RUSNANO PORTFOLIO COMPANIES
(31 operating factories)

Selecta Biosciences, Inc. & Selecta RUS

Vaccines Based on Selecta Biosciences' tSVPTM Nanoplatform

Operating Factories

http://www.selectabio.com

Shareholders in Portfolio Company
RUSNANO, Flagship Ventures, Polaris Venture Partners, OrbiMed Advisors, NanoDimension, other investors

Industry Sector
Medicine and Pharmacology
http://en.rusnano.com/portfolio/companies?branch=medicine

Production Location
Khimki, Moscow Oblast
Jobs created: 20

Investment Started: 2011

Total Budget

4.86 bln rubles

Co-investment by RUSNANO

0.75 bln rubles

selectabio.com
http://www.selectabio.com

Development and commercialization of an entirely new class of targeted vaccines that induce antigen-specific immune activation or antigen-specific immune tolerance for therapeutic and prophylactic applications

Selecta Biosciences, Inc. is a leader in development of synthetic nanovaccines and immunotherapies. Selecta's lead drug candidate, SEL-068, has entered human clinical studies as a vaccine for smoking cessation and relapse prevention. Other drug development programs include universal human papillomavirus vaccine, universal influenza vaccine, malaria vaccine, and type 1 diabetes therapeutic vaccine.

Selecta's patented technology originated in laboratories at Harvard Medical School under the direction of Professor Omid Farokhzad, MD and in laboratories at MIT under the direction of Professor Robert S. Langer. Professor Langer is a renowned scientist and a recipient of the National Medal of Science, the most prestigious honor for scientists bestowed by the United States, and an author of approximately 850 patents issued or pending worldwide. Professor Ulrich von Andrian, MD, PhD, head of the immunopathology laboratory at Harvard Medical School, is also a founder of Selecta.

This project enables Selecta Biosciences to open a laboratory and a manufacturing facility in Russia through a Russian subsidiary. By broadening its scientific and financial bases, Selecta Biosciences will be able to accelerate vaccine development. It gains access to rapidly growing pharmaceutical markets in Russia and the CIS and maximizes its technical platforms for creating new vaccines. The portfolio company will establish full-cycle development of pharmaceuticals — from research and testing through production and commercialization.

Areas of application

- Prevention and treatment of cancers and infectious and autoimmune diseases
- Therapies for nicotine dependence

Market

- Healthcare providers and their patients

Competitive advantages

- A new pharmaceutical platform for prophylactic and therapeutic vaccines
- Optimal immunological response
- Minimal side effects
- Low cost of production

Pilkington's Glass Plant in Russia and STiS Group

Energy-efficient and Self-cleaning Glass

Operating Factories

http://www.stis.ru

Shareholders in Portfolio Company
RUSNANO, Pilkington Group Limited (NSG Group), European Bank for Reconstruction and Development, STiS Group

Industry Sector
Nanomaterials
http://en.rusnano.com/portfolio/companies?branch=nanomaterials

Production Location
Moscow Oblast
Jobs to be created: 300

Investment Started: 2012

Total Budget

29.6 bln rubles

Co-investment by RUSNANO

7.4 bln rubles

stis.ru http://www.stis.ru

Production of high-quality glass and insulated glass units with nano-enabled coatings

Energy-efficient and self-cleaning glass—the primary products of the portfolio company—possess extraordinary characteristics thanks to multilayer coatings. By applying special layers ranging in depth from 5 nanometers to 500 nanometers, a window becomes capable of retaining heat within a building and maintaining a comfortable environment inside when it is too warm outside.

The use of energy-efficient windows can reduce heat loss during winter months by as much as 70 percent, and when the weather is warm, the glass prevents heat from permeating the building, reducing heating and cooling expenses. In mass production, the cost to manufacture insulated glass units with energy-efficient glass is only a little more than that of glass units with ordinary glass. Therefore, in many countries of the world, energy-efficient glass has become the standard, accounting for 80 percent to 100 percent of glass installed in new windows.

The agreement among shareholders provides for construction of a new factory in Moscow Oblast, not far from the existing Pilkington plant, which will be modernized as part of the project. The new factory is expected to produce 240,000 tons of high-quality glass per year of which 100,000 tons will be coated glass.

Areas of application

- Residential construction
- Industrial construction

Market

- Producers of windows, builders and siding companies

Competitive advantages

- Reduces heat dissipation by 50 percent
- Reduces damage from the sun's rays and heat entry on hot days
- Uses photocatalysis for self-cleaning

TBM

Basalt Fiber Construction Materials

Operating Factories

Shareholders in Portfolio Company
RUSNANO, Fund MIR (Modernization, Innovation, Development), Vnesheconombank Group, managing company TBM

Industry Sector
Nanomaterials
http://en.rusnano.com/portfolio/companies?branch=nanomaterials

Production Location
Pokrovsk and Yakutsk, Republic of Sakha (Yakutia)
Jobs to be created: 252

Investment Started: 2011

Total Budget

950 mln rubles

Co-investment by RUSNANO

400 mln rubles

Production of basalt fiber construction materials for Russia's Far East and other regions with permafrost conditions

TBM plans to manufacture four products:

- Basalt-concrete composites for industrial and civil construction
- Basalt-plastic armature for reinforced concrete buildings and road coverings
- Basalt-plastic grids for reinforcing roadways, embankments, and slopes
- Basalt continuous filament, raw material for production of composite building materials

Areas of application

- Housing construction
- Mining
- Road building

Market

- Construction companies, road building companies and companies engaged in mining

Competitive advantages

- Low heat conductivity
- Highly durable in extreme cold
- Long service life
- Resistant to chemicals and corrosion

NEVZ-CERAMICS

Nanostructured Ceramics
Operating Factories

http://www.nevz-ceramics.com

Shareholders in Portfolio Company
RUSNANO, Novosibirsk Electrovacuum Plant–Soyuz
Industry Sector
Nanomaterials
http://en.rusnano.com/portfolio/companies?branch=nanomaterials
Production Location
Novosibirsk
Jobs to be created: 350
Investment Started: 2011

Total Budget
2.44 bln rubles
Co-investment by RUSNANO
0.79 bln rubles

nevz-ceramics.com
http://www.nevz-ceramics.com

Production of nanostructured ceramics for use in a wide range of industries

NEVZ-CERAMICS will expand manufacturing of products in high demand: ceramic insulators for electric power, check valves for the oil and gas industry, armored gear and panels for armored vehicles and body protection, ceramic substrates for LEDs and other semiconductor devices, and thermoelectric modules. NEVZ-CERAMICS will also produce promising ceramic implants for advanced surgical treatment of spinal cord and joint injuries and diseases and for dentistry.

The company adds nanopowders to its ceramics to decrease the material's porosity and increase its density. By using ultrasound compacting, a method for dry formation of nonplastic ceramic powders, it ensures mechanical stability and uniform pressed density without employing plasticizing agents. After the compacted particles have been baked using microwave sintering and passed through hot pressing and spark plasma sintering, they retain their nanostructures. Average grain size in the ceramic material is 100 nanometers.

Areas of application

- Defense
- Oil and gas
- Industrial engineering
- Power engineering
- Orthopedics and dentistry

Market

- Producers of electrical equipment, armored gear and equipment, equipment for the oil and gas industry, medical and laboratory equipment

Competitive advantages

- Durable, high-strength, light-weight material
- Controllable thermal transmission and electrical properties

Russian Quartz

High Purity Quartz Concentrates

Operating Factories

http://www.russianquartz.com

Shareholders in Portfolio Company
RUSNANO, Kyshtym Mining, QuartzVIK

Industry Sector
Other
http://en.rusnano.com/portfolio/companies?branch=other

Production Location
Kyshtym, Chelyabinsk Oblast

Jobs to be created: 60

Investment Started: 2011

Total Budget

2.28 bln rubles

Co-investment by RUSNANO

0.75 bln rubles

russianquartz.com

http://www.russianquartz.com

Modernization and expansion of high purity quartz production at the Kyshtym Mining production facility and quartz deposit

Portfolio company Russian Quartz will produce quartz concentrates at the Kyshtym Mining facility in Chelyabinsk Oblast. Under the project, the field-based complex, which is currently mining and processing quartz and preparing high-purity concentrates, will be technically upgraded. The quartz concentrates are feedstock for obtaining high purity quartz with many high-technology applications: microelectronics, heavy-duty and ultraviolet lighting, special-purpose optics, and quartz ceramics, to name a few.

The project to upgrade the complex will be implemented over three years in two phases. When phase two is finished, the company's annual production capacity will have grown nearly sevenfold: from 1,500 tons to 10,000 tons of quartz concentrate with purity ranging from IOTA Standard to IOTA 6 grade.

In the first phase, scheduled for completion in mid-2012, the complex will bring quartz concentrate production to 6,000 tons annually. Currently world market of high-purity quartz concentrate stands at 60,000 tons per year. High demand from solar energy is creating a shortage. RUSNANO's investment will enable Kyshtym Mining to increase its sales in a market that will continue to grow.

Once domestic production of quart concentrates reaches required amounts, Russia will have the entire vertically integrated production chain for polysilicon in place — from mining raw quartz and preparing concentrate to production of the quartz crucible and the industrial equipment for obtaining silicon monocrystals with purity of 6N to 12N.

Areas of application

- Electronics
- Solar energy
- Lighting engineering
- Medical equipment
- Chemical industry
-

Market

- Producers of semiconductor electronics, solar modules, optics, equipment for the chemical industry

Competitive advantages

- High degree of purity
- Low production costs

RMT Ltd

Thermoelectric microcoolers

Operating Factories

http://www.rmtltd.ru

Shareholders in Portfolio Company
RUSNANO, S-Group Venture, Private shareholders

Industry Sector
Energy Efficiency
http://en.rusnano.com/portfolio/companies?branch=energy

Production Location
Moscow, Nizhny Novgorod
Jobs to be created: up to 320

Total Budget
797.02 mln rubles
Co-investment by RUSNANO
420 mln rubles

rmtltd.ru http://www.rmtltd.ru **Investment Started:** 2010

Producton of thermoelectric microcoolers using bismuth telluride nanopowder for optic-, micro-, and nanoelectronics

RMT Ltd is manufacturing thermoelectric micromodules based on the Peltier effect. The modules provide cooling, local heat dissipation, and heat regime maintenance for a variety of instruments and devices: semiconducting and other lasers, powerful LEDs, highly sensitive photo detectors, ICs, microprocessors, and biomedical instruments. These miniature thermoelectric coolers, the specialty of project initiator RMT, are integrated into microelectric units, thereby providing the most efficient cooling—the closer the cooling element is to the heat source, the more effectively the unit works.

The project opened a pilot production base in May 2011 in Moscow. In November of that year, it began operations at its main manufacturing facility in the Ankudinovka Technopark in Nizhny Novogorod. RMT Ltd is an outstanding example of how a scientific advance made by Russian specialists is commercialized and its production is later expanded to meet demand from foreign companies for an innovative product. RMT exports 80 percent of its output to the United States, Canada, Japan, Europe, and Southeast Asia.

Areas of application

- Optic-, micro-, and nanoectronics
- Laser equipment
- Instruments-making
- Biomedicine

Market

- Producers of lasers and electronics

Competitive advantages

- High quality products
- Low production costs
- Rapid fulfillment of orders
- Engineering support for customers
- Distribution networks in North America, Europe and Asia

Advanced Technologies Center

Analytical Equipment for the Nanoindustry

Operating Factories

http://www.nanoscopy.ru

	Shareholders in Portfolio Company	Total Budget
	RUSNANO, Scientific and Production Company ATC	
	Industry Sector	
	Other	**387** mln rubles
	http://en.rusnano.com/portfolio/companies?branch=other	Co-investment by RUSNANO
	Production Location	
	Moscow	
	Jobs to be created: 75	
nanoscopy.ru	**Investment Started:** 2010	**140** mln rubles
http://www.nanoscopy.ru		

Production of analytical instruments for research in materials science, biology, and medicine. Production of high-precision sensors for analyses of chemical and biological substances

Portfolio company Advanced Technologies Center manufactures the FemtoScan series of scanning probe microscopes—precision instruments that use the mechanical movement of a probe (cantilever) to study the surface of an object. The microscopes are precise to about one nanometer. ATC also produces atomic scales that can register the presence of particles of various substances at the level of individual atoms. One promising application of these scales is as quick-response biosensors.

The company has established an R&D center where it will conduct research to perfect technology, carry out engineering development, and test prototypes and models. The center will supply software to work in instrument-managing and image-processing modes.

The scanning probe microscopes that ATC produces are capable of more than 50 sophisticated research regimes—contact atomic force microscopy, resonance atomic force microscopy, scanning frictional microscopy, scanning resistance microscopy, scanning tunneling microscopy, electrostatic microscopy, magnetic force microscopy, force curve analysis, and nanolithography among them. Combining compact size with powerful software packages, ATC instruments can be accessed through the Internet with open architecture.

Areas of application

- Materials science
- Biology
- Medicine
- Nanotechnology
- Surface quality control

Market

- Nanotechnology centers
- Research institutes and departments
- Producers of nanoproducts

Competitive advantages

- Highly flexible, multipurpose instruments
- Broad capability for analyses
- Low production costs

Future Store

Model Retail Store with Nano-enabled RFID Solutions

Operating Factories

Shareholders in Portfolio Company
RUSNANO, SINTRONICS, X5 Retail Group
Industry Sector
Other
http://en.rusnano.com/portfolio/companies?branch=other
Production Location
Moscow
Investment Started: 2011

Total Budget

350 mln rubles
Co-investment by RUSNANO
116.65 mln rubles

Adaptation and improvement of RFID technology and implementation of an RFID tag system, via retail leader-integrator X5 Retail Group, to control consumer goods from manufacturer through retail sales via retail leader-integrator X5 Retail Group

This project will create technical solutions for introducing and exploiting RFID technology in the Russian Federation. If that effort, phase one of the project, is successful, the company-integrator will carry out an RFID demonstration project in retail trade.

RFID, radio frequency identification, tags are a modern method of identifying objects that is widely used by transnational retail food companies and transportation and logistics companies that work with them. RFID tags have many advantages over commonly used bar codes, and some day they may fully replace the older technology. RFID tags can accommodate significantly more information. Their useful lives are longer. They may be rewritten on numerous times.

RFID technology reduces expenses throughout the entire distribution and sales chain. Warehousing and turnover become more efficient thanks to RFID technology. Because the tags are an electronic certificate for the goods, they prevent counterfeit items from going to the consumer, improve control over vendors, and resolve costly problems with tracking and removing expired products—particularly important for drugs and other short-lived commodities.

The project plans to demonstrate the suitability of RFID technology by opening a pilot Future Store using X5 Retail Group as its base. X5 Retail Group owns supermarket chains Perekrestok, Pyaterochka, and Karusel. The store would open in 2013 and sell food and household goods. The project will also develop standards for the field, a prerequisite for changing the country's normative and legislative base for retail trade and manufacturing.

Area of application

- Retail operations

Market

- Russian operators of retail trade outlets, suppliers of fast-moving consumer goods, transportation and logistics companies

Competitive advantages

- Increases employee productivity
- Raises inventory accuracy to virtually 100%
- Reduces stock on hand
- Raises sales through efficient restocking and targeted marketing activities

Liotech

High-capacity Lithium-ion Bateries
Operating Factories

http://www.liotech.ru

Shareholders in Portfolio Company
RUSNANO, Chinese industry player
Industry Sector
Energy Efficiency
http://en.rusnano.com/portfolio/companies?branch=energy
Production Location
Novosibirsk
Jobs to be created: 532
Investment Started: 2010

Total Budget
13.57 bln rubles
Co-investment by RUSNANO
7.58 bln rubles

liotech.ru
http://www.liotech.ru

The First Russian Massive Manufacturing of New Generation Lithium-Ion Accumulators for Energetics and Electric Transport

In December 2011 within the framework of project the largest worldwide plant for manufacturing of high capacity lithium-ion accumulators of Liotech-company was started. Planned plant output will make up to 1gW•h or approximately one million accumulators per year. At the moment Liotech plant manufactures Li-Ion accumulators 240 A•h nominal capacity, since the 4th quarter 2012 manufacturing Li-Ion accumulators 380 and 770 A•h nominal capacity is planned.

Nano-structured cathode material—lithium-Iron-Phosphate (LiFePO4) is used in manufacturing technology. This material allows to achieve the best technical characteristics of accumulators while manufacturing. The main characteristics of the lithium-ion accumulators (LIA) are high energy density, wide temperature range, large cycle life, ecology and operational safety. Accumulators are assigned for usage as energy storages and installation at all types of electric transport.

Areas of aplication

- Energetics (stationary usage)
- Electric transport

Market

- Energy supply and energy safety systems
- Electric transport producers

Competitive advantages

- High capacity of the accumulators
- No memory effect
- Reliability and safety
- Wide temperature range of exploitation
- Large cycle life: in energetics—up to 25 years, at electric transport—up to 8 years
- Recourse, the charge level at a depth of discharge up to 80%—more than 3,000 cycles
- Accumulator recourse usage at electric transport—more than 600,000 km

ELVEES NeoTech

Fabless Center for 65-nm Technology Microchips

Operating Factories

http://www.elvees.ru

Shareholders in Portfolio Company
RUSNANO, Senesys, Inc. (USA)

Industry Sector
Optics and Electronics
http://en.rusnano.com/portfolio/companies?branch=optics-electronics

Production Location
Zelenograd

Jobs to be created: 370

Investment Started: 2011

Total Budget

2.81 bln rubles

Co-investment by RUSNANO

1.06 bln rubles

elvees.ru
http://www.elvees.ru

Design of highly integrated microchips with 65-nanometer and finer technology norms; manufacturing of web cameras and intelligent network video surveillance cameras

ELVEES, the project applicant, is putting finishing touches on a design center at its location on the outskirts of Moscow. There portfolio company ELVEES NeoTech will develop and contract to produce a variety of integrated microcircuits using 65-nanometer norm technology and later—45-nanometer. An entire line of innovative products is already being created using ELVEES's microchips: surveillance cameras with integrated signaling, web cameras, and terminals for professional connectivity to GLONASS.

Transition from 65- to 45-nanometer technology will significantly improve technical characteristics of the products. It will provide new functional qualities and reduce the cost of final goods.

Intelligent network surveillance cameras, webcams, and their microcircuits will be created with design center know-how. The center's products will be oriented primarily to export markets, although use in the domestic market will raise the competitiveness of domestic solutions for security, business monitoring, and more advanced Internet services.

Areas of application

- Security systems
- Business monitoring systems

Market

- Producers of video surveillance equipment and design and construction-assembly companies for security systems

Competitive advantages

- Superior technical and consumer characteristics
- Conceptually new approach for new disruptive applications
- Lower manufacturing costs

Uralplastic-N

Flexible High-barier Packaging Material

Operating Factories

http://www.uralplastic.com

Shareholders in Portfolio Company

RUSNANO, Uralplastic

Industry Sector

Nanomaterials

http://en.rusnano.com/portfolio/companies?branch=nanomaterials

Production Location

Aramil, Sverdlovsk Oblast

Jobs created: 450

Investment Started: 2010

Total Budget

2.55 bln rubles

Co-investment by RUSNANO

1.08 bln rubles

uralplastic.com

http://www.uralplastic.com

Production of high-barrier packaging solutions for storing food and non-food products

Uralplastic-N is using know-how in three related areas: production of nanocomposites from clay and ceramics, introduction of nanocomposite additives to polymer packaging material, and manufacturing of modified flexible films with improved qualities.

In October 2011 the company began producing the modified flexible polymer packaging. The factory has been equipped with machinery for preparing nanocomposites from clay and ceramics. The facility is designed to produce 1,800 tons of flexible material per month, roughly enough to wrap 650 million packages of prepared goods.

Areas of application

- Food products
- Detergents and other household products
- Cosmetics
- Industrial chemicals

Market

- Producers of fast-moving consumer goods, chemical companies

Competitive advantages

- High barrier properties, impermeable to oxygen and water vapor
- Better physical and mechanical properties
- Package is thinner by 20 percent to 30 percent

RUSALOX

High Thermal Conductivity LED Substrates

Operating Factories

http://www.rusalox.ru

Shareholders in Portfolio Company
RUSNANO, MCL (Israel), Tamir Fishman CIG (with participation of Russian Venture Company)

Industry Sector
Nanomaterials
http://en.rusnano.com/portfolio/companies?branch=nanomaterials

Production Location
Vladimir

Jobs created: up to 120

Investment Started: 2010

Total Budget

868 mln rubles

Co-investment by RUSNANO

120 mln rubles

rusalox.ru

http://www.rusalox.ru

Production of high thermal conductivity substrates for ultrabright LEDs and other electronic devices using proprietary ALOX technology

The project is based on patented technology ALOX™ from Israeli company MCL. Substrates manufactured with the technology are made of a conducting layer of aluminum or copper and a dielectric material with nanopourous structure. The dielectric material creates considerable competitive advantage: pores measuring 65 nanometers to 90 nanometers that have been suffused with special nanofillers achieve thermal conductivity of up to 200 W/m*K, dielectric breakdown voltage of more than five kilovolts, and good thermomechanical properties. Substrates produced with ALOX™ technology have passed all necessary testing, including tests for thermal reliability. RUSALOX's products outstrip alternatives on basic consumer characteristics — heat conductivity, by hundreds of times; price, by 20 percent to 30 percent; and reliability, by two orders of magnitude. Leading international players in the LED market are currently considering using the company's products Commissioned in February 2012, RUSALOX's factory is the first in Russia to produce high thermal conductivity substrates and panels for electronic devices, primarily for LEDs requiring superior heat sinks. In its first phase of operations, the Vladimir factory will produce 10,000 panels per month, providing enough output to assemble more than one million LED lamps.

Areas of application

- LED lighting systems
- Electronic devices requiring superior heat sinks

Market

- Producers of LED lighting and electronics

Competitive advantages

- High thermal conductivity
- High breakdown voltage
- Excellent thermomechanical properties
- Competitive pricing

RST-Invent

Ultra High-frequency RFID Chips and Integarted Systems

Operating Factories

http://www.rst-invent.ru

Shareholders in Portfolio Company
RUSNANO, Systematica, private co-investor

Industry Sector
Optics and Electronics
http://en.rusnano.com/portfolio/companies?branch=optics-electronics

Production Location
St. Petersburg
Jobs to be created: 90

Investment Started: 2011

Total Budget

781.01 mln rubles

Co-investment by RUSNANO

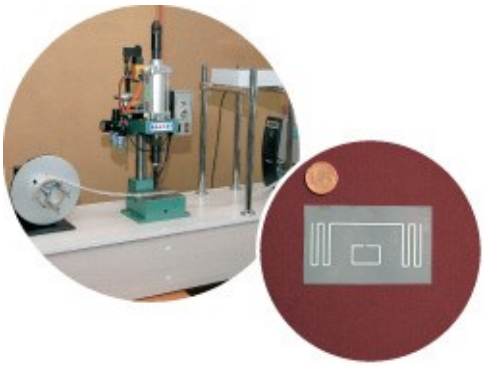
186.98 mln rubles

rst-invent.ru http://www.rst-invent.ru

Production of metal RFID tags and RFID labels for passive RFID systems

Portfolio company RST-Invent is using 90-nanometer technology to manufacture a new generation of ultra high-frequency RFID-chips to EPC Class-1 Generation-2 standards. Application of 90-nanometer process to RFIDs has brought a breakthrough in downscaling size, energy consumption, and cost of the chips.

The chips have built-in support for electronic digital signature technology GOST R 34.10–2001, which protects the goods against counterfeiting, making RST-Invent's product a strong competitor in a growing market.



The chips are being used to develop new tags as well as to update existing RFID tags, like the PatchTag™, a market leader in distance of registration among passive universal tags. RST-Invent will create other tag forms specifically for the new chip. One is the iNano family of adhesive tags that will feature greater read and write distances thanks to antennas with greater amplification gain and the 90-nanometer process technology.

Areas of application

- Retail
- Warehouses
- Libraries
- Construction industry
- Transport and logistics

Market

- Producers of fast-moving consumer goods, retail stores, logistics and transportation and companies, building companies, industrial enterprises, and libraries and archives

Competitive advantages

- Ability to read/write quickly and at considerable distance
- Lower energy use
- Operational within broad temperature range
- Meets European standard EPC Gen 2
- Optimal integration solutions

Unicom

Road Paving Modifier Unirem

Operating Factories

http://www.nk-group.ru

Shareholders in Portfolio Company
RUSNANO, Novy Kauchuk

Industry Sector
Nanomaterials
http://en.rusnano.com/portfolio/companies?branch=nanomaterials

Production Location
Podolsk, Moscow Oblast

Jobs to be created: 250

Investment Started: 2010

Total Budget

1.85 bln rubles

Co-investment by RUSNANO

1.29 bln rubles

nk-group.ru http://www.nk-group.ru

Production of composite material Unirem for road paving using nanostructured rubber powder to modify an asphalt-bitumen mixture

Last year 5,710 tons of Unirem were added to asphalt-cement material that was used to pave more than nine million square meters of roads and highways in the country. That work was part of a national effort to improve road infrastructure. The market for road surface modifiers in 2015, given the amount of construction, reconstruction, and repair expected, is estimated at more than $340 million.

Areas of aplication

- Road building
- Airport facilities

Market

- Road-construction companies

Competitive advantages

- Greater durability and longer service life
- Fewer ruts and reflective cracks
- Greater resistance to water and ice
- Less costly road repair and maintenance

METACLAY

Nanosilicates and Polymer Nanocomposites

Operating Factories

http://www.metaclay.ru

Shareholders in Portfolio Company
RUSNANO, Management Company METACLAY

Industry Sector
Nanomaterials
http://en.rusnano.com/portfolio/companies?branch=nanomaterials

Production Location
Karachev, Bryansk Oblast

Jobs created: 210

Investment Started: 2010

Total Budget

2.06 bln rubles

Co-investment by RUSNANO

1.10 bln rubles

metaclay.ru

http://www.metaclay.ru

Production of modified layered nanosilicates, masterbatches, and polymer nanocomposites

By 2014 about 80 percent of the portfolio company's products will be polymer nanocomposites from a moldable polymer base (matrix) and filler.

Compared with ordinary composites, the materials produced by METACLAY have new characteristics, including higher mechanical durability and fire safety and greater barriers to water and gas penetration. They are being used to protect oil and gas pipes from corrosion and to manufacture cushion blocks for railway fastenings, flexible packaging for FMCGs, and noncombustible cable insulation. Most of the products have been certified by customers and tested at their production lines.

METACLAY's technology is based on developments by scientists at Russia's leading R&D centers. To stay upfront, METACLAY has opened a high-end R&D center to execute the full cycle of scientific development. It can move from an idea, through studies of the materials, to manufacturing test batches for its own needs or on client's demand.

Areas of application

- Oil and gas
- Cable industry
- Packaging
- Automotive construction
- Construction

Market

- Customers in heavy industry and FMCG: pipes, cables, railway components and rolling stock, automotive components, and building materials as well as packaging for FMCG

Competitive advantages

- Superior characteristics over competing products at lower production costs

Germanium and Applications

Germanium-based Products for Optical- and Nanoelectronic Equipment

Operating Factories

http://www.geapplic.ru/en

Shareholders in Portfolio Company

RUSNANO, private co-investors

Industry Sector

Other

http://en.rusnano.com/portfolio/companies?branch=other

Production Location

Novomoskovsk, Tula Oblast

Novoshakhtinsky, Primorsk Krai

Jobs created: 150

Investment Started: 2009

Total Budget

2.17 bln rubles

Co-investment by RUSNANO

0.8 bln rubles

geapplic.ru/en

http://www.geapplic.ru/en

Vertically integrated production of germanium-based products: disks, bars, plates, and spherical blanks for lenses

In November 2011 Germanium and Applications launched new hightechnology production of electro-optical components in Novomoskovsk, in Tula Oblast. The plant is equipped with advanced measuring tools and other state-of-the-art equipment, like the numerically controlled machinery for preparing spheres and equipment to fine grind and polish optical lenses and substrates.

Production of germanium and germanium-containing components is part of a large-scale manufacturing complex belonging to Germanium and Applications that is being expanded with RUSNANO. Germaniumrich coal is extracted at the company's mines in Primorsky Krai. A few kilometers from the coal field, the company has introduced a unique process for manufacturing germanium concentrate.

Germanium and Applications is the only vertically integrated producer of germanium in Russia. When plant expansion is completed in 2013, the company will be set to pursue world-leading production of this strategic element.

Areas of application

- Chemical industry
- Metallurgy
- Electronics and lighting
- Alternative energy
- Medicine
-

Market

- Producers of infrared instruments and devices, thermal imagers, solar panels for space applications, and other high-tech areas
-

Competitive advantages

- Proprietary mineral base in Primorsky Krai with one of the world's richest reserves of germanium ore
- Vertically integrated production, reducing dependence on imports and other external factors

Connector Optics

Arsenide Gallium Wafers, Chips, Photodetectors, and Optical Components with VCSELs

Operating Factories

http://www.connector-optics.com

Shareholders in Portfolio Company
RUSNANO, VI Systems GmbH (Germany), BANK URALSIB

Industry Sector
Optics and Electronics
http://en.rusnano.com/portfolio/companies?branch=optics-electronics

Total Budget

1.1 bln rubles

Co-investment by RUSNANO

0.77 bln rubles

connector-optics.com
http://www.connector-optics.com

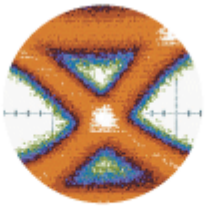
Production Location
St. Petersburg

Investment Started: 2009

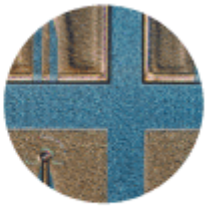
Production of vertical-cavity surface-emitting lasers and photodetectors in the 850-nm range: epitaxial wafers, chips, packaged components. Production of ultrahigh-speed (to 40 Gbit/s), energy-efficient optical components for data communications, computer, and consumer markets.

Manufacturing of this product is based on advanced technology for growing semiconductor heterostructures with molecular beam epitaxy, which ensures ultralow internal optical loss in the produced epitaxial wafers.

Photodetector chip



Eye diagram 25 Gbit/s



VCSEL array

Vertical cavity surface emitting lasers, photodiodes, and related optical components are used in highspeed data transmission devices for local networks, active optical cables, supercomputers, and devices based on promising standards USB 3.0 and 4.0. This project is well-timed: demand for faster information transmission is growing worldwide.

Markets

- Optical components, modules, transceivers, interconnects
- Systems integrators
- Computers

Competitive advantages

- Unique experience and know-how in design, epitaxial growth, and processing of VCSELs
- Data transfer rate per channel is four times faster compared with competing modules
- Low power consumption
- High termal stability

Sun Innovations

Nano-ink and Equipment for High-tech Digital Printing

Operating Factories

http://www.sunrussia.com

Shareholders in Portfolio Company
RUSNANO, business founder, BANK URALSIB

Industry Sector
Coatings and Surface Modification
http://en.rusnano.com/portfolio/companies?branch=coatings

Production Location
Berdsk, Novosibirsk Oblast
Jobs to be created: 200

Investment Started: 2010

Total Budget

1.36 bln rubles
Co-investment by RUSNANO
0.57 bln rubles

sunrussia.com
http://www.sunrussia.com

Modernization and expansion of nano-ink production for high-technology digital ink-jet printing. Production of printers using UV-LED ink curing technology

Novosibirsk company SUN has developed an innovative digital UV printing system that surpasses others in use across the globe today. The system owes its advantages largely to nanotechnology applications: the use of nanosized pigments and additives to the nanoink and ultrabright UV LEDs based on gallium nitride heterostructures in the printers.

Printers produced with this technology can apply images not only to advertising and printing products, as traditional printers can, but also to furniture, tile, glass, appliances and electronics, stretch ceilings, panels, and other surfaces. SUN printers combine high productivity with low operational costs, which significantly reduces the cost of the printed product. SUN nano-ink offers a broad range of color, high resistance to light, exact color reproduction, and long shelf life—important for UV curable ink.

Areas of application

- Advertising and design
- Printing
- Souvenirs
- Architecture
- Construction
- Interior design and decoration
- Furniture making

Competitive advantages

- Nano-ink: better stability on any material
- Ink-jet printing: greater durability
- UV-LED printers: safer to operate, more durable, consume less power

OptoSense

Explosive Gases Sensors

Operating Factories

http://www.optosense.ru

optosense.ru

http://www.optosense.ru

Shareholders in Portfolio Company
RUSNANO, ICO, REKS, EMI

Industry Sector
Optics and Electronics
http://en.rusnano.com/portfolio/companies?branch=optics-electronics

Production Location
St. Petersburg
Jobs to be created: up to 110

Investment Started: 2010

Total Budget

496.51 mln rubles

Co-investment by RUSNANO

209 mln rubles

Production of innovative sensors for industrial safety systems

The project makes unique use of semiconductor polycrystalline nanosized layers in mass production of radiation sources and photovoltaic receivers—a sensor's key elements. OptoSense produces infrared optical sensors that distinguish themselves for the rapidity with which they react (5.5 seconds compared with 10 seconds for competing devices), their service lives of seven years compared with five years for competing devices, and their low energy consumption (average consumption of 7 mW compared with 200 mW for competing devices). OptoSense sensors continue to operate effectively when humidity is high and oxygen is absent. These considerable advantages ensure demand for the sensors in Russia and in the global market.

OptoSense's production technology for infrared-optical sensors overcomes a number of problems that hamper other sensors in the industrial safety market such as ineffectual performance when humidity is high, lackluster reaction time, periodic downtime for battery discharge caused by high levels of energy onsumption.

In December 2011, at its St. Petersburg factory, the company commissioned a new production line for optical components, which are key elements in sensors of explosive gases. The line has enabled OptoSense to expand production up to 120,000 sensors per year. Its products have been certified as meeting international standards of ATEX and IECEx for operations in explosive gas environments.

OptoSense exports its goods to the United States and countries in Europe.

Areas of application

- Oil and gas
- Coal mining
- Chemicals
- Power engineering
- Utilities
- Telecommunications

Market

- Producers of gas analysis equipment for industrial use

Competitive advantages

- Low energy consumption
- Small dimensions
- Operation within a wide temperature range
- Resistance to corrosive gases
- Lengthy service life

NPC Springs

Ultrastrength Homogeneous Nanostructured Springs

Operating Factories

http://www.npc-springs.ru

Shareholders in Portfolio Company
RUSNANO, Izhmash, BANK URALSIB

Industry Sector
Nanomaterials
http://en.rusnano.com/portfolio/companies?branch=nanomaterials

Production Location
Izhevsk, Republic of Udmurtia

Jobs to be created: 200

Investment Started: 2009

Total Budget

1.11 bln rubles

Co-investment by RUSNANO

0.83 bln rubles

npc-springs.ru

http://www.npc-springs.ru

At the base of new technology for production of ultrastrength springs lies a process of hot winding that combines the optimal level of heating, degree of deformation during winding, and cooling-heating regime following each turn of the spring. As a result of these operations, nanosized substructures form, providing the products with ultrastrength properties.

The technology makes it possible to produce springs whose service life is several times longer, whose stress limit is at least doubled, whose capacity at low temperatures is greater, and whose compression and coil impingement are eliminated.

Use of the new springs for railway transport, for example, will reduce substantially the cost of repairs and maintenance for rolling stock and increase the volume of cargo transported by increasing the load on the car axle. By some estimates, the gain from equipping the entire fleet of rolling stock, one million cars, with new springs in Russia would equal four billion rubles.

Areas of application

- Rail transport
- Automotive industry
- Elevator manufacturing
- Power industry
- Agricultural and road machinery manufacturing

Competitive advantages

- Signifi cantly higher resistance to relaxation and longer service life without increasing raw materials costs
- 30 percent to 40 percent increase of allowable working tensions

Plackart

Protective Nanocoatings

Operating Factories

http://www.plackart.com

plackart.com

http://www.plackart.com

Shareholders in Portfolio Company
RUSNANO, Rosatom, Managing Company ODK, Management company Plackart

Industry Sector
Coatings and Surface Modification
http://en.rusnano.com/portfolio/companies?branch=coatings

Production Location
Moscow, St. Petersburg , Perm, Tyumen, Ufa (Bashkortostan), Kursk, Nizhny Novgorod, Naberezhnye Chelny (Tatarstan)
Jobs created: 300–500

Investment Started: 2010

Total Budget

3.22 bln rubles
Co-investment by RUSNANO
1.22 bln rubles

Deposition of functional nano-enabled coatings to equipment in a wide variety of industries through a network of service centers

Portfolio company Plackart offers industrial customers services and ready-made solutions for applying multipurpose nanostructured coatings—thermal-barrier, wear-resistant, and corrosion-resistant coatings—through a network of centers. The coatings protect drilling platforms, bridges, steel structures, and associated apparatuses from corrosion. They safeguard stop valves and tubing fittings and drilling and oil and gas production and processing equipment from wear and tear. Robotized equipment and metallurgical labs ensure strict quality control and permit the company to produce coatings with programmed hardness, porosity, and adhesion.

The project uses two of the most popular and promising application technologies in the world—thermal spraying and ion-plasma magnetron sputtering. The new technologies are replacing obsolete and environmentally harmful ones, especially galvanic technology. By combining these technologies, scientists are able to develop coatings with entirely new properties. For example, by depositing nanocoatings, Plackart enabled its client to attain significantly better gas turbine engines performance, higher power, and longer life cycle.

In 2011 Plackart launched two new lines, a line for thermal spraying in Sherbinka, a neighborhood in Moscow, and special installations for applying coatings in the Nizhny Novgorod. Those plants and the previously existing lines in Perm and Tyumen enable Plackart to apply nearly any coating known today for protecting metal from wear and corrosion.

Areas of application

- Engineering
- Oil and gas industry
- Energy
- Metallurgy
- Aviation

Market

- Wide range of industrial applications

Competitive advantages

- Better product characteristics
- Lower cost of deposition
- Environmentally safe deposition process

Optogan

LEDs and Energy-saving LED Lighting

Operating Factories

http://www.optogan.ru

Shareholders in Portfolio Company
RUSNANO, RIC&—Republican Investment Company, Sakha Republic (Yakutia), ONEXIM Group, Management Company Optogan

Industry Sector
Energy Efficiency
http://en.rusnano.com/portfolio/companies?branch=energy

Production Location
St. Petersburg
Jobs created: 400

Investment Started: 2009

Total Budget

4.64 bln rubles
Co-investment by RUSNANO
2.28 bln rubles

optogan.ru
http://www.optogan.ru

Production of ultrabright nanoheterostructured LEDs and LED-based lighting systems using proprietary technology

Optogan uses ultrabright LEDs to manufacture the latest in energyefficient lighting systems. Patented technology using gallium nitride and full-cycle production enable the company to produce competitively priced products and control quality at every stage. Optogan's products are among the best in the industry. Optogan's industrial-scale manufacturing facility is located in St. Petersburg where, in November 2010, the company commissioned its first line for LED mass production. In September 2011, the company released the first LED household bulbs ever serially produced in Russian, the Optolux E-27. With its standard screw base, the bulb can be used in any regular lamp.

The unique technology for chip production was developed by former students of Nobel Prize winner and Russian Academy of Sciences member Zhores Alferov—Maxim Odnoblyudov, Vladislav Bougrov, and Alexey Kovsh. Together they founded German-Finnish company OptoGaN. Today they lead the portfolio company. With the establishment of the new business in St. Petersburg, one of the most promising developments by Russian scientists in recent years has been brought home to the country of its origin.

Areas of application

- Lighting industry, all segments
- Consumer electronics

Market

- Producers of lighting systems and consumer electronics, individual consumers, and industrial companies and trade centers

Competitive advantages

- Patented technology for LED production meeting world-class standards
- Vertically integrated production including R&D
- Competitive prices

Prepreg-SKM

Prepregs — Carbon and Mineral Fiber Composites

Operating Factories

http://www.prepreg.ru

Shareholders in Portfolio Company
RUSNANO, Holding company Composite
Industry Sector
Nanomaterials
http://en.rusnano.com/portfolio/companies?branch=nanomaterials
Production Location
Moscow
Klimovsk, Moscow Oblast
Investment Started: 2009

Total Budget

3.46 bln rubles
Co-investment by RUSNANO
3.25 bln rubles

prepreg.ru
http://www.prepreg.ru

Production of prepregs based on nanomodified carbon and mineral fibers and nanomodified binding materials

Prepregs are semi-finished composite material produced by saturating a reinforced fibrous base with a uniformly distributed binder. Impregnation is carried out to maintain maximally the physical and mechanical properties of the reinforcing material. Prepreg technology makes it possible to obtain monolithic articles of complex forms with minimal tooling. In civil aircraft, these materials are used to manufacture airplane and helicopter bodies, wings, fairings, propellers, and rotors. Composite materials reduce aircraft weight and, consequently, fuel consumption; they also increase the strength and service life of the carriers.

Use of prepregs in production of blades for wind turbines is a promising market for expansion. In addition, prepregs can be used in the shipbuilding and automobile industries, for making ship hulls and non-weight-bearing auto body parts. In construction, prepregs can be used to reinforce concrete structures. They are adaptable to manufacturing prostheses, medical devices, and sports equipment.

Portfolio company Prepreg-SKM is building competitive domestic production of nanofilled and nanomodified prepregs from carbon fibers for polymer composite materials and finished goods. This will improve the competitiveness of Russian composite materials and significantly increase their use in Russia's industrial sectors.

Areas of application

- Aviation and space
- Automobile manufacturing and ship building
- Construction
- Oil and gas production
- Pipeline transport
- Medicine
- Wind power

Market

- Companies engaged in producing airplanes and space vehicles, builders of automobiles and ships, producers of equipment for oil and gas extraction, manufacturers of prosthetics and sporting goods

Competitive advantages

- Durability and fatigue resistance
- Resistance to corrosion and chemicals
- Elasticity
- Light weight

THERMOINTECH

Thermoelectric Cooling and Generating Systems

Operating Factories

http://www.thermointech.ru

Shareholders in Portfolio Company
RUSNANO, RIO

Industry Sector
Energy Efficiency
http://en.rusnano.com/portfolio/companies?branch=energy

Production Location
Zelenograd
Jobs to be created: 200

Investment Started: 2011

Total Budget

1.63 bln rubles
Co-investment by RUSNANO
0.6 bln rubles

thermointech.ru
http://www.thermointech.ru

Production of thermoelectric systems using CERATOM non-ceramic technology

Thermoelectricity is a promising alternative energy source. It is one of the lowest in cost and most reliable. CERATOM's thermoelectric system generates electricity at $.07/W, comparable to thermal and nuclear energy and considerably less costly than other alternative energy sources.

Thermoelectricity is used in active cooling, temperature control and electric power generation under conditions that are not amenable to traditional methods, such as in compressor or absorption refrigerators. Thermoelectric modules are used in equipment for transportation and space, lasers, electronics, and telecommunications, and in household appliances.

Areas of application

- Uninterruptible power supplies for gas distribution substations
- Cooling of solid-state and diode lasers
- Telecommunications
- Power generation
- Humidity control

Market

- Producers of lasers and telecommunications equipment and oil and gas companies

Competitive advantages

- Many configurations and sizes of thermoelectric modules
- High performance
- Low price

NANOELECTRO

Nanostructured Ultradurable Cable with High Conductivity
Operating Factories

http://www.nanoelectro.net

Shareholders in Portfolio Company
RUSNANO, VNIINM
Industry Sector
Nanomaterials
http://en.rusnano.com/portfolio/companies?branch=nanomaterials
Production Location
Moscow
Jobs to be created: 80
Investment Started: 2011

Total Budget

1.02 bln rubles
Co-investment by RUSNANO
0.45 bln rubles

nanoelectro.net
http://www.nanoelectro.net

Production of ultradurable, highly conductive nanostructured electrical cable developed at VNIINM
Moscow based portfolio company NANOELECTRO will manufacture up to 50 tons of ultradurable cable per year at design capacity.
Production technology involves melting and serial assembly of bimetallic rough-forged materials that then pass through a deformation process which introduces niobic fibers 6 nm to 10 nm thick into the copper matrix of wire. In a 2×3 mm cross section of the composite wire that results, as many as 400 million fibers will be present. They are responsible for the extraordinary mechanical durability of the wire—1,000 MPa to 1,200 MPa. The space between fibers is comparable to the average length of the path of electrons in the copper matrix. That achieves electrical conductivity of 65 percent to 85 percent of ultrapure copper. NANOELECTRO has already received numerous inquiries from Russian and international companies regarding purchase of the superwire.

Products

- Wound cable with rectangular intersection for high power impulse magnets and magnet-pulse inductors
- Compositional contact cables for high speed railway transport
- Wire and cable of greater reliability for aviation and space equipment, fleet, and defense industry
- Particularly durable microcable for electronics, mini-electric motors, and highly flexible cable

Areas of application

- Science and industry (powerful impulse magnets)
- High-speed rail
- Shipbuilding
- Aviation and space engineering
- Electronics

Market

- National High Magnetic Field Laboratory, Los Alamos
- Helmholtz-Zentrum Dresden-Rossendorf scientific center, Germany
- Russian Railways
- All-Russian Research and Development Institute for the Cable Industry
- ALPHISICA GmbH

Competitive advantages

- Durability comparable to steel
- Electrical conductivity comparable to copper

ECM

Electrochemical Equipment for High-precision Processing of Parts from Metals and Nanostructured Alloys Operating Factories

http://www.indec-ecm.com

Shareholders in Portfolio Company
RUSNANO, Invest AG, founders

Industry Sector
Coatings and Surface Modification
http://en.rusnano.com/portfolio/companies?branch=coatings

Production Location
Ufa, Republic of Bashkortostan

Investment Started: 2010

Total Budget

185.54 mln rubles
Co-investment by RUSNANO
70 mln rubles

indec-ecm.com
http://www.indec-ecm.com

Serial production of state-of-the-art, environmentally clean, precision electrochemical machines for manufacturing components from any metal or alloy. Production of tools and details with high productivity and low operating costs

The electrochemical machines that this project have been designed for nanometer-precision processing of virtually the entire spectrum of metals, including hard alloys and nanostructured metals. The technology used in the machines is comparable to that of the world's leading manufacturers and in some parameters—performance and cost of operation—superior. In addition, software that Russian engineers have developed expands signifi cantly the units' surface machining capabilities. The units are extremely versatile: they can be used to produce implants and surgical instruments and to manufacture complex parts from high-strength materials for aircraft engines and power turbines.
Production machines of this class have almost no presence in Russia today. Indeed, in 2008 they were less than 0.1 percent of the world market in the precision machinery industry.
The project will employ cutting-edge developments from Russia's electrochemistry institutes and put modern surface machining technology to work in high-tech industries: microelectronics, precision instruments, aerospace, energy, medicine, automotive, and other industries.

Areas of application

- Aviation construction
- Energy
- Automotive industry
- Electronics industry
- Medicine
- Instrument manufacturing

Competitive advantages

- Low operating costs
- High-precision copying and nanometric surfacing

SITRONICS-Nano

VLSI Microchips with 90-nm Process Technology

Operating Factories

http://www.mikron.sitronics.ru

Shareholders in Portfolio Company
RUSNANO, Mikron, Amex, SITRONICS, Sistema

Industry Sector
Optics and Electronics
http://en.rusnano.com/portfolio/companies?branch=optics-electronics

Production Location
Zelenograd

Jobs to be created: over 300

Investment Started: 2010

Total Budget

16.57 bln rubles

Co-investment by RUSNANO

8.28 bln rubles

mikron.sitronics.ru
http://www.mikron.sitronics.ru

Establishment of new 90-nm microchip production and design center

Portfolio company SITRONICS-Nano is producing integrated microchips with 90-nanometer technology norms at the Zelenograd manufacturing base of Mikron, the leading microelectronics producer in Russia. Mikron is a part of the Russian holding company Sistema.

SITRONICS-Nano has positioned itself for growth in rapidly expanding segments of the microelectronic components market: GLONASS/GPS navigation systems, industrial electronics, and chips with extended functionality for biometric passports and other personal documents, credit and social security cards, SIM cards, and RFID tags. These new integrated circuits are high performers with large memories. They are low energy consumers, and their protective mechanisms are extremely reliable.

The project partners with one of the world's leading producers of semiconductor devices—STMicroelectronics.

Areas of application

- Computing electronics
- Industrial electronics
- Navigational systems
- Smart cards and biometrical documents
- Monitoring and safety systems

Market

- Russian OEM producers of electronic devices

Competitive advantages

- Most advanced domestic producer of microchips
- Proprietary microcircuit design and development center

Hemacore

Blood Coagulation Testing Instruments

Operating Factories

http://www.hemacore.com

hemacore.com

http://www.hemacore.com

Shareholders in Portfolio Company

RUSNANO, Medical Innovations, Sberbank Capital

Industry Sector

Medicine and Pharmacology

http://en.rusnano.com/portfolio/companies?branch=medicine

Production Location

Moscow

Jobs to be created: 123

Investment Started: 2010

Total Budget

1.08 bln rubles

Co-investment by RUSNANO

0.58 bln rubles

Production of equipment and disposables for evaluating blood-clotting disorders using a new diagnostic method

Portfolio company Hemacore is the embodiment of many years of fundamental scientific work. The company will bring to market a new diagnostic method that can forecast thromboses and potentially save millions from stroke and heart attacks. This diagnostic tool evaluates various phases of blood clotting and is without analogue in today's medical instruments market.

The instrument can simultaneously analyze several blood samples; a diagnostic cycle requires only 30 minutes. Highly precise diagnoses, moderate test prices, and ease of use are expected to give this product a large share in the Russian market for coagulation analyzers and allow its producers to enter the international market.

Area of application

- Medicine

Market

- Clinical diagnostic laboratories and medical institutions. In 2008 Russia had more than 10,000 laboratories, including 66 labs specializing in coagulation diagnostics

Competitive advantages

- Simultaneous diagnosis of insufficient (hemophilia) and excessive (thrombosis) blood clotting
- Ability to forecast thromboses

Nanotech-Dubna

Colloidal Quantum Dots

Operating Factories

http://www.quantum-dots.ru

quantum-dots.ru

http://www.quantum-dots.ru

Shareholders in Portfolio Company

RUSNANO, TK-1, Scientific Research Institute for Applied Acoustics

Industry Sector

Nanomaterials

http://en.rusnano.com/portfolio/companies?branch=nanomaterials

Production Location

Dubna, Moscow Oblast

Jobs to be created: 20

Investment Started: 2010

Total Budget

71.5 mln rubles

Co-investment by RUSNANO

35 mln rubles

Production of colloidal quantum dots with 10-kg capacity

Among the many subsets of nanomaterials, quantum dots are like no other. At dimensions typically below 10 nanometers, nanocrystalline semiconductors, metals, and magnetic materials can all exhibit quantum confinement phenomenon. Basically, at the nanometer scale, their hysical size encroaches upon the fundamental quantum confinement dimensions of orbiting electrons that are uniquely prescribed by their atomic nucleus.

Quantum dots from one material of different sizes glow with different colors. In comparison with traditional florescent materials, quantum dots possess greater photostability and their color remains stable over several years.

Current and future applications of QDs impact a broad range of industrial markets. These include biology and biomedicine; computing and memory; electronics and displays; optoelectronic devices such as LEDs, lighting, and lasers; optical components used in telecommunications; and security applications such as covert identification tagging or biowarfare detection sensors.

Areas of application

- Security
- LEDs
- Labeling studies
- Medicine
- Future uses: solar modules, flexible electronics, and optoelectronic devices

Market

- Producers of LEDs, biomedical markers, and electronics

Competitive advantages

- Variable wavelength of fluorescence spectrum
- High photostability
- Broad wavelength range
- Low cost

Danaflex-Nano

High-barier Polymer Films and Flexible Packaging Materials

Operating Factories

http://www.danaflex.info

Shareholders in Portfolio Company
RUSNANO, Danaflex

Industry Sector
Nanomaterials
http://en.rusnano.com/portfolio/companies?branch=nanomaterials

Production Location
Kazan, Republic of Tatarstan

Jobs created: 600

Investment Started: 2009

Total Budget

2.45 bln rubles

Co-investment by RUSNANO

1.2 bln rubles

danaflex.info
http://www.danaflex.info

Production of high-barrier polymer films and flexible packaging materials derived from them

The portfolio company, which began manufacturing in 2011, produces high-barrier polymer film and flexible packaging materials based on the film. The material is designed mainly for packaging of food, household cleaning products, cosmetics, and pet food.

High-barrier flexible film is heat resistant, making it possible to process contents in hot or cold temperature regimes and to heat products in microwave ovens without unwrapping them. Barrier properties of the film prevent penetration of moisture, oil, fat, petroleum products, most household chemicals, gases, microbes, and UV radiation, maintaining the quality of the product. That and the fact that preservatives can be greatly reduced and shelf life is extended are significant competitive advantages for Danaflex-Nano's film.

The project is being undertaken jointly with Danaflex, the Russian leader in the market for polymer film and flexible packaging prepared from it. Danaflex's managers and shareholders have led the company to above-average growth in every year since its founding in 2001.

Areas of application

Packaging in several industries:

- Food
- Household cleaning products
- Cosmetics
- Pet food

Market

- Producers of food, household cleaning materials, cosmetics, and pet food

Competitive advantages

- Reduces preservatives in foodstuff
- Extends product shelf life
- Lowers cost and packaging weight
- Uses environmentally-friendly, recyclable materials

New Instrumental Solutions

Solid-cast Instruments with Multilayer Nanostructured Coatings

Operating Factories

http://www.zao-nir.com

Shareholders in Portfolio Company
RUSNANO, Gazprombank, NPO Saturn

Industry Sector
Coatings and Surface Modification
http://en.rusnano.com/portfolio/companies?branch=coatings

Production Location
Rybinsk, Yaroslavl Oblast

Investment Started: 2008

Total Budget

1 bln rubles

Co-investment by RUSNANO

0.50 bln rubles

zao-nir.com http://www.zao-nir.com

Full-cycle production of instruments with nanostructured PVD coating using a deposition technology developed at Kurchatov Institute

Researchers at the Kurchatov Institute developed the technology used in this project—application of nanostructured coatings to metal-cutting instruments. The coatings increase wear resistance of the tools by 2.5 times, decreasing the frequency of replacement and lowering overall tool costs.

Competitive advantages

- Highest quality tools
- Custom tool design and production
- Flexible pricing
- Fast shipment

Areas of application

- Jet engine building
- Aviation and space industries
- Mechanical engineering for power and transportation
- Shipbuilding