



Japan-ASEAN Cooperation



Sustainable Human Resource Development in logistics services for ASEAN Member States



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Dangerous Goods Handling UN Marking and Packaging

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UN Marking & Packaging

Objectives:

- ❖ This chapter will elaborate the **basic requirement of packaging** as well as required DG labels on packaging.
- ❖ It also explain the **UN standard of packaging code** as well as highlight the possible combination of all these codes.
- ❖ The different level of **packaging strengths** in compliance with the packing group will also be stated in this chapter.
- ❖ **Examples** of UN packaging will also be provided.
- ❖ **Other types of classification** and labelling **system** will be illustrated.



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UN Marking & Packaging

Presentation Outline

- ❖ UN Marking and Packaging
- ❖ Packaging for Dangerous Goods
- ❖ Package Marking & Labelling
- ❖ Strengths of Packaging
- ❖ Examples of UN Packagings
- ❖ Other Classification System
 - ❖ EU Labelling System (Directive 67/548/EEC)
 - ❖ US National Fire Protection Association (US NFPA)

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UN Marking & Packaging

Packaging for Dangerous Goods

The packaging for Dangerous must not exceed 400 kg or 450 liters per package. It must contain the label as well as the marking at least as follows:-

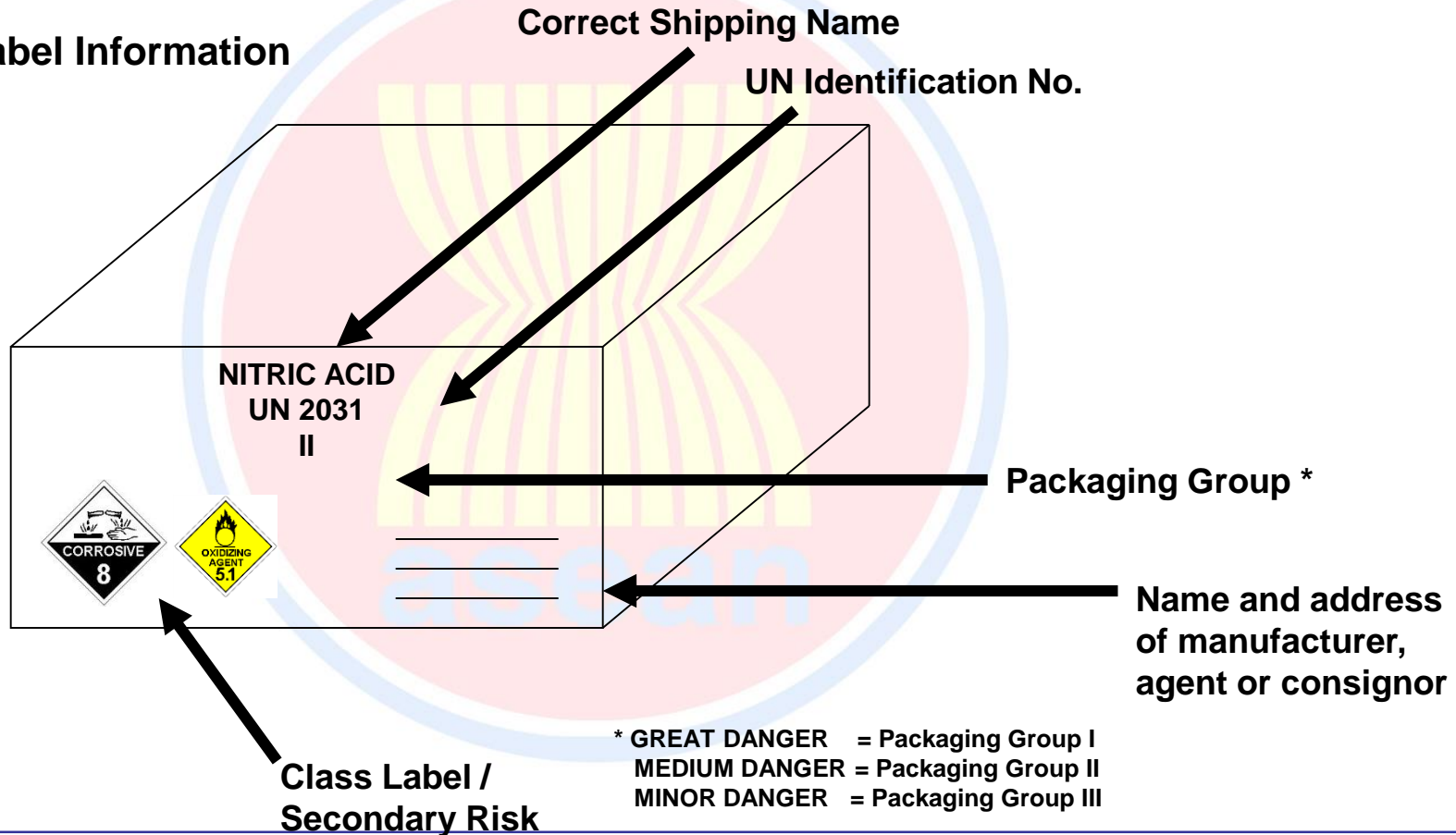
- (1) Label
- (2) UN number
- (3) Proper Shipping Name
- (4) UN Symbol to represent the standard and strength of the packaging
- (5) Any other markings



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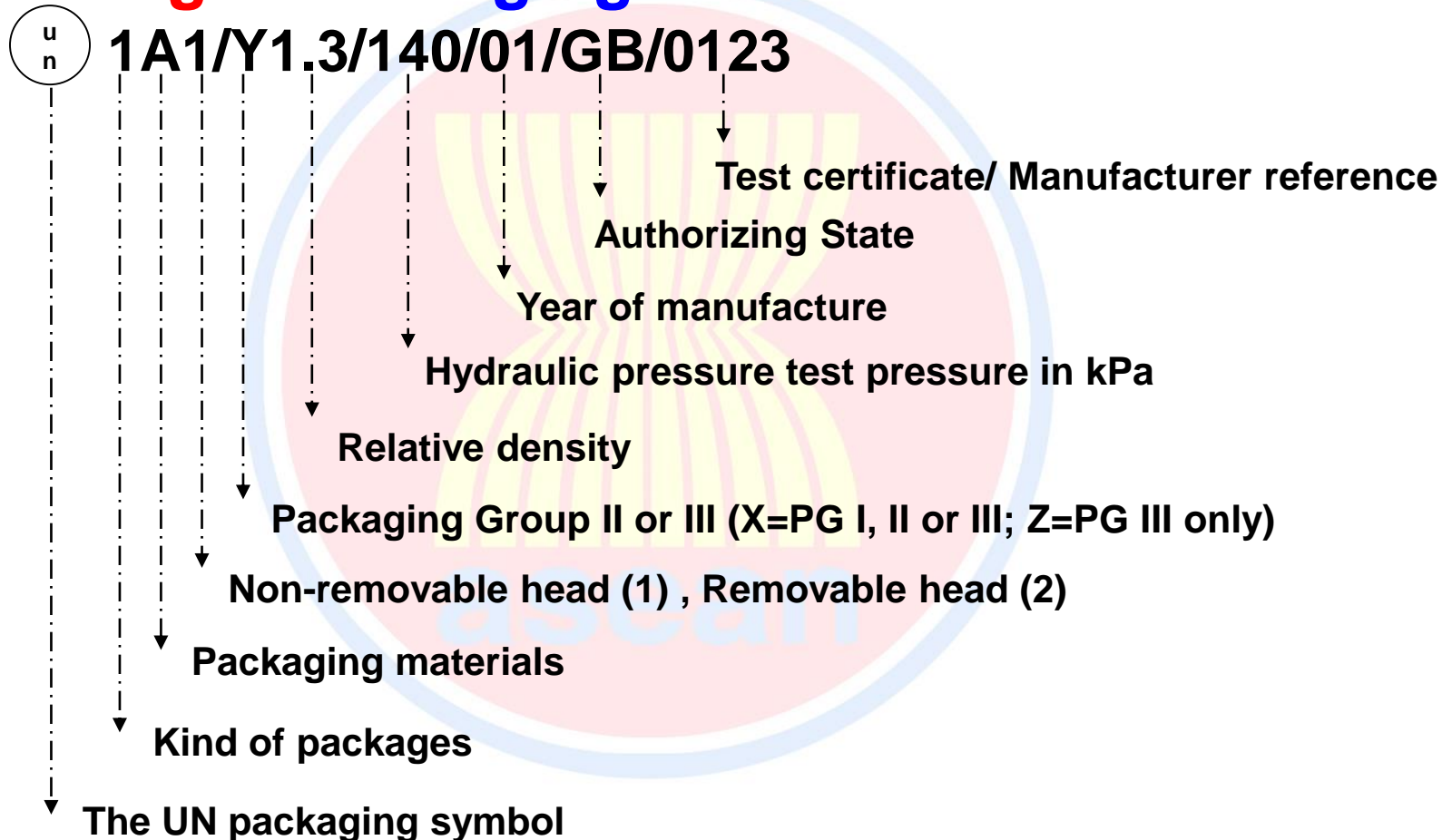
Package Marking & Labelling

Minimum Label Information



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Kinds of Packages

- 1 - drum
- 2 - wooden barrel
- 3 - jerrican
- 4 - box
- 5 - bag
- 6 - composite packaging

Packaging Material

- | | | | | | |
|---|---|--------------------|---|---|---------------------------------------|
| A | - | steel | M | - | paper, multiwall |
| B | - | aluminium | N | - | metal (other than steel or aluminium) |
| C | - | natural wood | P | - | glass, porcelain or stoneware |
| D | - | plywood | | | |
| F | - | reconstituted wood | | | |
| G | - | fibreboard | | | |
| H | - | plastics material | | | |
| L | - | textile | | | |

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| Kind | Material | Category | Code | Kind | Material | Category | Code |
|----------------|-----------------------|-----------------------|----------|-----------|----------------------------|--------------------------------|------|
| 1. Drums | A. Steel | non-removable head | 1A1 | 5. Bags | H. Woven plastics | without inner liner or coating | 5H1 |
| | | removable head | 1A2 | | | sift-proof | 5H2 |
| | B. Aluminium | non-removable head | 1B1 | | | water resistant | 5H3 |
| | | removable head | B2 | | | H. Plastics film | 5H4 |
| | D. Plywood | | 1D | | L. Textile | without inner liner or coating | 5L1 |
| | G. Fibre | | 1G | | | sift proof | 5L2 |
| | H. Plastics | non-removable head | 1H1 | | | water resistant | 5L3 |
| removable head | | 1H2 | M. Paper | multiwall | 5M1 | | |
| 2. Barrels | C. Wooden | bung type | | 2C1 | multiwall, water resistant | 5M2 | |
| | | removable head | 2C2 | | | | |
| 3. Jerricans | A. Steel | non-removable head | 3A1 | | | | |
| | | removable head | 3A2 | | | | |
| | B. Aluminium | non-removable head | 3B1 | | | | |
| | | removable head | 3B2 | | | | |
| | H. Plastics | non-removable head | 3H1 | | | | |
| | | removable head | 3H2 | | | | |
| 4. Boxes | A. Steel | | 4A | | | | |
| | B. Aluminium | | 4B | | | | |
| | C. Natural wood | ordinary | 4C1 | | | | |
| | | with sift-proof walls | 4C2 | | | | |
| | D. Plywood | | 4D | | | | |
| | F. Reconstituted wood | | 4F | | | | |
| | G. Fibreboard | | 4G | | | | |
| | H. Plastics | expanded | 4H1 | | | | |
| solid | | 4H2 | | | | | |

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| Kind | Material | Category | Code |
|-------------------------|---|---------------------------|------|
| 6. Composite packagings | H. Plastics receptacle | in steel drum | 6HA1 |
| | | in steel crate or box | 6HA2 |
| | | in aluminium drum | 6HB1 |
| | | in aluminium crate or box | 6HB2 |
| | | in wooden box | 6HC |
| | | in plywood drum | 6HD1 |
| | | in plywood box | 6HD2 |
| | | in fibre drum | 6HG1 |
| | | in fibreboard box | 6HG2 |
| | | in plastics drum | 6HH1 |
| | | in solid plastics box | 6HH2 |
| | P. Glass, porcelain or stoneware receptacle | in steel drum | 6PA1 |
| | | in steel crate or box | 6PA2 |
| | | in aluminium drum | 6PB1 |
| | | in aluminium crate or box | 6PB2 |
| | | in wooden box | 6PC |
| | | in plywood drum | 6PD1 |
| | | in wickerwork hamper | 6PD2 |
| | | in fibre drum | 6PG1 |
| in fibreboard box | 6PG2 | | |
| | in expanded plastics packaging | 6PH1 | |
| | in solid plastics packaging | 6PH2 | |

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Strengths of Packaging

There are three levels of the strengths of the packaging depending on its level of dangers by the thickness, resistance against pressure, drop test and etc

| <u>Packing Group</u> | <u>Strength</u> | <u>Symbol</u> |
|----------------------|-----------------|---------------|
| I | High | X |
| II | Medium | Y |
| III | Low | Z |

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Examples of UN Packagings



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Examples of UN Packagings



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Examples of UN Packagings



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Examples of UN Packagings



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Other Classification System

EU Labelling System (Directive 67/548/EEC)



toxic (T) substances &
very toxic (T+) substances



flammable (F) substances &
extremely flammable (F+) substances



irritating (Xi) substances &
harmful (Xn) substances



explosive (E) substances



oxidizing (O) substances



corrosive (C) substances



environmentally
dangerous (N) substances

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Other Classification System

US National Fire Protection Association (US NFPA)

HAZARDOUS MATERIALS LABEL IDENTIFICATION SYSTEM

| HAZARDOUS MATERIALS CLASSIFICATION | | HAZARDOUS INDEX RATINGS FOR CONTAINER LABELING | | | |
|------------------------------------|--|---|---|---|--|
| HAZARDOUS MATERIALS CLASSIFICATION | HAZARDOUS INDEX RATINGS FOR CONTAINER LABELING | HEALTH HAZARD | FIRE HAZARD | REACTIVITY | TARGET ORGAN |
| OXIDIZER | 4 - SEVERE HAZARD | 1 - FLAMMABLE LIQUID (FLAMMABLE SOLID) | 2 - EXTREMELY FLAMMABLE LIQUID (EXTREMELY FLAMMABLE SOLID) | 3 - HIGHLY FLAMMABLE LIQUID (HIGHLY FLAMMABLE SOLID) | 1 - BLINDING LIQUID (BLINDING SOLID) |
| ACID | 3 - SERIOUS HAZARD | 3 - EXTREMELY FLAMMABLE LIQUID (EXTREMELY FLAMMABLE SOLID) | 3 - EXTREMELY FLAMMABLE LIQUID (EXTREMELY FLAMMABLE SOLID) | 4 - EXTREMELY FLAMMABLE LIQUID (EXTREMELY FLAMMABLE SOLID) | 2 - CORROSIVE LIQUID (CORROSIVE SOLID) |
| ALKALI | 2 - MODERATE HAZARD | 4 - EXTREMELY FLAMMABLE LIQUID (EXTREMELY FLAMMABLE SOLID) | 4 - EXTREMELY FLAMMABLE LIQUID (EXTREMELY FLAMMABLE SOLID) | 5 - EXTREMELY FLAMMABLE LIQUID (EXTREMELY FLAMMABLE SOLID) | 3 - CORROSIVE LIQUID (CORROSIVE SOLID) |
| CORROSIVE | 1 - SLIGHT HAZARD | 5 - EXTREMELY FLAMMABLE LIQUID (EXTREMELY FLAMMABLE SOLID) | 5 - EXTREMELY FLAMMABLE LIQUID (EXTREMELY FLAMMABLE SOLID) | 6 - EXTREMELY FLAMMABLE LIQUID (EXTREMELY FLAMMABLE SOLID) | 4 - CORROSIVE LIQUID (CORROSIVE SOLID) |
| USE NO WATER | 0 - MINIMAL HAZARD | 6 - EXTREMELY FLAMMABLE LIQUID (EXTREMELY FLAMMABLE SOLID) | 6 - EXTREMELY FLAMMABLE LIQUID (EXTREMELY FLAMMABLE SOLID) | 7 - EXTREMELY FLAMMABLE LIQUID (EXTREMELY FLAMMABLE SOLID) | 5 - CORROSIVE LIQUID (CORROSIVE SOLID) |
| FLAMMABLE LIQUID | | 7 - EXTREMELY FLAMMABLE LIQUID (EXTREMELY FLAMMABLE SOLID) | 7 - EXTREMELY FLAMMABLE LIQUID (EXTREMELY FLAMMABLE SOLID) | 8 - EXTREMELY FLAMMABLE LIQUID (EXTREMELY FLAMMABLE SOLID) | 6 - CORROSIVE LIQUID (CORROSIVE SOLID) |
| FLAMMABLE SOLID | | 8 - EXTREMELY FLAMMABLE LIQUID (EXTREMELY FLAMMABLE SOLID) | 8 - EXTREMELY FLAMMABLE LIQUID (EXTREMELY FLAMMABLE SOLID) | 9 - EXTREMELY FLAMMABLE LIQUID (EXTREMELY FLAMMABLE SOLID) | 7 - CORROSIVE LIQUID (CORROSIVE SOLID) |
| FLAMMABLE GAS | | 9 - EXTREMELY FLAMMABLE LIQUID (EXTREMELY FLAMMABLE SOLID) | 9 - EXTREMELY FLAMMABLE LIQUID (EXTREMELY FLAMMABLE SOLID) | 10 - EXTREMELY FLAMMABLE LIQUID (EXTREMELY FLAMMABLE SOLID) | 8 - CORROSIVE LIQUID (CORROSIVE SOLID) |
| NON-FLAMMABLE GAS | | 10 - EXTREMELY FLAMMABLE LIQUID (EXTREMELY FLAMMABLE SOLID) | 10 - EXTREMELY FLAMMABLE LIQUID (EXTREMELY FLAMMABLE SOLID) | 11 - EXTREMELY FLAMMABLE LIQUID (EXTREMELY FLAMMABLE SOLID) | 9 - CORROSIVE LIQUID (CORROSIVE SOLID) |

| PERSONAL PROTECTION, TARGET ORGANS, & INDEX RATINGS | |
|---|---------------|
| PERSONAL PROTECTION | INDEX RATINGS |
| HEALTH HAZARD | HEALTH HAZARD |
| FLAMMABILITY | FLAMMABILITY |
| REACTIVITY | REACTIVITY |
| HEALTH HAZARD | HEALTH HAZARD |
| FLAMMABILITY | FLAMMABILITY |
| REACTIVITY | REACTIVITY |





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