

FIRN STC

Volume of investments required: \$ 2 000 thousand

Use of funds

R&D - 25%

Acquisition of fixed assets - 69.9%

Marketing - 0.1%

Acquisition of current assets - 5%

Company profile

1. Date of establishment – October 1998.
2. Size and source of investment to date – \$ 30 000. – The Foundation for Assistance to Small Innovative Enterprises.
3. Production – laser and optical materials, diode-pumped solid-state lasers.
4. Target market – material processing equipment, medical equipment, analytical instruments, projection systems, research equipment, defense and aerospace industry.
5. Sales 2004 – \$ 90 000.
6. Description and value of assets – \$ 680 000 – laboratories with the total area 2 500 sq.m., \$ 820 000 – special equipment.
7. Goodwill and intellectual property rights – patent # 2222852 (Laser Material), owner: O. Kuzmin, author: O. Kuzmin, issued 27 January, 2004; patent # 2231187 (Laser Material), owner: O. Kuzmin, author: O. Kuzmin, issued 20 June, 2004; patent # 2231881 (Laser Matrix Material), owner: O. Kuzmin, author: O. Kuzmin, issued 27 June, 2004. The specified patents have been assigned by the owner to "Firn" STC under license agreement.
8. Signs of public recognition – "Firn" STC is a member of Laser Association, the European Optical Society, the Optical Society of America; it is the winner of the Russian Innovation Contest in 2002 and the "Best company" at the Third Russian Venture Fair in 2002.

Owners

Individual	100%
Share of government property	0%

Products characteristics

Current products: optical and laser crystals, microlasers (infrared and visible ranges of spectrum). Crystal growth process developed in "Firn" STC allows crystals to have high optical homogeneity. Microlasers 1064 nm, 532 nm have been for the first time developed in "Firn" STC, microlaser design is a monolithic device free of additional optical components which require tuning in the process of resonator adjustment.

Products under development: highly efficient laser materials on the basis of ortho-borate of rare earth elements and scandium, activated by ions of neodymium. New laser material Nd:RSBO surpasses by far Neodymium: Yttrium-Aluminum Garnet (Nd:YAG) and Neodymium: Yttrium-Ortho-Vanadate (Nd:YVO4) crystals used in flashlamp- and diode-pumped solid state lasers. Optical losses in Nd:RSBO at generated wavelength 1064 nm are just 0.0003cm⁻¹. Optical slope efficiency of a diode-pumped laser on the basis of Nd:RSBO crystal is 68%, which is close to a theoretical limit of 76%. As to the main characteristics Nd:RSBO performs better than any of the known laser crystals.

Markets & Competition

Data	Product of "Firn" STC Nd:RSBO	Nd:YAG Synoptics, USA	Nd:YVO4 FEE GmbH, Germany
	Geographical Region – Worldwide. Market size \$ 200 million		
2004	Company market share, \$ ths / %	90 / 0.05%	25 000 / 12.5% 5 000 / 2.5%
	Geographical Region – Worldwide. Market size \$ 350 million		
2009	Company market share, \$ ths	2 500 / 0.7%	84 000 / 24% 15 000 / 4.3%

/ %			
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Marketing & Sales

The key marketing strategy of "Firn" STC involves launching the new laser material into the market by offering new products – microlasers and by demonstrating benefits of the new materials and technologies. This new highly efficient material provides opportunity to develop on its basis new generation of compact laser-containing devices. The new laser material with better spectral properties and diode-pumped solid state microlasers have attracted attention of the foreign manufacturers of the solid state lasers and laser-containing devices. Test samples of the laser material are supplied in limited quantities to R&D Institutes, Design Engineering Centers and developers of the new laser-containing devices including Russian Ministry of Defense, Ministry of Internal Affairs and Ministry of Emergencies. "Firn" STC intends initially to focus on the manufacturers from the most stable markets (e.g. analytical instruments) responsive to the improvements of the appliances characteristics. "Firn" STC developments have been presented at the international trade fairs "Laser 2003", "Laser 2005" held in Munich, Germany, and attracted attention of a number of major companies such as SONY, Leica Geosystems, Saab Dynamics, Northrop Grumman, Boston Laser. More then 60 companies from all over the world applied to "Firn" STC inquiring for delivery of the new laser material and microlasers. FEE GmbH, Germany, a small company and the major manufacturer of the Nd:YAG и Nd:YVO₄, laser crystals on the domestic market, has close contacts with "Firn" STC (the two companies were engaged in co-developing TGG crystals growth process) and shows interest in acquiring license for Nd:RSBO production. According to Samsung Electronics, also interested in cooperation with "Firn" STC, invention of the new highly efficient laser material is a unique competitive solution allowing for the development of the next generation projection TV systems based on the miniature laser sources. Total sales of the laser material and microlasers are supposed to reach more then \$ 30 mln.

Prospects of development

Laser industry enters on a new stage of its development and "Firn" STC stands out as a technological leader in this sphere. New laser material Nd:RSBO designed for being used as an active element in flashlamp- and diode-pumped solid state lasers will allow manufacturers to reduce their financial and running costs significantly while achieving higher performance characteristics of their products which used to be unobtainable or required considerable expenses. During the next year the center is going to strive for paramount influence in the initially chosen market sectors, within the following three years "Firn" STC plans to embark on new larger branches of industry with modern products which can be used, for example, in display units, high resolution DVDs and semiconductor industry.