

## ANNEX I

### REQUIREMENTS FOR STORAGE INSTALLATIONS AT TERMINALS

1. The external wall and roof of tanks above ground must be painted in a colour with a total radiant heat reflectance of 70 % or more. These operations may be programmed so as to be carried out as part of the usual maintenance cycles of the tanks within a period of three years. Member States may grant a derogation from this provision where required for the protection of special landscape areas which have been designated by national authority.

This provision shall not apply to tanks linked to a vapour recovery unit which conforms with the requirements set out in Annex II, point 2.

2. Tanks with external floating roofs must be equipped with a primary seal to cover the annular space between the tank wall and the outer periphery of the floating roof and with a secondary seal fitted above the primary seal. The seals should be designed to achieve an overall containment of vapours of 95 % or more as compared to a comparable fixed-roof tank with no vapour-containment controls (that is a fixed-roof tank with only vacuum/pressure relief valve).
3. All new storage installations at terminals, where vapour recovery is required according to Article 4 of the Directive (see Annex II) must be either:
  - (a) fixed-roof tanks connected to the vapour recovery unit in conformity with the requirements of Annex II; or
  - (b) designed with a floating roof, either external or internal, equipped with primary and secondary seals to meet the performance requirements set down in point 2.
4. Existing fixed-roof tanks must either:
  - (a) be connected to a vapour-recovery unit in conformity with the requirements of Annex II; or
  - (b) have an internal floating roof with a primary seal which should be designed to achieve an overall containment of vapours of 90 % or more in relation to a comparable fixed-roof tank with no vapour controls.
5. The requirements for vapour-containment controls mentioned under points 3 and 4 do not apply to fixed-roof tanks at terminals, where intermediate storage of vapours is permitted according to Annex II, point 1.

## ANNEX II

### REQUIREMENTS FOR LOADING AND UNLOADING INSTALLATIONS AT TERMINALS

1. Displacement vapours from the mobile container being loaded must be returned through a vapour-tight connection line to a vapour recovery unit for regeneration at the terminal.

This provision does not apply to top-loading tankers as long as that loading system is permitted.

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At terminals which load petrol onto vessels, a vapour incineration unit may be substituted for a vapour recovery unit if vapour recovery is unsafe or technically impossible because of the volume of return vapour. The requirements concerning atmospheric emissions from the vapour recovery unit shall also apply to the vapour incineration unit.

At terminals with a throughput of less than 25 000 tonnes/year, intermediate storage of vapours may be substituted for immediate vapour recovery at the terminal.

2. The mean concentration of vapours in the exhaust from the vapour recovery — unit corrected for dilution during treatment — must not exceed 35 g/normal cubic metre ( $\text{Nm}^3$ ) for any one hour.

For vapour recovery units, installed before 1 January 1993, the United Kingdom may grant a derogation from the limit value of 35 g/ $\text{Nm}^3$  for any one hour, set down in this Annex, subject to the following conditions:

- the installation shall meet a limit value of 50 g/ $\text{Nm}^3$  for any one hour measured according to the specifications set down in this Annex,
- the derogation shall expire at the latest nine years from the date referred to in Article 10 of the Directive,
- the Commission shall be notified of the individual installations affected by this derogation including information on their throughput of petrol and vapour emissions from the installation.

The Member States' competent authorities must ensure that the measurement and analysis methods and their frequency are established.

The measurements must be made over the course of one full working day (seven hours minimum) of normal throughput.

Measurements may be continuous or discontinuous. If discontinuous measurements are employed, at least four measurements per hour must be made.

The overall measurement error due to the equipment used, the calibration gas and the procedure used must not exceed 10 % of the measured value.

The equipment used must be capable of measuring concentrations at least as low as 3 g/ $\text{Nm}^3$ .

The precision must be at least 95 % of the measured value.

3. The Member States' competent authorities must ensure that the connection lines and pipe installations are checked regularly for leaks.
4. The Member States' competent authorities must ensure that loading operations are shut down at the gantry in the case of a leak of vapour. Equipment for such shutdown operations must be installed at the gantry.
5. Where top-loading of mobile containers is permissible, the outlet of the loading arm must be kept near the bottom of the mobile container, in order to avoid splash loading.

### ANNEX III

#### REQUIREMENTS FOR LOADING AND STORAGE INSTALLATIONS AT SERVICE STATIONS AND TERMINALS WHERE THE INTERMEDIATE STORAGE OF VAPOURS IS CARRIED OUT

Vapours displaced by the delivery of petrol into storage installations at service stations and in fixed-roof tanks used for the intermediate storage of vapours must be returned through a vapour-tight connection line to the mobile container delivering the petrol. Loading operations may not take place unless the arrangements are in place and properly functioning.

### ANNEX IV

#### SPECIFICATIONS FOR BOTTOM-LOADING, VAPOUR COLLECTION AND OVERFILL PROTECTION OF EUROPEAN ROAD TANKERS

1. Couplings
  - 1.1. The liquid coupler on the loading arm must be a female coupler which must mate with a 4-inch API (101,6 mm) male adapter located on the vehicle as defined by:
    - API Recommended Practice 1004Seventh Edition, November 1988.

Bottom loading and vapour recovery for MC-306 tank motor vehicles (Section 2.1.1.1 — Type of adapter used for bottom loading)

- 1.2. The vapour-collection coupler on the loading-gantry vapour-collection hose must be a cam-and-groove female coupler which must mate with a 4-inch (101,6 mm) cam-and-groove male adapter located on the vehicle as defined by:
  - API Recommended Practice 1004Seventh Edition November 1988.

Bottom loading and vapour recovery for MC-306 tank motor vehicles (Section 4.1.1.2 — Vapour-recovery adapter)

2. Loading conditions
  - 2.1. The normal liquid-loading rate must be 2 300 litres per minute (maximum 2 500 litres per minute) per loading arm.
  - 2.2. When the terminal is operating at peak demand, its loading gantry vapour collection system, including the vapour-recovery unit, is allowed to generate a maximum counterpressure of 55 millibar on the vehicle side of the vapour-collection adapter.
  - 2.3. All approved bottom-loading vehicles will carry an identification plate which specified the maximum permitted number of loading arms which may be operated simultaneously whilst ensuring that no vapours are released via the compartment P and V valves, when the maximum plant back pressure is 55 millibar as specified in 2.2.
3. Connection of vehicle earth/overflow detection

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The loading gantry must be equipped with an overflow-detection control unit which, when connected to the vehicle, must provide a fail-safe permission signal to enable loading, providing no compartment-overflow sensors detect a high level.

- 3.1. The vehicle must be connected to the control unit on the gantry via a 10-pin industry-standard electrical connector. The male connector must be mounted on the vehicle and the female connector must be attached to a flying lead connected to the gantry-mounted control unit.
- 3.2. The high-level detectors on the vehicle must be either 2-wire thermistor sensors, 2-wire optical sensors, 5-wire optical sensors or a compatible equivalent, provided the system is fail-safe. (NB: thermistors must have a negative temperature coefficient.)
- 3.3. The gantry control unit must be suitable for both 2-wire and 5-wire vehicle systems.
- 3.4. The vehicle must be bonded to the gantry via the common return wire of the overflow sensors, which must be connected to pin 10 on the male connector via the vehicle chassis. Pin 10 on the female connector must be connected to the control-unit enclosure which must be connected to the gantry earth.
- 3.5. All approved bottom-loading vehicles must carry an identification plate (see 2.3) which specifies the type of overflow-detection sensors installed (i. e. 2-wire or 5-wire).

#### 4. Location of the connections

- 4.1. The design of the liquid-loading and vapour collection facilities on the loading gantry must be based on the following vehicle-connection envelope.
  - 4.1.1. The height of the centre line of the liquid adapters must be: maximum 1,4 metres (unladen); minimum 0,5 metre (laden), the preferred height being 0,7 to 1,0 metres).
  - 4.1.2. The horizontal spacing of the adapters must be not less than 0,25 metres (preferred minimum spacing is 0,3 metres).
  - 4.1.3. All liquid adapters must be located within an envelope not exceeding 2,5 metres in length.
  - 4.1.4. The vapour-collection adapter should be located preferably to the right of the liquid adapters and at a height not exceeding 1,5 metres (unladen) and not less than 0,5 metres (laden).
- 4.2. The earth/overflow connector must be located to the right of the liquid and vapour-collection adapters and at a height not exceeding 1,5 metres (unladen) and not less than 0,5 metre (laden).
- 4.3. The above connections must be located on one side of the vehicle only.

#### 5. Safety interlocks

##### 5.1. Earth/Overflow detection

Loading must not be permitted unless a permissive signal is provided by the combined earth/overflow control unit.

In the event of an overflow condition or a loss of vehicle earth, the control unit on the gantry must close the gantry-loading control valve.

##### 5.2. Vapour-collection detection

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Loading must not be permitted unless the vapour-collection hose has been connected to the vehicle and there is a free passage for the displaced vapours to flow from the vehicle into the plant vapour-collection system.