

Economic Commission for Europe

Inland Transport Committee

Working Party on the Transport of Dangerous Goods

Joint Meeting of the RID Committee of Experts and the Working Party on the Transport of Dangerous Goods

17 March 2014

Bern, 17–21 March 2014

Item 5 (a) of the provisional agenda

Proposals for amendments to RID/ADR/ADN:

Pending issues

Comments of the Russian Federation to document ECE/TRANS/WP.15/AC.1/2014/13, prepared by Ukraine

1. According to the Russian Federation, special provision TU16 of RID/ADR contains unnecessary, technically, economically and environmentally unjustified requirement when at "presentation to uncleaned empty tanks (from under phosphorus) shall be filled with water to not less than 96% and not more than 98% of their capacity...".
2. In the Russian Federation and other countries with a width of 1520 mm gauge railway there is a long safe and environmentally sound practices when, in accordance with the Rules of transportation of liquid cargoes in bulk in tank-wagons and wagons for transportation of bunker type bitumen (approved by the Council for Rail Transport of the Commonwealth minutes from May 21-22, 2009 № 50), after the transport of white phosphorus (yellow):

« 4.3.9. "Draining the tank car must be made in full. After draining the consignee is obliged to clean the tank from the phosphorus residues and sludge pour into the car-clean water tank (calcium chloride solution) layer of 25-30 cm, close the hatch tank car, put on the cap and seal protection cover his ZPU (security seals).

4.3.10. Sender empty tank car in the graph consignment "Name of the cargo" shall contain: "Tank wagon empty out white phosphorus (yellow), completely drained, cleaned of residual phosphorus yellow, sludge and filled with water (calcium chloride solution) high layer ___ cm transportation tank car is subject to conditions of carriage of white phosphorus (yellow). "
3. Melting white (yellow), phosphorous in the range +44 (+34) ° C. Design of the device to heat, heating and drainage technology completely eliminates (drain) molten phosphorus from the upper and middle parts of the tank.
4. According to the Russian Federation, the requirement that at "presentation to Uncleaned empty tanks (from under phosphorus) shall be filled with water to not less than 96% and not more than 98% of their capacity have no technical justification, as well as economically and environmentally unjustifiably.

Appendix 1

Tanks for yellow phosphorus

Tanks Model 15-1412 (Fig. 1) and 15-1525 (Fig. 2) are intended for transportation of yellow phosphorus in a crystallized form.

Tank is made of two layers of longitudinal steel sheet ВСТ3СП2 (09Г2С) + 12Х18Н10Т thickness sheets: 8 mm high and medium and 10 mm - low. The tank has a heating-cooling jacket. In the upper part of the tank 5 with a hatch lid 4, as shown in Fig. 3. On the hatch installed tubes: 2 - drain-filling product, 3 for water and 8 - Sampling; fitting pressure gauge valve 7 and 9. Tightness of the cover provided by staging paronit gaskets 1 and tightening bolts and plugs 6. For complete draining of the product in the lower part of the tank is welded pallet handling facilities in which the tube is lowered. Manhole cover with closed valve casing.

The product is transported in a crystallized form underneath the ice-solution thickness of not less than 300 mm.

Tank shown in Fig. 4 has a heating-cooling jacket, when used as dispensing, and when discharging the product. Bay water under cooling with phosphorus is performed through one of the nozzles 7, arranged on both sides in the middle portion of the casing. Dripping when heating tank during product discharge through a funnel 6.

Pouring the product into the tank produced by the closed method. To do this:

- (a) open the safety cover and remove the plugs from the pipes drain and phosphorus loading and water according to the inscriptions on the flanges;
- (b) open the cap on the nozzle 8 (see Fig. 3) and set the transmitter or other device for controlling the filling;
- (c) material supply line connected to the phosphorus discharge-filling nozzle and fix the flange bolts. Material line serving the phosphorus in the tank must be equipped with a steam jacket or steam companion, with a shirt or satellite fed pairs, and through the material line - hot water temperature of 65-70 ° C. Water supply is made to form a layer of water in the tank is not less than 50 cm;
- (d) after heating pipe to the tank fed phosphorus and made filling the tank. At the end of loading requires that in winter conditions over phosphorus was poured ice-layer solution (calcium chloride or sodium chloride), a height of 30 cm, and in hot climates and in the summer the water layer should be at least 40-60 cm;
- (e) rapid cooling of phosphorus in the tank in a heating-cooling jacket via one of the ports in the upper housing part is fed cold water. Release of water - through the second port. The water pressure in the housing may be not more than 0.05 MPa.

The tank may be transported only after complete solidification of phosphorus in the tank. After filling the tank, the product:

- (a) Turn off and disconnect the filler communication;
- (b) set caps on tubes discharge-filling product and water;
- (c) check for seals on the intake valve-safety;
- (d) close to locking safety hood.

To drain the tank of the product must:

- (a) tank brake handbrake;
- (b) open the protection cover of the hatch 3;
- (c) connect the steam line to the Warming-cooling jacket of the tank and make heating phosphorus in the tank. Steam is fed under pressure 0.02-0.03 MPa.

Drain the product from the tank can be done in two ways: by pressing out of the product water; by pumping.

When draining the product by pressing out:

- (d) to remove the plugs from the pipes drain and phosphorus loading and water;
- (e) material supply line connected to the nozzle discharge of phosphorus-loading;
- (f) to connect to the water nozzle water supply hose to the tank (water temperature should be no lower than 60-65 °C);
- (h) to produce water flow into the tank by creating a pressure therein to 0.2 MPa to completely drained product.

When draining pump pumping product:

after heating in the tank to remove phosphorus from the manhole cover and drain plug from the socket-filling material and connect the line to the pump;

continuing heating phosphorus in the tank to produce pumping product.

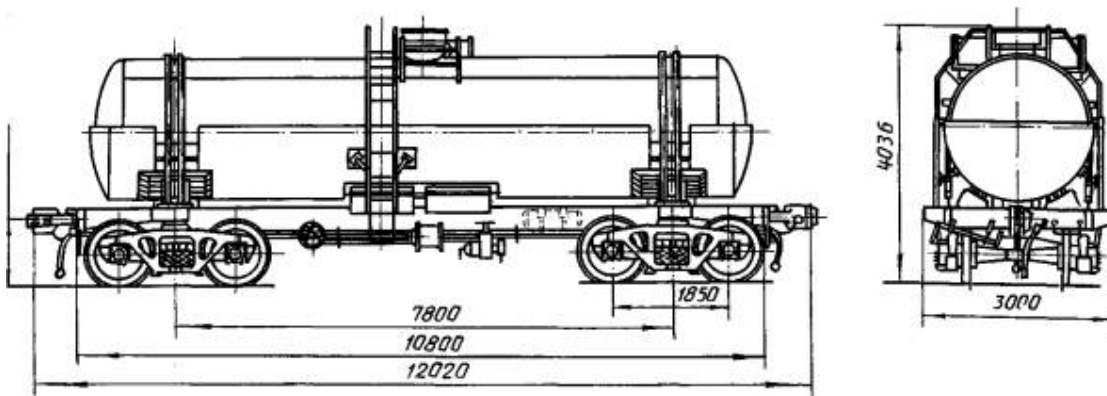


Fig. 1. Tetraaxial tank wagons for yellow phosphorus model 15-1412.

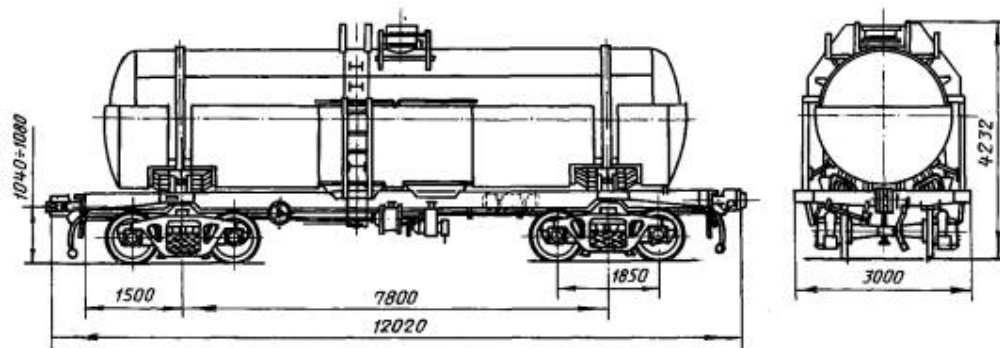


Fig. 2. Tetraaxial tank wagons for yellow phosphorus model 15-1525.

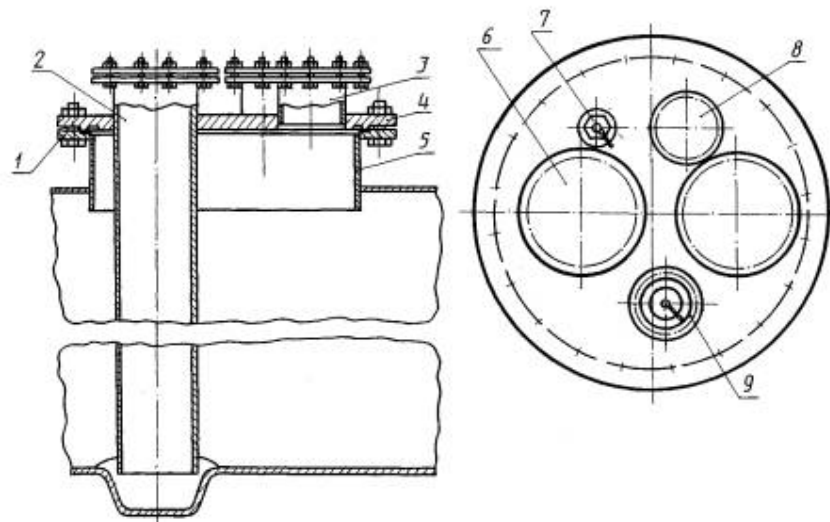


Fig. 3. Installing handling facilities and test valves on the tank model 15-1525:
 1 - gasket, 2, 3 - tubes, 4 - hatch, 5 - Sun 6 - Plug 7 - fitting pressure gauge, 8 - pipe 9 - valve.

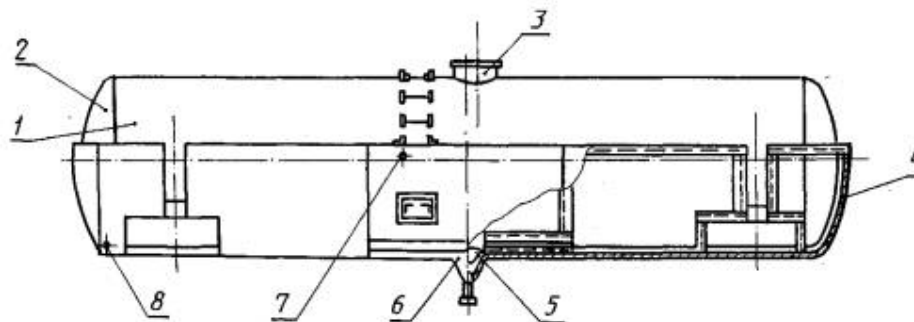


Fig. 4. Tank wagons for yellow phosphorus Model 15-1525:
 1 - shell, 2 - the bottom, 3 - sun, 4 - housing, 5 - pallet 6 - funnel, 7, 8 - tubes.

<http://www.gosthelp.ru/text/PosobieSpecializirovannye.html>

Appendix 2

Some physic-chemical and hazardous properties of phosphorus

White phosphorus

is a white substance (due to impurities can have a yellowish tint). In appearance it is very similar to the purified wax or paraffin, easily cut with a knife and deformed from small effort.

White phosphorus has a molecular structure, formula P_4 . Cast in an inert atmosphere in the form of rods (bars), it is stored in the absence of air beneath the purified water or in a special inert environment.

Easily soluble in organic solvents. Solubility of white phosphorus in carbon disulfide used for industrial cleaning it of impurities. Density of white phosphorus from all its modifications and the smallest is about 1823 kg/m^3 . White phosphorus melts at $44,1 \text{ }^\circ\text{C}$. In the vapor phase dissociation of molecules of phosphorus.

Chemically white phosphorus is extremely active. For example, it is slowly oxidized by oxygen in the air even at room temperature and light (green light-glow). White phosphorus is not only chemically active but also very toxic (causes damage to bone marrow necrosis of the jaws). Lethal dose of white phosphorus for an adult is $0.05\text{-}0.1 \text{ g}$.

Yellow phosphorus

The crude white phosphorus is usually referred to as "yellow phosphorus." Highly poisonous (maximum permissible concentration in air 0.0005 mg/m^3), flammable crystalline substance from light yellow to dark brown in color. Density of 1830 kg / m^3 , melts at $+34 \text{ }^\circ\text{C}$, boils at $+280 \text{ }^\circ\text{C}$. Insoluble in water, easily oxidized in air and ignites. Lights dazzling bright green flame, emitting a thick white smoke - tiny particles dekaoksid tetraphosphorus P_4O_{10} . Phosphorus reacts with water only at a temperature above 500 degrees Celsius, then water quenching the phosphorus is used in large quantities.
