

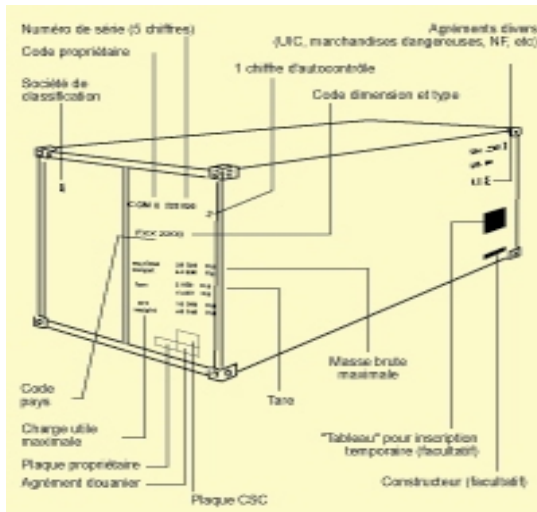
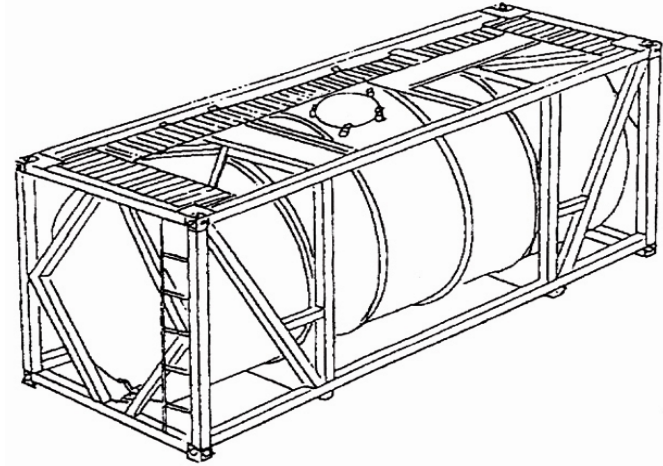


# MARITIME TRANSPORTATION OF HNS IN BULK AND IN CONTAINERS

## **TWO MODES OF MARITIME TRANSPORTATION OF HNS**

- **Bulk liquids and solids: by specialised ships**
  - **Chemical tankers or oil/chemical tankers**
  - **Bulk carriers**
- **Containers: by container ships**

# Tank containers



20 or 40 foot containers

**A 45,000 m<sup>3</sup>  
double hull  
oil/chemical tanker**



**Currently the largest  
container ship in the  
world:  
M/V Emma Maersk:  
11,000 TEU**

# **OPERATIONAL DIFFERENCES DUE TO DIFFERENT SHIPPING METHODS**

**Bulk: voyage charter**

**Containers: regular service**

# **APPLICABLE LEGISLATION**

## **IMO conventions**

### **Ship construction**

**IBC Code**

**IGC Code**

### **Shipping**

**Solas**

**Marpol and in particular annexes II and III**

**IMDG Code**

## **THE IMDG CODE**

**Established by IMO and updated every two years**

**It specifies**

- Responsibility for the declaration**
- Classification of cargo**
- Packaging**
- Segregation**

## **RESPONSIBILITY FOR THE DECLARATION**

**The classification is determined by the shipper/consignor.**

**The dangerous goods transport document should include a certificate or declaration. The form for this declaration is:**

**“I hereby declare that the contents of this consignment are fully and accurately described above by the Proper Shipping Name, and are classified, packaged, marked and labelled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.”**

**The declaration should be signed and dated by the consignor.**



# CLASSIFICATION

Classes	Description
Class 1	Explosives
Class 2.1	Flammable gases
Class 2.2	Non-flammable gases
Class 2.3	Toxic gases
Class 3	Flammable liquids
Class 4.1	Flammable solids
Class 4.2	Substances liable to spontaneous combustion
Class 4.3	Substances which, in contact with water, emit flammable gases
Class 5.1	Oxidizing substances
Class 5.2	Organic peroxides
Class 6.1	Toxic substances
Class 6.2	Infectious substances
Class 7	Radioactive material
Class 8	Corrosive substances
Class 9	Miscellaneous dangerous substances and articles

## **PACKAGING**

**Packaging for the transportation of HNS is subject to regulations.**

**These regulations take into account the risk level.**

**Must be codified and approved.**

## **SEGREGATION**

**The IMDG code defines 4 different types of separations which should be applied between different substances:**

- 1 “away from”**
- 2 “separated from”**
- 3 “separated by a complete compartment or hold from”**
- 4 “separated longitudinally by an intervening complete compartment or hold from”**

Class	1.1 1.2 1.5	1.3 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
<b>Explosives 1.1, 1.2, 1.5</b>	*	*	*	4	2	2	4	4	4	4	4	4	2	4	2	4	X
<b>Explosives 1.3, 1.6</b>	*	*	*	4	2	2	4	3	3	4	4	4	2	4	2	2	X
<b>Explosives 1.4</b>	*	*	*	2	1	1	2	2	2	2	2	2	X	4	2	2	X
<b>Flammable gases 2.1</b>	4	4	2	X	X	X	2	1	2	X	2	2	X	4	2	1	X
<b>Non-flammable, non-toxic gases 2.2</b>	2	2	1	X	X	X	1	X	1	X	X	1	X	2	1	X	X
<b>Toxic gases 2.3</b>	2	2	1	X	X	X	2	X	2	X	X	2	X	2	1	X	X
<b>Flammable liquids 3</b>	4	4	2	2	1	2	X	X	2	1	2	2	X	3	2	X	X
<b>Flammable solids, self-reactive substances and desensitized explosives 4.1</b>	4	3	2	1	X	X	X	X	1	X	1	2	X	3	2	1	X
<b>Substances liable to spontaneous combustion 4.2</b>	4	3	2	2	1	2	2	1	X	1	2	2	1	3	2	1	X
<b>Substances which, in contact with water, emit flammable gases 4.3</b>	4	4	2	X	X	X	1	X	1	X	2	2	X	2	2	1	X
<b>Oxidizing substances 5.1</b>	4	4	2	2	X	X	2	1	2	2	X	2	1	3	1	2	X
<b>Organic peroxides 5.2</b>	4	4	2	2	1	2	2	2	2	2	2	X	1	3	2	2	X
<b>Toxic substances 6.1</b>	2	2	X	X	X	X	X	X	1	X	1	1	X	1	X	X	X
<b>Infectious substances 6.2</b>	4	4	4	4	2	2	3	3	3	2	3	3	1	X	3	3	X
<b>Radioactive material 7</b>	2	2	2	2	1	1	2	2	2	2	1	2	X	3	X	2	X
<b>Corrosive substances 8</b>	4	2	2	1	X	X	X	1	1	1	2	2	X	3	2	X	X
<b>Miscellaneous dangerous substances and articles 9</b>	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

The numbers and symbols correspond to the following expressions, which are defined in this chapter:

1 “away from”

2 “separated from”

3 “separated by a complete compartment or hold from”

4 “separated longitudinally by a complete compartment or hold from”

X The regulations relating to the segregation of substances, where relevant, feature in the Dangerous Goods List

# **THE DIFFERENT DANGERS RELATED TO SHIPPING**

**Related to:**

**the sea, which is a hostile and dangerous environment**

**the merchandise transported**

**the vessel during commercial operations**

**threats to the safety of the vessel**

**the great increase in demand and in the number of vessels**

# MARITIME SAFETY

- **The sea is a hostile and dangerous environment.**



**CMA DJAKARTA**  
**July 1999**



**IEVOLI SUN**  
**October 2000**



**MSC NAPOLI**  
**January 2007**





## HANJIN PENNSYLVANIA Container of fireworks

A tank container after  
a fire





## **Response to these dangers**

**Improvement in the safety of ship construction**

**ISM code – Safety management system**

**Improvement in training of personnel**

**Port State control**

**Vetting**

## **Conclusion**

**Shipping is a safe method of transportation**

**Nevertheless, it is important to be prepared to respond to any pollution incident which may occur**