

## **CHAPTERS 4.5 AND 6.10**

### **4.5 USE AND OPERATION OF VACUUM OPERATED WASTE TANKS**

#### **4.5.1 Use**

**4.5.1.1** Substances in Classes 3, 4.1, 5.1, 6.1, 6.2, 8 and 9 may be carried in vacuum-operated waste tanks conforming to Chapter 6.10 if their carriage in fixed or demountable tanks is permitted according to Chapter 4.3.

[215 110]

#### **4.5.2 Operation**

**4.5.2.1** The provisions of Chapter 4.3 apply to the carriage in vacuum operated waste tanks and are supplemented by the provisions of 4.4.2.2 to 4.4.2.4 below.

**4.5.2.2** For carriage of liquids classified as flammable, vacuum-operated waste tanks shall be filled through fillings which discharge into the tank at a low level. Provisions shall be made to minimize the production of spray.

**4.5.2.3** When discharging flammable liquids with a flashpoint below 23° C by using air pressure the maximum allowed pressure is 100 kPa (1 bar).

**4.5.2.4** The use of tanks fitted with an internal piston operating as a compartment wall is allowed only when the substances on either side of the wall (piston) do not react dangerously with each other (see marginal 4.3.2.3.6).

[215 170]

### **6.10 REQUIREMENTS FOR THE CONSTRUCTION, EQUIPMENT, TYPE APPROVAL, TESTING AND MARKING OF VACUUM-OPERATED WASTE TANKS**

*Note: This Chapter applies to fixed tanks and demountable tanks.*

#### **6.10.1 General , scope (use of tanks), definitions**

[215 000-215 100]

##### **6.10.1.1 Definition**

**6.10.1.1.1** In the following requirements “*vacuum-operated waste tank*” means a fixed or demountable tank primarily used for the carriage of dangerous wastes, with special constructional features and/or equipment to facilitate the loading and discharge of wastes as specified in this Chapter.

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A tank which fully complies with the requirements of Chapters 6.7 or 6.8 is not considered to be a "vacuum-operated waste tank".

[215 101]

**6.10.1.1.2** The term "*protected area*" means the areas located as follows:

- (a) The lower part of the tank in a zone which extends over a 60° angle on either side of the lower generating line;
- (b) The top part of the tank in a zone which extends over a 30° angle on either side of the top generating line;
- (c) On the end front of the tank on motor vehicles;
- (d) On the rear end of the tank inside the protection volume formed by the device stipulated in 9.7.6.

[215 102]

### **6.10.1.2 Scope**

**6.10.1.2.1** The special requirements of sections 6.10.2 to 6.10.7 complete or modify Chapter 6.8 and are applied to vacuum-operated waste tanks.

Vacuum-operated waste tanks may be equipped with openable ends, if the requirements of Chapter 4.3 allow bottom discharge of the substances to be carried. [letter A or B in section 3 of the tank code, in accordance with 4.3.4.1.1].

Vacuum-operated waste tanks shall comply with all provisions of Chapter 6.8, with the exception of requirements overtaken by a special provision in this Chapter. However the provisions of 6.8.2.1.19, 6.8.2.1.20, 6.8.2.1.21 shall not apply.

[215 103]

### **6.10.2 Construction**

**6.10.2.1** Tanks shall be designed for a calculation pressure equal to 1.3 times the filling or discharge pressure but not less than 400 kPa (4 bar) (gauge pressure). For the carriage of substances for which a higher calculation pressure of the tank is specified in Chapter 6.8, this higher pressure shall apply.

[215 121]

**6.10.2.2** Tanks shall be designed to withstand a negative internal pressure of 100 kPa (1 bar).

### **6.10.3 Items of equipment**

**6.10.3.1** The items of equipment shall be so arranged as to be protected against the risk of being wrenched off or damaged during transport or handling. This requirement can be fulfilled by placing the equipment in a so called "*protected area*" (see 6.10.1.1.2).

[215 130]

**6.10.3.2** The bottom discharge of shells may be constituted by external piping with a stop-valve fitted

as close to the shell as practicable and a second closure which may be a blank flange or other equivalent device.

**[215 131]**

**6.10.3.3** The position and closing direction of the stop-valve(s) connected to the shell, or to any compartment in the case of compartmented shells, shall be unambiguous, and be able to be checked from the ground.

**[215 132]**

**6.10.3.4** In order to avoid any loss of contents in the event of damage to the external filling and discharge fittings (pipes, lateral shut-off devices), the internal stop-valve, or the first external stop-valve (where applicable), and its seatings shall be protected against the danger of being wrenched off by external stresses or shall be so designed as to withstand them. The filling and discharge devices (including flanges or threaded plugs) and protective caps (if any) shall be capable of being secured against any inadvertent opening.

**[215 133]**

**6.10.3.5** The tanks may be equipped with openable ends. Openable ends shall comply with the following conditions:

- (a) The ends shall be designed to be secured leaktight when closed;
- (b) Inadvertent opening shall not be possible;
- (c) Where the opening mechanism is power operated the end shall remain securely closed in the event of a power failure;
- (d) A safety or breakseal device shall be incorporated to ensure that the openable end cannot be opened when there is still a residual over pressure in the tank. This requirement does not apply to openable ends which are power-operated, where the movement is positively controlled. In this case the controls shall be of the dead-man type and be so positioned that the operator can observe the movement of the end at all times and is not endangered during opening and closing of the end; and
- (e) Provisions shall be made to protect the end and prevent it from being forced open during a roll-over of the vehicle.

**[215 134]**

**6.10.3.6** Vacuum-operated waste tanks which are fitted with an internal piston to assist in the cleaning of the tank or discharging shall be provided with stop-devices to prevent the piston in every operational position being ejected from the tank when a force equivalent to the maximum allowed working pressure of the tank is applied to the piston. The maximum allowed working pressure for tanks or compartments with pneumatic operated piston shall not exceed 100 kPa (1.0 bar). The internal piston shall be constructed in a manner and of materials which will not cause an ignition source when the piston is moved.

The internal piston may be used as a compartment provided it is secured in position. Where any of the means by which the internal piston is secured is external to the tank, it shall be placed in a position not

liable to accidental damage.

[215 135]

**6.10.3.7** The tanks may be equipped with suction booms if,

- (a) the boom is fitted with an internal or external stop-valve fixed directly to the shell, or directly to a bend that is welded to the shell;
- (b) the stop-valve mentioned in a) is so arranged that carriage with the valve in an open position is prevented; and
- (c) the boom is constructed in such a way that the tank will not leak as a result of accidental impact on the boom.

[215 136]

**6.10.3.8** The tanks shall be fitted with the following additional service equipment:

- (a) The outlet of a pump/exhauster unit shall be so arranged as to ensure that any flammable or toxic vapours are diverted to a place where they will not cause a danger;
- (b) A device to prevent immediate passage of flame shall be fitted to both the inlet and outlet of a vacuum pump/exhauster unit which may create sparks and which is fitted on a tank used for the carriage of flammable wastes;
- (c) Pumps which can deliver a positive pressure shall have a safety device fitted in the pipework which can be pressurised. The safety device shall be set to discharge at a pressure not exceeding the maximum working pressure of the tank;
- (d) A stop-valve shall be fitted between the shell, or the outlet of the overfill prevention device fitted to the shell, and the pipework connecting the shell to the pump/exhauster unit;
- (e) The tank shall be fitted with a suitable pressure/vacuum manometer which shall be mounted in a position where it can be easily read by the person operating the pump/exhauster unit. A distinguishing line shall be marked on the scale to indicate the maximum working pressure of the tank;
- (f) The tank, or in case of compartmented tanks, every compartment, shall be equipped with a level indicating device. Sight glasses may be used as level indicating devices provided:
  - (i) they form a part of the tank wall and have a resistance to the pressure comparable to that of the tank; or they are fitted external to the tank;
  - (ii) the top and bottom connections to the tank are equipped with shut-off valves fixed directly to the shell and so arranged that carriage with the valves in an open position is prevented;

(iii) are suitable for operation at the maximum allowed working pressure of the tank;  
and

(iv) are placed in a position where they will not be liable to accidental damage.

**[215 137]**

**6.10.3.9** Shells of vacuum-operated waste tanks shall have a safety valve preceded by a bursting disc.

**[215 138]**

#### **6.10.4 Tests**

Vacuum-operated waste tanks shall be subject to an internal and external examination at least every three years.

**[215 150]**

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