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Railroad Tank Wagons Production, Market and Forecast in the CIS

The 2nd edition, revised

Sample PDF

Moscow
March, 2014

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Annotation

The present review is the revised edition of the market research of railroad tank wagons in the CIS countries.

Purpose of research is the analysis of the market of tank wagons in the CIS countries, with the identification of key market players and development prospects.

Object of research are tank wagons.

The chronological scope of the study: 2000-2013; forecast – 2014-2020.

Geography of research: the CIS countries.

This work is a "desk" research. As information sources, data of the Federal Service of State Statistics (Rosstat), the Federal Customs Service (FCS), the State Statistics Committee of Ukraine, the State Customs Committee of Ukraine, the Republic of Kazakhstan Agency for Statistics, the National Statistics Committee of Belarus were employed.

Also, reports of issuers of securities, data of regional and industry media and Internet sites of producers and consumers of tank wagons were used.

The report contains 76 pages, including 24 tables, 29 figures and 2 Appendices.

The **first** chapter of the report contains general information on tank wagons, manufactured in the CIS.

The **second** chapter is devoted to the analysis of statistical data on the production of tank wagons in the CIS in the period from 2000 to 2013. It presents data on dynamics of production of this type of rolling stock, the largest manufacturers of these products in the CIS countries.

The chapter considers the current condition of the major players in the market of railroad tank cars. Unlike the previous version of the report, data are presented not only on the volume and dynamics of production, but also on the structure of production by types of produced tank wagons.

The **third** chapter of the report analyzes statistical data on foreign trade in Russia and Ukraine with tank wagons in 2000-2013. The main directions of supplies of these products are considered, and major consumers are identified.

The **fourth** chapter of the report presents data on the dynamics of prices for various types of tank wagons in 2009-2013.

The **fifth** chapter is devoted to consumption of tank railroad cars in the CIS countries. It provides information about the size of the fleets of tank wagons in Russia, Ukraine, Kazakhstan and Belarus, the age structure of the fleets of oil and gas tank railroad cars.

This chapter also presents data on the dynamics and structure of cargo carriage on the Russian railway network in general, and the volume and structure of the main types of goods transported in tank wagons.

The **sixth** chapter analyzes the current situation in the market of railroad tank cars and gives a forecast of its development for the period until 2020.

Appendix 1 lists the specifications of tank wagons, Appendix 2 shows the basic contact information for the manufacturers of these products.

1. General characteristics of tank wagons

A tank wagon or a cistern (from Latin *cisterna* - pond, reservoir) is an artificial decked structure (container) for storage or transportation of liquids, liquefied gases, and granular materials.

A tank wagon is a kind of rolling stock and is a welded metal tank of cylindrical shape, placed horizontally on a solid metal frame or two half-frames at its ends.

Depending on the type of transported goods wagons are divided into general-purpose tanks and special tanks. For general-purpose tanks belong tanks for transportation of a wide range of liquid petroleum products that do not require heating during loading and unloading in the range of climatic changes of temperature of the cargo. Tanks of general purpose constitute the bulk of the fleet of tank railroad cars.

Special tank wagons are intended for the carriage of certain types of cargo - liquefied and gaseous cargoes, liquid dangerous goods, including a wide range of chemicals, food products, cement, etc.

The tank or its individual sections have devices for loading and unloading, whose form depends on the load. The barrel of a tank wagon may be intended for the carriage of cargo without overpressure (petroleum, food, chemicals, etc.) or pressurized (liquefied gases).

For transportation of liquefied gases having a boiling point below the normal conditions the wagons with cryogenic vessels are used. To protect the metal of the barrel from corrosion caused by the carried substances special internal coatings or additives of corrosion inhibitors to the cargo are applied.

Vessels of special tanks may have a thermal insulation coating or equipment for heating the carried product, as well as instruments for monitoring its condition.

Permitted types of wagons for transportation of specific types of dangerous goods are set by technical specifications, standards specific to the product, and shipping rules.

Tank wagons are designed with consideration of the properties of dangerous goods, for which transportation they are intended, and, accordingly, tanks are equipped with special devices for performing loading/unloading operations and providing the security of transportation.

For each type of tanks the manufacturer develops among the technical documentation a manual for operational service, loading and unloading of the transported product, taking into account the design features of a particular model.

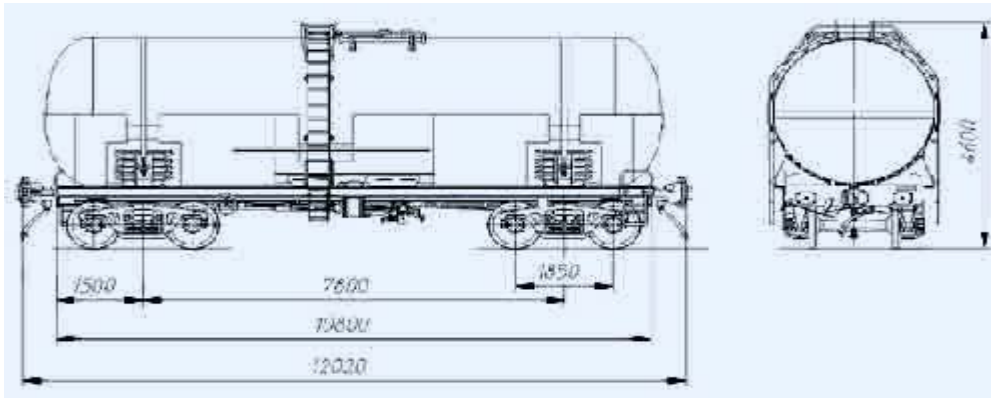
The volume of the barrel of a tank wagon and its carrying capacity varies in a very wide range. Main technical characteristics produced in the CIS tank wagons are presented in Appendix 1.

To increase the carrying capacity of the railways, the wagon manufacturers modernize the railcar freight rolling stock toward improving its main indicators - an increase of the specific volume of the tank, a reduction of the tare weight and an increase of the loading capacity.

The main types of cargo carried by tank railroad cars are oil and petroleum products, as well as chemical and petrochemical products.

Fig. 1 shows the specifications of the tank for transportation of viscous oil, Fig. 2 - for transportation of liquefied petroleum gases (propane, n-butane, isobutane, propane, butane, propylene, unstable gas gasoline, isopentane, n-pentane, etc.).

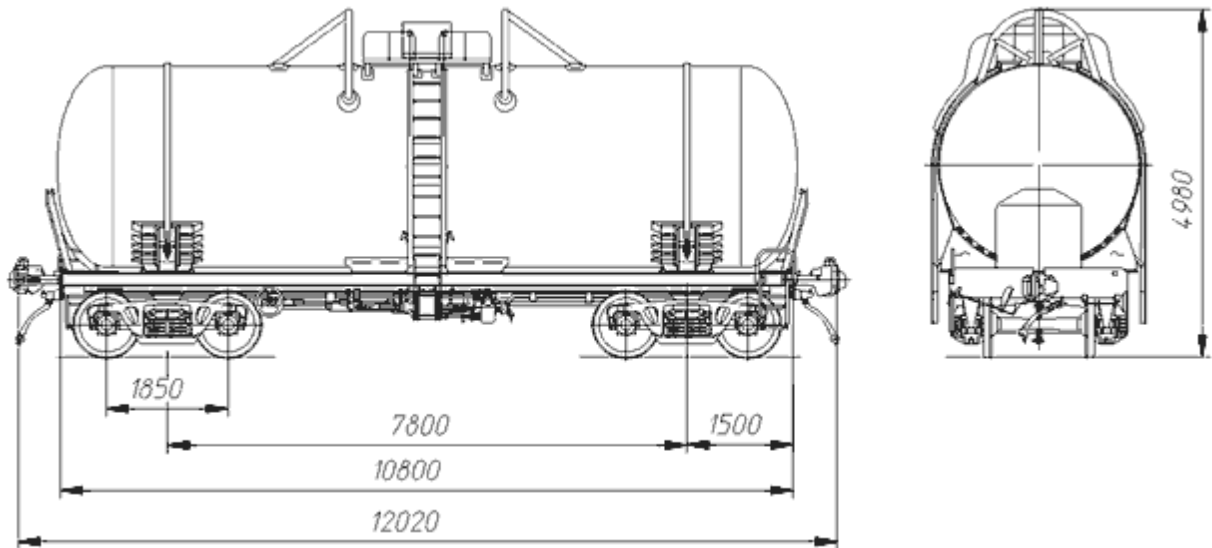
Figure 1. Technical specifications of the railway tank for transportation of viscous oil (the model 15-1566)



Track width, mm	1520
Carrying capacity, tons, at most	66
Tare weight, tons	28,4
Maximum calculated static load of wheel pair on rails, kN	230,0
Length over coupler pulling faces, mm, not less	12020
Body volume, m ³ :	
- full	72,44
- useful	69
Inner diameter of the barrel, mm	3000
External barrel length, mm	10880
Wheelbase, mm	7800
Console, mm	1500
Dimensions according to GOST 9238-83	02-VM
Frame length, mm	10800
Design speed, km/h	120
Operating pressure in the barrel, MPa, at most	0,069
The pressure in the barrel at the hydraulic test, MPa, at most	0,39
Adjusting pressure of the relief valve, MPa	0,15
Adjusting pressure of the intake valve, MPa	-0,01
Working pressure of a steam jacket	0,049
Availability of the barrel incline to a drain device	yes
Calibration type	72
Manufacturer	UralVagonZavod

Source: JSC "SPC "UralVagonZavod"

Figure 2. Technical specifications of the railway tank for transportation of liquefied petroleum gases (the model 15-144)



Carrying capacity, tons, at most	40,8
Tare weight, tons	37,7
Maximum calculated static load of wheel pair on rails, kN (tons)	230 (23,5)
Length over coupler pulling faces, mm, not less	12020
Barrel volume, m ³ :	
- full	73,9
- useful	62,8
Inner diameter of the barrel, mm	3000
Barrel length, mm	11004
Base of a tank, mm	7800
Dimensions according to GOST 9238:	
- trolleys	02-VM
- tank wagon	1-T
Design speed, km/h	120
Maximum height from rail head, mm	5055
Type of a coupler	SA-3 nonrigid
Bogie model	18-100, Type 2

Source: JSC "SPC "UralVagonZavod"