Class 5
Reformatted Packing Instructions

Packing Instruction for Certain Division 5.2 Liquid and Solid Organic Peroxides

5X1 PACKING INSTRUCTION 5X1 5X1

The general requirements of Part 4 Chapter 1 must be met. [Substances must be compatible with the packagings used according to 4; 1.1.3]

COMBINATION PACKAGINGS:

Single packagings are not permitted.

Plastic inner packagings conforming to IP.2 are permitted for passenger and cargo aircraft not exceeding the following quantities:

	Passenger Aircraft	*Cargo Aircraft*
For UN 3103, UN 3105	.5 L	1 L
For UN 3107, UN 3109	1 L	2.5 L
For UN 3104, UN 3106	.5 kg	1 kg
For UN 3108, UN 3110	1 kg	2.5 kg

The following outer packagings are authorized for all inner packagings permitted above:

Boxes	*Drums*	*Jerricans*
aluminium (4B)	aluminium (1B2)	aluminium (3A2)
fibreboard (4G)	fibre (1G)	plastics (3H2)
plywood (4D)	plastics (1H2)	steel (3B2)
solid plastics (4H2)	steel (1A2)	
steel (4A)	wooden (1D)	
wooden (4C1, 4C2, 4F)		

Additional requirements:

1. Packaging should comply with the provisions for medium danger (Packing Group II).
2. Organic peroxides presenting an explosive subsidiary risk must comply with the provisions of Part: 3.2.2 and 3.2.3.
3. Cushioning materials shall not be readily combustible.

Notes on 5X1:

- This PI applies to UN 3103, 3105, 3107 and 3109 (liquid organic peroxides) and 3104, 3106, 3108 and 3110 (solid organic peroxides)
- No changes to quantity limits.
- New outer packagings have been added to align with UN authorized packagings.
- The relevant ICAO PIs are PI 500 (passenger) and 502 (cargo) for liquids and 510 (passenger) and 513 (cargo) for solids.
- The relevant UN PI is P520.

Packing Instruction for Certain Division 5.1 Solid Oxidizing Substances

5X2 PACKING INSTRUCTION 5X2 5X2

The general packing requirements of Part 4, Chapter 1 must be met. Substances must be compatible with their packaging as required by 4;1.1.3.

COMBINATION PACKAGINGS:

The following inner packagings are authorized for passenger and cargo aircraft.

	Passenger Aircraft			*Cargo Aircraft*		
	PG I	*PG II*	*PG III*	*PG I*	*PG II*	*PG III*
Glass or earthenware (IP.1)	1 kg	1 kg	2.5 kg	2.5 kg	2.5 kg	5 kg
Plastics (IP.2)	1 kg	1 kg	2.5 kg	2.5 kg	2.5 kg	5 kg
Metal (IP.3)	1 kg	1 kg	2.5 kg	5 kg	5 kg	5 kg
Plastics Bag (IP.5)	1 kg	1 kg	2.5 kg	2.5 kg	2.5 kg	5 kg
Fibre (IP.6)	1 kg	1 kg	2.5 kg	2.5 kg	2.5 kg	5 kg

The following outer packagings are authorized for all of the inner packagings permitted above:

Boxes	*Drums*	*Jerricans*
aluminium (4B)	aluminium (1B2)	aluminium
expanded plastics (4H1)	fibre (1G)	(3B2)
fibreboard (4G)	plastics (1H2)	plastics (3H2)
plywood (4D)	plywood (1D)	steel (3A2)
reconstituted wood (4F)	steel (1A2)	
solid plastics (4H2)	other metal (1N2)	
steel (4A)		
wooden (4C1, 4C2)		

SINGLE PACKAGINGS:

Single packagings are permitted on cargo aircraft for all packing groups.

Boxes
Boxes (4A, 4B, 4C1, 4C2, 4D, 4F, 4G and 4H2)
Composite Plastics
Plastics receptacle in steel or aluminium drum (6HA1, 6HB1)
Plastics receptacle in fibre, plastic or plywood drum (6HG1, 6HH1, 6HD1)
Plastics receptacle in steel or aluminium crate or box or plastic receptacle in wood, plywood fibreboard, or solid plastics box (6HA2, 6HB2, 6HC, 6HD2, 6HG2, or 6HH2)
Drums
Aluminium (1B1, 1B2), fibre (1G), plastics (1H1, 1H2), plywood (1D), steel (1A1, 1A2), other metal (1N1, 1N2)
Jerricans
Plastics (3H1, 3H2), steel (3A1, 3A2), aluminium (3B1, 3B2)

Additional Requirements:
Single packagings consisting of boxes (4C1, 4C2, 4D, 4F, 4G, 4H2) and drums (1D, 1G) must be fitted with a water resistant inner bag, plastics film lining or water resistant coating.

Particular Packing Provisions:
PPXX For UN1458, 1459 and 1483 PGIII the limit per inner packaging is 1 kg for passenger and cargo aircraft and fibre inner packagings (lP.6) shall not be used.
PPYY For UN1511 the limit per inner packaging is 0.5 Kg for passenger and cargo aircraft.

Notes on PI 5X2:

- This packing instruction applies to the following UN numbers:

UN1439	UN1442	UN1444	UN1445	UN1446	UN1447	UN1448
UN1449	UN1450	UN1451	UN1452	UN1453	UN1454	UN1455
UN1456	UN1457	UN1458	UN1459	UN1461	UN1462	UN1463
UN1465	UN1466	UN1467	UN1469	UN1470	UN1471	UN1472
UN1473	UN1474	UN1475	UN1476	UN1477	UN1479	UN1481
UN1482	UN1483	UN1484	UN1485	UN1486	UN1487	UN1488
UN1489	UN1490	UN 1491	UN1492	UN1493	UN1494	UN1495
UN1496	UN1498	UN1499	UN1500	UN1502	UN1503	UN1504
UN1505	UN1506	UN1507	UN1508	UN1509	UN1511	UN1512
UN1513	UN1514	UN1515	UN1516	UN1748	UN1872	UN1942
UN2067	UN2068	UN2069	UN2070	UN2072	UN2208	UN2464
UN2465	UN2466	UN2468	UN2469	UN2547	UN2573	UN2627
UN2719	UN2720	UN2721	UN2722	UN2723	UN2724	UN2725
UN2726	UN2728	UN2741	UN2880	UN3085	UN3087	UN3212
UN3215	UN3247					

- The inner packaging quantities for some oxidizers (e.g. UN 1442, 1445, 1449, 1452, 1453, 1458, 1459...3212) that are currently assigned to PI 509 would increase from 0.5 kg to 1 kg. This proposed packing instruction assigns all PGI solid oxidizers an inner packaging limit of 1 kg with the exception of those that are F/F.
- In the current PI 509, UN1462, 1479 and 1483 have prohibitions on plastic bags. The PI working group could not determine why this prohibition exists for these three substances. The DGP working group should consider whether this prohibition is a valid safety issue. The proposed reformatted PI authorizes bags for these substances.
- The DGP working group should consider whether PPXX is necessary.
- PPYY is probably based on the fact that UN1511 has a Class 8 sub-risk and the TI treats Class 8 substances more restrictively. The DGP working group should consider whether PPYY is necessary.
- The working group should consider whether it would be useful to include an indication in the PIs when a substance is forbidden on passenger aircraft if the PI addresses both passenger and cargo aircraft. This carries through all of the packing instructions which address passenger and cargo limits.
- The working group should consider how to address whether the compatibility statement is necessary in the header (see square bracketed text). This carries through all of the packing instructions.
- PIs 508, 511, and 516 allow paper bags (IP.4). The working group should consider whether this packaging would be suitable as an authorized inner packaging for all substances covered by this instruction.
- PI 509 does not allow Fibre inner packagings (IP.6). The working group should consider whether this packaging would be suitable as an authorized inner packaging for all substances covered by this instruction.
- PI 512 has some restrictions on single packagings but the working group should consider whether these individual restrictions are necessary.
- PIs 518 and 519require PG II packaging for PG III substances. A PPR would need to be applied to these substances to maintain the requirement.
- Single packaging authorizations for some substances have been expanded to allow boxes.
- The relevant ICAO PIs are PIs 508, 509, 511, 512, 516, 517, 518 and 519.
- The relevant UN PI is P002.

Packing Instruction for Certain 5.1 Liquid Substances

5X3 PACKING INSTRUCTION 5X3 5X3

The general packing requirements of Part 4, Chapter 1 must be met. Substances must be compatible with their packaging as required by 4;1.1.3.

COMBINATION PACKAGINGS:

The following inner packagings are authorized for passenger and cargo aircraft.

	Passenger Aircraft		*Cargo Aircraft*		
	PG II	*PG III*	*PG I*	*PG II*	*PG III*
Glass or earthenware (IP.1)	1 L	2.5 L	2.5 L	5 L	5L
Plastics (IP.2)	1 L	2.5 L	2.5 L	5 L	5L
Metal (IP.3)	1 L	2.5 L	5 L	2.5 L	5L

The following outer packagings are authorized for all inner packagings permitted above:

Boxes	*Drums*	*Jerricans*
aluminium (4B)	aluminium (1B2)	aluminium (3B2)
expanded plastics (4H1)	fibre (1G)	plastics (3H2)
fibreboard (4G)	other metal (1N2)	steel (3A2)
plywood (4D)	plastics (1H2)	
reconstituted wood (4F)	plywood (1D)	
solid plastics (4H2)	steel (1A2)	
steel (4A)		
wooden (4C1, 4C2)		

SINGLE PACKAGINGS:

Single packagings are permitted on cargo aircraft for packing group III substances only.

Boxes
Boxes (4A, 4C1, 4C2, 4D, 4F, 4G and 4H2)
Composite Plastics
Plastics receptacle in steel or aluminium drum (6HA1, 6HB1)
Plastics receptacle in fibre, plastic or plywood drum (6HG1, 6HH1, 6HD1)
Plastics receptacle in steel or aluminium crate or box or plastic receptacle in wood, plywood fibreboard, or solid plastics box (6HA2, 6HB2, 6HC, 6HD2, 6HG2, or 6HH2)
Drums
Aluminium (1B1, 1B2), plastics (1H1, 1H2), steel (1A1, 1A2), other metal (1N1, 1N2)
Jerricans
Plastics (3H1, 3H2), steel (3A1, 3A2), aluminium (3B1, 3B2)

Particular Packing Provisions:
[PPXX For UN 2014, 2429, 3098, 3099, 3210 and 3211 (PG II) inner packagings shall not exceed 0.5 L for passenger aircraft and 1 L for cargo aircraft.]

This instruction applies to the following UN numbers:
2014, 2427, 2428, 2429, 2984, 3098, 3099, 3139, 3149, 3210, 3211, 3213, 3214, 3216, 3218, 3219.

- The inner packaging quantities for UN 2014, 2429, 3098, 3210 and 3211 would increase from 0.5 L to 1 L for passenger and from 1 L to 2.5 L for CAO for the PG II entries. This could be addressed by PPXX or by

developing a PI for this group of PG II substances. The working group should consider whether the more restrictive limits are necessary and whether this group of substances possesses unique hazard characteristics.

- The DGP working group should consider whether open head single packagings should be allowed for liquid oxiding substances.
- UN2495, Iodine pentaflouride was amended to indicate that it is forbidden on both passenger and cargo aircraft at DGP 18. The UN Model Regulations only permits transport in cylinders.
- The DGP working group should consider adopting PP29 from the UN Model Regulations which deals with ullage.
- PIs 501, 503, 505, 506 and 507 do not currently allow expanded plastic boxes as outer packages. The working group should consider whether these packages would be suitable for all substances covered by this instruction.
- For some substances currently assigned to PI 501, P506 and PI 507 metal inner packagings would no longer be prohibited. The PI working group viewed this as a compatibility issue.
- PI 507 which applies to three substances (aqueous solutions of calcium chlorate and aqueous solutions of n.o.s. inorganic chlorates and perchlorates) restricts single packagings to composite plastics and requires PG II packaging. The working group did not feel that special consideration was needed for these substances. Merhing them into the new 5X3 will allow a wider selection of single packagings on cargo aircraft and authorize the use of metal inner receptacles for combination packagings.
- The relevant ICAO PIs are PI 501, 503, 505, 506, 507, 514, and 515.
- The relevant UN PIs are P501, 502, P503 and P504.

Reformatted Packing Instruction for Limited Quantities of Division 5.1 Solid Substances

Y5XX **PACKING INSTRUCTION Y5XX** **Y5XX**

The general packing requirements of Part 4, Chapter 1 must be met. Substances must be compatible with their packaging as required by 4;1.1.3.

COMBINATION PACKAGINGS:

The following inner packagings are authorized for passenger and cargo aircraft.

	Passenger and Cargo Aircraft	
	PG II	*PG III*
Glass or earthenware (IP.1)	.5 kg	1 kg
Plastics (IP.2)	.5 kg	1 kg
Metal (IP.3)	.5 kg	1 kg
Plastics Bag (IP.5)	.5 kg	1 kg
Fibre (IP.6)	.5 kg	1 kg

The following outer packagings are authorized for all inner packagings permitted above:

Boxes	*Drums*	*Jerricans*
aluminium	aluminium	aluminium
fibreboard	fibre	plastics
plastics	other metal	steel
plywood	plastics	
reconstituted wood	plywood	
steel	steel	
wooden		

Particular Packing Provisions:

PPXX For UN1458, 1459 and 1483 PGIII the limit per inner packaging is 0.5 Kg. Fibre inner packagings (lP.6) shall not be used.

PPYY For UN1511 the limit per inner packaging is 0.5 Kg

Notes on PI Y5XX:

This packing instruction applies to the following UN numbers:

UN1439	UN1442	UN1444	UN1445	UN1446	UN1447	UN1448
UN1449	UN1450	UN1451	UN1452	UN1453	UN1454	UN1455
UN1456	UN1457	UN1458	UN1459	UN1461	UN1462	UN1463
UN1465	UN1466	UN1467	UN1469	UN1470	UN1471	UN1472
UN1473	UN1474	UN1475	UN1476	UN1477	UN1481	UN1482
UN1483	UN1484	UN1485	UN1486	UN1487	UN1488	UN1489
UN1490	UN 1491	UN1492	UN1493	UN1494	UN1495	UN1496
UN1498	UN1499	UN1500	UN1502	UN1503	UN1504	UN1505
UN1506	UN1507	UN1508	UN1509	UN1511	UN1512	UN1513
UN1514	UN1515	UN1516	UN1748	UN1872	UN1942	UN2067
UN2068	UN2069	UN2070	UN2208	UN2464	UN2465	UN2466
UN2468	UN2469	UN2547	UN2573	UN2627	UN2719	UN2720
UN2721	UN2722	UN2723	UN2724	UN2725	UN2726	
UN2728	UN2741	UN2880	UN3212	UN3215	UN3247	

The list of applicable UN numbers is the same as that for 5X2 except that UN 1479, 2072, 3085 and 3087 are not permitted as limited quantities.

- No quantity changes.
- The working group should consider whether PPXX is necessary.
- UN1483 has a prohibition on plastics bags but in the current PI Y509 but this has not been proposed.
- The relevant ICAO PIs are Y508, Y509, Y516 and Y517.
- There is no relevant UN PI - see Dangerous goods list column 7 and Chapter 3.4

Packing Instruction for Limited Quantities of Division 5.1 Substances

Y5XY **PACKING INSTRUCTION Y5XY** **Y5XY**

The general packing requirements of Part 4, Chapter 1 must be met. Substances must be compatible with their packaging as required by 4;1.1.3.

COMBINATION PACKAGINGS:

The following inner packagings are authorized for passenger and cargo aircraft:

	Passenger and Cargo Aircraft	
	PG II	*PG III*
Glass or earthenware (IP.1)	.1 kg/.1L	.5 kg/.5L
Plastics (IP.2)	.1 kg/.1L	.5 kg/.5L
Metal (IP.3)	.1 kg/.1L	.5 kg/.5L

The following outer packagings are authorized for all inner packagings permitted above:

Boxes	*Drums*	*Jerricans*
aluminium	aluminium	aluminium
expanded plastics	fibre	plastics
fibreboard	other metal	steel
plywood	plastics	
reconstituted wood	plywood	
solid plastics	steel	
steel		
wooden		

Notes on Y5XY:

- This instruction applies to limited quantities of the following UN numbers: UN2014, UN2427, UN2428, UN2429, UN 2984, UN3098, UN3139, UN3149, UN3210, UN3211, UN3213, UN3214, UN3216, UN3218 and UN3219.
- No quantity changes.
- The relevant ICAO PIs are Y501, Y503, Y506 and Y514.
- There is no relevant UN PI - see Dangerous goods list column 7 and Chapter 3.4