

## Complex/Miscellaneous Exercises

1. A chemical company in Spain is preparing to ship a consignment of Tripropylamine by train to Poland in a freight container. The shipment will consist of two pallets of 20 non-UN certified boxes each containing 4 x 5L jerricans and 20 x 1000L IBCs. (This question requires you to recognise the LQ option available combined with marking, labelling, placarding and plating knowledge)

What labels and marks should be applied to the boxes and IBCs?

The boxes will qualify as limited quantity packages as each jerrican is within the 5 L limit for inner receptacles and a box containing 4 jerricans will weigh less than 30 kg.

Thus the boxes need only be marked with the Limited Quantity Mark plus orientation marks on two opposite side as the opening of the inner packages contain liquids and are not visible. No labels are required (you must actually state the negative to avoid dropping a mark)

The IBCs will have to be labelled with Class 3 and Class 8 labels and marked with the UN number, UN 2260, all on two opposite sides as the capacity is greater than 450L.

What plates and/or placards must be visible on the transport unit moving the container from the shipper to the railway terminal?

The carrying vehicle must display blank orange plates front and rear of the vehicle. Placards corresponding to Class 3 and 8 must be displayed on all four sides of the container. Placards corresponding to the LQ mark are not required.

2. You are asked to send 7,500 L of 60 % perchloric acid from Ireland to a customer in Poland. Some of the journey on the continent will be by rail as it is more cost effective. Your tank provider has available a 10,000 L single-compartment non-baffled T10 tank or a twin compartment 15,000 L T19 tank. (Case study style question i.e. a series of questions relating to a particular shipment scenario)

Which tank would you select and why?

60% Perchloric acid meets the criteria of UN 1873. It has the UN portable tank code T10. However, 7,500 L in a 10,000 L single compartment tank without baffles is not permitted according to 4.2.1.9.6(a) as it is >20% and <80% filled and thus susceptible to unacceptable surging. A T19 is an acceptable alternative according to 4.2.5.2.5 and as the two compartments are only 7,500 L each, anti-surge filling restrictions will not apply – so the 15,000L T19 tank is acceptable

Your manager advises that a second order for 6,000 L of 70% perchloric acid has just come in and that if you were going to use the 15,000 L tank then the two orders could be shipped together in the one tank. How would you respond?

It will not work as the 7,500 L of 60 % hypochloride will have to be split between the two compartments as the maximum degree of filling has to be less than 97% ( see TP1) and thus you could not fill all the 7,500 L in one compartment

How should the tank be marked and labelled?

Class 5.1 and 8 placards (250 x 250 mm) on all four sides (5.3.2.1)

Orange plates showing 558 and 1873 on the sides (5.3.2.1.2) The option of using blank plates on the tank and numbered plates on the front and rear of the vehicle is not practical as the UN number will disappear when transferred to rail (note IMDG requirements would dictate that the UN number is shown on all four sides)

Show how the goods should be described in the transport document

UN 1873 PERCHORIC ACID, 5.1 (8), I (B/E)

7500 L (in a T19 UN Portable Tank)

The carrier arrives with a FL approved vehicle to pick up the tank. Is this acceptable?

Yes – ADR 7.4.2

On checking the safety equipment on the vehicle it is observed that a drain seal and breathing apparatus are not present. Is this acceptable?

No, the drain seal is required as the tank has a class 8 label

Describe the plates that should be shown on the front of the vehicle.

300 X 400 mm blank orange plate with a 15 mm black border

The driver taking the tank on the final leg of the journey from the rail terminal to the customer has to rest as he is approaching the limit of his tachograph hours. What are his options in terms of where he can leave the vehicle while resting? – it is not a sleeper cab

S20 applies as he is carrying more than 3,000 L in tanks. Thus a supervised vehicle park, a public or private park where damage is unlikely or an isolated space away from motorways dwelling and public congregation ADR 8.4.1

On emptying the customer will send the tank to a cleaning station. How should the tank be described in the transport document?

EMPTY PORTABLE TANK, LAST LOAD: UN UN 1873 PERCHORIC ACID, 5.1 (8), I (B/E)

## Miscellaneous Questions

Short questions that may be found in part B of the road paper or the core paper

1. By definition what types of goods are restricted in a Category C tunnel? Goods which may lead to a very large explosion, a large explosion or a large toxic release
2. To what packing group are explosives and organic peroxides assigned? II - ADR 4.1.5.5 & 4.1.7.1.1
3. What regulations govern the transport of dangerous goods by air? ICAO Technical Instructions (not IATA)
4. What labels and marks would need to be applied to packages containing the pure self reactive substance 4-nitrosophenol? What additional information must be included on the transport document? It is assigned to UN3236 Class 4.1 labels and mark UN 3236 On the transport document the control 35°C and emergency 40°C temperatures
5. What labels and marks would need to be applied to packages containing a 60% solution of the organic peroxide tertr-butyl peroxyacetate? Assigned to UN3101 Thus 5.2 and 1 labels Mark with UN 3101