

NLMK

GROUP

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NLMK appoints new VPs

Two new positions have been created at NLMK – Vice President for Social Affairs and Vice President for Logistics.

Following a decree issued by the Company President, a new position has been created at NLMK. Mr Alexander Sapronov has been appointed Vice President for Logistics. This will improve the efficiency and operational flexibility of the Group's management structure.

In his new capacity, Alexander Sapronov will be in charge of international and domestic logistics, and well as the Group's logistic infrastructure.

Mr Alexander Sokolov has been appointed Vice President for Social Affairs.

In his new capacity, he will oversee the implementation of NLMK Group's social projects and the development of our social assets. He will also be responsible for interacting with the local authorities in the regions where we operate. 🌟



CV

Alexander Sapronov was born in 1953. From 2009 to January 2012 he was Director General for Independent Transportation Company (NTK). Prior to that he worked as Deputy Director General for Strategy and Corporate Development at Freight One (PGK) and Vice President at Rosneft. He graduated from All-Union Correspondence Law Institute, and the Russian Management Academy. In 2007 he received an MBA in Logistics and Supply Chain Management from the State University Higher School of Economics.



CV

Alexander Sokolov, PhD, Ec. was born in 1961. He has served as one of NLMK's top managers since 1997. From 1992 to 1997 he worked for the state tax authorities in the Lipetsk Region. In 2010 - 2011 he was Head of the Lipetsk City Council of Deputies. He graduated from Voronezh Forestry Engineering Institute, majoring in engineering; Voronezh Agrarian State University, majoring in economics, and Moscow Institute of International Law and Economics, majoring in law. In 2000 he was named Best Accountant of Russia.



FOREIGN BRANDS IN THE OPEN PIT

Stoilensky added a new loader and bulldozer to its mining machinery pool, supplied by Caterpillar.

The new loader is up there with the mining giants: it is almost 20 m long and



about 4 m high, with a loader bucket of over 6 cubic meters capacity. Despite the impressive size, the new loader is very manoeuvrable.

"It moves around easily and quickly," says operator Fedor Krasichkov, "and it is very easy to operate, I do not get tired. It's a pleasure to work with it!"

Everyone whose work depends on the bulldozer felt the benefits of the new machine: access routes are made much quicker now. According to operator Sergey Simonov, the new machine is much more comfortable to work with. "The view from the cabin is great, the seat is comfortable. Air-conditioning keeps it cool in the summer, and the oven keeps in warm in the winter."

The new loader and bulldozer are not the only machines supplied to Stoilensky by Caterpillar. A vibro roller was delivered at the end of last year, and a land leveler is expected soon. ■

NO NOISE, NO DUST

NLMK is revamping the central dust collection systems at sintering machines #3&4 at its Sinter Plant in Lipetsk.

The introduction of a new type of electrostatic precipitator by Alstom Power will reduce residual dust content in exhaust air almost fourfold. Total dust emissions from the Sinter Plant will decrease almost 20%.

Total investment into these improvements is expected to come to approximately RUR1.2 billion (~US\$40 million; ~EUR30.5 million). NLMK plans to complete the works at Sintering Machine #4 by the end of the year, whilst work at Sintering Machine #3 will be completed by mid 2013.

Since the launch of its Technical Upgrade Program in 2000 the Company has implemented around 250 projects at its Lipetsk site worth a total of RUR12.3 billion (~US\$410.7 million; ~EUR312.7 million) aimed at protecting the atmosphere against industrial emissions. As a result, emissions at the site have been reduced by 22%. The



total amount of funding allocated to environmental projects at the Lipetsk site exceeded RUR17 billion (~US\$567.6 million; ~EUR432.6 million) since 2000. Alongside the projects at the Sinter Plant, NLMK is currently revamping the gas cleaning systems at its steelmaking facilities which will allow reducing graphite emissions. ■



VIZ-STAL STARTS UP NEW ROLLING MILL

In December VIZ-Stal completed equipment assembly for the new reversing mill and the commissioning process is well under way.

Commissioning is managed by experts from the German Andritz Sundwig. Andritz Sundwig manufactured the equipment and is now leading the assembly.

All the necessary adjustments to the schemes and mechanisms will be made during commissioning. The mill is scheduled for launch in H1 2012. ■



VIZ-STAL SOURCES PRODUCTION MANAGEMENT SYSTEM

VIZ-Stal is implementing an automated process management system based on the PSImetals 5 software solution developed by the German PSI.

This over US\$2.5 million project will ensure a continuous process for accumulating and processing technical information at all stages of production; optimize the metal distribution process, work-in-progress and resource use, increasing the quality and time-efficiency of informed decision-making.

PSImetals 5 will give VIZ-Stal a competitive edge in the global steel market by cutting production costs, improving consumer properties of its products, reducing lead times, and improving production efficiency and planning. ■

Russia's accession to the WTO: it's worth the effort

After the ratification of the Protocol for Russia's accession to the WTO, which was signed last December in Geneva, our country will officially become a member of the World Trade Organization. How will Russia benefit from this? What impact will this have on the domestic economy? Which industries stand to gain, and which will face losses? These and other questions related to our entry to a more liberal market are discussed below by Anton Bazulev, NLMK's Director of External Relations.



First, a brief look at the WTO itself. It was established in 1995 with a view of facilitating equitable competitive conditions for goods, services and investments across the economic domain of all its member countries. The Organization is the successor to the General Agreement on Trade and Tariffs (GATT), which was instituted in 1947. Experts estimate that after Russia's accession the WTO will encompass almost 95% of the global market. WTO encourages tariff-based regulation of trade (through customs duties) and discourages non-tariff-based regulation (quotas, licensing, standardization, etc.). Within the WTO framework customs legislation and procedures

are unified and streamlined. Naturally, Russian exporters will be able to operate with greater comfort when the legislation of various countries is better aligned.

But nothing is as simple as it may look at first glance. In order to protect their markets the WTO countries resort heavily to the so-called anti-dumping investigations. Countries often have disputes over import duties. It won't come as a revelation if I tell you that the products of Russian steelmakers are very often discriminated against in international markets. The Russian steel industry accounts for 60% of all investigations against Russian exports in the last 15 years.

We did take this into account

and created a special office within NLMK to handle government relations; their job is to counteract anti-dumping investigations by relying on the support of the Russian Government and the Ministry of Economy and Development, as the name of the unit suggests. On several occasions our Government Relations (GR) department has been recognized as the best in the steel industry. Through its efforts and in comparison to other large domestic steelmakers we are enjoying a relatively low level of duties applicable to NLMK products. For the sake of fairness I should stress that it is both a credit to the unit and NLMK's policy of





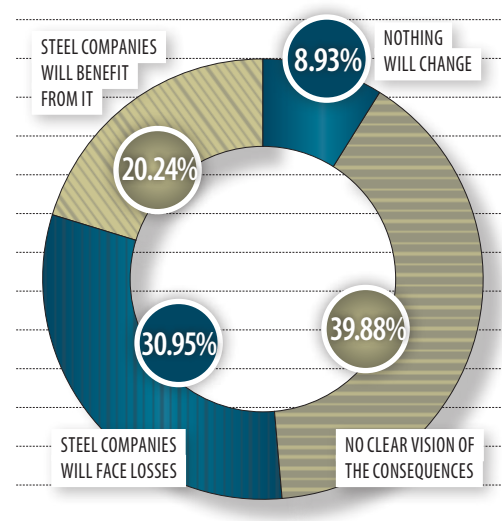
transparency, which it continues to pursue unwaveringly. Experts from countries undertaking anti-dumping investigations can do their work without any impediments and receive all the documentation they require. In many cases we succeed in explaining that their concerns were unwarranted, that we do not resort to dumping practices, it is a fact of life and there are no grounds for claims against us.

We have also seen cases when our products are being squeezed out of certain markets. For example, now that China has developed its domestic capacity for manufacturing transformer steel, it is making attempts to artificially restrict imports from other countries. In 2009 and 2010 the Ministry of Commerce of China conducted an anti-dumping investigation against Russia and the United States. Based on its findings US manufacturers were de facto forced to leave the Chinese market, while a duty at a rate of 6.3% was applied to imports from Russia, because it had been proven

that we did not resort to dumping practices. China, however, did not stop at that and launched yet another anti-dumping investigation against NLMK. In all likelihood this spike in protectionism was caused by the next round of the crisis, and I expect that in addition to China such protectionist attitude will grow stronger in the United States and Europe. But, as the saying goes, forewarned is forearmed. Naturally, anti-dumping investigations will continue as a practice, but with Russia's accession to the WTO it will become easier for domestic companies to safeguard their interests. Russian exporters will start to benefit from arrangements which will allow them to contest unsound decisions, and it will become more difficult to intimidate them with 'court action'. If any company believes that it has been subjected to discriminatory anti-dumping measures, it may file a complaint with the WTO dispute settlement body, and the complaint will be considered in an unbiased manner. And those who initiate

anti-dumping investigations against Russia will have to take this into account. There are reasons to believe that they will opt for a more balanced approach towards making allegations against us and will stop looking for abuse where none is to

How will accession to the WTO impact Russian steel companies?





▲ ELVIRA NABIULLINA, RUSSIAN MINISTER OF ECONOMIC DEVELOPMENT, AND PASCAL LAMY, WTO DIRECTOR-GENERAL, AFTER THE CEREMONY OF THE SIGNING OF THE PROTOCOL FOR RUSSIA'S ACCESSION TO THE WTO

be found. One way or another, from now on foreign countries will find it more difficult to restrict imports from Russia.

One should not, however, expect any immediate impact from the accession to the WTO. It has taken Russia almost 18 years to complete the accession process, and over the years the majority of the World Trade Organization requirements have been implemented and the country de facto has been following them for a long time. By the way, the steel sector was the testing range for these requirements. For

example, NLMK has been applying market-oriented principles in its operations with EU and US companies since the early 2000s. Experts agree that Russia already knows how to incorporate WTO requirements when designing its development policies and strategies. In addition, Russia was able to gain accession to the WTO on quite favorable terms, with most of the concessions it had made being of a topical nature, while at the same time it had managed to defend a substantial part of its import tariffs and retain the right to apply

country-specific arrangements. Also, the WTO accession should be viewed as an additional impetus for stronger growth of the Russian gross domestic product. According to the Constitution of Russia international treaties supersede domestic laws. In practice this implies that both Russian and foreign investors will have the ability to refer to WTO rules, whenever these are contradicted by domestic legislation, and demand their proper alignment. In the future this would improve the business climate in the country, helping to attract more investments and to accelerate GDP growth.

There is yet another important aspect. Many experts agree that the steelmakers will gain the most from Russia's accession to the WTO. However, they fail to be more specific on what these benefits would be. Personally, I don't see the steelmakers gaining anything much. Of course, the EU will have to remove quotas applicable to Russian steel. It may be that Russian steelmakers will have the opportunity to export more steel to European markets. However, assuming that there is an increase in exports, wouldn't this prompt the EU to file anti-dumping complaints, as we have already experienced in the past? The European Commission is quick to review and introduce trade protection measures, in the form of, first, temporary and later permanent duties. Why do I say 'assuming'? Because in recent years Russian exports, with the exception of hot-rolled steel, have been consistently below the allowed quota levels. While at the same time Russia will be required to open its domestic markets to imported machinery and equipment, and this, in my view, will be used to their advantage by European, Chinese, and other manufacturers, which is likely to increase the competitive pressure in our domestic market. There is a danger that consumption of Russian-made steel by domestic manufacturers, which is quite



▲ NLMK'S GOVERNMENT RELATIONS DEPARTMENT

modest already, and stands at 40 million tonnes compared to 70-75 million tonnes produced, will come under pressure with all relevant consequences. From this perspective the trade liberalization which stems from the accession to the WTO is rather questionable. And only time will tell whether the benefits will outweigh the drawbacks. We can gain some optimism by looking at China and how it had benefitted from accession to the WTO; however, Russia is following a different path of development.

This raises a natural question of how the existence of the Customs Union between Russia, Belarus and Kazakhstan will affect the dispute settlement arrangement. Well, only Russia will enjoy all the rights accorded to it by the WTO, and the other two members of the Customs Union will need to join WTO before they can benefit from the same. And as soon as that happens we may expect the Customs Union itself to become a member.

How will accession to the WTO impact regular people? One should not expect anything major in terms of a radical contraction in prices for goods and services or explosive growth in imports of goods manufactured by foreign companies. A transition period of between two and three years will be in place in order to maintain a balance between the interests of consumers and the employees of those companies which will be affected by tighter competition. For some more sensitive issues it will be extended for periods of 7 to 10 and even 15 years. In other words, we shall see a gradual reduction in duties for imported goods. There is hope that domestic manufacturers will use this opportunity to improve the quality of their products and their competitiveness. This is especially true for automobile manufacturers. Some time in the future the duties for foreign made automobiles will be reduced dramatically, and the car manufacturers do not have much of

HOW WILL ACCESSION TO THE WTO IMPACT REGULAR PEOPLE? ONE SHOULD NOT EXPECT ANY RADICAL CONTRACTION IN PRICES FOR GOODS AND SERVICES OR EXPLOSIVE GROWTH IN IMPORTS

a choice; they will have to improve the quality of their products, or reduce prices, or face elimination.

During the transition period duties applicable to imported medicines are expected to be reduced from 15 to 5%. Not immediately, but at a later time copycat pharmaceuticals will cease to be available, because the manufacturing of so-called generic medicines is prohibited by WTO rules. It is quite possible that by the time when lowered duties begin to make an impact, the cost of imported goods would increase due to inflation, which remains a factor affecting prices.

With the accession to WTO foreign higher learning institutions will be allowed to establish their outlets in Russia and foreign banks will have easier access to the Russian market, and they offer lower lending rates compared to their domestic peers. There will be stronger competition in the insurance industry, telecommunications and other sectors, and I am convinced that this will be for the benefit of the

Russian consumer.

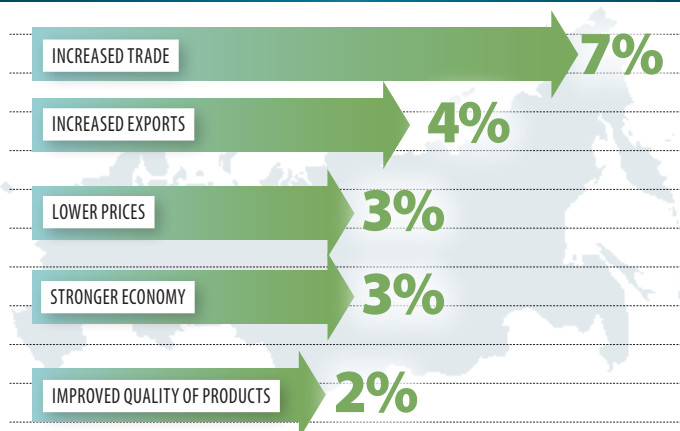
Experts are concerned about the competitiveness of the agro-industrial sector. But even there, given the growing shortage of food in the world and the country's immense resources, the domestic agricultural sector is likely to succeed in the long term. Even more so now that the allowed level of subsidies will be US\$9 billion once Russia joins the WTO, and will over time be reduced to US\$4.4 billion. This is in line with the average volume of subsidies provided to the Russian agricultural sector between 2006 and 2008.

Naturally, Russia's membership in the WTO will be associated with certain challenges, and I have covered some of them already. But these and other issues are minor compared to the fact that Russia has gained access to the process for developing general policy for the operation of the global economy and international trade, and this opens new horizons for our country. 🌟

Anton Bazulev

NLMK Director of External Relations

How Russians perceive the benefits of WTO accession



Outperforming in innovative development, not trailing behind

NLMK President (Chairman of the Management Board) Alexey Lapshin talks with Alexander Sutormin of NLMK Company magazine.



Q: Mr Lapshin, it is customary in the first few months of the year to take stock of achievements, review performance and make projections for the future. Maybe, we should begin with this. Are you satisfied with how the NLMK Group performed in 2011? Were there any notable achievements worth mentioning?

A: The past year proved to be rather challenging for the steel industry. It began with strengthening prices for steel, but later in the year demand slumped and so did sales. In other words, the markets were not always favorable. Nevertheless, in general we are satisfied with

our performance, and I would like to use this opportunity to extend my cordial gratitude to Company employees for their dedicated work.

As regards achievements, 2011 was a landmark year for the Company. Output of steel has increased to 12 million tonnes, which is 4% higher than in 2010. Sales of steel products rose by 10% to a record 12.9 million tonnes. This was brought about by large-scale investments in production capacity, acquisition of new assets and proper performance by all Group businesses, which all have made their worthy contribution to the common cause.

Among the key factors which

contributed to stronger operational performance were the hot tests of Blast Furnace #7 and the commissioning of the new BOF at the Lipetsk site. This major project became the first of its kind in terms of scale in all of post-Soviet history. While previously similar construction projects would have been supervised by the government and involve many businesses from other industries with advance planning for the production of all relevant inputs and required machinery, this time NLMK employees were handling the coordination at all stages of the project, and this required significant organizational skills. The successful launch into operation of the state-of-the-art steelmaking facility became yet another vivid example of their professionalism. I am proud of our employees.

In 2011 we also worked on the development of a new product, high permeability transformer steel, the demand for which is growing very rapidly. Company experts have developed a unique technology for manufacturing it, and the technology is now being introduced at Novolipetsk and VIZ-Stal. For these purposes the factory in the Urals is installing a new rolling mill, upgrading the equipment used for applying electrical insulation coating, and developing the technology for laser beam treatment of rolled transformer steel. I believe it is by no chance that notwithstanding the low demand for electrical steel, in 2011 VIZ-Stal

continued to operate at high rates of capacity utilization, increasing output of rolled transformer steel by more than 10%.

The output of long products also increased by almost 10%. This also means a lot, especially if you take into account the break-down of a transformer at one of the electric-arc furnaces in July at NSMMZ. Through close collaboration between plant managers and manufacturers of electrical equipment the furnace was put back on-line in just six months, even though repairs of this type usually require 12 months to complete. In order to continue operations while the furnace was under repairs billets were procured from other suppliers. Still, notwithstanding these challenges the NLMK Long Products division has shown improved performance across a range of indicators.

As you know last year we expanded our presence in the global markets by acquiring several rolling businesses in the United States and Europe, which allowed us to increase our sales of value-added products. However, not everything went as smoothly as we would have liked it to go. Low demand for steel products in the European and US markets in the latter half of the year, unfortunately, prevented us from benefitting fully from the synergies between our Russian and overseas assets. The situation in the EU is very challenging, with the economic slowdown exacerbated by the debt problems of several countries, causing our European businesses to operate below capacity; combined with low prices for steel products all of the above drove the financials of our overseas division into the red.

Q: It would be interesting to know how we compare to other steel companies, because they must also be affected by the same difficulties.

A: Lack of market stability is not the core issue for the steel industry. Add to that higher prices

for inputs and energy. The limited supply of resources and significant increases in global output of steel (it increased by 7% in 2011, according to the World Steel Association) led to a bias in profitability towards raw materials. Lower profit margins in the steel industry are a global trend. For example, the operating profit margins for Arcelor Mittal and BHP Billiton (the world's largest steelmaker, and mining company) in 2010 stood at 5% and 44%, respectively. Against this background vertically integrated companies like NLMK found themselves in a more favorable position. In 2011 more than half of its profits were generated by Stoilensky and Altai-Koks. We intend to continue to invest in our mining businesses. For example, in 2012 we will continue to expand the open pit mine at Stoilensky and the construction of a pelletizing

self-sufficient in fat coal.

Q: We have grown used to the fact that our Company is one of the global leaders in terms of profitability. Is it true that the Company has lost some ground in this respect? What was the cause, and how can the situation be remedied?

A: Yes, it is true that NLMK profitability has contracted in the second half of 2011. I have described the reasons for that earlier, i.e. slumping demand and consolidation of overseas assets, which historically had enjoyed a lower profit margin compared to Russian businesses. But it would be absolutely wrong to claim that we have lost our competitive advantages. Our strong sides continue to be up-to-date technology, vertical integration, a varied product mix, and a balanced

IN 2012 WE INTEND TO INCREASE WAGES, SALARIES AND RELATED COMPENSATION BY AT LEAST 10%

plant with the capacity of 6 million tonnes of pellets per year. After its commissioning in 2015 the Company will become fully self-sufficient in terms of iron ore.

The Company is also entertaining a number of projects to improve our self-sufficiency in coal. The design and exploration work at the Zhernovsky plot are in their final stages. If the Company decides to proceed with the development of this plot the first tonne of coal may be produced as early as 2016. Geological survey works are under way at Plot Number 3 of the Usinskoye coal deposit in the Republic of Komi; their objective is to clarify the available reserves of coal. The proposed mining operation is expected to reach its design capacity of 2.7 million tonnes in 2018.

Once these plans are implemented this will make the Group more than 50% self-sufficient in coal and fully

sales geography. As a result, the cost of steel at Novolipetsk is below global averages, while the quality of the product is in line with world standards.

Lower profit margins are a general trend for the industry. We, however, won't bear with this, nor treat it as a fact of life. I believe that Company employees will back us up on this. We have designed a comprehensive program of action to further improve the quality of our products, expand their mix, reduce costs, and to improve the effectiveness of our operations in general.

In terms of sales our objective is to increase the sales of high value-added products. One of the paths towards achieving this is to quickly boost the effectiveness of our overseas assets.

A key area for the Group's development is the efficient use of resources. For example, in 2011

at Novolipetsk we introduced a recovery co-generation plant, which utilizes blast furnace gas to generate electric power for in-house consumption. This way we are achieving three objectives: we reduce our environmental footprint, lower our production costs, and make the Company less dependent on outside sources of energy. In addition, we also continue to introduce pulverized coal injection at NLMK blast furnaces, thereby reducing the consumption of coking coal and natural gas. This

through stormy waters and it is only natural that we rely on this experience. In case of a downturn we will curtail our investment spending and re-focus it on key projects within the context of the Group's technical upgrade program, thereby reducing the drain on our financial resources. Again, during the crisis in 2009 our capital investments were cut by more than 40%. There may be scope for a temporary shut-down of some operations if there is no demand for steel products. We may

year our capital expenditures are expected to be around US\$1.7 billion. Key projects that we intend to commission include phase one (electric steelmaking shop) and phase two (bar mill) at our Kaluga facility and the 4200 thick plate mill at DanSteel. This will allow us to expand our product mix and offer us the opportunity to produce new types of rolled products, including larger gauge and wider thick plate, which the markets want.

Also in 2012 we will continue work on the expansion of the open pit mine and construction of a pelletizing plant at Stoilensky. Once the pelletizing plant reaches its design capacity of 6 million tonnes per year in 2015, this will fully cover the requirements of our blast furnace operations in iron ore inputs.

In addition, Blast Furnace #7 and the new BOF facility will reach full capacity, allowing NLMK to produce a record high of 15 million tonnes of steel. We also expect that the synergies with our overseas assets and our strengthened position in the domestic Russian markets would allow us to increase sales by almost 30% to around 17 million tonnes, of which about 6 million tonnes will account for value-added products.

Novolipetsk will launch production of high permeability transformer steel and continue to develop the production of galvanized 0.22-0.29 millimeter gauge steel sheet for construction purposes and household appliances. We have identified a number of projects to develop the sintering and blast furnace, steelmaking, and rolling operations. We are considering the options for producing high-grade hot-dip galvanized steel for use in the automotive industry.

All of these projects will help the NLMK Group to increase output of products, improve their quality, retain low cost of production, and also to expand its presence in existing markets and tap into new markets. 🌱

WE HAVE DESIGNED A WHOLE RANGE OF MEASURES WHICH WOULD ALLOW THE COMPANY TO STAY AFLOAT AND PRESERVE ITS STAFF. WE HAVE DONE THIS IN THE PAST AND WE SHALL DO THIS AGAIN IN CASE OF A NEW CRISIS

is fairly important given the rising energy prices. On top of that, this helps to reduce the emissions of pollutants into the air. We also intend to further tighten monitoring of compliance with applicable technology requirements and resource consumption rates.

Q: Mr Lapshin, the economic crisis remains a concern for everyone. Based on what you were saying, the crisis also had a strong impact on the steel industry. How likely is it that our Company would cope with it successfully?

A: We have every reason to be confident that we will withstand the second round effect of the crisis. The Company is showing flexibility in its marketing policy: we can quickly re-divert our products to more lucrative markets, adjust the mix of our products in order to maximize profits in an unfavorable market environment. This is backed by our experience of coping with the crisis in 2009. At a time when many major companies were running losses NLMK was able to quickly restore its steelmaking capacity to full utilization and make profit.

The Company has acquired valuable experience of sailing

resort to strong austerity measures. In other words, we have designed a whole range of measures which would allow the Company to stay afloat and preserve its staff. We have done this in the past and we shall do this again in case of a new crisis.

Q: Do you have plans to reduce wages?

A: On the contrary, in 2012 we expect to raise wages, salaries and related compensation. In line with the collective bargaining agreements we have started raising wages across our Russian businesses on January 1. The Company is diligently complying with its social commitments to improve the well-being of our employees, and consistent wage increases outpace consumer price growth.

Q: How do you see 2012 for NLMK Group businesses? What projects will be pursued? Which of them are most significant? What would be the ultimate result?

A: It may be that 2012 will prove to be a turning point for us. We are finalizing phase two of the technical upgrade program and moving into phase three. This

Lipetsk Vs Tamerlane

NLMK employees took part in one of Lipetsk's 2011 cultural highlights.



By Elena Frolova,
Reporter for portal *gorod48* exclusively for
NLMK Magazine

In July last year, an opera –
*The Legend of the Ancient Town
of Yelets, the Virgin Mary and*

Tamerlane – premiered on the
banks of the Bystraya Sosna River
in the town of Yelets.

The opera, composed by
Alexander Tchaikovsky, is based
on a mysterious historical fact: in
1395 Tamerlane was advancing
upon Moscow with his huge
army then suddenly stopped near
the town of Yelets, and after a
fortnight of doubts turned back
and retreated. The legend says he
had a vision of the Virgin Mary
surrounded by saints. On the very
same day, August 26, the citizens
of Moscow were greeting the
miracle-working Vladimir Icon of
the Mother of God, praying and
begging it to protect them from the
terrible invasion. Daunted by the
luminous apparition, Tamerlane
decided that his forces would not
stand against the Divine forces
protecting Russia.

An opera about Tamerlane the
Invader is impossible without
battle scenes. Stage director

Georgy Isaakyan was lucky to
discover many fans of historic
reconstruction in Lipetsk and
the neighboring areas. 82 men
participated in the crowd scenes,
coming from the cities of Lipetsk,
Yelets, Zadonsk, Borisoglebsk,
Tula, Voronezh, and Kursk,
including two NLMK employees.

All members of military historic
clubs, they came to the set with
their own armor, weapons and
special costumes. The re-enactor
army was quickly split in two:
some were asked to represent the
Tartars and the Mongols, while
others took the side of Russian
warriors and citizens.

Yevgeny Sitnikov, maintenance
technician at NLMK, was fighting
with the "Russian army" against
"Tamerlane". He has been doing
historical reconstructions for 7
years and manages a military
historic club, called Severny Bereg
(the Northern Shore). His costume
of a Russian warrior – an iron

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LEAD SINGERS, INCLUDING ARTISTS FROM
THE RUSSIAN STATE SYMPHONY CAPPELLA
DIRECTED BY VALERY POLYANSKY, THE BOLSHOI
THEATRE, NOVAYA OPERA, GELIKON OPERA,
THE POKROVSKY AND STANISLAVSKY MUSIC
THEATRES

110

ORCHESTRA MUSICIANS

1 hour 20 minutes

OPERA DURATION

2000

SPECTATORS IN THE SPECIALLY
ASSEMBLED OPEN AIR AUDITORIUM ON
THE BANKS OF THE RIVER SOSNA

OPERA IN
NUMBERS





**YEVGENY SITNIKOV,
MAINTENANCE
TECHNICIAN AT NLMK
WAS BATTLING ON THE
SIDE OF THE "RUSSIAN
ARMY" AGAINST
"TAMERLANE'S TROOPS"**





TAMERLANE

(Temür, Tēmör) – “iron”

Timur, Timur Leng was a Turkic ruler and conqueror, one of the greatest military campaigners in history. He was born on April 8, 1336 near the city of Samarqand, in what is now Uzbekistan. He was named Timur at birth; to this was later added Lang, meaning “lame” in Persian. The name Timur Lang became, in European usage, Tamerlane (or Tamburlaine). Tamerlane

was a member of the tribe of Barlas, Mongols who had accompanied 13th century Mongol conqueror Genghis Khan and his sons on conquests of Central Asia and after these conquests adopted the Turkic tongue, as well as the religion of Islam. Later, Tamerlane constructed a fictitious genealogy to link his ancestry with Genghis.

From the mixed population of Samarqand, Tamerlane organized an army of infantry, engineers, and cavalry. In 1381 he campaigned in Iran, and in subsequent years (1386, 1392 and 1399) he conducted what he called his “three-year,” “five-year,” and “seven-year” invasions of that country. Extensions of these campaigns led him into Armenia and Georgia, then India, and, finally, Syria and Turkey.

On these distant expeditions Tamerlane ordered atrocities that are still remembered. At Delhi, in India, he had 100,000 Hindu inhabitants slaughtered and razed the city. At Esfahan (Isfahan), in Iran, which had rebelled after surrendering, he massacred 70,000 people and constructed towers of their skulls. He is believed to have died planning a campaign to invade China, although there is no evidence of his intentions to go beyond Xinjiang and Western Mongolia. Tamerlane died on January 19, 1405.

armor, forged helmet, and a steel sword – weighs as much as 20 kilos.

“I was over the moon to be taking part in this extraordinary event! Staging an opera on the shore of a river is a very original idea, and I am really glad they brought it here,” Evgeny says, “A huge cloud was floating above the Assumption Cathedral, and it seemed to be participating in the staging too.”

The opera culminated in the apparition of the Virgin Mary that stunned and terrified Tamerlane. Art director Ernst Heidenbrecht spent a while trying to come up with an idea of how to depict it. Finally, the concept was born: he decided to send a boat down the river, projecting a light image of Holy Mother of God onto the sail. A historic club called Kopje (Spear) from Yelets came up with the boat.

Alexandre Uglov, also a maintenance technician at NLMK and a fan of historic reconstruction, took part in the rehearsals.

“The boat that was used in the opera was moored in Lipetsk, and the organizers went to the city embankment to check it out,” Alexandre says, “They set up a projector and a power generator on the bow. Once we’ve sailed far away from the shore, they projected the image onto the sail.”

The organizers were extremely happy with the results. And on the opening night the boat looked

even better as it sailed through the twilight.

The audience lost their breath as they watched the boat glide through the dark waters, almost invisible. The icon projected onto the sail seemed to emerge from the darkness on its own.

A trail of lights stretched behind the boat made of floating candles launched by the artists.



A whole team was working hard for everything to come together, lead on board by Yevgeny Sitnikov.

The opera about the ancient town of Yelets and Tamerlane might become an annual event. And all participants really hope that this is going to happen – they can’t wait to feel a part of this breathtaking happening once again. ☆

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METERS: THE LENGTH OF THE PODIUM SHAPED AS AN ORTHODOX CROSS THAT WAS USED AS A STAGE

OPERA IN NUMBERS

15

PAIRS OF SHOES WERE MADE BY THE YELETS SHOE FACTORY FOR THE PARTICIPANTS OF THE LEGEND OF THE ANCIENT TOWN OF YELETS OPERA

82

PEOPLE WERE IN THE CROWD GATHERED TO PARTICIPATE IN THE STAGING BY PAVEL SEMENOV, HEAD OF THE KOPJE (SPEAR) HISTORIC CLUB


25

METERS OF SILK WAS USED TO MAKE THE METROPOLITAN'S ROBE THAT THE ARTISTS HAD TO CARRY ON THEIR SHOULDERS DURING THE SACRED PROCESSION



ALEXANDRE UGLOV,
MAINTENANCE
TECHNICIAN AT NLMK,
TOOK PART IN THE
REHEARSAL OF ONE OF
THE MOST COMPLEX
SCENES OF THE OPERA,
THE APPARITION OF
HOLY MOTHER OF GOD

In natural colors

A color photograph of a river scene. In the foreground, a small boat with a red and white hull is on the water. Several people are in the boat; one person is standing on the grassy bank to the left, looking towards the boat. The background features a steep, rocky cliff with some trees and a small structure on top. The water is calm, reflecting the sky and the cliff. The overall scene is a natural landscape.

At the beginning of the twentieth century Russia saw the launch of a project, unprecedented in scope and importance, to depict the expanse of the country, with its cities, monuments, factories, people and nature, in color photographs. The project was authored and almost single-handedly executed by Sergey Prokudin-Gorsky (1863-1944), the descendant of a prominent noble family, and photographer, inventor, tireless traveler and explorer.

Between 1908 and 1918 he produced several thousand photographs. Without any pretense of being unbiased he took photographs of everything he thought was worthy of being depicted, as he had described it, 'in natural colors'. The outcome was a unique portrayal of early twentieth century Russia and a depiction of its life in all of its abundance. His photographs show ancient Russian Orthodox monasteries and Russian birch trees, as well as photographs of Asian cities, assumed into Russia, next to depictions of generator rooms of power stations and buildings of steel works. The nature of the Caucasus Mountains is depicted with the same care and affection as the rivers of the mining areas of the Urals. Currently these photographs are the core part of *The Empire That Was Russia* photograph collection in the Library of Congress. The photographs in the collection are continuously researched, and this work, along with the rest of Prokudin-Gorsky's heritage, continues to evoke the interest of the public and researchers all over the world. Given the significance of the collection the US has long made it accessible to all; digitized photographs are publicly available on the Library of Congress website.

Notwithstanding the historical and cultural significance of his works, Prokudin-Gorsky saw 'natural colors' as the most important element of this undertaking. In his memoirs he called color photographs his 'life's work'.

In the late nineteenth and early twentieth century color photographs were taken by using the color separation process: an object would be photographed by taking a series of pictures with a monochrome photographic plate from the same position using three colored filters in green, blue, and red. This generated three color separated negatives, which were then combined to produce black and white positives, or, more often, slides. Color photographs were printed on very rare occasions. In order to view them they would be projected onto a screen with a projector equipped with green, blue, and red filters. The trick was to carefully superimpose all three images. Naturally, this made the process of obtaining color photographs fairly expensive, while their quality remained low. Nevertheless, it was a major accomplishment, allowing to capture



the world in all its beauty, or in 'true colors', as Prokudin-Gorsky described it.

Prokudin-Gorsky became fascinated with color photography in the late 1890s, when he was about thirty years old. By that time he had already graduated from the Saint-Petersburg University, where he met D. Mendeleev, attended a course at the Imperial Military Medical Academy, and also studied painting at the Academy of Arts, and showed a serious interest in playing the violin...

In 1890 Prokudin-Gorsky married Anna Lavrova, the daughter of Alexander Lavrov, a renowned Russian metallurgist and manager of the steel works at Gatchina. With his father-in-law's support Prokudin-Gorsky found employment with

the Management Board of the Gatchina Steel Works. Prokudin-Gorsky was very conscientious about his new job and by 1896 prepared a study on the state of foundry practices in Russia and presented it at a conference at the Imperial Russian Technical Society (IRTS). While doing research in metallurgy Prokudin-Gorsky had to deal closely with some priority issues in chemistry, which led him to photography.

In 1898 he joined the photography section of the IRTS and soon made a fundamental presentation on how to take photographs of falling stars, or meteor showers, and later exhibited his first photographic works and produced photographs of seventeenth and



eighteenth century paintings. Researchers believe that the experience with paintings prompted Prokudin-Gorsky to look closely into the process for transmitting colors in photographs. In 1902 he leaves for Europe to study the methods for transmitting colors in photographs, where he works under the guidance of Adolph Miethe, who was at the time the leading expert on the separation of colors. In later life Prokudin-Gorsky always had the fondest recollections of Miethe, but excelled his teacher in a number of ways. He came up with a significant improvement of Miethe's design for the photo camera and invented a new emulsion, which made the photographic plates equally sensitive to all colors.

The moment of glory for the inventor came in 1905, when at academic conferences in Moscow and Saint-Petersburg he used a large screen to exhibit his color photographs, including sights of Berlin, villages of Daghestan, coast of the Black Sea, the Caucasus Mountains, forests

and plains of Finland. The photographs became a revelation for the audience. The newspapers reported that "they astounded by their true portrayal of rich colors and

caused ovations and cries of admiration from the viewers". Prokudin-Gorsky spent the following two years exhibiting his photographs in Europe, where he also won



recognition as a photographer and received numerous exclusive awards.

Even before Prokudin-Gorsky rose from a small-time steelmaker to become a world renowned master of color photography, he developed an ambition to capture the natural and historical patrimony of Russia in color. His plan was to use the photographs as a learning aid in schools in order to exhibit the riches of the country.

To achieve his dream Prokudin-Gorsky travelled across Russia making a great number of photographs. Frequent photography expeditions went to the detriment of his physical health and financial wealth, because, notwithstanding any technological breakthroughs, photography remained a very strenuous and expensive process. He attempted to recover the costs by selling postcards, but these were not in great demand. His only hope was that someone would be willing to sponsor his ambitious plans.

His big break came in 1908, when Prokudin-Gorsky showed his photographs to Emperor Nicholas II. The Emperor was delighted to see photographs of “sunsets, snowy landscapes, peasant children, flowers, and autumn studies”, and Prokudin-Gorsky used the opportunity to share with him his dream of “portraying all the sights of our vast country in natural colors”. Nicholas II immediately issued orders to provide Prokudin-Gorsky with a specially equipped railroad car to be used as a photo laboratory and to facilitate his travel around the country.

Only a few days after his life-changing discussion with the Emperor Prokudin-Gorsky was sailing down the Mariinsky Canal System, making colorful photographs of the canals, landscapes around it, steamboats and towns.

The following year Prokudin-Gorsky travelled to the Ural Mountains, which he knew so well from his past experience in metallurgy. Prokudin-Gorsky travelled along the Chusovaya River, the main waterway of the Urals in a motor boat. To this day his photographs are used to illustrate encyclopedia entries about the river. One of his important successes was the view of the Maksimov Rock, which became a trademark of the Ural Mountains and a major landmark.

Apart from the Urals photography



expedition Prokudin-Gorsky's travels to Central Asia, the Caucasus and Lower Volga were also a major source of creative color photographs.

All these expeditions, however, led to Prokudin-Gorsky's gradual impoverishment. He began looking for new sources of funding and even swallowed his pride and approached the government for support, but without much avail. Once

he ran out of money Prokudin-Gorsky was forced to discontinue his project to make color photographs of “the sights of our vast country” half-way before its completion.

Later he had made several further attempts to resume the project, but World War I, the Russian Revolution and the Russian Civil War eventually forced him to leave the country and abandon his ambitious plans. 🚫

Robots of the Gallant Age

Today robots are very complex mechanisms finding wider applications in various areas of industry.

Their predecessors were also rather complex for their time, but they were used for entertainment rather than for work.

In a famous tale by Anderson a powerful Chinese Emperor is given an artificial nightingale that can sing like a real bird and imitate the movements of a live creature. The interesting part is that the author didn't have to make it up: such self-operating mechanisms weren't all that uncommon in the 18th century.

And they even had a name: automata. These, of course, appeared much earlier. Animated clock figures on the churches and city halls of Medieval Europe could also be considered to be automata; and the first mentions of artificial self-automated men and animals can be found in scientific literature of the Antiquity.

Their popularity peaked in the 18th century, when the art of designing "live mechanisms" was blossoming. Why? First of all, by the 18th century mechanics made a huge step forward, enabling the creation of far more complicated animated figures. Secondly, Europe was captivated by the idea of unlimited possibilities of the human mind, and robots came as the best confirmation of the theory. And finally, Europeans of the Gallant Age were in a constant pursuit of entertainment, fun and adventure. Human-like and zoomorphic automata

(that were essentially dolls) fitted in perfectly. The notion of "gallantry" that gave its name to the period is mostly associated with the relations between men and women from aristocratic (mainly court) background. Translated from



▲ JACQUES DE VAUCANSON

French, gallantry means elegant politeness, or exceptional courtesy.

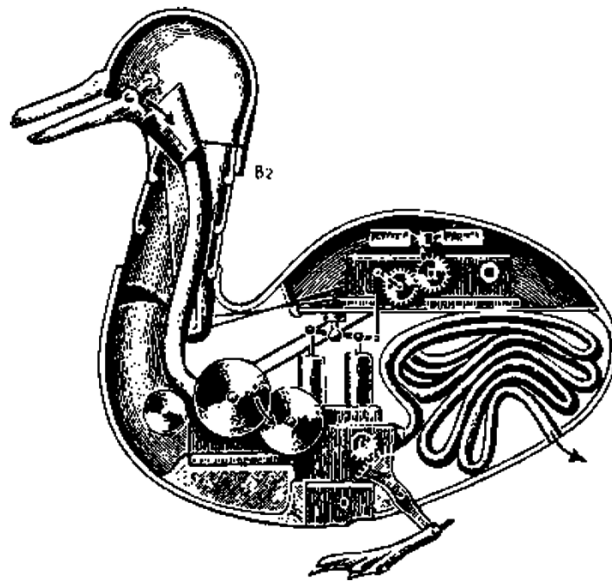
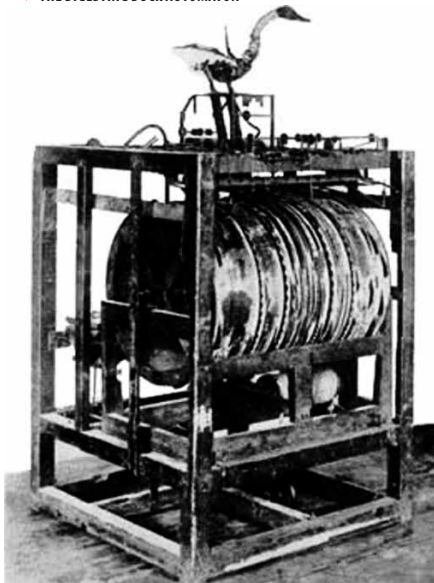
The Duck and the musician

Jacques de Vaucanson (1709 – 1782), a French mechanic and statesman, was one of the most popular automata inventors in the 18th century. *The Flute Player* and *The Digesting Duck* are his most famous creations.

Vaucanson built his first automata before the age of 30. The tenth child of a poor glove-maker from Grenoble, he had to make his own living from a very early age. His interest in mechanic devices and relevant talents allowed him to become a clockmaker's apprentice, where he probably learned the basics of mechanical engineering. However, he soon went on to study theology and joined the powerful Order of the Minims. There, in ancient monasteries, he was taught various sciences by the best teachers, including the details of anatomy. This knowledge later allowed him to develop his automata and led him to the idea of creating mechanical devices that fully mimicked the movements of a human being.

At 18 years of age he left the monastery and settled in Lyon, where he opened his own workshop to construct and repair agricultural machines. It was here that Vaucanson tried making his first automata. A few years later there was a visit from one of the governing heads of Les Minimes and Vaucanson decided to demonstrate his new skill to his ex-teacher by creating an automaton that would serve dinner and clear the tables for the visiting monk. We don't know what Vaucanson

▼ THE DIGESTING DUCK AUTOMATON



ended up making, but the head of Les Minimes wasn't happy with the result and ordered that Vaucanson's workshop be shut down.

Vaucanson didn't give up and after years of hard work and intensive scientific research he built the first truly impressive automaton, *The Flute Player*, a life-size figure that played the tabor and the pipe. It had a metal frame operated by a system of springs. Bellows inside *The Flute Player* blew air into the flute. The carefully calculated movements of the artificial musician's fingers opened and closed the necessary holes in the body of the instrument to make music. The automaton had a repertoire of 11 songs.

Despite the abundance of automatons at the time, *The Flute Player* was recognized for its sophistication and immediately attracted the interest of the scientific community. In 1738 Vaucanson presented his creation to the Académie des Sciences, where it was met with applause and cheers. Later, members of the Académie are going to petition the King of France to grant Vaucanson a title of nobility to

VAUCANSON BUILT HIS FIRST AUTOMATA BEFORE THE AGE OF 30

mark his scientific achievements. A year after the success of *The Flute Player* Vaucanson created two additional automatons, *The Tambourine Player* and *The Digesting Duck*. The metal duck had a thousand moving parts, and could flap its wings, tilt forward, swallow grain, and... drink water.

Having earned both public and scientific approval for building automata, Vaucanson

is said to have tired quickly of his creations. He sold *The Flute Player*, *The Tambourine Player* and *The Digesting Duck* and dedicated himself to government service, becoming the minister of agriculture. His original automata have all been lost, but copies can still be found, for example *The Digesting Duck* is on display at the Museum of Automata in Grenoble.

▼ THE PEACOCK CLOCK





▲ MARIE-ANTOINETTE'S ANDROID, CREATED BY PETER KINTZING AND DAVID ROENTGEN



▲ MARIE-ANTOINETTE AUTOMATON, MECHANISM



▲ THE TRIUMPH OF BACCHUS, 1605, A MUSICAL AUTOMATON THAT MOVES AROUND THE TABLE CARRYING WINE

The Peacock and The Writer

Although Vaucanson's original *Duck* was lost, but another famous mechanical bird from the 18th century survived and is still functioning today – the *Peacock* by British jeweler James Cox. His automaton became part of the famous *Peacock Clock* that is now on display in the State Hermitage Museum in Saint Petersburg. Russian TV viewers can see it in action every day on the “Culture” channel before every newscast.

In 1777 Duchess of Kingston

Elizabeth visited Russia. At one of the balls she told Prince Grigory Potemkin, favorite of Catherine the Great, about the mechanical *Peacock*, and the prince decided to present the Empress with an original gift, one of Mr Cox's “amazing pieces” (curiously enough, he paid 11,000 rubles for it from Catherine's savings). In 1781 the clock with a golden “Peacock”, “rooster” and “owl” arrived to Russia in several boxes. It was assembled by Russian inventor Ivan Kulibin. When the famous self-taught genius was

done, it turned out that the “owl” could turn its head and body, the “rooster” could tilt back its comb and cock-a-doodle-doo, and the “peacock” could spread its tail glamorously and twist.

Assembling the *Peacock* wasn't Kulibin's first encounter with clockwork automata. A few years before that he built a small egg-shaped clock that housed a whole miniature theatre with moving figurines.

Automata and watchmaking were closely interrelated. For example, the astonishing humanoid mechanisms created by a Swiss-born watchmaker Pierre Jaquet-Droz continue to fascinate the public (today Pierre

**AUTOMATA AND WATCHMAKING
WERE CLOSELY INTERRELATED**



▲ THE MUSICIAN

Jaquet-Droz is the name of a prestigious Swiss watch brand).

By 1768 Pierre Jaquet-Droz, at the age of 46, was at the peak of his watch making career. His precious metal chronometers decorated with moving figurines of people, birds and animals were sold all over the world. The kings and emperors of Spain, India and China would show them off to their subjects and distinguished guests. And Pierre Jaquet decided to go even bigger. Over the next six years together with his son Henri-Louis he presented three mechanical dolls 80 cm high. The first and the simplest one, *The draughtsman*, was made of 2000 pieces and could actually



▲ THE WRITER

draw images on a piece of paper, including a portrait of Louis XV and a dog with "Mon toutou" ("my doggy") written beside it, Marie Antoinette and her husband Louis XVI, and a scene of Cupid driving a chariot pulled by a butterfly. The automaton also moves on his chair, and he periodically blows on the pencil to remove dust.

Another doll – *The musician* – was made of 2500 pieces. *The musician* is a female organ player. The doll moves her fingers and follows the keys with her eyes. If you look closely, you will notice



▲ PIERRE JAQUET-DROZ

her "breathe" (the movements of the chest can be seen). And finally the last doll, *The writer*, the most complex of all Droz creations, made of 6000 pieces. Using a system of cams, he is able to write a text up to 40 letters

with a goose feather. He inks the feather, shakes it, and blows on the piece of paper to dry the ink once he finished writing.

The original automata built by Droz, still working and functional, are housed at the art and history museum in Neuchâtel, Switzerland. 🇨🇭

“Corroding” beauty

Because of its outstanding qualities, Corten steel can be used to create the most amazing works of art and architecture.

The *Angel of the North*, the biggest sculpture of an angel in the world, depicts a man with airplane wings measuring 54 meters across. It stands on a hill near the town of Gateshead in North-West England. Completed in 1998, it already looks... rusty.

In reality, the *Angel* has always been like this because it was built using Corten steel, which is covered with rust from the very beginning.

Why? To make it rust-proof.

CORTEN is a registered trademarks owned by United States Steel Corporation.

This type of steel was patented in 1933, and is widely used today because of its unique qualities, CORrosion resistance and TENsile strength (thus the name).

Corten is a type of alloyed steel. When exposed to the weather, the surface corrodes to a certain depth, forming a stable rust-like appearance. The strong and even patina cannot be washed away or destructed. Paradoxically, corrosion protects



▲ FRANCESCO MARINO DI TEANA, L'ARBRE DE FONTENAY



Mini architecture

Wim Delvoye, a Belgian artist, became famous for his “Gothic” works. He uses a laser machine and computer programs to cut intricate

Gothic cathedrals and towers out of Corten steel sheets. Several meters high, these models look very realistic. Besides architectural objects, Delvoye uses Corten to cut out construction machinery, for instance, excavators and bulldozers.



steel from corroding.

Corten steel is widely used for construction and decoration in a multitude of fields, including shipbuilding, civil and industrial construction, landscape design, and modern architecture.

Antony Gormley, the man behind the *Angel of the North*, liked to work with Corten, and with good reasons. The climate in North-West England, where



THE ANGEL OF
THE NORTH, THE
BIGGEST SCULPTURE
OF AN ANGEL IN THE
WORLD, DEPICTS
A MAN WITH
AIRPLANE WINGS
MEASURING 54
METERS ACROSS

the sculpture is located, is very humid, with very strong winds and frequent mists. For a construction as huge as the *Angel* such an environment is very dangerous, and if it were made from ordinary steel, saving it from corrosion would cost a fortune. And it cost a fortune as it is. Building and transporting the statue (three trucks were used to move the *Angel* from the plant to Gateshead, one for the body and two for the wings) cost around £1 million. Most of the

project funding was provided by the National Lottery, and the investment paid off. In July 2008 a man-sized model from which the sculpture was created was sold at auction for £2 million. The famous Spanish painter Pablo Picasso also worked with Corten. In 1967 his Cubist sculpture, considered to be one of the first to be made of Corten, appeared near the Richard J. Daley Center in Chicago. Picasso left his piece untitled, but it became very popular and is now referred to in

the US as the *Chicago Picasso*, or just *The Picasso*.

For Gormley and Picasso using Corten wasn't a signature feature. Unlike Francesco Marino di Teana who could be called the king of Corten. He created a few dozen sculptures from "corroded" steel, including *L'arbre de Fontenay* (The Tree of Fontenay), one of the biggest sculptures in Europe located in Paris.

Richard Serra, American sculptor and video artist, also often used Corten in his art.



▲ RICHARD SERRA, TILTED ARC, NEW YORK

In his youth, he spent some years working at a steel mill, which determined his choice of sculpture material and his love for the industrial style, including laconic shapes and simple objects.

Another important trait of his art is attention to how his sculptures interact with the environment. Natural and urban landscapes are always a part of Serra's artistic vision.

In 1981, Serra built *Tilted Arc*, commissioned by the US Government. A gently curved, 36.6 meters long, 3.66 meters high and 5 cm thick arc of rusting mild steel was installed in the Federal Plaza in New York City. There was controversy over the installation from day one: some complained that the arc was blocking the view, others said that the steel wall obstructed the passage through the plaza



▼ RICHARD SERRA, FULCRUM 1987, LONDON



▼ RICHARD SERRA, THE MATTER OF TIME, GUGGENHEIM MUSEUM BILBAO

and they had to walk a few extra meters around it every day, yet others were unhappy that it became a graffiti Mecca. At a public hearing on moving the arc, Serra argued the sculpture was site specific and that “To remove the work is to destroy it.” Eventually in 1989, the sculpture was dismantled, cut into parts and consigned to a warehouse.

One of Serra’s latest works, *The Matter of Time*, is located in

A Corten bridge

The first Corten steel bridge was built over the New River in West Virginia. Besides the innovative material, the bridge was also noted for being the world’s longest steel single-span arch bridge for 26 years with the longest span of 518 meters. In 2003 the title went to the Lupu Bridge in Shanghai.



▲ EERO SAARINEN, THE JOHN DEER HEADQUARTERS, MOLINE

the Guggenheim Museum Bilbao. The sculpture was mounted in 2005 and occupied an entire gallery. The work consists of sinuous Corten steel sheets 3.7 to 4.3 meters high assembled into mammoth blocks weighing a total of 276 tons.

The famous Eero Saarinen, known as the Father of “International Style”, was the first to use weathering steel in modern architecture. In the beginning of the 60’s he was invited to design the John Deere headquarters in

Moline, Illinois. He created an elegant characteristically “rusty”-colored multi-storey building.

In 2006 one of the oldest and most prestigious architectural magazines, *The Architectural Review*, awarded its annual prize to the Texan Miro Rivera Architects for a small building that looks very similar to Richard Serra’s sculptures. Not far from the Colorado River they built two parallel Corten steel plates to make... a public restroom.

Miro Rivera Architects often use Corten steel to build luxurious mansions (Stonehedge Residence), public buildings (a theatre in Austin, Texas) and business centers. But it’s the “rusty” restrooms that became their trademark. They recently completed the construction of another one in a public park in Austin. Forty nine vertical Corten steel plates, whose width and height vary significantly in size, are arranged forming a spine that



▲ U.S. STEEL BUILDING



▲ U.S. STEEL BUILDING BROADCASTING TOWER IN LEEDS

coils at one end to form the restroom walls.

As the use of Corten became more and more common in architecture, some disadvantages emerged. Corten is sensitive to salt-laden air environments and to water. In such environments, the protective patina may not stabilize but instead continue to

corrode. This was a major factor in the decision to demolish the Omni Coliseum in Atlanta built using Corten steel. Because it was so close to the ocean, it simply never stopped rusting, and eventually large holes appeared in the structure.

Another unexpected and unpleasant characteristic of

Corten emerged in connection with one of the most beautiful skyscrapers in America, the U.S. Steel Building. This dark-colored building (darker than rust) noted for its triangular shape and the use of a special system of liquid-filled fireproofed columns, was built in 1975. It soon turned out that the weathering of the material was resulting in a discoloration of the surrounding city sidewalks, as well as other nearby buildings. A cleanup effort was orchestrated, but the sidewalks still have a decidedly rusty tinge.

In time, solutions were found to all of these challenges, and today more and more most spectacular buildings are being created using “rusty” steel all over the world. 🌟

Wet paint!

Designers of the Design Museum Holon in Israel wanted to play on the fact that Corten still can turn different shades of orange as it oxidizes. The building's exterior is shrouded by a sinuous ribbon façade composed of five bands of Corten weathering steel. Initially, each one was intended to be a tone different from the previous one. To achieve this, the oxidation process had to be stopped at different stages, but this didn't work. The designers had to order a special coloring agent from Italy that allowed achieving the desired effect. The museum opened in 2010, but the painted Corten still stains.

