

Hazcheck | eLearning



Welcome to this free IMDG Code introduction from Exis Technologies.

This introduction provides a brief overview of the rules for shipping dangerous goods by sea, as contained in the International Maritime Dangerous Goods (IMDG) Code.

We hope you enjoy it.

If you want to find the appropriate IMDG e-learning course for you or your colleagues, or simply find out more about the courses we offer, then please visit www.existec.com.

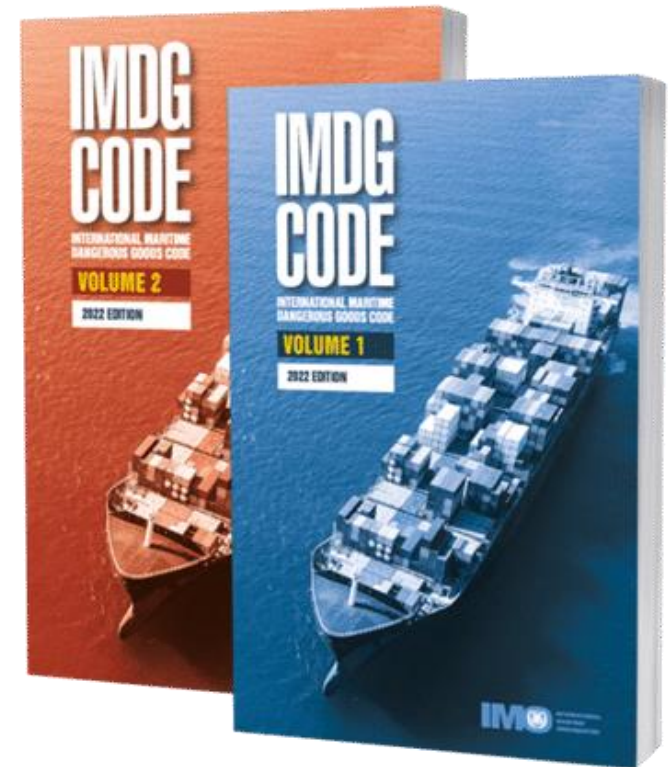
What is the IMDG Code?

The International Maritime Dangerous Goods (IMDG) Code contains provisions for the safe carriage of dangerous goods by sea with the key objectives of protecting human life, preventing marine pollution and facilitating the free movement of dangerous goods.

The IMDG Code is produced by the International Maritime Organization (IMO), a specialist United Nations (UN) agency responsible for developing and maintaining regulatory frameworks for sea transport.

The Code's provisions are based on recommendations developed by the UN. These are published in the UN 'Recommendations on the Transport of Dangerous Goods', known as the 'Model Regulations' because the document provides a framework of rules for the safe transport of dangerous goods by all modes – air, road and rail as well as sea.

The UN Model Regulations provide a uniform set of safety procedures covering consignment and transport issues such as classification, identification, packing, marking and labelling, documentation, security and training.



What are dangerous goods and why are they useful?

Dangerous goods are substances or articles¹ which can pose a threat to people, property and/or the environment.

They can exist in three physical states – as a solid, liquid or gas – and can present a range of dangers in a transport environment – flammability, toxicity (poisonous) and corrosivity being the most common.

The physical state and properties affect packing, handling and transport decisions.

Many dangerous goods are essential in the manufacture of other products such as cars, plastics, electronics and pharmaceuticals on which progress and world trade depend.



¹Substance or articles

The term 'substance' refers to dangerous goods in their chemical format; an 'article' is a finished product such as an aerosol, battery or firework.

Different types of dangerous goods



Substances or articles are classified as 'dangerous goods' for sea shipment if they meet the classification criteria prescribed in the IMDG Code for any of these classes.

The danger(s) presented by a particular substance or article determine the safe transport procedures for it e.g. the way it needs to be packed, whether it can be loaded in the same freight container as other dangerous goods, where it needs to be stored within the port or stowed on board the ship.

Different types of dangerous goods

For transport purposes, dangerous goods are allocated to one of nine 'classes', according to the main danger they present. These are as follows:

Class 1 - Explosives

Class 2 - Gases

Class 3 - Flammable liquids

Class 4 - Flammable solids; substances liable to spontaneous combustion; substances which, in contact with water, emit flammable gases

Class 5 - Oxidizing substances and organic peroxides

Class 6 - Toxic and infectious substances

Class 7 - Radioactive material

Class 8 - Corrosive substances

Class 9 - Miscellaneous dangerous substances and articles (Class 9) and environmentally hazardous substances

Many of the classes are sub-divided. For example, toxic substances are allocated to class 6.1; infectious substances are allocated to class 6.2.

Identifying dangerous goods

To identify the separate classes each has a diamond warning label which highlights the potential danger it poses when being transported.



Within each class, specific dangerous goods are uniquely identified for transport by UN Numbers and Proper Shipping Names (PSNs).

The UN Number and PSN facilitate rapid and precise identification during transport to ensure correct handling, stowage, segregation etc., and appropriate actions in an emergency.

For example, Kerosene is classified as a flammable liquid (class 3); 'KEROSENE' is the recognised PSN; the UN Number for it is UN 1223.

Below is an example of the dangerous goods list entry for this substance as provided by Hazcheck Online¹.

UN 1223: KEROSENE

CLASSIFICATION INFORMATION



(1) UN Number 1223

(2) Proper Shipping Name KEROSENE

(3) Class / Division 3

(4) Subsidiary Hazards -

(5) Packing Group III

(6) Special Provisions -

(7a) Limited Quantities 5 L

(7b) Excepted Quantities E1

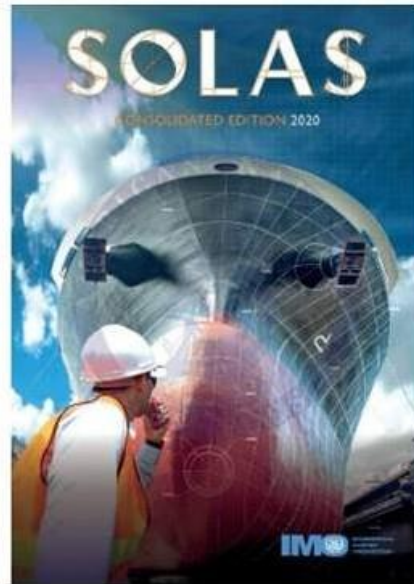
¹Hazcheck Online

Further details of this validation tool are available from here - <https://existec.com/product/hazcheck-online/>

Application of the IMDG Code

The IMDG Code's requirements apply to all ships which are subject to the following two conventions:

- International Convention for the Safety of Life at sea, 1974 (SOLAS 1974) - this covers the safety implications of dangerous goods onboard ships; and
- International Convention for the Prevention of Pollution from ships (MARPOL) - which covers the pollution aspects for ships carrying dangerous goods.



The IMDG Code amplifies the relevant safety and pollution prevention provisions of these Conventions. Most of the requirements in the IMDG Code apply on a mandatory basis but there are a few provisions which are recommendatory.

The IMDG Code is applied automatically by the governments of all the States which are members of SOLAS and has a worldwide application to the movement of dangerous goods by sea.

While some SOLAS Member Governments incorporate the requirements of the IMDG Code without amendment into their national legislation, others apply some different and/or additional (usually more stringent) national requirements.

Other international and national modal regulations also exist. For example, in many countries dangerous goods transport by road transport is covered under ADR¹. These other modal regulations may recognise all or part of the provisions of the IMDG Code.

When shipping dangerous goods, it is also important to be aware of any further restrictions or requirements which may apply in a particular country or port.

Also, Competent Authorities² may authorise, approve or grant exemptions from particular requirements of the IMDG Code.

¹ADR

Over 50 countries are contracting parties to the Agreement Concerning the International Carriage of Dangerous Goods by Road (known as ADR); these countries accept compliance with ADR when dangerous goods are carried by road from, to or through their territories as part of an international journey.

Overview of the IMDG Code

The IMDG Code requires certain provisions to be followed whenever dangerous goods are shipped by sea. These require that dangerous goods are correctly and safely:

- Classified and identified
- Packed
- Marked, labelled and placarded¹
- Documented
- Stowed on board the vessel
- Segregated from other dangerous goods with which they may react dangerously
- That appropriate emergency response information is made available



The Code also contains security requirements designed to minimise the opportunity for terrorists to access and misuse dangerous goods.

Appropriate training must be given to all personnel involved in the transport of dangerous goods by sea.

¹Placarded

Placards are large hazard labels (diamonds) that are generally required on cargo transport units e.g. freight containers, loaded with dangerous

Layout of the IMDG Code

The IMDG Code is composed of seven parts and is presented in two volumes, Volume 1 and Volume 2, both volumes must be used to obtain all the required information and instructions when dangerous goods are shipped by sea.

There is also a Supplement which provides additional guidance, mainly focused on the crew of the vessel.

Volume 1 contains most of the detailed instructions for safely preparing and transporting dangerous goods by sea:

- Part 1: General Provisions, Definitions, Training, Security and Radioactive Material Transport
- Part 2: Classification
- Part 4: Packing and Tank Provisions
- Part 5: Consignment Procedures
- Part 6: Construction and Testing of Packaging's, Intermediate Bulk Containers (IBCs), Large Packaging's, Portable Tanks, Multiple Element Gas Containers (MEGCs) and Road Tank Vehicles
- Part 7: Provisions Concerning Transport Operations

Volume 2 contains:

- Part 3: Dangerous Goods List (DGL), Special Provisions and Exceptions (Limited and Excepted Quantities)
- Appendix A: List of Generic and N.O.S. Proper Shipping Names
- Appendix B: Glossary of terms
- Alphabetical Index: An alphabetical index of Proper Shipping Names,
- synonyms¹ and other names

The **IMDG Code Supplement** contains the following sections related to the Code.

- Emergency Response Procedures for Ships Carrying Dangerous Goods; Medical First Aid Guide;
- Reporting Procedures;
- Safe Use of Pesticides in Ships, in CTUs and cargo holds;
- International Code for the Carriage of Packaged Irradiated Nuclear Fuel, Plutonium and High-level Radioactive Wastes on board ships.
- An appendix of relevant IMO Resolutions and Circulars

¹Synonyms

A 'synonym' is another name for the substance. In the index if the word 'see' appears after the name of the substance, material or article, it identifies that the name is a recognised description but not a "Proper Shipping Name". The Proper Shipping Name to be used for transport purposes will be found by reference to the UN Number listed against the entry.

Dangerous Goods List

In the IMDG Code, most of the decisions on safe shipping and transport procedures stem from the use of the DGL located in Volume 2.

The DGL is an index of substances and articles, arranged in UN Number order.

It comprises 18 columns of information for each listed substance/article, presented as a two-page spread in the printed books.

Much of the information is in a coded form to make it easier to present in a table.

The meaning and implications of these codes are explained in the relevant chapters and sections of Volumes 1 and 2, an initial point of reference being provided at the head of each column.

Decisions on packing arrangements, marking and labelling requirements, documentation entries, stowage, segregation and other shipping and transport duties generally stem from the columns of the DGL.

If the UN Number is not available there is also an Alphabetical Index of substances and articles in Volume 2.

This can be used as the initial point of reference when the name of the substance or article rather than the UN Number is known.

Once the relevant UN Number is discovered from this index, the DGL can be used as the source of further information, as indicated on the previous page.

Amendment Cycle of the IMDG Code

The IMDG Code is an international regulation that is updated every two years to reflect biennial revisions in the UN Recommendations on the

Transport of Dangerous Goods (UN Model Regulations). These changes reflect:

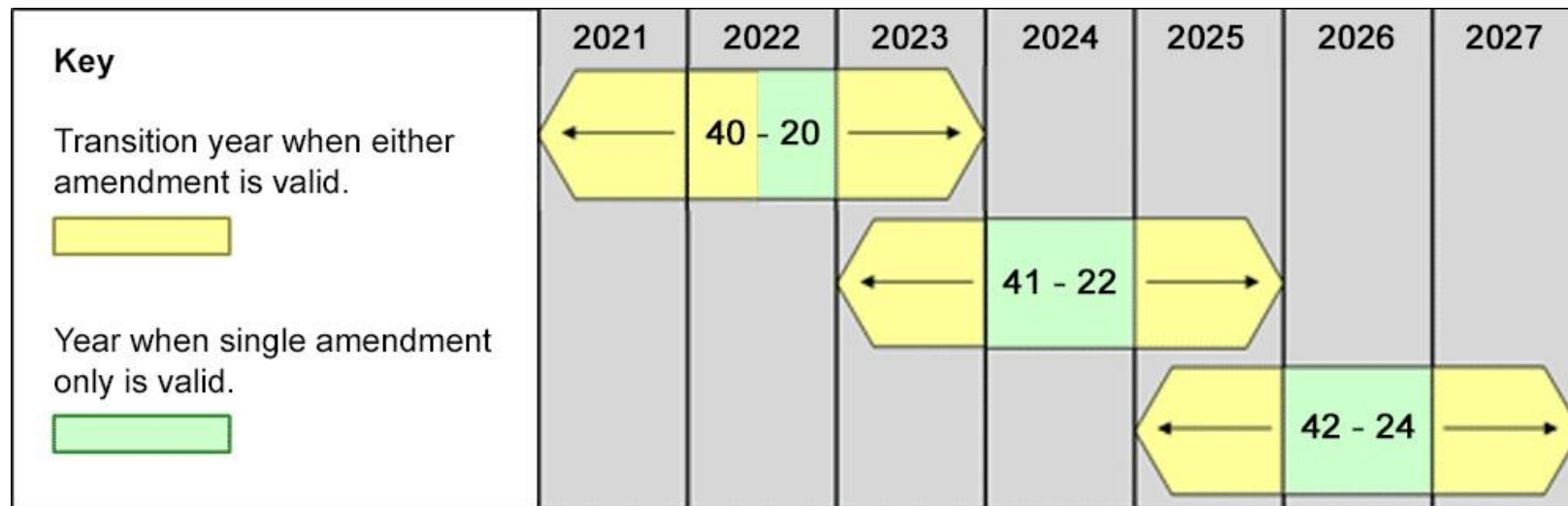
- the inclusion of newly classified dangerous substances/articles, amendments to or deletions of existing entries;
- new technology and new methods of handling dangerous goods;
- safety concerns which arise as a result of human experience; and
- new materials and designs for packaging

Although the Code is updated every two years, in general, the basic principles remain constant and once you have understood them, you will be able to look up information in future.

This introductory course is based on **Amendment 41-22** of the IMDG Code i.e. the 41st Amendment which was published in 2022.

New Amendments to the IMDG Code are released according to the timeframes in the chart below.

- A new Amendment is published every two years.
- Each Amendment is valid for up to three years.
- New Amendments can be used from 1 January of odd numbered years (shown in yellow) subject to the timing of National Competent Authority adoption.
- During even numbered years (shown in green) only the current Amendment can be used.
- The year before an Amendment comes into force on a mandatory basis is a transition year¹ (shown in yellow) when either the current or newly published Amendment may be used.



¹Transition year

Note, the A39 transition year was extended, and the A40 in force only period shortened due to delays encountered finalising that Amendment during the Covid 19 pandemic.

Training requirements for shore-side personnel



The successful application of dangerous goods transport regulations is greatly dependent on all persons concerned appreciating the risks involved and having an appropriate understanding of the requirements.

This can only be achieved by properly planned and maintained training and retraining programmes for all relevant personnel.

Chapter 1.3 of the IMDG Code deals with the training of shore-side staff.

The training requirements for shore-side personnel are mandatory.

Personnel engaged with the transport of dangerous goods by sea must be trained according to their role and responsibilities. Staff directly involved in

dangerous goods operations must have function specific training while general awareness training is required for those who although not directly involved, do require a familiarisation with the IMDG Code.

Companies must determine which personnel need to be trained, the level of training required and appropriate methods for conducting the training.

Exis Technologies developed IMDG Code e-learning to meet the challenge of training large numbers of shore side staff to the IMDG Code requirements.

Shippers, ferry operators, port operators, freight forwarders and many of the top 20 container lines use our IMDG e-learning courses to train their staff worldwide.

For more information about these courses please see www.existec.com.

Compliance solutions from Exis Technologies

Exis also supply compliance tools for the automatic validation of dangerous goods shipments under the 'Hazcheck' brand. The screenshots below show examples of Enquiry and Validation features.

UN 1234: METHYLAL

CLASSIFICATION INFORMATION

(1) UN Number	1234	(2) Proper Shipping Name	METHYLAL
(3) Class / Division	3	(4) Subsidiary Hazards	-
(5) Packing Group	II	(6) Special Provisions	-
(7a) Limited Quantities	1 L	(7b) Excepted Quantities	E2

PACKING INFORMATION

(8) Packing Instructions	P001	(9) Packing Provisions	-
(10) IBC Instructions	IBC02	(11) IBC Provisions	B8
(13) Tank Instructions	T7	(14) Tank Provisions	TP2

ADDITIONAL INFORMATION


(15) Emergency Schedules	Fire: F-E Spillage: S-D	(16a) Stowage and Handling	Category: E
(16b) Segregation	-	(16b) Segregation Groups	-
(17) Properties and Observations	Colourless, volatile liquid with a chloroform-like odour Flashpoint: -28°C c Explosive limits: 3 6% to 12 6% Boiling point: 42°C Miscible with water Irritating to skin, eyes and mucous membranes		
Flashpoint	-28°C c.c.	High Consequence	In quantities > 3000 L
State	Liquid	Marine Pollutant	No

GENERAL STOWAGE REQUIREMENTS


CARGO SHIPS ON DECK OR UNDER DECK	PASSENGER SHIPS PROHIBITED
<ul style="list-style-type: none"> When under deck, in a mechanically ventilated space, and where approved by the Administration. When on deck shall be stowed at least 2.4m (container ships) or 3m (other cases) from any potential source of ignition. Packages on deck shall be protected from sources of heat. 	<ul style="list-style-type: none"> No information specified

PLACARDS, MARKS AND LABELS

PACKAGE LABELS



CTU PLACARDS



IMDG SEGREGATION BAR

Class	Segregation Requirements
1.1/1.2/1.5	4
1.3/1.6	4
1.4	2
2.1	2
2.2	1
2.3	2
3	X
4.1	X
4.2	2
4.3	2
5.1	2
5.2	2
6.1	X
6.2	3
7	2
8	X
9	X

TABLE KEY



Enquiry screen

< BACK VIEW RESULTS FOR ALL CTUS >

VALIDATION RESULTS

Untitled CTU PRINT CTU REPORT

⚠ Load Does Not Comply
Segregation is required between pairs of substances

CARGO 📦			
Warning Signage	Substance	Segregation Groups	Current Status
	UN1234 METHYLAL		<ul style="list-style-type: none"> Clashes with other cargo
	UN1456 CALCIUM PERMANGANATE	SGG14	<ul style="list-style-type: none"> Clashes with other cargo

SEGREGATION CLASHES 🔍		
Substance	Clashes With	
1234	1456	Separated from Class 5.1 (UN1456) conflicts with Class 3 (UN1234). Substances cannot be co-loaded in same container unless at least one substance is declared in Limited Quantity or Excepted Quantity.

STOWAGE REQUIREMENTS ⚙️

- On deck only.
- When on deck shall be stowed at least 2.4m (container ships) or 3m (other cases) from any potential source of ignition.
- SG38 Stow "separated from" SGG2 - ammonium compounds.
- SG49 Stow "separated from" SGG6 - cyanides.
- SG60 Stow "separated from" SGG16 - peroxides.

Validation screen

These tools are available for all sectors of the transport of dangerous goods by sea chain. For more information, free demos, trials and to purchase go to <https://existec.com/product-category/hazcheck/>