLG	220.0 L
1113	Amyl nitrite	3		II	Y305	30YLB	1.0 L	305	30PLD	5.0 L	307	30CLE	60.0 L
1114	Benzene	3		II	Y305	30YLB	1.0 L	305	30PLD	5.0 L	307	30CLE	60.0 L
1120	Butanols	3		II	Y305	30YLB	1.0 L	305	30PLD	5.0 L	307	30CLE	60.0 L
1120	Butanols	3		III	Y309	30YLE	10.0 L	309	30PLF	60.0 L	310	30CLG	220.0 L
1123	Butyl acetates	3		II	Y305	30YLB	1.0 L	305	30PLD	5.0 L	307	30CLE	60.0 L
1123	Butyl acetates	3		III	Y309	30YLE	10.0 L	309	30PLF	60.0 L	310	30CLG	220.0 L
1125	n-Butylamine	3	8	II	Y305	30YLA	0.5 L	305	30PLC	1.0 L	307	30CLD	5.0 L
1126	1-Bromobutane	3		II	Y305	30YLB	1.0 L	305	30PLD	5.0 L	307	30CLE	60.0 L
1127	Chlorobutanes	3		II	Y305	30YLB	1.0 L	305	30PLD	5.0 L	307	30CLE	60.0 L
1128	n-Butyl formate	3		II	Y305	30YLB	1.0 L	305	30PLD	5.0 L	307	30CLE	60.0 L
1129	Butyraldehyde	3		II	Y305	30YLB	1.0 L	305	30PLD	5.0 L	307	30CLE	60.0 L
1130	Camphor oil	3		III	Y309	30YLE	10.0 L	309	30PLF	60.0 L	310	30CLG	220.0 L
1133	Adhesives containing flammable liquid	3		I	F	F	F	302	30PLB	1.0 L	303	30CLB	30.0 L

Questions

DANGEROUS GOODS PANEL (DGP)/TWENTIETH MEETING

Montréal, 24 October to 4 November 2005

Comment to DGP/20-IP/13

(Presented by H. Brockhaus)

In most additional packaging requirements for liquids of IP/13 there is provided:

*“Glass or earthenware inner packagings **must** be packed with absorbent material and placed in a leakproof receptacle before placing in outer packagings.”*

See now for **PASSENGER AIRCRAFT LIQUIDS PG I:**

„GLASS, PLASTIC OR METAL INNER PACKAGINGS MUST BE PACKED WITH ABSORBENT MATERIAL AND PLACED IN A RIGID LEAKPROOF RECEPTACLE BEFORE PACKING IN OUTER PACKAGINGS“ or

see now for **PASSENGER AIRCRAFT LIQUIDS PG II:**

„GLASS INNER PACKAGINGS MUST BE PACKED WITH ABSORBENT MATERIAL AND PLACED IN A LEAKPROOF LINER, PLASTIC BAG OR OTHER EQUALLY EFFECTIVE MEANS OF INTERMEDIATE LEAKPROOF CONTAINMENT.“

Questions

On the other hand ICAO-TI requires (see 4;1.1.10.1): *“Unless otherwise provided in the packing instructions, liquids in Class 3, 4 or 8, or Division 5.1, 5.2 or 6.1 that are packaged in glass, earthenware, **plastic or metal inner packagings** must be packaged using absorbent material as follows:*

.....”

and (see 4;1.1.10.2)

*“Absorbent material is **not** required if the inner packagings are so protected that **breakage of them** and leakage of their contents from the outer packaging **will not occur** during normal conditions of transport. Where absorbent material is required and an outer packaging **is not liquid tight**, a means of containing the liquid in the event of a leakage must be provided in the form of a **leakproof liner, plastic bag or other equally efficient means** of containment.*

Questions

In the light of those provisions the new additional requirement could only be justified, if it could be assumed that **all** plastic and metal inner packagings are not liable to have a breakage under normal conditions of transport. For some plastic material this would not be true, because they can become brittle at low temperature (as example polypropylene at -12 °C). Furthermore, the “must” for glass or earthenware inner packagings can be only justified, if it is not possible to protect those inner packagings from breakage.

In another additional packaging requirement for liquids of IP/13 there is provided:
“For combination packages, plastic and metal inner packagings (respectively all inner packagings) must be placed in a leakproof liner, plastic bag or other equally efficient means of intermediate leakproof containment.”

As demonstrated above, this is only necessary if the outer packaging is not liquid tight!