ТЕМПЕРИЛОДЖИСТИКСЕООД
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Producers of ilmenite concentrate in Ukraine.
Thelargesttraders-exporters.

Ukraine has significant deposits of titanium. Approved reserves are in the range of 7-12% of the world reserves (8.4 million tons: ilmenite - 5.9 million tons, rutile - 2.5 million tons, according to the State Geological Service of the USA). Their deposits are concentrated in the stripe: Zhytomyr - Kyiv - Cherkasy - Kirovograd - Dnepropetrovsk region.

In Ukraine, 78 deposits of different levels of exploration were discovered. But in fact, the mineral raw-material base of titanium in Ukraineconsists of 40 fields including one unique field, 13 large and 10 medium-sized fields. Nowadays titanium ores in Ukraine are developed only from placer deposits, accounting for 10% of all proven reserves.

At the same time Ukraine is one of five countries producing titanium ore concentrates in the world.

The industrial extraction of titanium is mainly produced from ilmenite - FeTiO3 (36,8% iron, 31,6% oxygen, 31,6% titanium) and rutile - TiO2 (60% titanium, 40% oxygen).

Annually Ukraine produces up to one million tons of titanium-containing concentrates, most of which are not processed but exported as raw materials.

According to the results of January-August 2022, mining companies shipped abroad 219.8 thousand tons of titanium ore, which is 41.8% less than during the same period of 2021. The main consumers of Ukrainian titanium ores in 2022 were the Czech Republic (47.9% in money equivalent), the USA (11.9%), and Romania (9.8%). The main supplies in 2021 were to Mexico (21.23% of supplies in money terms), China (18.2%,) and the Czech Republic (14.1%).

Producers and traders of ilmenite concentrate

Producers of titanium ores in Ukraine:

1. PJSC "United Mining and Chemical Company";
2. Group DF MezhdurechenskiyMINING AND PROCESSING PLANT, LLC;
3. Group DF "Valki-Ilmenite" LLC;
4. PKF “Velta” LLC
5. Demurinskiy Mining and Processing Plant

The largest traders-exporters:

1. "Tsvetmet Ltd" LLC
2. “A-Z Terminals” LLC
3. “Keramplus” LLC
4. “STMTransgroup”LLC
5. “Imeks Minerals” LLC

1.PJSC "United Mining and Chemical Company";

Ukraine's state-owned company United Mining and Chemical Company, one of the world's largest producers of titanium raw materials, operates the Irshanskiy Mining and Processing Plant (IHPC, Zhytomyr region) and the Volnogorsk Mining and Metallurgical Plant (VMMC, Dnepropetrovsk region), selling products to more than 30 countries worldwide and accounting for 4% of the world market.

The main markets are the EU, China, and Turkey, as well as the U.S. and African countries. Since 2019 PJSC "UGCC" is managed by the State Property Fund of Ukraine, the company has more than 5800 employees.

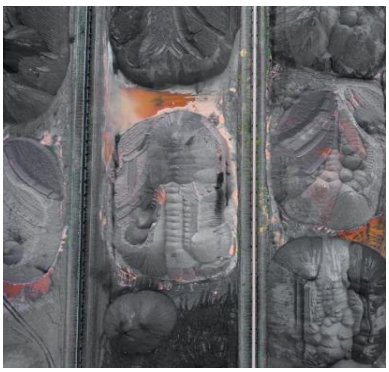
The company, according to 2021, produces more than 500 thousand tons of ore concentrates per year.

Now there are about 4.5 thousand tons of ilmenite and several thousand tons of rutile and zircon in the reserves of OGCK. The ore sand reserves of Volnogorsk MCC may increase twofold: from 15.9 thousand cubic meters to 31.6 thousand cubic meters.

Volnogorsk Mining and Metallurgical Combine

Leading plant for the production of concentrates of non-ferrous and rare metals, located in Volnogorsk, Dnepropetrovsk region.

It is a raw material base for several industries important to the country's economy, including chemical, electrical, and machine-building industries.



The main structural subdivision of VGMK is mining production, which includes open-pit mining with subsequent land reclamation; disintegration; alluvial desliming, gravitation, electrostatic and magnetic enrichment, metallurgical production, including chemical and metallurgical processes of concentrate processing with the release of zirconium dioxide, zirconium sulfate, silicon tetrachloride compounds.

Ilmenite concentrate of the Volnogorsk Mining and Metallurgical Combine

Ilmenite concentrate TiO2 min. 63%

End use: Ilmenite concentrate is used in the production of synthetic rutile, pigmented titanium dioxide, welding electrodes, titanium sponge, titanium metal, and in steelmaking furnaces.

Shipping: In bulk in railcars or bilges of ships; 50 kg bags; Soft containers (big bag) 1-ton net.

GeneralInformation:

Other names: ilmenite sand, ilmenite.
CAS Number: 1317-80-2
Formula: Fe2O3*TiO2
Technical specifications of Ukraine TU-U 14-10-005-98
Agree onproductcode 2614001000

Chemicalanalysis:

Content, %	STANDARD	LOW Al2O3	LOW Cr2O3
TiO2, not less	63	63	63
Al2O3, not more	3	1,5	3
SiO2, not more	2	1,4	2
Cr2O3, not more	None	None	0,4
Moisture, notmore	0,5	0,5	0,5
Residue of mesh #04, not more	0,4	0,4	0,4

Physicaldescriptionandproperties:

Appearance: usually black loose sand.
Grainshape: depressed-spherical.
Grain color: light brown to black.

Minerals	Content, %
Ilmenite:	90-96
Rutile/leucoxene:	0,5-4
Zircon:	0,1-0,5
Monazite:	<0,2
Stavrolite:	0,5 – 4,0
Kyanite:	0,05 – 0,3
Tourmaline:	0,05 – 0,2
Pinelitechromites:	1,5-3,0

Storage: in closed containers or bags, protect from physical damage. Durationofstorageisnotlimited.

Meltingpoint:	~1365°C
Specificgravity:	4120 – 4170 kg/m3
Bulkdensity:	2130 – 2240 kg/m3
Grainsize:	63 -160 mcm
Flammable:	Notflammable
Watersolubility:	Insoluble
Angleoffriction::	32
Hardness:	5

Sieveaperture (microns)	Cumulativeretention, %
212	Traces
150	10
106	64
75	99
-75	100

Mining and processing plant of Irshansk

It is located in the town of Irshansk in the Volodarsko-Volynsky district of the Zhytomyr region.

The leading Ukrainian titanium ore mining and processing company specializes in the development of ilmenite ore. IMINING AND PROCESSING PLANT mines raw materials from placer deposits located within a radius of 6 to 21 km from Irshansk.

The production technology is unique and involves the opening, extraction, and concentration of ore.

Ilmenite concentrate from Irshanskiy Mining and Processing Combine

Ilmenite concentrate TiO2 min. 54%

End use: Ilmenite concentrate is used in the production of synthetic rutile, pigmented titanium dioxide, welding electrodes, titanium sponge, titanium metal, and in steelmaking furnaces.

Shipment: In bulk in railcars or 20' sea containers

General information:

Other names: ilmenite sand, ilmenite.
CAS Number: 1317-80-2
Formula: Fe2O3*TiO2
Technical specifications of Ukraine TU-U 14-10-009-97
Agree on product code 2614001000

Chemicalanalysis:

Content, %	
TiO2	54,0-58,0
Al2O3	None
SiO2	0,60-2,00
Cr2O3	0,02-0,05
Moisture, notmore	1,5
Residueonsienna №04	None
Fe2O3	13:00-21:00
FeO	15,00-25,00
P2O5	0,100-0,190

Physicaldescriptionandproperties:

Appearance: Dry loose sand of gray-black color with a metallic luster.	
Grainshape: angular, spherical.	
Minerals	Content, %
Ilmenite:	94,5 min
Rutile:	Traces
Zircon:	0,05-0,40
Siderite:	0,8-4,0
Hydroxides:	0,1-0,5
marcasite:	0,1-3,0
Garnet, staurolite:	Traces-0,5
Leucoxene:	0,02-1,00
Apatite:	Traces-0,1
Pyroxene:	Traces
Mica:	Traces
Quartz:	0,2-3,00

Storage: shelf life is not limited.

Meltingpoint:	~1365°C
Specificgravity:	4150 – 4250 kg/m3
Bulkdensity:	2150 – 235 kg/m3
Grainsize:	300 mcm
Flammable:	Notflammable
Watersolubility:	Insoluble
Angleoffriction:	32
Hardness:	5
Sieveaperture (microns)	Cumulativeretention, %
2,0	Traces
1,0	4
0,56	23
0,28	27
0,14	34
0,10	8
-0,10	4

UNCChas a direct agreement to supply 80 thousand tons of ilmenite concentrate to American Chemours.

In 10 months of 2020, the company exported 347.0 thousand tons of titanium raw materials to Egypt. The company exported 347.0 thousand tons of titanium raw materials to Egypt, Mexico, Russia, etc.

Contacts:
044-359-02-50
info@umcc-titanium.com
https://www.umcc-titanium.com/

2. Group DF

Vertically integrated holding Group DF owns Valki-Ilmenite LLC and Mezhdurechenskiy MINING AND PROCESSING PLANT, as well as two plants under construction: Motronovskiy MINING AND PROCESSING PLANT and Stremygorodskiy MINING AND PROCESSING PLANT (Zhytomyr region).

Group DF's titanium business operates exclusively in the "chemical titanium" segment - producing concentrate used to produce pigmented titanium dioxide, which is used to produce paint, paper, plastics, etc.

Group DF's titanium business is represented by the following companies:

Titaniumminingandprocessing:

- Mezhdurechenskiy mining and processing plant (Irshansk, Zhitomir Region)
- Valki Ilmenite (Irshansk, Zhytomyr Region)
- Motronovsky mining and processing plant (Dnepropetrovsk region)
- Stremikorodskiy Mining and Processing Combine

The combined annual production capacity of Group DF's beneficiation companies is approximately 755,000 tonnes of ilmenite and 65,000 tonnes of rutile.

"Mezhdurechenskiy mining and processing plant" (Irshansk settlement, Zhytomyr region, Ukraine) - an enterprise that specializes in the extraction and production of ilmenite concentrate, with a capacity of 100 thousand tons per year. The maximum design capacity of 180 thousand tons of ilmenite concentrates per year.

Ilmenite concentrate is used for the further production of titanium dioxide.

MezhdurechenskiyMINING AND PROCESSING PLANT extracts titanium-containing ores using the open-pit method at the Mezhdurechenskoye field - Isakovskoye and Yuzhny sites.

During the 10 months of 2020, the company exported 47.7 thousand tons of titanium raw materials, mainly to the Czech Republic.

"Valki-Ilmenite" (Irshansk settlement, Zhytomyr region, Ukraine) is an enterprise that specializes in the extraction and production of ilmenite concentrate, with a capacity of 45 thousand tons per year. Ilmenite concentrate is used for the further production of titanium dioxide.

Valki-Ilmenite mines titanium-containing ores using the open-pit method at the Valki-Gatzkovskoye deposit. The company also has a license to develop the Stremigorodskoye ilmenite and apatite deposits.

Motronovsky Mining and Processing Plant

Group DF launched the Motronovsky mining and processing plant project in 2014.

The project is based on the construction of an open pit for ore extraction at the Motronovsko-Annovskoye section of the Malyshevskoye zircon-rutile-ilmenite-bearing sands deposit, as well as an enrichment complex to produce zirconium, rutile, and ilmenite concentrates. In the first phase of the project will be built quarry with a capacity of 2.7 million m^3 of ore per year. It is assumed that the enterprise will be able to produce annually about 120 thousand tons of ilmenite concentrate, 14 thousand tons of zirconium concentrate, and 20 thousand tons of rutile concentrate.

Stremigorod Mining and Processing Plant

Investments in the project **"StremigorodskyMining and Processing Plant"** have already exceeded 100 million hryvnias.

Now the design and survey works are being carried out. After the implementation of the first phase of the project, the design capacity of the combine will be about 500 thousand tons per year of ilmenite concentrate and 150-200 thousand tons per year of apatite concentrate.

In 2022 the Group DF titanium division produced 1,798 mln cubic meters of ilmenite ore (-36.8%) and 103.6 thousand tons of ilmenite concentrate (-27.0%).

Contacts:

Group DF

https://www.groupdf.com/uk/

3. Production and Commercial Firm "VELTA" (Dnepropetrovsk)

VELTA LLC is a mining company, which owns two resource assets - Birzulovskoye and Lekarevskoye ilmenite deposits in the Novomirgorodskiy district of Kirovograd region of Ukraine. "VELTA" occupies 2% of the world market of ilmenite supplies and 35% of the Ukrainian market and is a supplier of about 10% of volume to the world's largest U.S. consumer of titanium raw materials - the company Chemours (DuPont). As of January2021, the total resource base of the two assets is up to 6 million tons of ilmenite ore. The total number of jobs is more than 500.

The Birzulovskoe ilmenite deposit is located in central Ukraine, near the village of Korobchino, Novomirgorod district, Kirovograd region. KorobchinoNovomirgorod district, Kirovograd region. In 2011, a mining and processing complex for the extraction and processing of ilmenite ores with a capacity of 185 thousand tons of ilmenite per year was built based on the deposit for a record-breaking 8 months. In 2013, the second stage of the mining and processing complex was launched.

Birzulovskiy Mining and Processing Plant

The current capacity of Birzulovskiy mining and processing plant (Kirovograd region) is 270 thousand tons of ilmenite concentrate per year.

Lekarevskoye field of ilmenite loose ores is located 6 km from the already operating mining and processing plant, its resource capacity is 2.6 million tons of titanium raw materials. The planned capacity of the enterprise is 110 thousand tons of ilmenite concentrate per year.

Mineral resources are extracted using the open-pit method.
In 2019"VELTA" produced more than 1,000,000 tons of ilmenite concentrate. The company mainly supplies ore to China and the Czech Republic.In the first 10 months of 2020, it exported 258,300 tons of titanium ore.

VELTA introduces several innovative solutions in the production of titanium powder using the green technology patented in Ukraine and the USA.

According to the new technology VeltaTi Process the cost of titanium powder is 3-4 times lower in comparison with Kroll's method. The end product of the advanced Velta method is high-quality titanium powder, which can be used both for traditional powder metallurgy and for new additive technologies, including 3D printing.

Velta is now working on a new facility in the Czech Republic, VeltaTi Process, to launch its manufacturing process, which the company claims makes it possible to produce metallic titanium powder at lower costs and much less harm to the environment. The Czech plant is expected to be up and running by the fall of 2023.
PKF "VELTA" LLC is part of the holding structure Velta Holding US Inc, USA.

Contacts:
+38 (056) 732-04-04
office@velta-ua.com
https://velta-ua.com/

4. Demurinskiy Mining and Processing Plant

Demurinskiy Mining and Processing Plant is engaged in the extraction and enrichment of non-ferrous metal ores and is located in Demurino, Dnepropetrovsk region, since February 2023 it is owned by the state.

Demurinskiy Mining and Processing Plant produces titanium raw materials: ilmenite, rutile, and zircon. The company has confirmed reserves of titanium-containing ores at 5 million tons and a license to develop the Volchanskoye deposit in the Dnepropetrovsk region until 2030.

The capacity of the combine does not exceed 50 thousand tons of ilmenite, 10 thousand tons of rutile, and 5 thousand tons of zircon annually. The Mining and Processing Combine's revenues for 9M 2021 amounted to UAH 348.04 mln, with a profit of UAH 83 mln.

In 2020, the plant earned revenue of 308.8 million UAH and a loss of almost 42 million UAH. The debt liabilities of the plant reach 20 million dollars. Demurinskiy Mining and Processing Plant's book value of UAH 14 mln.

Products

Concentrate ilmenite (titanium), grade K. The content of TIO2 63,0%, as the sand of brown color, TU U 13.2-31614145-001:2008. Type of processing: enrichment, used in metallurgy for the production of ferrotitanium. HS-Code2614000000- Ores and concentrates of titanium.

In 10 months of 2020, the company exported about 16 thousand tons of raw materials worth $9 million to Kazakhstan, Russia, Algeria, Germany, Turkey, etc.

Since February 2022, the combine sells products exclusively to domestic consumers - manufacturers of electrodes, ceramics, and other companies processing rutile, zircon, disten-sillimanite, and staurolite. In particular, Plasmatec. Ilmenite remains unmarketable in the company warehouses.

The inability to export products resulted in the accumulation of about 6 thousand tons of titanium concentrates atthe Demurinskiy Mining and Processing Plant.

Contacts:

+38 (056) 370-11-62

The largest traders-exporters of titanium raw materials

1. LLC “Tsvetmet Ltd”.

Tsvetmet Ltd., registered in the Dnepropetrovsk region, Volnogorsk, the main activities are the extraction of non-ferrous metals, as well as the wholesale trade of metals and metal ores.

Owners: EvgenyKossov

Products

Concentrate ilmenite (titanium) TIO2 content 64.4% in the form of dark brown sand, TU U 141000598 processing type: enrichment, used in metallurgy for production of ferrotitanium.
HS-Code2614000000- Ores and concentrates of titanium.
In 10 months of 2020, the company exported 5,8 thousand tons of ilmenite concentrate to the Netherlands and Russia.

Contacts:

+38 (056) 770-40-93
39966306@ukr.net

2. "A-ZTerminals" LLC

Owners: Andrey Skurtenko, Alexander Nefedov

Forwarding company, Odessa, engaged in packing, escorting, and transshipment of goods in the ports of Odessa and Chernomorsk (formerly - Ilyichevsk).

In 10 months of 2020, the company exported 3.9 thousand tons of ilmenite concentrate to Russia, Romania, Poland, and Sweden.

Contacts:

+380 (50) 493-90-40
+380 (48) 717-45-41
http://www.a-zterminals.com

3. “Keramplus” LLC

Owners: Vitaly Kuchuk

In 10 months of 2020, the company exported 1.8 thousand tons of concentrate to Russia.

The company acts as a customs broker in all export operations.

Contacts:

https://keramplus.com/about-us/

4. “STM Transgroup” LLC

Owners: Sergey Martynenko

In 10 months of 2020, the company exported 1.6 thousand tons of ilmenite concentrate to the Russian Federation.

Concentrate ilmenite in dry condition, free-flowing black/brown sand, TU U 14-10-005-98, net weight 67000 kg. chemical composition, %: TIO2: 65.80; AL2O3: 1.90; SIO2: 1.25; P2O3: 0.13; moisture: 0.24.

Malyshevskoe deposit. HS-CODE2614000000

Contacts:
+38 (044)232-61-49

5. “Imex Minerals” LLC

Owners: Vitaly Kravchenko

In 10 months of 2020, the company exported 1.2 thousand tons of ilmenite concentrate worth $1.1 million to Belarus.

Contacts:

+38(063)536-15-86

+38(044)228-01-16

Another dozen of Ukrainian traders exported no more than 300 tons of titanium raw material each.