

Chapter 9

CLASS 9 – MISCELLANEOUS DANGEROUS SUBSTANCES AND ARTICLES, INCLUDING ENVIRONMENTALLY HAZARDOUS SUBSTANCES

Parts of this Chapter are affected by State Variations DE 5, NL 4; see Table A-1

9.1 DEFINITION

9.1.1 *Class 9 substances and articles (miscellaneous dangerous substances and articles)* are substances and articles which, during air transport, present a danger not covered by other classes.

9.1.2 *Genetically modified micro-organisms (GMMOs) and genetically modified organisms (GMOs)* are micro-organisms and organisms in which genetic material has been purposely altered through genetic engineering in a way that does not occur naturally.

9.2 ASSIGNMENT TO CLASS 9

The substances and articles of Class 9 are subdivided as shown in Table 2-16.

Table 2-16. Substances and articles of Class 9

<i>UN number</i>	<i>Name</i>	<i>Notes</i>
<i>Substances which, on inhalation as fine dust, may endanger health</i>		
2212	Asbestos, amphibole (amosite, tremolite, actinolite, anthophyllite, crocidolite)	
2590	Asbestos, chrysotile	
<i>Substances evolving flammable vapour</i>		
2211	Polymeric beads, expandable , evolving flammable vapour	
3314	Plastics moulding compound in dough, sheet or extruded rope form evolving flammable vapour	
<i>Lithium batteries</i>		
3090	Lithium metal batteries (including lithium alloy batteries)	See 9.3
3091	Lithium metal batteries contained in equipment (including lithium alloy batteries)	
3091	Lithium metal batteries packed with equipment (including lithium alloy batteries)	
3480	Lithium ion batteries (including lithium ion polymer batteries)	
3481	Lithium ion batteries contained in equipment (including lithium ion polymer batteries)	
3481	Lithium ion batteries packed with equipment (including lithium ion polymer batteries)	
3536	Lithium batteries installed in cargo transport unit	

UN number	Name	Notes
+ Sodium ion batteries		
3551	Sodium ion batteries with organic electrolyte	See 9.4
3552	Sodium ion batteries contained in equipment with organic electrolyte	
3552	Sodium ion batteries packed with equipment with organic electrolyte	
Capacitors		
3499	Capacitor, electric double layer (with an energy storage capacity greater than 0.3 Wh)	
3508	Capacitor, asymmetric (with an energy storage capacity greater than 0.3 Wh)	
Life-saving appliances		
2990	Life-saving appliances, self-inflating	
3072	Life-saving appliances, not self-inflating containing dangerous goods as equipment	
3268	Safety devices, electrically initiated	
+ 3559	Fire suppressant dispersing devices	
Substances and articles which, in the event of fire, may form dioxins		
2315	Polychlorinated biphenyls, liquid	Examples of articles are transformers, condensers and apparatus containing those substances.
3432	Polychlorinated biphenyls, solid	
3151	Polyhalogenated biphenyls, liquid	
3151	Halogenated monomethyldiphenylmethanes, liquid	
3151	Polyhalogenated terphenyls, liquid	
3152	Polyhalogenated biphenyls, solid	
3152	Halogenated monomethyldiphenylmethanes, solid	
3152	Polyhalogenated terphenyls, solid	
Substances transported or offered for transport at elevated temperatures		
3257	Elevated temperature liquid, n.o.s., at or above 100°C and below its flash point (including molten metals, molten salts, etc.)	Elevated temperature substances (i.e. substances that are transported or offered for transport at temperatures equal to or exceeding 100°C in a liquid state or at temperatures equal to or exceeding 240°C in a solid state (these substances may only be carried under 1;1.1)).
3258	Elevated temperature solid, n.o.s., at or above 240°C	
Environmentally hazardous substances		
3077	Environmentally hazardous substance, solid, n.o.s.	Environmentally hazardous substances (aquatic environment) are those that meet the criteria in 2.9.3 of the UN Model Regulations or that meet criteria in international regulations or national regulations established by the appropriate national authority in the State of Origin, Transit or Destination of the consignment. Substances or mixtures dangerous to the aquatic environment not otherwise classified under these Instructions must be assigned to Packing Group III and assigned to UN 3077 or UN 3082.
3082	Environmentally hazardous substance, liquid, n.o.s.	

UN number	Name	Notes
Genetically modified micro-organisms (GMMOs) and genetically modified organisms (GMOs)		
3245	Genetically modified micro-organisms	GMMOs or GMOs which do not meet the definition of toxic substances (see 6.2) or infectious substances (see 6.3) must be assigned to UN 3245. GMMOs or GMOs are not subject to these Instructions when authorized for use by the appropriate national authorities of the States of Origin, Transit and Destination. Pharmaceutical products (such as vaccines) that are packed in a form ready to be administered, including those in clinical trials, and that contain GMMOs or GMOs are not subject to these Instructions. Genetically modified live animals must be transported under terms and conditions of the appropriate national authorities of the States of Origin and Destination.
3245	Genetically modified organisms	

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Ammonium nitrate based fertilizers		
2071	Ammonium nitrate based fertilizer	Solid ammonium nitrate based fertilizers must be classified in accordance with the procedure as set out in the UN Manual of Tests and Criteria, Part III, Section 39.

Other substances or articles presenting a danger during transport, but not meeting the definitions of another class

1841	Acetaldehyde ammonia	
1845	Dry ice	
1845	Carbon dioxide, solid	
1931	Zinc dithionite	
1931	Zinc hydrosulphite	
1941	Dibromodifluoromethane	
1990	Benzaldehyde	
2216	Fish meal, stabilized	
2216	Fish scrap, stabilized	

UN number	Name	Notes
2807	Magnetized material	<p>Magnetized material is any material which, when packed for air transport, has a maximum magnetic field strength sufficient to cause a compass deflection of more than 2 degrees at a distance of 2.1 m from any point on the surface of the assembled package. The magnetic field strength at the compass producing a 2 degree deflection is taken to be 0.418 A/m (0.00525 Gauss).</p> <p>The magnetic field strength must be measured with a magnetic compass sensitive enough to read a 2 degree variation, preferably in 1 degree increments or finer, or using a Gauss meter having a sensitivity sufficient to measure magnetic fields greater than 0.0005 Gauss within a tolerance of plus or minus 5 per cent, or by an equivalent means.</p> <p>Compass measurements must be taken in an area free from magnetic interference other than the Earth's magnetic field. When using a compass, the material and the compass must be aligned in an east-west direction. Gauss meter measurements must be in accordance with the manufacturer's instructions. Measurements are taken while the packaged material is rotated through 360 degrees in its horizontal plane while maintaining a constant distance (2.1 m or 4.6 m as referred to in Packing Instruction 953) between the measuring device and any point on the outside surface of the package. Shielding may be used to reduce the package's magnetic strength.</p> <p><i>Note.— Masses of ferro-magnetic metals such as automobiles, automobile parts, metal fencing, piping and metal construction material, even if not meeting the definition of magnetized material may affect aircraft compasses, as may packages or items which individually do not meet the definition of magnetized material but cumulatively may have a magnetic field strength of a magnetized material.</i></p>
2969	Castor beans	
2969	Castor meal	
2969	Castor pomace	
2969	Castor flake	
3166	Vehicle, flammable gas powered	
3166	Vehicle, flammable liquid powered	
3166	Vehicle, fuel cell, flammable gas powered	
3166	Vehicle, fuel cell, flammable liquid powered	
3171	Battery-powered vehicle	
3171	Battery-powered equipment	
3316	Chemical kit	
3316	First aid kit	
3334	Aviation regulated liquid, n.o.s.	<p>Aviation regulated liquid is any material which has narcotic, noxious or other properties such that, in the event of spillage or leakage on an aircraft, extreme annoyance or discomfort could be caused to crew members so as to prevent the correct performance of assigned duties.</p>

UN number	Name	Notes
3335	Aviation regulated solid, n.o.s.	Aviation regulated solid is any material which has narcotic, noxious or other properties such that, in the event of spillage or leakage on an aircraft, extreme annoyance or discomfort could be caused to crew members so as to prevent the correct performance of assigned duties.
3359	Fumigated cargo transport unit	
3363	Dangerous goods in machinery	
3363	Dangerous goods in apparatus	
3363	Dangerous goods in articles	
3509	Packagings, discarded, empty, uncleaned	
3530	Engine, internal combustion	
3530	Machinery, internal combustion	
3548	Articles containing miscellaneous dangerous goods, n.o.s.	
+ 3556	Vehicle, lithium ion battery powered	
+ 3557	Vehicle, lithium metal battery powered	
+ 3558	Vehicle, sodium ion battery powered	

9.3 LITHIUM BATTERIES

≠ Cells and batteries, cells and batteries contained in equipment or cells and batteries packed with equipment, containing lithium in any form must be assigned to UN Nos. 3090, 3091, 3480 or 3481, as appropriate. They may be transported under these entries provided:

- a) each cell or battery is of the type proved to meet the requirements of each test of the UN *Manual of Tests and Criteria*, Part III, subsection 38.3;

Cells and batteries manufactured according to a type meeting the requirements of subsection 38.3 of the UN *Manual of Tests and Criteria*, Revision 3, Amendment 1 or any subsequent revision and amendment applicable at the date of the type testing may continue to be transported, unless otherwise provided in these Instructions.

Cell and battery types only meeting the requirements of the UN Manual of Tests and Criteria, Revision 3, are no longer valid. However, cells and batteries manufactured in conformity with such types before 1 July 2003 may continue to be transported if all other applicable requirements are fulfilled.

Note.— Batteries must be of a type proved to meet the testing requirements of the UN Manual of Tests and Criteria, Part III, subsection 38.3, irrespective of whether the cells of which they are composed are of a tested type.

- b) each cell and battery incorporates a safety venting device or is designed to preclude a violent rupture under conditions normally incident to transport;
- c) each cell and battery is equipped with an effective means of preventing external short circuits;
- d) each battery containing cells or a series of cells connected in parallel is equipped with effective means as necessary to prevent dangerous reverse current flow (such as diodes, fuses, etc.);

≠ e) cells and batteries are manufactured under a quality management programme that includes:

- 1) a description of the organizational structure and responsibilities of personnel with regard to design and product quality;
- 2) the relevant inspection and test, quality control, quality assurance, and process operation instructions that will be used;
- 3) process controls that should include relevant activities to prevent and detect internal short circuit failure during manufacture of cells;
- 4) quality records, such as inspection reports, test data, calibration data and certificates. Test data must be kept and made available to the appropriate national authority upon request;

- 5) management reviews to ensure the effective operation of the quality management programme;
- 6) a process for control of documents and their revision;
- 7) a means for control of cells or batteries that are not conforming to the type tested in accordance with Part III, subsection 38.3 of the UN *Manual of Tests and Criteria*;
- 8) training programmes and qualification procedures for relevant personnel;
- 9) procedures to ensure that there is no damage to the final product;

Note.— In-house quality management programmes may be accepted. Third-party certification is not required, but the procedures listed in 1) to 9) above must be properly recorded and traceable. A copy of the quality management programme must be made available to the appropriate national authority upon request.

- ≠ f) lithium batteries, containing both primary lithium metal cells and rechargeable lithium ion cells, that are not designed to be externally charged (see Special Provision A213), meet the following conditions:
 - i) the rechargeable lithium ion cells can only be charged from the primary lithium metal cells;
 - ii) overcharge of the rechargeable lithium ion cells is precluded by design;
 - iii) the battery has been tested as a lithium primary battery;
 - iv) component cells of the battery are of a type proved to meet the respective testing requirements of the UN *Manual of Tests and Criteria*, Part III, subsection 38.3; and
- ≠ g) except for button cells installed in equipment (including circuit boards), manufacturers and subsequent distributors of cells or batteries manufactured after 30 June 2003 make available the test summary as specified in the UN *Manual of Tests and Criteria*, Part III, subsection 38.3, paragraph 38.3.5.

+ *Note.— The term “make available” means that manufacturers and subsequent distributors ensure that the test summary is accessible so that the shipper or other persons in the supply chain can confirm compliance.*

+ 9.4 SODIUM ION BATTERIES

Cells and batteries, cells and batteries contained in equipment or cells and batteries packed with equipment containing sodium ion, which are a rechargeable electrochemical system where the positive and negative electrode are both intercalation or insertion compounds, constructed with no metallic sodium (or sodium alloy) in either electrode and with an organic non-aqueous compound as electrolyte, must be assigned to UN Nos. 3551 or 3552, as appropriate.

Note.— Intercalated sodium exists in an ionic or quasi-atomic form in the lattice of the electrode material.

They may be transported under these entries provided:

- a) each cell or battery is of the type proved to meet the requirements of applicable tests of the UN *Manual of Tests and Criteria*, Part III, subsection 38.3;

Note.— Batteries must be of a type proved to meet the testing requirements of the UN Manual of Tests and Criteria, Part III, subsection 38.3, irrespective of whether the cells of which they are composed are of a tested type.
- b) each cell and battery incorporates a safety venting device or is designed to preclude a violent rupture under conditions normally encountered during transport;
- c) each cell and battery is equipped with an effective means of preventing external short circuits;
- d) each battery containing cells or a series of cells connected in parallel is equipped with effective means as necessary to prevent dangerous reverse current flow (such as diodes, fuses, etc.);
- e) cells and batteries are manufactured under a quality management programme as prescribed under 9.3 e) 1) to 9);
- f) manufacturers and subsequent distributors of cells or batteries make available the test summary as specified in the UN *Manual of Tests and Criteria*, Part III, subsection 38.3, paragraph 38.3.5.

Note.— The term “make available” means that manufacturers and subsequent distributors ensure that the test summary is accessible so that the shipper or other persons in the supply chain can confirm compliance.