1. CARRIAGE OF DANGEROUS GOODS

Scope:

Module 3: This Module addresses the competencies on the following:

Carriage of Dangerous Goods

Objectives:

Module 3: Upon completion of this module, the candidate shall be able to:

a) Refer to appropriate international regulations, codes and standards, codes and recommendations when carrying dangerous cargoes
b) Exercise precautions during loading, unloading and care during the voyage for the carriage of dangerous, hazardous and harmful cargoes

1. CARRIAGE OF DANGEROUS GOODS

1.1 Refer to appropriate interntional regulations, standards, codes and recommendations when carrying dangerous goods

Class 1: Explosives

CLASS 1.1

Substances and articles which have a mass explosion hazard

CLASS 1.2

Substances and articles which have a projection hazard but not a mass explosion hazard

CLASS 1.3

Substances and articles which have a fire hazard and either a minor blast hazard and/or minor projection hazard, but not a mass explosion hazard

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Class 1: Explosives

Class 1.1

A cargo has a mass explosion when the explosion is instantaneously released in the total cargo.

Examples of substances in this group are NYTROGLYCERINE and BOMBS

CLASS 1.1

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plosion hazard

CLASS 1.3

Substances and articles which have a fire hazard and either a minor blast hazard and/or minor projection hazard, but not a mass explosion hazard

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Class 1: Explosives

CLASS 1.4

Substances and articles which present no significant hazard

CLASS 1.5

Very insensitive substances which have a mass explosion hazard

CLASS 1.6

Extremely insensitive articles, which do not have a mass explosion hazard

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Class 4: Flammable solids

Cargo in this class, where practical, should be monitored for any unexplained rise in temperature.

CLASS 4.1

Flammable solids, self-reactive substances and desensitized explosives

CLASS 4.2

Substances liable to spontaneous combustion

CLASS 4.3

Substances which, in contact with water, emit flammable gases.

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Class 8: Corrosive substances

The substances in this class are solids or liquids possessing in their original state, the common property of being able, more or less severely, to damage living tissue. The escape of such a substance from its packaging may also cause damage to other cargo or to the ship.

CLASS 8.1

Spillage of these substances may damage other cargo and be injorious to human health.

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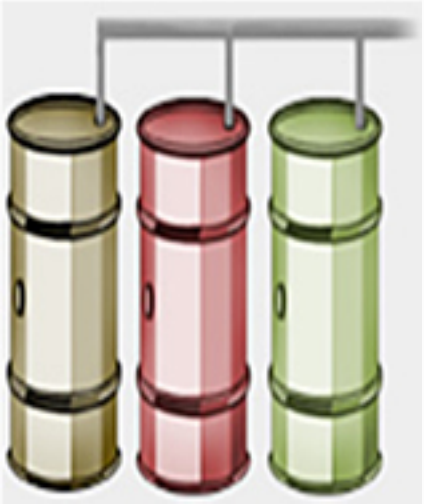
Leakproofness test – only single packaging for liquids

The leakproofness test should be performed on all designs types of packaging intended to contain liquids; however, this test is not required for the inner packaging of combination packaging.

I.e.: The Jerrican, should be restrained under water for 5 minutes while an internal air pressure is applied. The method of re-straint should not affect the results of the test. The air pressure (gauge) to be applied should be: 30 kPa (0.3 bar) – 20 kPa (0.2 bar) dependent on package group.



Internal pressure (hydraulic) test – only single packaging for liquids

Packaging to be tested: the internal pressure (hydraulic) test should be carried out on all design types of metal, plastics and composite packaging intended to contain liquids. This test is not required for inner packaging of combination packaging.

Example: three barrels should be subjected to the test pressure for 5 minutes. This pressure is the one to be included in the marking required. The test pressure should be applied continuously and evenly; it should be kept constant throughout the test.

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Labelling

All dangerous goods' packages offered for shipment must be correctly labelled (or stencilled) with the appropriate dangerous goods labels and show the proper shipping name and UN no. as used in the shipping documents.
Four dangerous goods' class labels (placards) should be affixed to the container, one on each side and one on each end including one on the right hand door. The label on each side should be positioned so as to be clear of the container doors when opened and secured back.
The label on the front end of the container should be positioned so as to be clear of the towing vehicle if possible. The dangerous goods' label affixed to the right hand door should be fully completed with the technical name(s) of the substances in the container together with the UN no. and number of packages as well as any other information considered useful. The label should be completed using a waterproof medium, e.g. a spirit pen.

Hazard labels

Each package containing a dangerous substances shall be explicitly marked, by the shipper (consignor) before it is transported. Labels are provided which denote the hazard by means of colors and symbols.
The class number should appear in the bottom corner of the labels, except that, in the case of labels for class 5, it is the sub-class number, i.e. 5.1 or 5.2, which should appear.
The text on the labels for class 7 should always appear. If text is used, the text shown is recommended for the purpose of uniformity.
The labels for packages should not be less than 100 mm x 100 mm except in the case of packages which, because of their size, can only bear smaller labels.

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Four categories of segregation

There are four categories of segregation:

1. **Away from** – this means separated by distance of 3 meters or by a steel or bulkhead

2. **Separated from** – this means in separate holds or, where a deck is resistant to fire and liquid, in separate compartments in a hold. For "on deck" stowage, this is interpreted to mean a distance of 6 meters horizontally.

3. **Separated by complete compartment from** - this means that the good must be separated by a complete hold. However, if there are decks, which are resistant to fire and liquid, the separation can be separated by a complete compartment. If one package is under deck but in the upper compartment and the other on deck, 12 meters segregation is applied.

4. **Separated longitudinally by an intervening complete compartment or hold from** - This is similar to the previous criteria except that the separation by a deck is not permitted and so these dangerous goods cannot be stowed in the same vertical line as each other. For "on deck" stowage, the distance is increased to 24 meters including from a package under deck.

Legend

Segregation table

The following table shows the general requirements for segregation between the various classes of dangerous goods.

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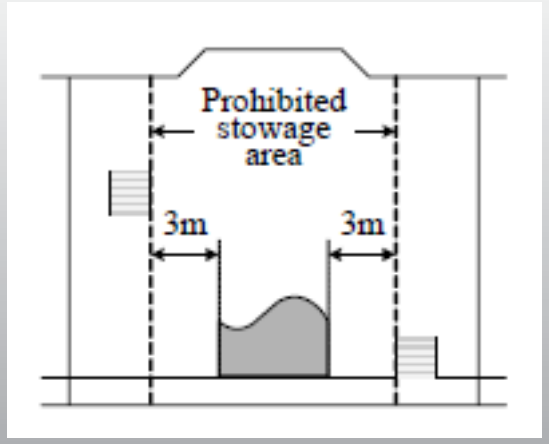
Away from



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Class	1.1 1.2 1.5	1.6	1.4	2.1	2.2	2.3	3	4.1	4.2	4.3	5.1	5.2	6.1	6.2	7	8	9
1.1, 1.2, 1.5	*	*	*	4	2	2	4	4	4	4	4	4	2	4	2	4	x
1.3, 1.6	*	*	*	4	2	2	4	3	3	4	4	4	2	4	2	2	x
1.4	*	*	*	2	1	1	2	2	2	2	2	2	x	4	2	2	x
2.1	4	4	2	x	x	x	2	1	2	x	2	2	x	4	2	1	x
2.2	2	2	1	x	x	x	1	x	1	x	x	1	x	2	1	x	x
2.3	2	2	1	x	x	x	2	x	2	x	x	2	x	2	1	x	x
3	4	4	2	2	1	2	x	x	2	1	2	2	x	3	2	x	x
4.1	4	3	2	1	x	x	x	x	1	x	1	2	x	3	2	1	x
4.2	4	3	2	2	1	2	2	1	x	1	2	2	1	3	1	1	x
4.3	4	4	2	x	x	x	1	x	1	x	2	2	x	2	2	1	x
5.1	4	4	2	2	x	x	2	1	2	2	x	2	1	2	1	2	x
5.2	4	4	2	2	1	2	2	2	2	2	2	x	1	3	2	2	x
6.1	2	2	x	x	x	x	x	x	1	x	1	1	x	1	x	x	x
6.2	4	4	4	4	2	2	3	3	3	2	3	3	1	x	3	3	x
7	2	2	2	2	1	1	2	2	2	2	1	2	x	3	x	2	x
8	4	2	2	1	x	x	x	1	1	1	2	2	x	3	2	x	x
9	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

1. CARRIAGE OF DANGEROUS GOODS

1.2 Exercise precautions during loading, unloading and care during the voyage for the carriage of dangerous, hazardous and harmful cargoes

Ventilation openings shall be provided in holds intended for the carriage of cargoes that require continuous ventilation. Such openings shall comply with the requirements of the Load Line Convention as amended for openings not fitted with means of closure.

Ventilation shall be such that any escaping hazardous gases, vapours or dust cannot enter the accommodation or other interior spaces in hazardous concentrations. Due consideration shall be given to prevent escaping hazardous gases, vapours or dust from reaching enclosed work areas. Adequate precautions shall be taken to protect the personnel in these work areas.

When a cargo may heat spontaneously, ventilation other than surface ventilation shall not be applied. On no account shall air be directed into the body of the cargo.

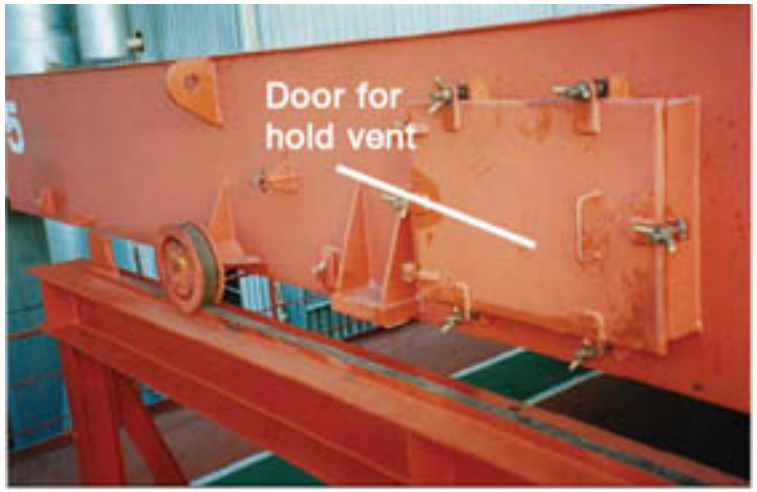

Fig. 15.1 Hold ventilator set into hatch panel

Fig. 15.2 Hold vent set into cover, upper side open