Technology center for three-dimensional assembly of integrated circuits to open in Russia

Medical Design Technology

The technology for three-dimensional assembly of semiconductor elements, or 3D assembly, is one of today's most promising methods for reducing the size of the integrated circuit. It does this by making the substrate more dense, by raising the connectivity inside the chip, and by reducing its energy consumption. The technology makes it possible to combine components—digital and analog circuits, memory, and microelectromechanical systems—that have been produced with different technologies in one encasement. The 3D assembly raises the reliability of microelectronic goods and continues the downward trend in production costs.

In 2008 the world market for 3D assembly was $1.3 billion. Experts forecast that microelectronic products manufactured with 3D assembly will grow fivefold by 2012 after which the technology will attain widespread use. Forecasted volume in 2015 is $42 billion.

The project that RUSNANO has agreed to support will create a center where technological processes for 3D assembly will be developed. There the project company will organize production of three lines: electrochemical materials based on self-optimizing additives used in 3D assembly of chips with silicon current-conducting channels, metallization of integrated circuits, and solar elements. In addition, the project intends to produce electronic elements for 3D assembly that are formed from its own electrochemical materials.

In 2015 sales of the project company in the 3D assembly sector are forecasted at 992 million rubles in the global market and 1.13 billion rubles in the domestic market. In the sector for electrochemical materials for copper metallization, something not done in Russia to date, the company will achieve 6.7 percent of the world market and 100 percent of the Russian market. Project company earnings in 2015 are put at 2.5 billion rubles.

New production will be based on the unique experience of the project applicants, Voronezh Semiconductor Plant–Assembly and NANO3D SYSTEMS LLC.

There will be two phases for realization of the project: In the first (2010–2012), the company will organize production of electrochemical materials and establish pilot production of electronic devices using 3D assembly. In the second phase (2013–2015), production of electrochemical materials will grow and commercial production of electronic devices will begin.

The total budget for project implementation is 1.57 billion rubles. RUSNANO will invest up to 300 million rubles in equity of the project company and, in the second phase, extend a guarantee of up to 600 million rubles.

"This project will give Russian manufacturers of electronics a component base created with state-of-the-art assembly technology. It will lower product costs and reduce dependence on foreign suppliers, making Russian electronics companies more competitive in global markets. We anticipate that the project will stimulate other advances in the microelectronic sector," **Evengy Evdokimov**, RUSNANO managing director, explained.

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