

Packaging Selection, Marking & Consignment

1. Hydrogen peroxide and peroxyacetic acid mixture, stabilised containing 4% peroxyacetic acid is to be shipped in 1,000 L 31HA1 IBCs from Dublin to Cork
 - a) Are these IBC's allowed?

Yes, IBC 02 which applies to UN 3149 allows the use of such IBC's
 - b) What marks and labels must be applied to the IBCs?

The IBC must be marked with the UN number UN3149 on two opposite sides of the IBC as it is greater than 450L in characters 12 mm high

Orientation arrows are also required on two opposite sides as the IBC must be vented according to IBC special provision B5

The IBC must be labelled with no 5.1 and 8 labels on two opposite sides again because the capacity is greater than 450 L
2. An Ethanol based hand sanitiser with a flash point of 24.5C is to be distributed in fibreboard boxes containing 12 x 1L bottles. According to ADR what labels and marks need to be applied to the boxes? (You need to recognise that this qualifies for LQ marking)

Ethanol solution with a flashpoint of 24.5C is assigned to UN 1170 PG III. This allows the boxes to qualify as limited quantity packages as the inner bottle are less than the 5L inner packaging limit and the total weight of the box will not exceed 30 kg – 12x1L bottles will weigh approx. 12 kg.

Thus, the boxes just need to be marked with the Limited Quantity mark and because you have liquids in a combination package, orientation arrows on two opposite sides are also required. No labels are required.
3. A company wishes to ship 3L of acetaldehyde packed together with 15 kg of potassium hydrogen fluoride in fibreboard boxes. (This is a mixed packaging combined with a labelling/marketing question)

Is this possible?

Acetaldehyde = UN1089, Clas3 3, MP7 and MP17 apply

Potassium hydrogen fluoride, solid = UN1811 (you know it is a solid because of kg in the question), Class 8 MP 10 applies

MP7 is not relevant (different classes involved). MP17 allows packing with other classes but requires the acetaldehyde in max 0.5 L per inner and 1L per package

MP10 allows packing with other classes subject to a limit of 5 kg

So, yes mixed packaging is allowed.

What is the minimum number of inner and outer packages required?

Because of the size restrictions you require a minimum of 9 inner packages and 3 outer packages i.e. each package can only contain 2 x 0.5L acetaldehyde and 1 x 5kg potassium hydrogen fluoride.

State another aspect that must be checked before proceeding with the packaging

The goods must not react dangerously with each other (There is usually 1 mark going for this add on question in a mixed packaging question)

What labels and marks are required on the packages?

Class 3, 8 and 6.1 labels

Marks UN 1089, UN1811 plus orientation arrows two opposite sides because acetaldehyde is a liquid

4. As a freight forwarder state three reasons why you would refuse to accept the following consignment if presented for carriage by road

Package



Marks and labels found on package

 1H2/Z15/S/02/IRL 1234



UN 1687

Information on the transport document

UN 1687 SODIUM AZIDE, 6.1, II, (D/E)

2 X OT Plastic drums Net quantity 40 kg

The packaging approval is only for PG III (Z code) but the material is PG II

The plastic drum was manufactured in 02 so is more than 5 years old and cannot be used without CA approval

The packaging capacity is exceeded – the transport document indicates a net quantity of 40 kg in two plastic drums, but the permitted gross mass per drum is only 15 kg according to the packaging approval code

5. You are asked to ship 90 kg of Azodicarbonamide formulation, Type B, Temperature controlled. When tested, the SADT for the packages used was found to be 42C.

What is the minimum number of packages required?

What information must be shown on the packages and transport document (ignore packaging approval markings or consignor/consignee information)?

According to the table of known self reactive substances, azodicarbonamide formulations type b are assigned to UN 3232 and packing method OP5. Looking up OP5 in P520 shows that the maximum mass per package for solids is 25 kg. Thus 4 packages will be required.

From the measured SADT for the packages, control and emergency temperatures are determined according to Table 1 in 2.2.41.1.18 as 32C for control and 37C for emergency temperatures

The packages will have to display 4.1 and 1 labels according to the dangerous goods list entry and also note 2 in the table of known self reactive substances and the mark UN 3232.

The Transport document will have to display the following

UN 3232 SELF-REACTIVE SOLID, TYPE B, TEMPERATURE CONTROLLED (X% Azodicarbonamide), 4.1 (1), (B)

Control Temperature 32C, Emergency Temperature 37C

4 x description of packages

6. What information must be shown on combination packages and the transport document for a shipment of 70% isopropylcumyl hydroperoxide in a Type B diluent

According to the table of known peroxides isopropylcumyl hydroperoxide in a Type B diluent is assigned to UN3109 and packing method OP8

The packages must show labels numbers 5.2 and also 8 as note 13 in the organic peroxides tables indicates that such a peroxide also carries a corrosive risk. The packages must also show the UN number 3109 and two orientation marks as the packages contain liquids in combination packages

The transport document must show

UN 3109 ORGANIC PEROXIDE TYPE F, LIQUID (70% isopropylcumyl hydroperoxide), 5.2 (8), (D)

The inclusion of the number 8 label in the transport document is implied by special provision 122

7. A company received a plastic drum from Germany containing 37 litres of a dilute aqueous solution which was classified as 'Corrosive Liquid, Acidic, Inorganic, N.O.S.', UN3264, Class 8, PG III. The drum was UN tested (1H2/X108/S/10) and was contained in a 205 litre metal drum (1A2/Y1.5/110/11/D). The 205 litre drum was packed with vermiculite, an adsorbant/cushioning material. Is this shipment compliant with the regulations? **No.** A precise interpretation of the packaging codes indicates that the inner plastic drum is only UN

approved for solids and inner receptacles, so it can not be used as a single packaging and could only be used for liquids as part of a combination package. The outer steel drum is approved for liquids but not solids or inner receptacles, so can not be used as the outer layer of a combination package as it appears to be used in this example.

8. Can Cyclobutyl chloroformate be carried in any of the following tanks?

T4 Tank	No – see portable tank hierarchy 4.2.5.2.5
L10CH	Yes, suitable in place of L4BH see table in 4.3.4.1.2
L4BN	No, not hermetically sealed
T15	Yes - see portable tank hierarchy 4.2.5.2.5
S4AH	No – only suitable for solids, not liquids
L4DH	Yes, suitable in place of L4BH see table in 4.3.4.1.2

9. Can Dichlorosilane be carried in the following tanks?

P20DH Yes, Table 4.3.3.2.5 shows the minimum test pressure (10 Bar) which the tank exceeds while 4.3.3.1.2 tank hierarchy shows that a P#DH can replace a P*BH

P5BH No, the tank has an insufficient pressure rating

10. A transport company is planning to start bulk transport of Bitumen with a flash point greater than 250C. Carriage will be between 100 and 200C. You are asked to advise as to what type of tanks are required, the placarding and marking of the vehicle and the product information that must be shown in the transport document.

The product will have to be transported as UN 3257 ELEVATED TEMPERATURE LIQUID N.O.S.

Thus an LGAV tank will be required.

The tank will have to display Class 9 placards and the elevated temperature on the back and sides. Orange plates showing 99 and 3257 will have to be displayed at the front and back of the vehicle.

The transport document will have to contain the following

UN 3257 ELEVATED TEMPERATURE LIQUID N.O.S. (Bitumen), 9, III, D plus the total quantity carried