



ARGUS UKRAINIAN MOTOR FUELS

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The most up-to-date Argus Ukrainian Motor Fuels methodology is available on www.argusmedia.com

Market overview

Ukraine produces and imports up to 10mn t/year of motor gasoline and diesel. Ukrainian refinery output is insufficient to satisfy domestic demand. Import share varies from 30pc to 70pc depending on market fundamentals.

Gasoline consumption in Ukraine peaks in May–September, and diesel – in April–September. During the cold season (November to March) Ukrainian refineries produce winter-grade diesel. Winter and summer diesel grades overlap between seasons.

Refineries in Lisichansk, Kremenchug and Shebelinka gas processing plant are the main producers of motor fuels in Ukraine.

Gasoline is imported from Romania, Lithuania, Belarus, Russia and Poland, while diesel is brought from Russia, Belarus, Kazakhstan and Lithuania. Products are imported by rail, pipeline and by sea.

Importers and refinery operators prioritise supplies to own retail networks and sell the remainder on the open market.

Price reporting and analysis

Argus publishes price assessments for domestically produced and imported motor fuels in in the Russian-language daily *Argus Ukrainian Motor Fuels*. Argus publishes prices that report and reflect prevailing levels for open-market arm's length transactions (please see the Argus Global Compliance Policy for a detailed definition of arm's length). The information on deals done, bids and offers is collected from traders, producers, wholesale consumers and other market participants by phone or electronic means of communication throughout the day. All data received are subject to detailed re-research and re-verification. The report is then distributed at 6.00pm Kiev time.

Domestic market prices

Argus price assessments for Ukrainian domestic market reflect information gathered on transactions and daily bid/ask spreads for each product under the general terms and conditions employed for standard contracts in common use. Cargo size for Ukrainian domestic market is 60–600t with delivery within 1–15 days basis fca railway station. As a rule full payments are made in advance. Prices are set daily in hryvnas per ton (*see table below*). The number of companies with direct access to producers is limited. If there is more than one offer on the market from the same refinery Argus

assessment reflects the lowest price available for maximum number of buyers.

When assessing fuel on domestic market the prices of the traders which are working with Ukrainian refineries and imported products are accounted.

Quotations are published with the minimum and maximum values. As a rule, deals made on the open market are within that range. The volumes of the product offerings should be sufficient for the assessment of each product on the market. In case if the product was not available on the open market in the sufficient amount for assessment, the quotation of this product will not be published this day.

Fuel quality

Ukrainian gasoline quality usually complies with DSTU 4063:2001 and DSTU 4839:2007 standards (*see p4, 6*), and diesel – with DSTU 3868:99 and DSTU 4840:2007 standards (*see p5, 7*). But producers and importers also supply products of different quality to the market. There is no common methodology for price adjustment depending on product quality. Traders rely on their experience in most cases.

If the quality of product supplied within the framework of a specific transaction (or when defining demand and supply level) differs from the quality specified in this methodology, the price differential is based on the trading practice.

Gasoline and diesel fuel quality differs substantially depending on delivery basis. Argus publishes prices for the following product grades:

Mogas fca Kagamlyskaya

Since 2011 Kremenchug refinery (Poltava region) produces gasoline Mogas A-95 and Mogas A-92 which comply with Euro-4 standard for auto engines.

Mogas fca Novozolotarevka

Since July 2011 Lisichansk refinery (Lugansk region) produces Mogas A-95 and Mogas A-92 which comply with Euro-4 standard for auto engines.

Mogas fca Shebelinka

Shebelinka gas processing plant basis fca Shebelinka railway

Domestic products prices

Refinery/terminal	Location	Basis	Mogas A-95	Mogas A-92	Mogas A-80	Summer diesel	Winter diesel
Kremenchug refinery	Kagamlyskaya	fca	X	X	X	X	X
Lisichansk refinery	Novozolotarevka	fca	X	X	–	X	X
Shebelinka gas processing plant	Shebelinka	fca	X	X	X	X	X
Novograd-Volynsky terminal	Novograd-Volynsky	fca	–	–	–	X	–
Korosten station	Korosten	fca	X	X	–	X	X
Feodosiya/Kherson terminal	Ayvazovskaya/ Kherson	fca	X	–	–	–	–

station (Kharkov region) produces Mogas A-95, Mogas A-92 and Mogas A-80 which comply with Euro-2 standard for auto engines.

Mogas A-95 fca Korosten (Euro-5)

Importers supply Belarusian and Lithuanian Mogas A-95 which complies with Euro-5 standard for auto engines to railway station Korosten (Zhytomir region). Argus publishes prices for Belarusian Mogas A-95.

Mogas A-95 fca Ayvazovskaya/Kherson (Euro-5)

Importers supply Mogas A-95 which complies with Euro-5 standard for auto engines to terminals in Feodosiya (Krym region) and Kherson. Products supplied from Romania, Bulgaria and Mediterranean countries.

Mogas A-92 fca Korosten (Euro-3, 4)

From Belarusia to railway station Korosten (Zhytomir region) importers supply Mogas A-92 which complies with Euro-2 and Euro-3 standards for auto engines. The price of the product does not depend on the ecological standard.

Diesel fca Kagamlykyskaya (sulphur content up to 50ppm)

Kremenchug refinery (Poltava region) produces diesel with sulphur content up to 50ppm.

Diesel fca Novozolotarevka (50ppm)

Argus publishes prices for 50ppm diesel produced by Lisichansk refinery basis fca Novozolotarevka railway station (Lugansk region).

Diesel fca Shebelinka (2,000ppm)

Argus publishes prices for 2,000ppm (0.2pc) diesel produced by Shebelinka gas processing plant basis fca Shebelinka railway station (Kharkov region).

Diesel fca Novograd-Volynsky (500ppm)

Argus publishes prices for 500ppm (0.1pc) diesel supplied by pipeline from Russia basis fca Novograd-Volynsky (Zhitomir region).

Diesel fca Korosten (10ppm)

Argus publishes prices for 10ppm diesel supplied from Belarus to Korosten railway station (Zhitomir region).

Imported products prices

Argus publishes price assessments for motor gasoline and diesel imported to Ukraine from Lithuania, Belarus, Russia and Romania in the daily *Argus Ukrainian Motor Fuel* report. Argus reporters analyze information on deals done, bids and offers for cargoes delivered within 15 days on cif or daf basis with 100pc prepayment.

Size is 500-2,500t for rail cargoes and 1,000–5,000t for pipeline and tanker cargoes. Prices are published daily in US dollars per tonne (see table below). Full payment for fuel is made in advance.

Particularities of pricing:

Imported product sales at discharge ports or border crossings are usually priced at formulas linked to international benchmark assessments. Argus discovers pricing differentials over the course of the trading day, and applies them to latest available international benchmarks published in *Argus European Products* daily report. Separately Argus quotes spot and term contracts.

Quotations based on long-term contracts include:

Mogas A-95 daf Belarussian border

Argus publishes prices for term contracts with A-95 gasoline produced by Mazeikiu Nafta refinery basis daf Ukraint-Belarus border. About 80pc of the product supplied from Lithuania to Ukraine is sold under term deals, and spot sales are insignificant. For Lithuanian gasoline the quotation period is three days before the date of shipments, and for Belarusian - average quotation of the current month for the respective date. Mogas A-95 complies with ecological standard Euro-5.

Quotations of the contracts on the spot market:

Mogas A-95 cif Feodosiya, cif Kherson

Argus assessments of seaborne prices for A-95 gasoline are based on deals done, bid and offer levels for 5,000t cargoes basis cif Kherson and cif Feodosiya, as well as prices at fob Constanta (Romania) and market freight rates for shipments between Constanta and Ukrainian ports. Mogas A-95 complies with ecological standard of auto engines Euro-5. Prices do not include port charges. These prices apply for products with the base density units 745. For gasoline the quotation period is three days before the date of the shipment.

Mogas A-92 and diesel daf Belarussian border

Argus price assessments for Belarusian gasoline and diesel are based on deals done at the Electronic Trading System of Belarus' state-owned refining concern Belneftekhim. These quotations calculated by the average quotation of similar products in Europe from the beginning of the current month.

Diesel ddu Novograd-Volynsky

Russian gasoil quotations calculated based on the average sulfur gasoil quotes in Europe from the beginning of the current month.

Imported products assessments				
Product origin	Basis	Mogas A-95	Mogas A-92	Diesel
Belarus	daf Ukraine/Belarus border	X	X	X
Lithuania	daf Ukraine/Belarus border	X	–	–
Russia	ddu Novograd-Volynsky	–	–	X
Romania	cif Kherson	X	–	–
Black Sea basin countries	cif Feodosiya	X	–	–

Fuel quality

Mogas A-95

Participants of Ukrainian gasoline market normally distinguish A-95 premium grade (complies with Euro-5) and A-95 standard grade (does not comply with Euro-5). Premium A-95 gasoline is sold at retail stations under individual brands at higher prices. Wholesale cargoes of this grade are also sold at a premium to prices for standard A-95 gasoline.

Diesel daf Ukraine-Belarus border

Diesel sold basis daf Ukraine-Belarus border crossings at Udritsk/Goryn, Slovechno/Berezhest, Teryukha/Gornostaevka, Terekhovka/Khorobichi is supplied from Belarusian refineries in Mozyr and Novopolotsk, as well as from Mazeikiu refinery in Lithuania. Argus publishes prices for 10ppm diesel produced by Mozyr refinery.

Diesel ddu Novograd-Volynsky

Diesel supplied via product pipeline from Russia to the terminal in Novograd-Volynsky contains up to 500ppm sulphur. Pipeline is used only for summer-grade fuel regardless of the season. Argus publishes prices for 500ppm summer-grade diesel basis ddu Novograd-Volynsky.

Netback prices

In addition to domestic and imported cargo prices, Argus calculates the netback price indexes to compare profitability of fuel exports from Russian and Belarusian refineries to Ukraine and Northwest Europe (through the port of Ventspils). These indexes are set daily by netting back prices for similar products from Ukrainian and European markets to the common basis (market prices minus taxes and transportation costs).

Russian diesel

Diesel prices basis fca Novograd-Volynsky in hryvnas per tonne are converted into US dollars per tonne (based on the interbank exchange rate provided by *Ukrdealing*) and cleared of taxes (VAT, ecological tax and excise tax), storage and loading costs in Novograd-Volynsky, pipeline tariffs in Ukraine and Belarus to the Russian border, and dispatching costs.

In a similar manner, the average quotation of Russian gasoil price basis cif Northwest Europe calculated cumulatively from the beginning of the month, is cleared of freight market assessment for 30,000t clean product tankers on Ventspils – Rotterdam route, port loading in Ventspils, pipeline transportation and dispatching costs in Latvia, Lithuania and Belarus. Two netback prices at daf Russian-Belarusian border are then compared to assess relative profitability of Russian gasoil exports to Ukraine and Northwest Europe.

Belarussian diesel fuel

Diesel prices basis fca Korosten in hryvnas per tonne are converted into US dollars per tonne (based on the interbank exchange rate provided by *Ukrdealing*) and cleared of taxes (VAT, ecological tax

and excise tax), railway tariffs on Berezhest – Korosten route (including VAT) and Barbarov – Slovechno route (net of VAT).

In a similar manner, the average quotation of French diesel 10ppm cargo price basis cif Northwest Europe calculated cumulatively from the beginning of the month, is cleared of freight market assessment for 30,000t clean product tankers on Ventspils – Rotterdam route, port loading in Ventspils and railway transportation costs across Latvia and Belarus (Barbarov – Bigosovo, net of VAT). Two netback prices at fca Barbarov are then compared to assess relative profitability of Belarusian diesel exports to Ukraine and Northwest Europe.

Belarussian A-95 gasoline

Gasoline prices basis fca Korosten in hryvnas per tonne are converted into US dollars per tonne (based on the interbank exchange rate provided by *Ukrdealing*) and cleared of taxes (VAT, ecological tax and excise tax), railway transportation costs on Berezhest – Korosten route (including VAT) and Barbarov – Slovechno route (net of VAT).

In a similar manner, the average quotation of Eurobob fob Northwest Europe calculated cumulatively from the beginning of the month, is cleared of freight market assessment for 30,000t clean product tankers on Ventspils – Rotterdam route, port loading in Ventspils and railway costs across Latvia and Belarus (Barbarov – Bigosovo, net of VAT). Two netback prices at fca Barbarov are then compared to assess relative profitability of Belarusian gasoline exports to Ukraine and Northwest Europe.

Belarussian A-92 gasoline

Gasoline prices basis fca Korosten in hryvnas per tonne are converted into US dollars per tonne (based on the interbank exchange rate provided by *Ukrdealing*) and cleared of taxes (VAT, ecological tax and excise tax), railway transportation costs on Berezhest – Korosten route (including VAT) and Barbarov – Slovechno route (net of VAT).

In a similar manner, the average quotation of 91r motor gasoline cif Northwest Europe calculated cumulatively from the beginning of the month, is cleared of freight market assessment for 30,000t clean product tankers on Ventspils – Rotterdam route, port loading in Ventspils and railway costs across Latvia and Belarus (Barbarov – Bigosovo, net of VAT). Two netback prices at fca Barbarov are then compared to assess relative profitability of Belarusian gasoline exports to Ukraine and Northwest Europe.

The methodologies for European products and freight rates assessments are available at www.argusmedia.com.

International market prices

International prices for gasoline and diesel are published in *Argus European Products* daily. Price reporting methodology is available at www.argusmedia.com in European Products section.

Physical, chemical and performance indicators of motor gasoline (Ukrainian national standardization system 4839-2007)				
Indicator	Values for the following grades			Inspection method
	A-92-Euro	A-95-Euro	A-98-Euro	
1. Antiknock value:				
- research octane number, min.	92,0	95,0	98,0	according to GOST 8226 or EN ISO 5164 [1] or ASTM D 2699 [2]
- motor octane number, min.	82,5	85,0	88,0	according to GOST 511 or EN ISO 5163 [3] or ASTM D 2700 [4]
2. Lead concentration, mg/dm ³ , max	5	5	5	according to Ukrainian national standardization system EN 237, or GOST 28828, or EN 237
3. Density at 15 C, kg/m ³ , within	720-775	720-775	720-775	according to Ukrainian national standardization system GOST 31072 or ASTM D 1298 [6] or EN ISO 3675 [7] or EN ISO 12185 [8] or ASTM D 4052 [9]
4. Sulphur content, mg/kg, max				
type I	10	10	10	according to Ukrainian national standardization system ISO 20846 or EN ISO 20846 [10] or EN ISO 20884 [11]
type II	50	50	50	according to Ukrainian national standardization system ISO 20846 or EN ISO 20847 or EN ISO 20846 [10] or EN ISO 20847 [12] or EN ISO 20884 [11]
5. Oxidation stability (induction period), min., not less than	360	360	360	according to GOST 4039 or ASTM D 525 [13] or ASTM D 873 [14] or EN ISO 7536 [15]
6. Existent gum concentration, mg/100 cm ³ max	5	5	5	according to Ukrainian national standardization system GOST 1567 or ASTM D 381 [16] or EN ISO 6246 [17]
7. Copper plate test	OK	OK	OK	according to GOST 6321
8. Acid neutralisation value	1	1	1	
(3 hours ± 5 min) at				according to GOST 6321 or EN ISO 2160 [18] or ASTM D 130 [19]
50 C, class max				
8. Appearance	transparent and clear, without suspended solids and water	transparent and clear, without suspended solids and water	transparent and clear, without suspended solids and water	Visual inspection according to 9.3
9. Carbohydrate volume ratio				according to Ukrainian national standardization system EN 14517 or GOST 29040 or ASTM D 1319 [20] or ASTM D 5134 [21] or ASTM D 5580 [22] or ASTM D 6729 [23] or EN 14517 [24]
% max				
- olefine	18	18	18	
- aromatic	35	35	35	
10. Benzene volume ratio, %	1	1	1	according to Ukrainian national standardization system 4019 or Ukrainian national standardization system EN 238 or Ukrainian national standardization system EN 12177 или Ukrainian national standardization system EN 14517 or GOST 29040 or COУМПЕ 23.2.004 [25] or ASTM D 5580 [22] or EN 238 [26] or EN 12177 [27] or EN 14517 [24]
max				
11. Oxygen weight content, %, max	2,7	2,7	2,7	according to Ukrainian national standardization system EN 13132 or Ukrainian national standardization system EN 1601 or EN 1601 [28] or EN 13132 [29] or ASTM D 5845 [30]
12. Volume ratio of organic oxygen-containing compounds				
% max				
- methanol	3	3	3	according to Ukrainian national standardization system EN 1601 or Ukrainian national standardization system EN 13132 or ASTM D 4815 [31] or ASTM D 5845 [30] or EN 1601 [28] or EN 13132 [29]
- ethyl alcohol	5,0	5,0	5,0	
- isopropyl alcohol	10	10	10	
- isobutyl alcohol	10	10	10	
- tert-butyl alcohol	7	7	7	
- simple ethers	15	15	15	
- other organic oxygen-containing compounds with max. end boiling point 210 C	10	10	10	
[1] Inspection techniques referred to in this standard must contain accuracy requirements, otherwise EN ISO 4259 [32] methodologies are used.				
[2] 0.2 correction factor must be used for final calculations prior to data registration according to the requirements of EU Directive 98/70/EC [33], including 2003/17/EC [34] amendment				
[3] Reference method (if disputable) with factor 3 - EN ISO 3675 [7]				
[4] Reference method (if disputable) with factor 9 - ASTM D 1319 [20]				
[5] Reference method (if disputable) with factor 10 - EN 12177 [27]				
[6] Reference method (if disputable) with factor 11, 12 - EN 1601 [28]				
[7] Stabilizing agent added				
[8] Stabilizing agent added if necessary				
Reference method if products are supplied to the domestic market.				

Physical, chemical and performance indicators of gasoil (DSTU 4840-2007 standard)		
Indicator	Value	Inspection method
1. Octane number, not less than	51	according to GOST 3122 or ASTM D 613 [1] or EN ISO 5165 [2]
2. Octane index, not less than	46	according to GOST 27768, Ukrainian national standardization system ISO 4264 or ASTM D 4737 [3] or EN ISO 4264 [4] and 9.7
3. Density at 15 C, kg/m ³ within	820-845	according to Ukrainian national standardization system GOST 31072, or ASTM D 1298 [5] or EN ISO 3675 [6] or EN ISO 12185 [7] or ASTM D 4052 [8]
4. Weight percent of polycyclic aromatic hydrocarbons, %	11	according to Ukrainian national standardization system EN 12916 or EN 12916
max		
5. Sulphur content, mg/kg, max		
type I	10	according to Ukrainian national standardization system ISO 20846, or EN ISO 20846 [10] or EN ISO 20884 [11]
type II	50	according to Ukrainian national standardization system ISO 20846, or Ukrainian national standardization system ISO 20847 or EN ISO 20846 [10] or EN ISO 20847 [12] or EN ISO 20884 [11]
6. Flammability point in closed cup, C, at least	55	according to Ukrainian national standardization system ISO 2719, or GOST 6356 or ASTM D 93 [13] or EN ISO 2719 [14]
7. Coking ability of 10% residue, %, (wt), max	0,30	according to GOST 19932, or GOST 8852 or ASTM D 189 [15] or ASTM D 524 [16] or EN ISO 10370 [17]
8. Ash, % (wt.), max	0,01	according to GOST 1461, or ASTM D 482 [18] or EN ISO 6245 [19]
9. Water content	нет	according to GOST 2477
or water content, mg/kg max	200	according to EN ISO 12937 [20]
10. Suspended solids	нет	according to GOST 6370
or residue, mg/kg, max	24	according to EN 12662 [21]
11. Copper plate test	OK	according to GOST 6321
or neutralisation value 3 hours +_ 5 min	1	according to GOST 6321, or EN ISO 2160 [22] or ASTM D 130 [23]
at 50C, class, max		
12. Oxidation stability, r/m ³ , max	25	according to ASTM D 2274 [24] or EN ISO 12205 [25]
13. Lubrication capacity: wear scar diameter	460	according to EN ISO 12156-1 [26] or Ukrainian national standardization system ISO 12156-1
at 60 C, micron, max		
14. Kinematic viscosity at 40 C, mm ² /s, within	2,00-4,50	according to Ukrainian national standardization system GOST 33, or ASTM D 445 [27] or EN ISO 3104 [28]
15. Fractional composition:		according to GOST 2177 (method A) or
at 250 C	65	Ukrainian national standardization system ISO 3924 or ASTM D 86 [29] or EN ISO 3405 [30]
vaporizes, % (vol.) max		
at 350 C	85	
vaporizes, % (vol.) not less than		
95 % (vol.) vaporizes at, C, not higher than	360	
16. Volume ratio of methyl ethers of fatty acids	5	according to EN 14078 [31]
% max		
<i>Reference method if products are supplied to the domestic market.</i>		

Physical, chemical and performance indicators автобензина (Ukrainian national standardization system 4063:2001)						
Indicator	UOM	A-76	A-80	A-92	A-95	A-98
Density at 20 deg.C	kg/m ³	700-760	700-760	725-780	725-780	725-780
Antiknock value:						
- research octane number, min.		-	80	92	95	98
- motor octane number, min.		76	76	82,5	85	88
Fractional composition:						
IBP, min.	deg.C	30	30	30	30	30
- 10% yield, max.	deg.C	75	75	75	75	75
- 50% yield, max.	deg.C	120	120	120	120	120
- 90% yield, max.	deg.C	190	190	190	190	190
- EBP,max.		215	215	215	215	215
- distillation test residue, max.	%	1,5	1,5	1,5	1,5	1,5
- residue and losses, max.	%	4	4	4	4	4
Saturated vapour pressure, max.	кПа	79,9	79,9	79,9	79,9	79,9
Acidity, max.	мг KOH/100 см ³	3	3	3	3	3
Existent gum concentration, max.:						
- on production site	mg/100 cm ³	5	5	5	5	5
- on consumption site	mg/100 cm ³	10	10	10	10	10
oxidation stability of gasoline on production site, min.	min, %	360	360	360	360	360
Sulphur mass fraction, max.		0,05	0,05	0,05	0,05	0,05
Copper plate test		OK				
Water-soluble acids and alkali		none				
Suspended solids and water		none				
Colour		clear or light yellow				
Lead concentration, max.	g/dm ³	0,013	0,013	0,013	0,013	0,013
Total content of aromatic hydrocarbons, max.	% wt.	42	42	45	45	48
Benzene weight percent, max.	%	5	5	5	5	5
Oxygen weight content, max.		2,7	2,7	2,7	2,7	2,7
Oxygen compounds weight percent, max.:	%					
- methanol	%	3	3	3	3	3
- ethyl alcohol	%	5	5	5	5	5
- isopropyl alcohol	%	10	10	10	10	10
- isobutyl alcohol	%	10	10	10	10	10
- tert-butyl alcohol	%	7	7	7	7	7
- simple ethers	%	15	15	15	15	15
- other oxygen compounds with EBPmax. 210 C	%	10	10	10	10	10

Physical, chemical and performance indicators of gasoil (DSTU 3868-99 standard)			
indicator	UOM	Summer grade	Winter grade
Cetane number, min.		45	45
Distillation:			
- 50% yield, max.	deg.C	280	280
- 96% yield, max.	deg.C	370	370
Kinematic viscosity at 20 deg.C	mm ² /s	3,0-6,0	1,8-6,0
Pour point, max.	deg.C	-10	-25
Closed cup flash point, min.			
- for diesel engines of locomotives, vessels and gas turbines	deg.C	62	40
- for general purpose diesel engines	deg.C	40	35
Sulphur content, max.			
- type I	%	0,05	0,05
- type II	%	0,1	0,1
- type III	%	0,2	0,2
- type VI	%	0,5	0,5
Mercaptan sulphur content, max.	%	0,01	0,01
Hydrogen sulphide content		none	
Copper strip test		OK	
Existent gum concentration, max.	mg/100 cm ³	40	30
Acidity, max.	mr KOH/100 cm ³	5	5
Iodine value, max.	g/100g	6	6
Ash, max.	%	0,01	0,01
Coking ability of 10% residue, max.	%	0,3	0,3
Filtration coefficient, max.		3	3
Suspended solids		none	
Water content		none	
Density at 20 deg.C, max.	kg/m ³	860	840
Cold filter plugging point, max.	deg.C	-5	-15