



RUSNANO



Press release

August 11, 2011

Israeli Technology ALOX™ to be Used in Vladimir LED Substrate Production Project

Agreements for rent of facilities and equipment in Vladimir were signed today between project company MCLR and TOCHMASH, a subsidiary of nuclear fuel company TVEL. According to the documents, the Russian-Israeli company will manufacture LED circuit boards using patented Israeli technology ALOXT™ at a production complex in Vladimir that belongs to TOCHMASH. Co-investors in the project are RUSNANO and a venture fund established with the participation of Russian Venture Company and Israeli company Micro Components Ltd., the developer of the technology. The venture fund is managed by Innovative Solutions. The total budget of the project is 868 rubles. RUSNANO will cofinance 120 million rubles. Production of the LED substrates will get underway in the first half of 2012.

“We chose the Vladimir site for a number of reasons. First, the TOCHMASH facility is a well-equipped base for modernization and the addition of some new equipment. Second, the company has highly qualified employees. Third, TOCHMASH management and the Vladimir Oblast administration were enthusiastic about placing cutting-edge high-tech production on their territory and are providing support,” recounted **RUSNANO Senior Investment Manager Vasily Kostyanovsky**.

TVEL Vice-President Mikhail Kulikov explained that the TOCHMASH location was a logical and advantageous choice. The production complex park contains more than 100,000 square meters with excellent location for the project—eight kilometers from the Moscow-Vladimir-Nizhny Novgorod highway, 180 kilometers from Moscow and 250 kilometers from Nizhny Novgorod. The TOCHMASH territory already has common infrastructure—power generating facilities and electricity distribution networks, heating, water, waste treatment, telecommunications, and security and sophisticated logistics infrastructure, including rail transportation facilities.

“By placing manufacturing in Vladimir, we shall be able to organize production of the LED substrates quickly and efficiently and resolve logistics issues thanks to the city’s convenient location and developed transportation infrastructure,” **MSLR General Director Shimon Neftin** said. “In 2012 we plan to produce goods worth about 70 million rubles, and by 2014 we’ll produce more than one billion rubles worth of goods.”

Open joint stock company RUSNANO

10A, Prospekt 60-letiya Oktyabrya, Moscow, Russia, 117036

Tel. +7(495) 988-56-77, Fax. +7(495) 988-53-99



MSLR, a joint project of RUSNANO and Tamir Fishman CiG, a venture fund with Russian Venture Company participation, will demonstrate how a foreign technology may be used to establish commercial manufacturing in Russia with production for the entire world. “TOCHMASH is an outstanding partner for that kind of project,” commented **Yan Ryazantsev, director of the Department of Investment and Expertise at Russian Venture Company.**



Technical information

Light-emitting diodes are semiconducting devices that transform an electric current into a light ray. LEDs are made of a semiconductor crystal on an LED chip, an optic system (a lens), and a casing with contact terminals.

LED lamps draw little electricity, are highly reliable, and have many appealing qualities: they are environmentally sound, firesafe, and easily allow change in the level and chromatic characteristics of light. The weak spot in LEDs, however, is that the crystal heats when they are lit. When the temperature of the crystal rises, light output declines and the service life of the lamp decreases. Israeli company Micro Components Ltd. was able to resolve that problem with its state-of-the-art ALOX technology, which works by lowering the temperature of the crystal with rapid heat sink. At the heart of the technology is a process of *selectively staged aluminum oxidation* in which dielectric material is obtained on the surface of the metal and in its depths. MCL was the first company in the world to succeed in forming a *structure of insulating conductors inside the metal* during the process of obtaining an oxide. MCL's approach resulted in a **new type of inexpensive back plane with high heat conductivity**.

Models of goods produced with technology ALOX™



Drilling and metallization of perforations is not required with ALOX™ because the interconnections are made entirely of aluminum and the dielectric material is made of high-quality ceramic. The process is simple, low cost, and requires a limited number of process operations.

ALOX™ is a broad technological platform that can be applied in packaging various electronic goods: microwave electronics, SiP (system-in-package) technology, three-dimensional memory stacks, MEMS devices, and powerful modules and components.



RUSNANO was founded in March 2011 as an open joint stock company through reorganization of state corporation Russian Corporation of Nanotechnologies. RUSNANO's mission is to develop the Russian nanotechnology industry through co-investment in nanotechnology projects with substantial economic potential or social benefit. The Government of the Russian Federation owns 100 percent of the shares in RUSNANO. **Anatoly Chubais** is CEO and chairman of the Executive Board of RUSNANO.

Work to establish nanotechnology infrastructure and training for nanotechnology specialists, formerly conducted by the Russian Corporation of Nanotechnologies, has been entrusted to the Fund for Infrastructure and Educational Programs, a non-commercial fund also established through reorganization of the Russian Corporation of Nanotechnologies.

www.rusnano.com

Contact information:

10A Prospekt 60-letia Oktyabrya, Moscow, Russia 117036
Telephone: +7 (495) 988-5677, fax: +7 (495) 988-5399, e-mail: press@rusnano.com

Micro Components Ltd. specializes in developing and producing circuit boards with high thermal conductivity and substrates based on innovative technical solutions developed by its employees. The solutions are used in the electronics industry. Today the ALOX technology is already at work in pilot production in Israel at MCL Ltd. and in commercial production of single-layer circuit boards in Malaysia.

TOCHMASH (Vladimir, Russia) is a producer of precision instruments and machine engineering, gas centrifuges for enriching uranium, and loss-of-coolant ampoules, which are containers for storing spent fuel as fuel element bundles. TOCHMASH is part of TVEL, which is a subsidiary of State Atomic Energy Corporation ROSATOM. The TOCHMASH production complex, facilities that have been released from factory use, is well situated for rail and road transportation and contains more than 100,000 square meters of common engineering infrastructure and well-developed logistics infrastructure. The greater Vladimir region has a large number of highly qualified engineers and specialists.

Contact information:

<http://www.vpotochmash.ru>

Tamir Fishman CiG venture fund was established in 2008 in partnership with Russian Venture Company and private investors. Asset Management company Tamir Fishman, Israel, is a consultant and partner to Innovative Solutions, the management company for the fund. The fund, which focuses on investments in innovative high-tech technology projects, has assets of two billion rubles.

Russian Venture Company is a government fund of funds and a development institute of the Russian Federation, one of Russia's key tools in building its own national innovation system. Russian Venture Company was established by the Russian Government on June 7, 2006, (order No. 838-r). Its mission is to foster the growth of Russia's venture capital industry and boost the financial resources in venture capital funds. RVC's role is that of a government fund of venture funds through which the state



stimulates venture investment and financial support for the high-technology sector. As a development institute, RVC is responsible for forming an ecosystem of innovative-technological entrepreneurship.

RVC has equity in excess of 30 billion rubles. The company is wholly owned by the Russian Federation through the Federal Agency for State Property Management (Rosimuschestvo). Russian Venture Company has created 12 funds with aggregate assets of 25 billion rubles; its share in those funds is around 15 billion rubles. RVC's funds have invested more than 8.2 billion rubles in 71 companies.