



## DANGEROUS GOODS PANEL (DGP)

### TWENTY-EIGHTH MEETING

Virtual, 15 to 19 November 2021

#### Agenda Item 2: Managing air-specific safety risks and identifying anomalies

#### 2.2: Develop proposals, if necessary, for amendments to the *Technical Instructions for the Safe Transport of Dangerous Goods by Air (Doc 9284)* for incorporation in the 2023-2024 Edition

### ADDITION OF PACKING GROUPS TO THE DANGEROUS GOODS LIST FOR SUBSTANCES FORBIDDEN ON PASSENGER AND CARGO AIRCRAFT

(Presented by T. Muller)

#### SUMMARY

This working paper proposes to add the packing group, if applicable, in the UN packing group field (column 8) of Table 3-1 — Dangerous Goods List for substances which are forbidden for transport on both passenger and cargo aircraft.

**Action by the DGP:** The DGP is invited to consider the addition of the packing group in column 8 of Table 3.1 — Dangerous Goods List for items which are forbidden on both passenger and cargo aircraft, as shown in the appendix to this working paper.

## 1. INTRODUCTION

1.1 Except for dangerous goods in Classes 1, 2 and 7, in Divisions 5.2 and 6.2 and self-reactive substances of Division 4.1, dangerous goods are assigned to packing groups in accordance with the degree of danger. The packing group to which a substance is assigned is indicated in column 8 of Table 3-1 — Dangerous Goods List in Part 3;2.

1.2 Although the packing group is part of the classification process for dangerous goods, if a substance is forbidden for transport on both passenger and cargo aircraft, the packing group, if applicable, is not mentioned in the dangerous goods list.

1.3 It is felt that the packing group should also be added for substances which are forbidden on both passenger and cargo aircraft not only because the packing group is part of the full classification of a

substance, but it is believed that adding the packing group for items may improve and clarify the use of the dangerous list. As an example, the extract below from the dangerous goods list clearly shows that Packing Group I is not indicated against UN 1693 — **Tear gas substance, liquid, n.o.s.** since UN 1693, Packing Group I is forbidden for transport on both passenger and cargo aircraft:

Tear gas substance, liquid, n.o.s.*	1693	6.1			Toxic	AU 1	A2				FORBIDDEN	FORBIDDEN
						CA 7	A36	II	E0		FORBIDDEN	659
						IR 3						5 L
						NL 1						
						US 3						

However, special provision A36 refers to the packing group I entry:

A36 The provisions of Special Provision A2 apply to this entry for Packing Group I only and the provisions of Special Provision A1 apply to this entry for Packing Group II only, as applicable.

The absence of Packing Group I may cause confusion, particularly for a person who is rarely using the Technical Instructions.

**2. ACTION BY THE DGP**

2.1 The DGP is invited to consider the addition of the packing group in column 8 of Table 3.1 —Dangerous Goods List for items which are forbidden on both passenger and cargo aircraft, as shown in the appendix to this working paper.

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APPENDIX

PROPOSED AMENDMENT TO PART 3 OF THE TECHNICAL INSTRUCTIONS

Part 3

**DANGEROUS GOODS LIST,  
SPECIAL PROVISIONS AND  
LIMITED AND EXCEPTED QUANTITIES**

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Chapter 2

**ARRANGEMENT OF THE  
DANGEROUS GOODS LIST (TABLE 3-1)**

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Table 3-1. Dangerous Goods List

For the sake of simplicity, only the proper shipping name is shown in column 1 and only the columns from Table 3-1 that are relevant to the proposal are shown. A comment column is included to highlight specific items of dangerous goods that are not assigned packing groups despite being of a class or division for which a packing group is normally assigned.

<i>Proper shipping name (1)</i>	<i>UN No. (2)</i>	<i>Class or division (3)</i>	<i>Subsidiary Hazard (4)</i>	<i>UN packing group (8)</i>	<i>Comments</i>
Acetone cyanohydrin, stabilized	1541	6.1		↓	
Acrolein, stabilized	1092	6.1	3	↓	
Allyl alcohol	1098	6.1	3	↓	
Allyl chloroformate	1722	6.1	8 3	↓	
Allylamine	2334	6.1	3	↓	
Aluminium borohydride	2870	4.2	4.3	↓	
Aluminium borohydride in devices	2870	4.2	4.3	↓	
Aluminium phosphide pesticide	3048	6.1		↓	
Ammonium nitrate emulsion	3375	5.1		↓↓	
Ammonium nitrate gel	3375	5.1		↓↓	
Ammonium nitrate suspension	3375	5.1		↓↓	
Ammonium nitrate, liquid	2426	5.1			No PG assigned
Arsenic trichloride	1560	6.1		↓	
Articles containing a substance liable to spontaneous combustion, n.o.s.*	3542	4.2	See 2;0.6		No PG assigned

<i>Proper shipping name (1)</i>	<i>UN No. (2)</i>	<i>Class or divi- sion (3)</i>	<i>Sub- sidiary Hazard (4)</i>	<i>UN packing group (8)</i>	<i>Comments</i>
Articles containing a substance which emits flammable gas in contact with water, n.o.s.*	3543	4.3	See 2;0.6		No PG assigned
Articles containing corrosive substance, n.o.s.*	3547	8	See 2;0.6		No PG assigned
Articles containing flammable liquid, n.o.s.*	3540	3	See 2;0.6		No PG assigned
Articles containing flammable solid, n.o.s.*	3541	4.1	See 2;0.6		No PG assigned
Articles containing miscellaneous dangerous goods, n.o.s.*	3548	9	See 2;0.6		No PG assigned
Articles containing oxidizing substance, n.o.s.*	3544	5.1	See 2;0.6		No PG assigned
Articles containing toxic substance, n.o.s.*	3546	6.1	See 2;0.6		No PG assigned
Asbestos, amphibole*	2212	9		<u>II</u>	
Azodicarbonamide	3242	4.1		<u>II</u>	
Barium alloys, pyrophoric	1854	4.2		<u>I</u>	
Bhusa	1327	4.1			No PG assigned
Boron tribromide	2692	8		<u>I</u>	
Bromine	1744	8	6.1	<u>I</u>	
Bromine pentafluoride	1745	5.1	6.1 8	<u>I</u>	
Bromine solution	1744	8	6.1	<u>I</u>	
Bromine trifluoride	1746	5.1	8 6.1	<u>I</u>	
Bromoacetone	1569	6.1	3	<u>II</u>	
n-Butyl chloroformate	2743	6.1	3 8	<u>II</u>	
tert-Butyl hypochlorite	3255	4.2	8	<u>I</u>	
tert-Butyl isocyanate	2484	6.1	3	<u>I</u>	
n-Butyl isocyanate	2485	6.1	3	<u>I</u>	
5-tert-Butyl-2,4,6-trinitro-m-xylene	2956	4.1		<u>III</u>	
Calcium alloys, pyrophoric	1855	4.2		<u>I</u>	
Calcium, pyrophoric	1855	4.2		<u>I</u>	
Carbon	1361	4.2		<u>II</u>	
Carbon	1361	4.2		<u>III</u>	
Carbon disulphide	1131	3	6.1	<u>I</u>	
Celluloid, scrap	2002	4.2		<u>III</u>	
Chemical sample, toxic	3315	6.1		<u>I</u>	
Chloric acid, aqueous solution	2626	5.1		<u>II</u>	
Chloroacetic acid, molten	3250	6.1	8	<u>II</u>	

<i>Proper shipping name (1)</i>	<i>UN No. (2)</i>	<i>Class or divi- sion (3)</i>	<i>Sub- sidiary Hazard (4)</i>	<i>UN packing group (8)</i>	<i>Comments</i>
Chloroacetone, stabilized	1695	6.1	8 3	↓	
Chloroacetonitrile	2668	6.1	3	↓	
Chloroacetyl chloride	1752	6.1	8	↓	
2-Chloroethanal	2232	6.1		↓	
Chloropicrin	1580	6.1		↓	
Chloropicrin mixture, n.o.s.*	1583	6.1		↓	
Chloropicrin mixture, n.o.s.*	1583	6.1		↓	
Chloropicrin mixture, n.o.s.*	1583	6.1		↓	
Chlorosulphonic acid	1754	8		↓	
Copra	1363	4.2		↓	
Corrosive liquid, water-reactive, n.o.s.*	3094	8	4.3	↓	
Cotton waste, oily	1364	4.2		↓	
Cotton, wet	1365	4.2		↓	
Crotonaldehyde	1143	6.1	3	↓	
Crotonaldehyde, stabilized	1143	6.1	3	↓	
Cyanogen bromide	1889	6.1	8	↓	
Cyclohexyl isocyanate	2488	6.1	3	↓	
Desensitized explosive, liquid, n.o.s.*	3379	3		↓	
Desensitized explosive, solid, n.o.s.*	3380	4.1		↓	
Dichlorodimethyl ether, symmetrical	2249	6.1	3	↓	
Diketene, stabilized	2521	6.1	3	↓	
Dimethyl disulphide	2381	3	6.1	↓	
Dimethyl sulphate	1595	6.1	8	↓	
Dimethylhydrazine, symmetrical	2382	6.1	3	↓	
Dimethylhydrazine, unsymmetrical	1163	6.1	3 8	↓	
Dinitrotoluenes, molten	1600	6.1		↓	
Diphenylamine chloroarsine	1698	6.1		↓	
Diphenylchloroarsine, liquid	1699	6.1		↓	
Elevated temperature liquid, n.o.s.*	3257	9		↓	
Elevated temperature liquid, flammable, n.o.s.*	3256	3		↓	
Elevated temperature solid, n.o.s.*	3258	9		↓	
Epibromohydrin	2558	6.1	3	↓	
Ethyl bromoacetate	1603	6.1	3	↓	
Ethyl chloroformate	1182	6.1	3 8	↓	
Ethyl chlorothioformate	2826	8	3	↓	
Ethyl isocyanate	2481	6.1	3	↓	
Ethyl nitrite solution	1194	3	6.1	↓	

<i>Proper shipping name (1)</i>	<i>UN No. (2)</i>	<i>Class or divi- sion (3)</i>	<i>Sub- sidiary Hazard (4)</i>	<i>UN packing group (8)</i>	<i>Comments</i>
Ethylchloroarsine	1892	6.1		↓	
Ethylene chlorohydrin	1135	6.1	3	↓	
Ethylene dibromide	1605	6.1		↓	
Ethyleneimine, stabilized	1185	6.1	3	↓	
Fabrics, animal, n.o.s.	1373	4.2		III	
Fabrics, synthetic, n.o.s.	1373	4.2		III	
Fabrics, vegetable, n.o.s.	1373	4.2		III	
Fibres, animal	1372	4.2		III	
Fibres, animal, n.o.s.	1373	4.2		III	
Fibres, synthetic, n.o.s.	1373	4.2		III	
Fibres, vegetable	1372	4.2		III	
Fibres, vegetable, dry	3360	4.1			No PG assigned
Fibres, vegetable, n.o.s.	1373	4.2		III	
Fish meal, unstabilized	1374	4.2		II	
Fish scrap, stabilized	2216	9		III	
Fish scrap, unstabilized	1374	4.2		II	
Flammable solid, organic, molten, n.o.s.*	3176	4.1		II	
Flammable solid, organic, molten, n.o.s.*	3176	4.1		III	
Flammable solid, oxidizing, n.o.s.*	3097	4.1	5.1	II	
Flammable solid, oxidizing, n.o.s.*	3097	4.1	5.1	III	
Fumigated cargo transport unit	3359	9			No PG assigned
Hafnium powder, dry	2545	4.2		↓	
Hay	1327	4.1			No PG assigned
Heat producing articles, battery operated equipment, such as underwater torches or soldering equipment, which, if accidentally activated, will generate extreme heat and can cause fire	0	9			No PG assigned
Hexachlorocyclopentadiene	2646	6.1		↓	
Hydrobromic acid	1788	8		II	
Hydrocyanic acid, aqueous solution	1613	6.1		↓	
Hydrogen cyanide, aqueous solution	1613	6.1		↓	
Hydrogen cyanide, solution in alcohol	3294	6.1	3	↓	
Hydrogen cyanide, stabilized	1614	6.1		↓	
Hydrogen cyanide, stabilized	1051	6.1	3	↓	
Hydrogen fluoride, anhydrous	1052	8	6.1	↓	
Hydrogen peroxide, aqueous solution	2014	5.1	8	II	

<i>Proper shipping name (1)</i>	<i>UN No. (2)</i>	<i>Class or divi- sion (3)</i>	<i>Sub- sidiary Hazard (4)</i>	<i>UN packing group (8)</i>	<i>Comments</i>
Hydrogen peroxide, aqueous solution, stabilized	2015	5.1	8	↓	
Hydrogen peroxide, stabilized	2015	5.1	8	↓	
Iodine pentafluoride	2495	5.1	6.1 8	↓	
Iron oxide, spent	1376	4.2		III	
Iron pentacarbonyl	1994	6.1	3	↓	
Iron sponge, spent	1376	4.2		III	
Isobutyl isocyanate	2486	6.1	3	↓	
Isopropyl chloroformate	2407	6.1	3 8	↓	
Isopropyl isocyanate	2483	6.1	3	↓	
Isosorbide-5-mononitrate	3251	4.1		III	
Lithium batteries installed in cargo transport unit	3536	9			No PG assigned
Maleic anhydride, molten	2215	8		III	
Matches, 'strike anywhere'	1331	4.1		III	
Matches, fusee	2254	4.1		III	
Metal catalyst, dry*	2881	4.2		↓	
Methacrylonitrile, stabilized	3079	6.1	3	↓	
Methanesulphonyl chloride	3246	6.1	8	↓	
Methoxymethyl isocyanate	2605	6.1	3	↓	
Methyl bromide and ethylene dibromide mixture, liquid	1647	6.1		↓	
Methyl chloroacetate	2295	6.1	3	↓	
Methyl chloroformate	1238	6.1	3 8	↓	
Methyl chloromethyl ether	1239	6.1	3	↓	
Methyl iodide	2644	6.1		↓	
Methyl isocyanate	2480	6.1	3	↓	
Methyl isothiocyanate	2477	6.1	3	↓	
Methyl orthosilicate	2606	6.1	3	↓	
Methyl vinyl ketone, stabilized	1251	6.1	3 8	↓	
2-Methyl-2-heptanethiol	3023	6.1	3	↓	
Methylhydrazine	1244	6.1	3 8	↓	
Motor fuel anti-knock mixture, flammable	3483	6.1	3	↓	
Musk xylene	2956	4.1		III	
Naphthalene, molten	2304	4.1		III	
Nickel carbonyl	1259	6.1	3	↓	

<i>Proper shipping name (1)</i>	<i>UN No. (2)</i>	<i>Class or divi- sion (3)</i>	<i>Sub- sidiary Hazard (4)</i>	<i>UN packing group (8)</i>	<i>Comments</i>
Nitric acid, red fuming	2032	8	5.1 6.1	I	
Nitroglycerin mixture, desensitized, liquid flammable, n.o.s.*	3343	3			No PG assigned
Nitroglycerin mixture, desensitized, liquid, n.o.s.*	3357	3		II	
4-Nitrophenylhydrazine	3376	4.1		I	
Organometallic substance, liquid, pyrophoric*	3392	4.2		I	
Organometallic substance, liquid, pyrophoric, water reactive*	3394	4.2	4.3	I	
Organometallic substance, solid, pyrophoric*	3391	4.2		I	
Organometallic substance, solid, pyrophoric, water reactive*	3393	4.2	4.3	I	
Oxidizing liquid, corrosive, n.o.s.*	3098	5.1	8	I	
Oxidizing solid, flammable, n.o.s.*	3137	5.1	4.1	I	
Oxidizing solid, self-heating, n.o.s.*	3100	5.1	4.2	I	
Oxidizing solid, self-heating, n.o.s.*	3100	5.1	4.2	II	
Oxidizing solid, water-reactive, n.o.s.*	3121	5.1	4.3	I	
Oxidizing solid, water-reactive, n.o.s.*	3121	5.1	4.3	II	
Packagings, discarded, empty, uncleaned	3509	9			No PG assigned
Paper, unsaturated oil treated	1379	4.2		III	
Pentaborane	1380	4.2	6.1	I	
Pentaerythrite tetranitrate mixture desensitized, solid, n.o.s.*	3344	4.1		II	
Pentaerythritol tetranitrate mixture desensitized, solid, n.o.s.*	3344	4.1		II	
Perchloromethyl mercaptan	1670	6.1		I	
PETN mixture desensitized, solid, n.o.s.*	3344	4.1		II	
Phenol, molten	2312	6.1		II	
Phenyl isocyanate	2487	6.1	3	I	
Phenyl mercaptan	2337	6.1	3	I	
Phenylcarbylamine chloride	1672	6.1		I	
Phosphorus oxybromide, molten	2576	8		II	
Phosphorus oxychloride	1810	6.1	8	I	
Phosphorus trichloride	1809	6.1	8	I	
Phosphorus, white, dry	1381	4.2	6.1	I	
Phosphorus, white, in solution	1381	4.2	6.1	I	
Phosphorus, white, molten	2447	4.2	6.1	I	
Phosphorus, white, under water	1381	4.2	6.1	I	



<i>Proper shipping name (1)</i>	<i>UN No. (2)</i>	<i>Class or divi- sion (3)</i>	<i>Sub- sidiary Hazard (4)</i>	<i>UN packing group (8)</i>	<i>Comments</i>
Phosphorus, yellow, dry	1381	4.2	6.1	↓	
Phosphorus, yellow, in solution	1381	4.2	6.1	↓	
Phosphorus, yellow, under water	1381	4.2	6.1	↓	
Plastics, nitrocellulose-based, self-heating, n.o.s.*	2006	4.2		III	
Polymerizing substance, liquid, temperature controlled, n.o.s.*	3534	4.1		III	
Polymerizing substance, solid, temperature controlled, n.o.s.*	3533	4.1		III	
n-Propyl chloroformate	2740	6.1	8 3	↓	
n-Propyl isocyanate	2482	6.1	3	↓	
Pyrophoric alloy, n.o.s.*	1383	4.2		↓	
Pyrophoric liquid, inorganic, n.o.s.*	3194	4.2		↓	
Pyrophoric liquid, organic, n.o.s.* †	2845	4.2		↓	
Pyrophoric metal, n.o.s.*	1383	4.2		↓	
Pyrophoric solid, inorganic, n.o.s.*	3200	4.2		↓	
Pyrophoric solid, organic, n.o.s.*	2846	4.2		↓	
Rags, oily	1856	4.2			No PG assigned
Seed cake	2217	4.2		III	
Seed cake	1386	4.2		III	
Self-heating solid, oxidizing, n.o.s.*	3127	4.2	5.1	III	
Self-heating solid, oxidizing, n.o.s.*	3127	4.2	5.1	II	
Silver picrate, wetted	1347	4.1		↓	
Straw	1327	4.1			No PG assigned
Sulphur trioxide, stabilized	1829	8		↓	
Sulphur, molten	2448	4.1		III	
Sulphuric acid, fuming	1831	8	6.1	↓	
Sulphuryl chloride	1834	6.1	8	↓	
Tear gas substance, liquid, n.o.s.*	1693	6.1		↓	
Tetranitromethane	1510	6.1	5.1	↓	
Textile waste, wet	1857	4.2		III	
Thionyl chloride	1836	8		↓	
Thiophosgene	2474	6.1		↓	
Titanium powder, dry	2546	4.2		↓	
Titanium tetrachloride	1838	6.1	8	II	
Titanium trichloride mixture, pyrophoric	2441	4.2	8	↓	
Titanium trichloride, pyrophoric	2441	4.2	8	↓	
Toxic by inhalation liquid, corrosive, n.o.s.*	3389	6.1	8	↓	

<i>Proper shipping name (1)</i>	<i>UN No. (2)</i>	<i>Class or divi- sion (3)</i>	<i>Sub- sidiary Hazard (4)</i>	<i>UN packing group (8)</i>	<i>Comments</i>
Toxic by inhalation liquid, corrosive, n.o.s.*	3390	6.1	8	I	
Toxic by inhalation liquid, flammable, corrosive, n.o.s.*	3488	6.1	3 8	I	
Toxic by inhalation liquid, flammable, corrosive, n.o.s.*	3489	6.1	3 8	I	
Toxic by inhalation liquid, flammable, n.o.s.*	3384	6.1	3	I	
Toxic by inhalation liquid, flammable, n.o.s.*	3383	6.1	3	I	
Toxic by inhalation liquid, n.o.s.*	3381	6.1		I	
Toxic by inhalation liquid, n.o.s.*	3382	6.1		I	
Toxic by inhalation liquid, oxidizing, n.o.s.*	3387	6.1	5.1	I	
Toxic by inhalation liquid, oxidizing, n.o.s.*	3388	6.1	5.1	I	
Toxic by inhalation liquid, water-reactive, flammable, n.o.s.*	3491	6.1	3 4.3	I	
Toxic by inhalation liquid, water-reactive, flammable, n.o.s.*	3490	6.1	3 4.3	I	
Toxic by inhalation liquid, water-reactive, n.o.s.*	3386	6.1	4.3	I	
Toxic by inhalation liquid, water-reactive, n.o.s.*	3385	6.1	4.3	I	
Tributylphosphane	3254	4.2		I	
Trichloroacetyl chloride	2442	8		II	
Trichlorosilane	1295	4.3	3 8	I	
Trimethylacetyl chloride	2438	6.1	3 8	I	
Water-reactive solid, oxidizing, n.o.s.*	3133	4.3	5.1	III	
Water-reactive solid, oxidizing, n.o.s.*	3133	4.3	5.1	II	
Wool waste, wet	1387	4.2		III	
Zirconium powder, dry	2008	4.2		I	
Zirconium scrap	1932	4.2		III	