

# SYSTEM OF MEASURES TO PROVIDE FUEL QUALITY AT GASOLINE STATIONS

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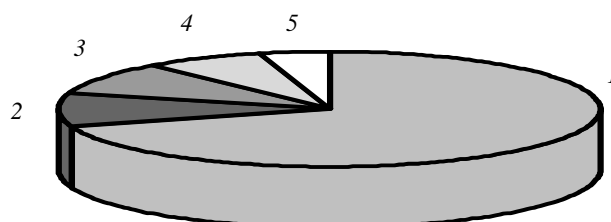
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**Keywords:** quality, fuel, transport, ecological problems, gasoline station.

## Introduction

Problem of providing a fuel quality distributed at gasoline stations is very actual today. There are two main reasons of non-quality gasoline supply by fuel-filling stations: the production of fabricated gasoline and violations of production technology, transportation and storage of gasoline.

Energy ecological problems and aspects of its rational development are very urgent today (figure 1).



**Figure 1: Harmful substances emission balance during transport exploitation:**

1 – automobile transport (70 %); 2 – agricultural (9,4 %);  
3 – railway (9,2 %); 4 – air (7,3 %); 5 – water (4,1 %).

Fuel for transport engines is well-known toxically harmful substances, which can cause industrial injury, diseases or health problems of people who work in specific area. Environment pollution by oil products is caused by its evaporation or leakage and fuel combustion emissions into atmosphere during engine working.

High atmospheric air quality providing is one of the most important aspects. Ukraine with other industrialized countries signed and performs Montreal protocol (1988) about ozone depletion protection, Convention of Organization of United Nations at New-York (1992) about climate change and Kiyoto Protocol (1997), which assigned decreasing of harmful substances emissions to the whole country and separately to each branch of economy, where energy is individual part. The main goal is to prevent global consequences from carbon dioxide and other emissions, which cause ozone depletion.

Requirements for harmful substances emissions regulate by rule 49 EEC OUN and directive 88/77 EU (table 1).

**Table 1: Regulations for transport ecological compatibility**

Directive EU and rules EEC OUN	Harmful substances emissions, g/kw			
	CO	CH	NO <sub>x</sub>	Particular matter
Rule 49 EEC OUN	14,0	3,5	18,0	—
Directive 88/77 EU	11,2	2,4	14,4	—
Euro-1 (from 1993)	4,5	1,1	8,0	0,36
Euro-2 (from 1996)	4,0	1,1	7,0	0,15
Euro-3 (from 1.10.2000)	2,0	0,6	5,0	0,1
Euro-4 (2003–2005 years)	1,5	0,5	3,5	0,08
Euro-5 (2006–2009 years)	1,0	0,5	2	0,05

**Table 2: Regulations dynamic for automobile toxicity**

Norms	Engine type	Introduction term (Europe)	Maximum-permissible emissions of harmful substances, g/km				
			CO	CH	NO <sub>x</sub>	CH + NO <sub>x</sub>	Particular matter
Euro-1	Petrol	1993	2,72	—	—	0,97	—
	Diesel		2,72	—	—	0,97	0,14
Euro-2	Petrol	1996	2,2	—	—	0,05	—
	Diesel		1,0	—	—	0,7	0,08
Euro-3	Petrol	2000	2,3	0,2	0,15	—	—
Euro-4	Petrol	2005	1,0	0,1	0,08	0,3	0,025
	Diesel		0,5	—	0,25	—	—

**Table 3: Regulations dynamic for diesel automobile toxicity**

Norms	Introduction term (Europe)	Maximum-permissible emissions of harmful substances, g/kW*h			
		CO	CH	NO <sub>x</sub>	Particular matter
Euro-2	1996	4	1,1	7	0,15
Euro-3	2000	2,1	0,66	5	0,1—0,13
Euro-4	2005	1,5	0,25	2	0,02
Euro-5	2008	1,5	0,25	2	0,02

USA selected strategic direction in reformulated petrol producing for increasing of petrol ecological characteristics. California State developed hardwired production and application of reformulated petrol – California Air Resources Board (CARB-I, CARB-II).

Production technologies of modern motor fuels are high technologies, and oil companies invest huge sums for their introduction and certification according to the ISO 9000 and ISO 14000.

To improve the quality of produced motor fuels it is necessary to certify a production of products, at that an order of licensing and issuing the certificate must provide a guarantee of stable quality of output.

Contamination of motor fuels by resin compounds and water during transportation, storage and distribution at gasoline stations are unsolvable problems too. Therefore, the quality of motor fuels can be guaranteed only if will be infuse a strict adherence to production technology, skilled quality control of finished products and providing proper transport and storage conditions. As reliability, durability, cost effectiveness and reliability of the vehicle engine can be achieved only if used gasoline corresponds to exploitation indicators established by standard-technical documentation.

Permanently growing prices on petroleum products, rapid increase of gasoline stations quantity, increased losses from evaporation of petroleum products, increasing fuel quality requirements, quantity increase of control organizations - this is not an exhaustive list of reasons why quality control from the side of owners moving from cumbersome in the format required consciously.

To solve this enough difficult problem we would propose to consider a system of procedures which will help to improve the quality of petroleum products at gasoline stations.

First of all it should be organize a quality control of gasoline and diesel fuels by micro-laboratories located in the office or on the station.

Second way is connected with the input of required controlling documentation to create a principal new system of control, which will be base on these documents. Its essence is as follows.

First stage of control is not oversight, it's rather informative. Each gasoline station owner monthly checks quality of products sold by technical means - either independently or in specialized organizations that have the necessary equipment and personnel. Then he transfers the information to the information center of fuel quality monitoring at gasoline stations. In case of poor fuel indication, any sanctions will not be applied.

Second stage of control is supervisory control. Organization controls a fuel sampling, and if tests show their inconsistencies, then imposed some sanctions. Also this organization will be superposing by a function of technical quality control of motor fuel at gasoline stations (sampling and testing organization).

Other direction to improve the quality of fuels is a creation of the nationwide hotline - Emergency Referral Service, which will take comments, complaints and suggestions from consumers to service of gasoline stations during 24 hours.

Introduction of system of procedures to provide a quality of fuels at gasoline stations, which we proposed, will at least partially solve the problem associated with filling of vehicles by poor quality fuel.