2nd Dangerous Goods Awareness Webinar 29 Oct. 25

DGSC TG – Dangerous Goods Supply Chain Task Group - Introduction and Initiatives

Packaging and Labelling Regulations

Liz Anderson

2nd Dangerous Goods Awareness Webinar 29 Oct. 25

DGSC TG – Dangerous Goods Supply Chain Task Group Initiatives

The Task Group is a Public Private Partnership – Government and Industry working together to address Dangerous Goods challenges in a practical way. There are several Expert Working Groups –

- EWG Legal, Monitoring and Enforcement – better alignment res & penalties, communication and cooperation across Government Depts & Regulators
- EWG Risk Assessment & Emergency Response
- EWG Training & Awareness

With Sub working groups on various projects and joint Exercises, **Initiatives include** –

A new Dangerous Goods Regulations Website - https://www.transport.gov.za/?page_id=2388 for All 4 Transport modes + Sections for ***Training, Packaging and Awareness Raising***

New Skills Training requirements – with TETA and the QCTO

Awareness Raising Posters

Dangerous Goods Exercises

National Dangerous Goods Awareness Day

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Training requirements for Dangerous Goods are regulated and requirements specified in -

- The UN Model Regulations for Transport of Dangerous Goods Chapter 1.3
- The IMDG Code Chapter 1.3
- ICAO Technical Regulations for Dangerous Goods, includes competency

New - QCTO Skills Training programmes include -

- Air Transport Dangerous Goods Practitioner – 26 March 2025
- Dangerous Goods Storage & Warehouse Handler – 31 March 2025
- Dangerous Goods Rail Handler – 31 March 2025
- Shore-side Dangerous Goods Freight Handler – 26 March 2025
- Proficient Road Transport Dangerous Goods Driver - 13 Dec 2024
- Road Transport Dangerous Goods Driver – 31 March 2025

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The ***UN Packaging and Labelling Regulations*** - cascade to,

Maritime, Air + Regional e.g. ADR + National Road & Rail Regulations

Part 1.2 UN TDG & IMDG Code - Definitions

Part 3.2 Dangerous Goods List – UN number references the applicable -

Part 4 Packing and Tank Provisions

Part 6 Requirements for Construction, Test & Certification of Packagings, Intermediate Bulk Containers (IBC's), Large Packagings, Portable Tanks, Multiple-Element Gas Containers (MEGC's) and Bulk Containers

Part 5 Consignment Procedures – includes Marking & Labelling, + Placarding & marking of CTU's & Bulk Containers + Documentation & Special Provisions

Part 7 Provisions concerning Transport Operations by ALL Modes

ISO and National Standards – SANS 10229 also inform

Construction & Test of Dangerous Goods packaging

Management of Dangerous Goods

Principles for DG Packaging:

- Compatible with product to be packed
- Robust - strong enough to withstand stresses of transport, handling and use
- Compliant – tested i.e. stack, drop & leak-proof as a minimum AND for Dangerous Goods - UN Certified and permanently marked
- Correct specification for product
- Correctly filled & sealed – seals & valves must be compatible and sufficient ullage available for liquids
- Shall be in good condition – ***no sign of damage, wear or leaks***
- Correctly marked with UN Certification, AND Labelled
- Correctly secured with correct Documentation

For safe, compliant Transport

Management of Dangerous Goods - Legal

Construction, Test, Certification and Marking is regulated for ALL Transport Modes, the UN Modal Regulations provide the framework

- **Air – ICAO & IATA** have some special requirements due to the limitations in size and the hazard of being in confined & pressurised space - Some products are not allowed by air!
- **Sea – IMO/IMDG** has special circumstances as ships are exposed to extreme weather
- **IMO - SOLAS** – Safety of Life at Sea, Reg. 3 of Ch VII requires Packaged goods to comply with the IMDG Code and CTU Packing Code, with NO product on the outside.
- **IMO – MARPOL (**prevention of pollution) Reg. 2 of Annex III states that packages shall be adequate to contain contents to minimize hazards to the marine environment.
- **UNTDG Part 2** introduces the 9 Classes of DG **and packaging groups** for each Hazard Class
- **Part 4**. General Provisions for all packagings includes the requirement to manufacture and /or recondition /remanufacture/clean for reuse **under a formal QA system**. 4.1 is the Packaging Instructions per Class, Ch 4.2 is Portable Tanks & MEGC's & Ch 4.3 Use of Bulk Containers
- **Part 5** Consignment Procedures including Empty Packaging, Ch 5.2 Marking and Labeling, Ch 5.3 Placarding & Marking of CTU's, Ch 5.4 Documentation and 5.5 Special Provisions
- **Part 6** – **Requirements for Construction, Testing and Certification** of ALL types of Packaging for Dangerous Goods, Ch 6.5 IBC's and FIBC's e.g. 13H3 or 13H4

Management of Dangerous Goods

Key Packaging Definitions include –

- Container: Receptacle to contain a substance or article
- Bag – flexible packaging, paper, plastics film, textiles, woven material or other suitable material
- Box – rectangular or polygonal packaging made of any suitable material able to pass the prescribed tests.
- CTU: Cargo Transport Unit: road or rail transport tank, freight vehicle /wagon, multi-modal freight container, portable tank or MECG
- Package: the complete product of packaging operation consisting of packaging and its contents
- Packaging: receptacles + any materials or components necessary for safe containment
- Packing: the placing, loading and filling of cargo into and onto a CTU - e.g. Stuffing

Packing and Tank Provisions

UN TDG & IMDG Code Part 4 – all are Regulated

4.1 Use of packagings including for IBC's and large packagings + Packing Instructions

4.2 Use of portable tanks and multiple-element gas containers (MEGCs)

4.3 Use of bulk containers

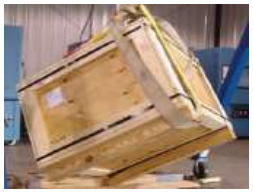
Packing and Tank Provisions

Different type of packaging and tanks

1. Packaging
   - Standard single packaging up to 450 l/ 400 kg
   - Intermediate Bulk Container (IBC) up to 3000 l/kg
   - Large Packaging (LP) 450/400 kg – 3000 l/kg

2. Tanks
   - Portable tanks more than 450 l/kg
   - Multiple Element Gas Container (MEGCs) more than 1000 l

3. Bulk containers more than 450 l/kg

Packing Provisions

General provisions for packaging:

- Be strong enough to withstand the shocks and loadings
- Be constructed & closed to prevent any loss of contents
- Be tested, approved & certified as per Part 6
- ***Be permanently marked with the UN Test Certification***
- Be closed in accordance with Manufacturers instructions
- ***No residue shall adhere to the outside once packed !***
- ***NB*** *can be tested & certified to more than one specification*

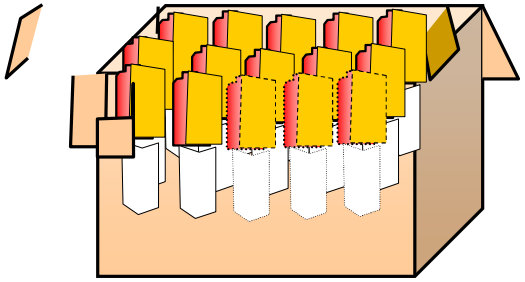
Types of Packaging

Single packaging:

- Drum (e.g. steel, aluminium, plastic)
- Jerrican (e.g. steel, aluminium, plastic)
- Box (steel, wood, plywood, fibreboard, plastic)
- Bag (woven plastic, textile, paper)

Combination packaging:

- One or several inner packaging packed in an outer packaging



Why Regulate Packaging - Maritime

Non - compliant packaging, incompatibility, incorrect container packing, Labelling & documentation can have devastating effects!

Take note -
Shipping Lines declared several years ago that they will charge shippers for mis-declarations and non-compliance, starting at $15 000/ container !!

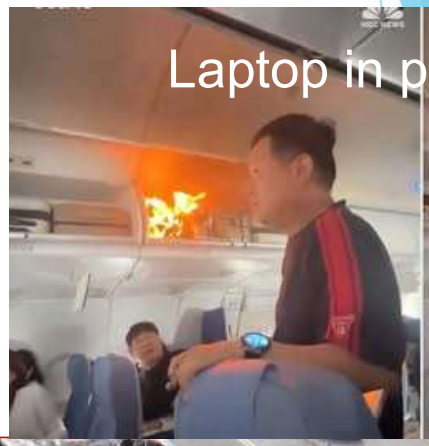
Packaging compliance is essential -

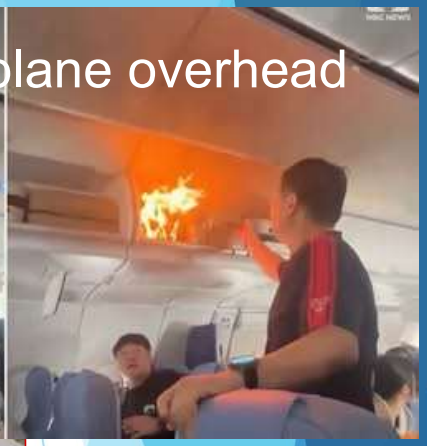
To Reduce Failures, Incidents and loss

Common Items can cause Uncommon Problems !!!

+

= Disaster





RPMASA

IMDG Part 5: Consignment Procedures

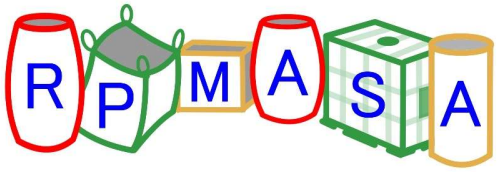
Labelling and Documentation required for Dangerous Goods is also Regulated so as to be consistent and readily understood by all in the Supply Chain everywhere in the World in ALL Transport modes

- Labelling for all modes of transport – the UN Dangerous Goods Transport diamond labels must be used with correct size and colour - minimum 100 x 100 mm, for all packages
- UN number minimum 12 mm high
- PSN - Proper Shipping Name
- Documentation - Dangerous Goods or DG Waste Manifest

IMDG 5.2: Marking & Labelling requirements

- ✓ Labels shall be located on the same surface of the package near the PSN *5.2.2.1.6 (a)*
- ✓ Primary and subsidiary risk labels are located next to each other *5.2.2.1.6 (c)*
- ✓ IBCs + Large Packages > 450 l shall be marked on two opposite sides *5.2.2.1.7*
- ✓ labels shall be able to withstand open weather exposure ***without substantial reduction*** in effectiveness *5.2.2.2.1.7 IMDG* - survive at least three months immersion at sea
- ✓ minimum size for DG Hazard Diamond Label is 100 x 100mm

DG Documentation Requirements



Documentation – Dangerous Goods Declarations – DGD & Shipping Documents

- ✓ Loading, Dangerous Goods Declaration or Hazardous Waste declaration as per SANS 10231
- ✓ For shipping use the IMO Multi-modal Dangerous Goods declaration as per IMDG Volume I - 5.4 documentation
- ✓ For air use the ICAO / IATA specified documentation
- ✓ Road and Rail – DGD as per SANS 10231 + Transport Emergency Card – SANS 10232 part 4
- ✓ UN & IMDG Multimodal Dangerous Goods Form – as per example to include the Verified Gross Mass & the SAMSA VGM approval

Multimodal Dangerous Goods Form – 5.4.5

- ✓ Information required is mandatory
- ✓ Common form for dangerous goods declaration by road, rail + Maritime
- ✓ Meets requirements of :
  - ✓ SOLAS 74, chapter VII, regulation 4
  - ✓ MARPOL 73/78, Annex III, regulation 4
- ✓ Copy of DG Documents shall be kept for at least 3months and/or until reaches destination

MULTI MODAL DANGEROUS GOODS FORM

This form may be used as a dangerous goods declaration as it meets the requirements of SOLAS 74, Chapter VII, regulation 5; MARPOL 73/78, Annex III, regulation 4

1 Shipper/Consignor/Sender	2 Transport document number
[fill in proper name]	[type the number]
	3 Page 1 of [type No.] Pages
	4 Shipper's reference [type the reference]
	5 Freight Forwarder's reference [type the reference]
6 Consignee [fill in proper name]	7 Carrier (to be completed by the carrier) M/V [name of vessel]
	SHIPPER'S DECLARATION I hereby declare that the contents of this consignment are fully and accurately described below 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 the applicable international and national government regulations.
8 This shipment is within the limitations prescribed for: (Delete non-applicable) PASSENGER AND CARGO AIRCRAFT / CARGO AIRCRAFT ONLY	9 Additional handling information [type vital info e.x emergency phone no etc.]
10 Date of Shipment [yyyy-mm-dd]	11 Port/place of loading [name of port]
12 Port/place of discharge [name of port]	13 Destination

14 Shipping marks	Quantity [pcs]	Shipping name (see note *)	IMDG Class	UN Number	Packing group	Gross mass [kg]	Net mass [kg]	Cube [m³]
[type identification or registration number if applicable]	[e.g.2]	[fill in proper shipping name [Compulsory]]	[Compulsory]	[Compulsory]	[Group I, II or III]	[11000]	[1000]	[10.1]

15 Container identification No. / vehicle registration No.	16 Tare mass (kg)	17 Container/vehicle size & type	18 Tare mass (kg)	19 Total gross (including tare) (kg)

CONTAINER/VEHICLE PACKING CERTIFICATE	21 RECEIVING ORGANISATION RECEIPT
I hereby declare that the goods described above have been packed/loaded into the container/vehicle identified in accordance with the applicable provisions.** **MUST BE COMPLETED AND SIGNED FOR ALL CONTAINER/VEHICLE LOADS BY PERSON RESPONSIBLE FOR PACKING/LOADING.**	Received the above number of packages/containers/trailers in apparent good order and condition (except as otherwise stated hereon). RECEIVING ORGANISATION REMARKS:
20 Name of company [If not packed in POL state; SEE ATTACHMENT and attach packing certificate to this form.]	Haulier's name [Truck To Port Company Name]
Name/Status of declarant	Vehicle reg. No.
Place and date	Signature and date
Signature of declarant	DRIVER'S SIGNATURE

22 Name of company (IF SHIPPER PREPARING THIS NOTE) [your company name]
Name/status of declarant [fill in your name]
Place and date [Name of city, yyyy.mm.dd]
Signature of declarant

* DANGEROUS GOODS: You must specify proper shipping name, hazard class, UN No., Packing group, (where assigned) marine pollutant and observe the mandatory requirements under applicable national and international governmental regulations. For the purposes of the IMDG Code see 5.4.1.1.
† For the purposes of the IMDG Code see 5.4.2.

Dangerous Goods Packaging is poorly understood in SA, yet it is the starting point for safety & compliance !

Management of Dangerous Goods

Part 6 Construction and Testing of ALL Packaging types

- 6.1 Requirements for Constructing & Testing other than Class 6.2
- 6.2 Pressure receptacles including Aerosols, Fuel Cells & Gas Cartridges
- 6.3 Packagings for Class 6.2 Infectious
- 6.4 Approvals for Radio-active Materials
- 6.5 Intermediate Bulk Containers – IBC's & FIBC's
- 6.6 Large Packagings
- 6.7 Portable tank and MEGC's – including marking plate
- 6.8 Bulk Containers including Inspection requirements

Compliant packaging is as a major part of Regulations

Packaging & Labeling Guide

STEP 1 Determine UN number, Proper Shipping Name - **Consult the UN / IMDG Dangerous Goods List**

↓

STEP 2 Determine Hazard Class, Packing Group & Packing Instruction e.g. UN1203 Fuel, Class 3.1 Flammable Liquid

↓

STEP 3. Determine test, certification & marking required as per Part 6 of the UN TDG / IMDG Code

↓

STEP 4. Manufacturer submits for Test and certification, each unit manufactured shall then be permanently marked with the certification mark issued by Test Body

UN Testing and Certification of Non-Bulk Packaging to prevent failures in use

- ✓ Drop test
- ✓ Stack test
- ✓ Air Leakage test
- ✓ Hydrostatic Pressure test
- ✓ Vibration (USA)
- ✓ Various other

Bottom Corner Drop

Testing and Certification of IBC's – Intermediate Bulk Containers

Drop Test

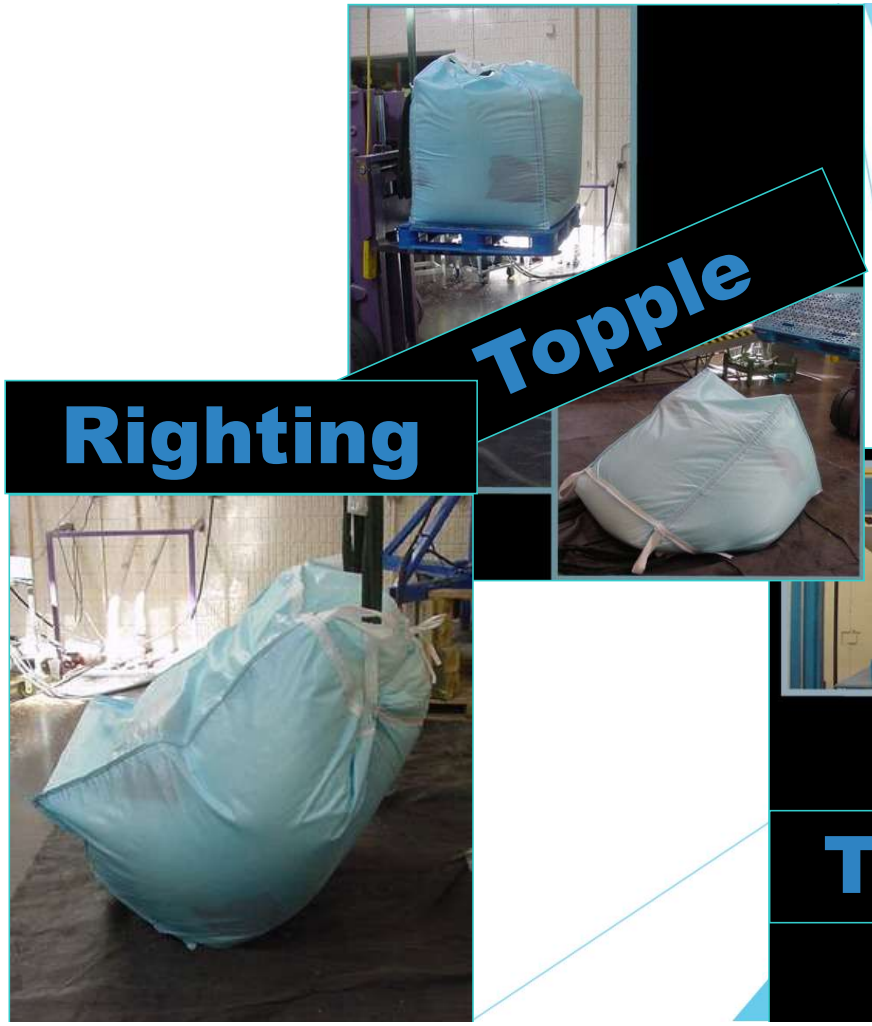
Stack Test

Testing and Certification of IBCs

Leakproofness Test

Testing and Certification – IBC's & FIBC's

Leakproofness Test



Test & Certification of new & used Packaging

Packaging once tested & approved, **each unit** shall be **permanently marked** with the applicable UN packaging codes designated by the Test Authority e.g.

1A1/X1.3/125/14/ZA/CT10 Where: -

1A1 - Denotes non-removable-head steel drum (1H1 – plastic)

X1.3 - Denotes tested for liquids up to 1.3 density

125 - Denotes hydraulic test pressure 125 kPa

14/ZA - Approved in South Africa 2014 and CT10 – is approval Certificate no.10

Reconditioned e.g. 1A2/Z150/S/12/ZA/RB/14R -

Steel Removable Head/Pack Group III Max 150 kg/

Solid/Man. 2012 /SA approved/ RB= Reconditioners symbol

Reconditioned 2014

For FIBC's - 13H3 or 4 for sift-proof containing a liner + stack weight, date manufacture

Test & Certification of FIBC – Bulk Bags

Packaging once tested & approved, **each unit** shall be **permanently marked** with the applicable UN packaging codes designated by the Test Authority e.g.

u n 13H1/Y/02.11/ZA/CT /producer mark/ 7200/1000 Where: -

13H1 - Denotes the type of FIBC – no coating or liner (**H2** coated, no liner)

13H3 or 4 for sift-proof containing a liner

Y packaging group II, medium risk can pack group II and III designated materials,

02.11 Year and month of manufacture

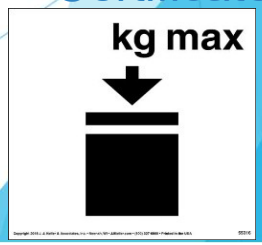
ZA – Country of approval - South Africa

CT is for the Test & Approval body e.g. SABS or Ten e in South Africa + Certificate no

Manufacturer mark

Stacking test – maximum weight – 0 if not designed to be stacked

Maximum content in Kgs.



Provisions for Large Packaging's 6.6.3

Stacking symbol

- The maximum permitted stacking load shall be displayed on a symbol as follows:

Large packaging capable of being stacked

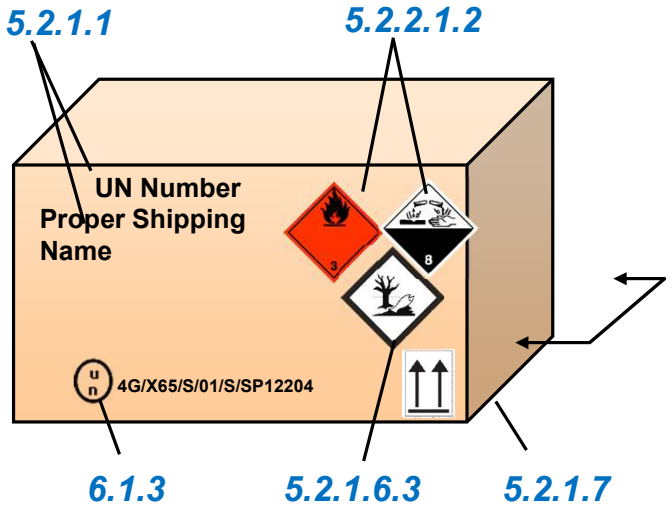
Large packaging NOT capable of being stacked

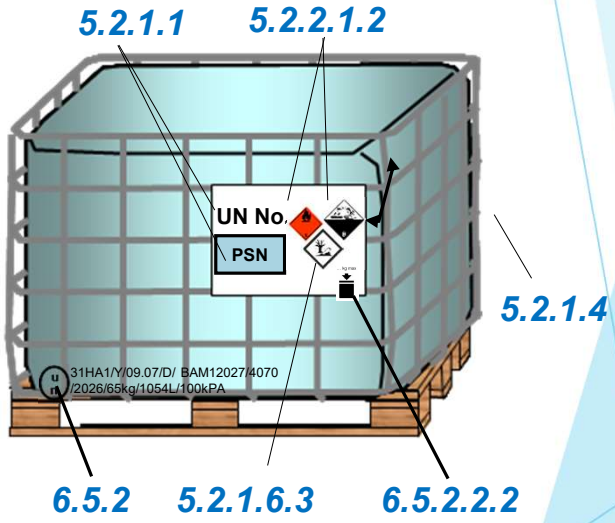
- The mass marked above the symbol shall not exceed the load imposed during the design test divided by 1.8

- This provision is valid for large packagings manufactured, repaired or remanufactured as from 1st January 2015

Marking and labelling of packages – Part 5

UN References – where to find full details



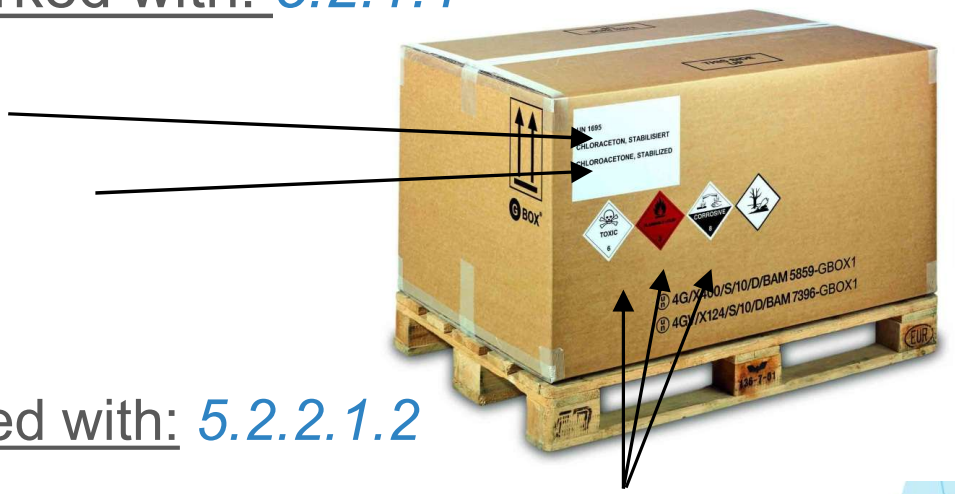


NB - each unit of packaging shall be permanently marked with the approved UN Certification 6.1.3 & 6.5.2

Typical Marking and labelling of packages

Each package shall be marked with: *5.2.1.1*

- ”UN” + UN-number
- Proper Shipping Name

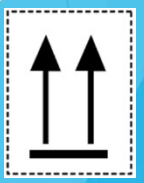


Each package shall be labelled with: *5.2.2.1.2*

- **Danger class label** (100×100 mm) for the primary and subsidiary risk(s)

Note! Large packages, IBC & FIBC with a volume over 450 l shall be marked and labelled on two opposite sides *5.2.1.4*

Orientation Marks



Management of Dangerous Goods

Re-use of packaging e.g.

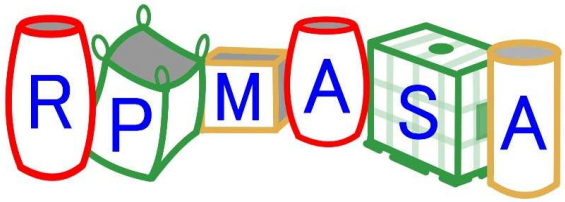
- Reconditioned drums & IBC's – metal, plastics or combination that are cleaned to original material of construction, with all contents and labels removed. These have to be tested as per Part 6 with a minimum of leakproofness test. The reconditioner shall then mark the unit with his mark + date after the original certification mark
- Routine maintenance IBC's – cleaning, removal & checking and /or replacing of seals & equipment that will not impact on structural integrity
- Remanufacturing of drums & IBC's - replacing of structural items or change from one UN type to another UN type. Such items are regulated and subject to the same test and certification requirements as if the new ones of that UN type!
- FIBC's can be used if in a closed loop, re-use for same product but should be carefully inspected and **not** exceed 2 year life

Management of Dangerous Goods

Labelling Principles - Transport and GHS

Minimum requirements for combined Transport – GHS labels

- ✓ Name of Product – Proper Shipping Name, PSN in CAPITALS
- ✓ Hazard warnings – applicable Transport diamonds min size 10cm X 10 cm
- ✓ UN Number – minimum height 12mm!
- ✓ Name and contacts of manufacturer / supplier
- ✓ 24/7 / 365 Emergency number
- ✓ GHS – Hazard and Precautionary statements as per SDS
- ✓ Signal word as per SDS
- ✓ GHS pictograms as per SDS
- ✓ IBC's & Large Packaging's – shall be labelled on 2 sides
- ✓ Containers and Vehicles – Transport hazard warnings only
- ✓ Small & retail packagings – GHS hazard pictogram
- ✓ Outer boxes for small /retail shall be labelled for Transport



Example of combined Transport/GHS Label

GHS Classification & Labelling is now a legal requirement in most countries

Single packaging using 3 adjacent panels to convey multiple hazards.

Product classified as: (a) Category 2 Flammable liquid; (b) Category Acute 4 (by inhalation); and (c) Category 2 Specific target organ toxicant following repeated exposure.

CODE

PRODUCT NAME

Danger

Keep out of the reach of children.
Read label before use.

UN Number
Proper shipping name

COMPANY NAME

Street Address
City, State, Postal Code, Country
Phone Number
Emergency Phone Number

DIRECTIONS FOR USE:
XXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXX

Highly flammable liquid and vapour.
Harmful if inhaled.
May cause liver and kidney damage through prolonged or repeated exposure.

Keep container tightly closed.
Keep away from heat/sparks/open flame. No smoking.
Use only outdoors or in a well-ventilated area.
Do not breath fume/gas/mist/vapours/spray.
Wear protective gloves and eye/face protection [as specified….]
Ground/bond container and receiving equipment.

IN CASE OF FIRE use [as specified] to extinguish.

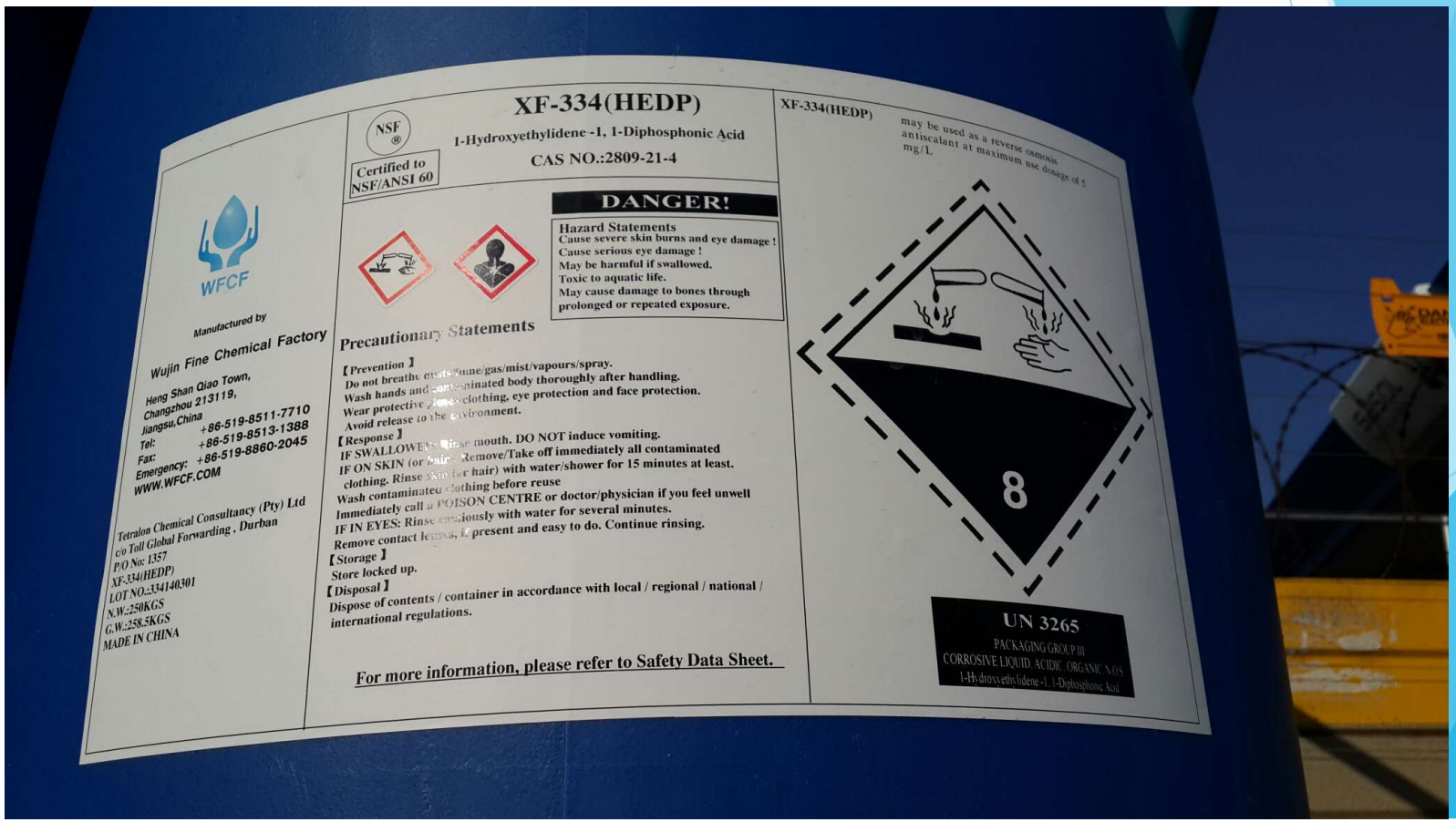
FIRST AID
IF INHALED: Remove person to fresh air and keep in a position comfortable for breathing.
Call a POISON CENTER/doctor if you feel unwell.

Store in a cool, well-ventilated place.

[Universal Product Code (UPC)]

Fill weight:	**XXXX**	**Lot Number:**	**XXXX**
Gross weight:	**XXXX**	**Fill Date:**	**XXXX**
Expiration Date:	**XXXX**		

Example of a drum with a combined Transport & GHS Label



Provisions for *Marking* Portable tanks 6.7.2.20 -

A corrosion-resistant metal plate accessible for inspection, **similar to Tankers & CTU's -** required information:

- ✓ Owner information
- ✓ Manufacturing information
- ✓ Approval information – CSC plate
- ✓ Pressures
- ✓ Temperatures
- ✓ Materials
- ✓ Capacity
- ✓ Periodic inspections and tests

Additional information:

- Name of the operator
- Maximum permissible gross mass (MPGM)
- Unladen (tare) mass
- Portable tank instruction