

BY-PRODUCTS

PRODUCTS FOR
AGRICULTURE





NLMK GROUP

As the largest steel producer in Russia, NLMK is a partner of choice for thousands of businesses. Our product mix enables supplies to key sectors of industry, from power engineering, the petrochemical and pipe industries and construction to manufacturers of rail transport, mining equipment, cars, and home appliances. We also offer custom products and personalized solutions.

OUR ADVANTAGES



GUARANTEE OF RELIABILITY

NLMK’s business model allows us to control the quality at each stage: from the raw materials mining to finished product manufacturing. Self-sufficiency in raw material and energy supplies ensures stability of operations and unfailing delivery of all commitments towards our partners.

STRONG TEAM

We attract top industry experts to deliver exceptional quality and service to our customers. Our sales model enables us to work directly with businesses of all categories, and at NLMK Trading House you can always find metal in stock on favourable terms.

EASE OF DOING BUSINESS

Any business values its time, flexibility and ease of operations, thus we are actively developing our service portfolio and offer partners high-quality services and a custom tailored approach.

HARMONY WITH NATURE

NLMK’s stewardship of the environment is manifested in our closed-loop production system: 99% of secondary resources is recycled back into production and 97% of water is reused.

RECYCLING

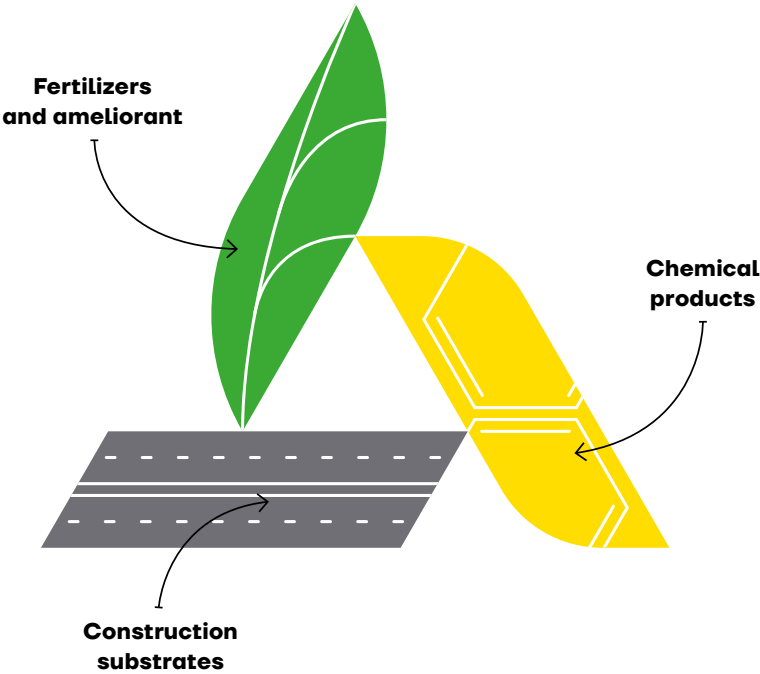
A responsible attitude towards the environment and the efficient use of natural resources are the key principles of NLMK's Sustainable Development Policy. The products generated during the steel production process are utilized in a diverse range of industries, including the steelmaking, mechanical engineering, chemical, construction, and agro-industrial sectors, among many others.

In 2024, the total recycling rate in the company reached 99%. Reuse of materials and natural resources not only curbs the environmental impacts but also gives a new life to recyclables.

We use a special symbol for recycling, which is shaped to resemble the classic recycling designation conveying the idea of infinity and the cyclical nature of material usage possibilities.

The symbol is comprised of three distinct elements, which, through their design, colour, and supplementary features, serve as a visual representation of the three key categories in recyclables:

- **Construction substrates** — metal slag, sand, sludge, microsilica, iron-containing additives, iron oxide
- **Fertilizers and ameliorant** — ammonium sulphate, dolomitic flour
- **Chemical products** — benzene and polymer fractions, resins, and distillates



AMMONIUM SULFATE



A unique nitrogen fertilizer that combines the ammonium form of nitrogen, which ensures long-lasting effects, with a high sulphur content. Availability of crystalline and granular ammonium sulphate products offers flexible application options for soil.

Production takes place at two sites: Altai-Koks (Town of Zarinsk) and NLMK Lipetsk.

PRODUCTS FOR AGRICULTURE

NLMK fertilizers and ameliorants offer an optimal solution for soil fertility and high-yielding harvests. The company produces crystalline and granular ammonium sulphate, and dolomite powder.

"NLMK Group has extensive experience in producing dolomite-based nitrogen fertilizers and ameliorants. The high performance of our products is certified by quality certificates and product registration certificates."

Alexander Fedotov, Head of Coke Operations Discipline, By-Product Sales Division, NLMK Group

DOLOMITE POWDER



Used as a mineral fertilizer to reduce soil acidity and as a supplement in animal feed ensuring healthy development of poultry and livestock. The varying particle size and moisture content of our dolomite powder support a broad range of applications.

We produce dolomite powder at Dolomit in the town of Dankov.

AMMONIUM SULFATE

High-performance universal nitrogen fertilizer with high sulphur content for a diverse range of crops. This fertilizer promotes plant growth and development, increases protein content in cereal and rapeseed crops, and positively impacts crop quality.

NUTRIENT CONTENT

NITROGEN	SULPHUR
21%	24%

NLMK IS THE SOLE
PRODUCER OF
AMMONIUM SULPHATE
IN THE CENTRAL BLACK
EARTH REGION

AMMONIUM SULFATE FOR AGRICULTURE

Product form:

- crystals
- granules

Advantages:

- source of nitrogen and sulphur for crop growth (sulphur deficiency in plants is just as dangerous as nitrogen deficiency, and external manifestations of sulphur deficiency appear similarly to nitrogen deficiency)
- promotes the growth of plant greenery
- enhances protein content in cereals and oil content in rapeseed
- high efficiency in systems with prolonged ammonium nutrition (accelerates decomposition of crop residues to improve soil fertility)

Granular product advantages:

- the product's granular form allows for simultaneous application of fertilizers with seeding, optimizing seeding equipment operations
- the product does not generate dust ensuring high speed and uniform fertilizer application to the soil and uniform germination of crops
- does not cake for at least 6 months of storage.
- not susceptible to climate-related phenomena (temperature and humidity fluctuations)

Applications:

- as a standalone ammonium-sulphur fertilizer
- as part of compound fertilizers (mixtures)
- in tank mixes with post-emergence herbicides to achieve a greater effect in weed control by reducing water alkalinity

Crops: most agricultural crops

Soil types:

- neutral
- slightly alkaline

Application season: spring to fall, main application at seeding, root and foliar applications

GRANULATED AMMONIUM SULPHATE

Technical requirements:

- TS 20.15.32-001-41598162-2022

Minimum order size: 1 t

Packaging: big bag (FIBC)

Delivery:

- Railway or vehicle transportation
- Pick up at Promyshlenniy Proezd, Estate 7, Lipetsk, Russia

Guaranteed shelf life: 6 months

Agrochemical shelf life: unlimited

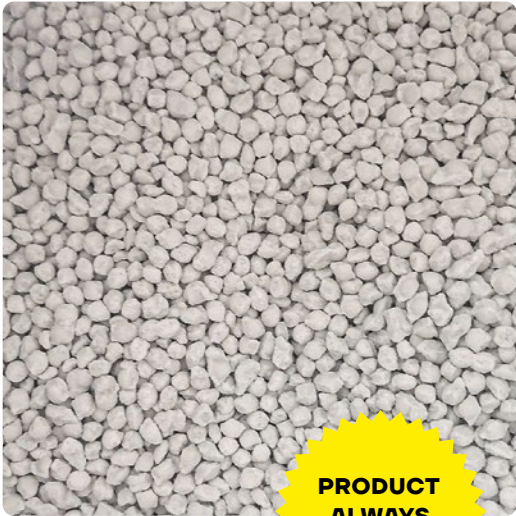
Storage: enclosed warehouse facilities (moisture control and protection from the elements)

Manufacturer: NLMK Lipetsk (Novolipetsk Steel)

Certification: State registration certificate of a pesticide or agrochemical No. 4428 issued 26 February 2024 No. 916-10-4428-1

Physical and chemical properties

Nitrogen mass fraction on dry basis, %	≥21
Sulphur mass fraction on dry basis, %	≥24
Water content, mass %	≤0.2
Sulphuric acid content, mass%	≤0.03
Friableness, %	100
Particle size distribution, %	
≤1 mm	≤2
2–5 mm	96
<6 mm	100
Static strength	3 MPa



PRODUCT
ALWAYS
IN STOCK

CRISTALLINE AMMONIUM SULPHATE

Technical requirements:

- TS 113-03-625-90 (Altay-Koks)
- TS 14-106-399-91 (NLMK Lipetsk)

Minimum order volume:

- 50 kg (bag)
- 900 kg (FIBC)
- 1 t (bulk)

Packaging:

- Bags (50 kg), FIBC (900 kg), or bulk — Altay-Koks
- bulk — NLMK Lipetsk

Delivery:

- Railway or vehicle transportation
- Customer pick-up

Guaranteed shelf life: 6 months

Agrochemical shelf life: unlimited

Storage: dry and well-ventilated storage facilities (moisture control and protection from the elements)

Manufacturer:

- Altai-Koks, Zarinsk
- NLMK Lipetsk (Novolipetsk Steel)

Certification: State registration certificate of a pesticide or agrochemical No. 3924 issued 28 February 2022 No. 851-15-3924-1 (Altai-Koks), No. 3876 issd 14 November 2022 No 844-15-3876-1 (NLMK Lipetsk)

Physical and chemical properties

Nitrogen mass fraction on dry basis, %	≥21
Sulphur mass fraction on dry basis, %	≥24
Water content, mass %	≤0.3
Sulphuric acid content, mass%	≤0.05
Friableness, %	100
Content of >0.5 mm fraction, mass %	≥80
Content of <6 mm fraction, mass %	100
Share of insoluble impurities, %	≤0.02



PRODUCT
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Five reasons to use ammonium sulphate

1 BROAD RANGE OF APPLICATIONS
Ammonium sulphate supplies crops with nitrogen during active growth, promotes better plant development, and helps achieve stable yields. It is an effective fertiliser for winter rye, oats, potatoes, and especially so for tea and rice. The standard application rate is 330 kg of ammonium sulphate per 1 ha, but can be adjusted depending on the specific crop. Each tonne of ammonium sulphate deployed increases the yield of wheat by 4 t, potatoes by 23 t, or surag beet by 40 t.

2 DOUBLE ACTION
Alongside nitrogen, phosphorus and potassium, sulphur enhances the produce quality and serves as an important addition to the main active ingredients in fertilizers. An undersupply of sulphur of at least 1 kg can deprive the crop from 10 kg of nitrogen.

A decrease in sulphur content in soils is observed in 80% of agricultural land in Russia, including in the Belgorod, Kursk, Voronezh, Lipetsk, Tambov, Volgograd, Rostov, and Pskov regions. Low sulphur in the soil prevents proper synthesis of proteins, fats, and vitamins in agricultural crops, while promoting nitrogen accumulation in the form of nitrates.

At grain yields of 200–300 kg per hectare, the application of ammonium sulphate together with crop residues ensures delivery of 30–40 kg of nitrogen, 50–80 kg of phosphorus, 18–24 kg of potassium, and 35–45 kg of sulphur that helps increase in protein levels in the produce.

3 HIGH EFFICIENCY
Comparative tests demonstrate that various types of nitrogen fertilizers have equal efficacy (equal application of 69 kg of nitrogen as the active ingredient). Ammonium sulphate has a long-lasting effect and, unlike ammonium nitrate, does not leach out of the soil. In addition, the ammonium form of nitrogen is compatible with sulphur, which, unlike other nitrogen fertilisers, results in a 3× reduction of nitrate accumulation in plants.

4 DISPOSAL OF STRAW
Ammonium sulphate has another special application whereby it is deployed together with crop residues (crushed straw). Application dosage: 10 kg nitrogen per 1 t straw to ensure accelerated decomposition of fibre. This application has several benefits, including useful disposal of straw, improvement of straw properties as a fertilizer, and environmental stewardship.

5 FLEXIBLE PRICING
NLMK Group offers a flexible pricing system to end-consumers as well as volume- and season-based discounts. Our agriculture products are always in stock.

COMPARISON OF NITROGEN FERTILIZERS

	Ammonium sulphate	Urea	Ammonium nitrate
Fertilizer type	Mineral	Organic	Mineral
Soil type	Application in acidic soils only with acidification retardants	Applicable in any soil type	Application in acidic soils not advised
Impact on soil pH	Promotes higher soil acidity	Does not affect the pH	Promotes higher soil acidity
Nitrogen content	Lower than urea or nitrate, but with a higher content of sulphur (24%)	High nitrogen content	Lower nitrogen content (26–35%) than urea
Application season	Any season (starting from early spring and until late autumn, as well as over frozen soil or snow)	Efficacy will depend on ambient temperature and application into warm soil is advisable	From early spring until July
Application effects	Quick, evident and long-lasting effects	Delayed, but long-lasting effects	Immediate effect but short-lasting relative to urea
Types of application	Application for soil nutrition, root and foliar applications	Application for soil nutrition, root and foliar applications	Mostly root application is advisable
Accessibility	High accessibility for crops and low migratory aptitude	High accessibility for crops	Lower accessibility relative to urea
Environmental impact	Contains ammonium forms of nitrogen. Does not lead to nitrate accumulation in fruits	If granulated, forms biuret, a toxic substance, that resolves within 10–15 days. Safe at contents below 1%	Contains two forms of nitrogen (nitrate and ammonia). Can lead to nitrate accumulation in fruits in case of misdosage
Content	Nitrogen — 21–22% Sulphur — 24% Water — 0.3% Sulphuric acid — 0.03%	Nitrogen — 46.2% Ammonia — ≤0.03% Water — 0.3–0.6%	Nitrogen — 34.4% Water — 0.3% Salt extract pH — 5.5%

DOLOMITE POWDER

Limestone (dolomite) powder is a fine inorganic material obtained through crushing of lime or dolomite debris, followed by screening and mill grinding. It is rich with calcium and environmentally friendly. Does not contain any harmful chemicals.

NUTRIENT CONTENT

CaCO₃ + MgCO₃

≥90%



DOLOMITE POWDER FOR CROP FARMING

Natural, mineral-based ameliorant

Dolomite powder is used for soil deoxidation and in production of mineral fertilizers to improve their efficacy and better protect crops against disease. Furthermore, dolomite powder enhances soil fertility and suppresses pest weeds.

Advantages:

- improves soil structure and fertility
- improves performance of fertilizers and crop protection agents
- reduces the nitrate content in yields
- reduces the prevalence of pest weeds
- improves crop resistance to disease
- improves root growth and photosynthesis performance
- reduces the prevalence of chitinous insects

Crops:

- all agricultural crops

Soil types:

- highly acidic
- acidic
- moderately acidic

Application season:

- prior to seeding
- following the autumn ploughing

Application must follow the dosage guidelines based on soil acidity and mechanical soil composition.

Soil acidity	Mechanical soil composition, t/ha		
	Light	Medium	Heavy
Highly acidic: pH <4.5	3.5–4.5	5.0–6.0	6.0–7.0
Acidic: pH 4.5–5.2	3.0–3.5	4.5–5.0	5.0–6.0
Moderately acidic: pH 5.2–5.6	2.5–3.0	3.5–4.5	4.0–5.0



DOLOMITE POWDER FOR ANIMAL FARMING

Accessible phosphorus, calcium and manganese to ensure balanced nutrition of livestock and poultry

Used in compound feed and mineral supplements in poultry and livestock diets. Dolomite powder provides calcium for bone formation, regulation of biophysics and biochemistry, as well as stability of growth, development and digestion. Supplementation with dolomite powder balances the diet of livestock and poultry, resulting in higher produce yields.

Advantages:

- accelerates growth of livestock and poultry
- promotes better egg yields
- reduces disease incidence in cattle and promotes formation of healthy bone tissue

DOLOMITE POWDER

Standard: GOST 14050-93

Produced by: Dolomit (Town of Dankov)

Product form:

- Grade A
- Grade C

Shelf life: 1 year

Minimum order volume:

- Grade A – 800 kg (big bag), 1 t (bulk). Product always in stock
- Grade C – 50 kg

Packaging: big bag (FIBC), bulk

Delivery:

- Grade A: hoppers, cement trucks, mineral hoppers, gondola cars (packaged), road vehicles (packaged)
- Grade C: gondola cars (bulk), road vehicles

Storage: enclosed warehouse facilities (moisture control and protection from the elements)

Certification: State registration certificate of a pesticide or agrochemical No. 3094 issued 12 April 2021 No. 690-12-3094-1



PRODUCT
ALWAYS
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Physical and chemical properties

	Grade A	Grade C
Total mass fraction of calcium and magnesium carbonates (CaCO ₃ + MgCO ₃), %	91.17	90.50
Calcium oxide (CaO), %	30.90	31.95
Magnesium oxide (MgO), %	17.74	17.50
SiO ₂ , %	4.32	2.40–5.00
R ₂ O ₃ , %	0.80	0.90
F ₂ O ₃ , %	0.46	0.42
Particle size distribution, %		
>5 mm	0	0
>3 mm	0	≤20
>1 mm	0.03	≤40
Moisture mass fraction, %		
October through March	0.31	≤6
April through September	0.31	≤12

PRODUCTION SITES

NLMK Lipetsk

- City of Lipetsk
- NLMK Lipetsk is the flagship site of NLMK Group, an international steelmaking company and the largest steelmaker in Russia. One of the products of the enterprise’s coke and chemical operations is ammonium sulphate.



ALTAI-KOKS

- Town of Zarinsk
- One of the largest coke and chemical enterprises in Russia, accounting for 13% of all coke produced in Russia. The site covers all technology operations: from coal concentrate processing to production of coke and chemical products, including ammonium sulphate.

DOLOMIT

- Town of Dankov
- Russia’s largest producer of dolomite products used in the metals, construction and glass industries, as well as in the production of mineral fertilisers.





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