

Nagano/Ueda

(Fiscal Year 2002-2006)

Developing creative and internationally competitive smart devices and product groups featuring the same

Core Organization Nagano Techno Foundation

Participating Research Organizations (Bold: Core Research Organization)

Industry··IAM Co., Ltd., Algol Corporation, E and F Corporation, Usui Kokusai Sangyo Kaisha Ltd., Engineering System Co., Ltd., Orion Machinery Co., Ltd., GAST JAPAN Co., Ltd., KOA Corporation, Cosina Co., Ltd., Sun-kt Corporation, Citizen Miyota Co., Ltd., Shinano Kenshi Co., Ltd., Shinano Fujitsu Co., Ltd., Seiko Epson Corporation, Seimi Chemical Co., Ltd., Ceratech Japan Co., Ltd., Tamagawa Seiki Co., Ltd., Chinontech Industries Inc., Tsukada Riken Industry Co., Ltd., Totoku Electric Co., Ltd., Toukai Rubber Industries Ltd., Tokyo Seiden Ltd., Nagano Keiki Co., Ltd., Nagano Tancho Co., Ltd., Nagano Japan Radio Co., Ltd., Napac Co., Ltd., Nichicon Corporation, Nissin Kogyo Co., Ltd., Nissei Plastic Industrial Co., Ltd., Nippon Soda Co., Ltd., Nihon Techno Co., Ltd., Boron Japan Co., Ltd., Hioki E.E. Corporation, Nomura Unison Co., Ltd., Fujimori Kogyo Co., Ltd., Heat-Sink & OS Co., Ltd., Hodogaya Chemical Co., Ltd., Material Science Products & Engineering, Nagano Co., Micro Coatech Co., Ltd., Matsuyama Giken Co., Ltd., Mikuni Kogyo Co., Ltd., Misuzukogyo Co., Ltd., Minebea Co., Ltd., Mimaki Engineering Co., Ltd., Miyasaka Rubber Co., Ltd., MEFS Co., Ltd., Yamato Corporation,

Academia··**Shinshu University**, Nagano National College of Technology, Tokyo University of Science, Matsumoto Dental University, Yamagata University
Government··Nagano Prefecture General Industry Technology Center

Project Overview

With the participation of Shinshu University, the Nagano Prefecture General Industrial Technology Center, the Tokyo University of Science, and development-oriented companies, we are working to create smart devices that utilize CNT, organic and inorganic nanomaterials while promoting activities targeting the development of new products and commercialization. Though these activities, we are improving industry-academia-government collaboration, creating human networks, developing human resources, and promoting international exchanges.

●R&D on smart functional devices using nano carbon composites

With the Shinshu University Faculty of Engineering at its core, this project is conducting research on new composite materials with CNT as fillers in order to develop devices and compound modules with superior characteristics like thermal and electrical forms of conductivity.

●R&D on organic nano material devices using functional nano high-polymer materials.

With the Shinshu University Faculty of Textile Science and Technology at its core, this project is conducting research on organic materials based on functional nano macromolecule materials and developing organic light-emitting element technology. Progress is also being made in the development of applied products based on these technologies.

●R&D on commercialized applied technology with CNT composite materials.

With the Nagano Prefecture General Industrial Technology Center at its core, this project is conducting research on applied technology for commercialization using new composites with CNT as a filler.

●R&D on Inorganic nano material smart function.

With the Tokyo University of Science at its core, this project is conducting research on highly functional devices and applied products utilizing inorganic nanoparticles, thin films, and catalysts.

Main Results

1. Development on Ultra precision parts with CNT Resin Composite

Precision parts that are extremely hard, have a low friction coefficient and little variation in precision were developed by adding CNT and glass beads to the resin.

2. Development of functional Gold (Au) Plating for Probes

A special plating technique that ensures hardness, provides low resistance, and provides solder adhesion has resolved issues with probes for the testing of electronic components.

3. Development of Digital Circuits using Organic Materials

An organic digital circuit was developed using a high-performance n-type organic thin film transistor. This circuit has achieved a signal gain of more than 500, a driving voltage of 5V, and a logic speed of 1 MHz.

4. Development of High-strength Transparent Nylon

Transparent nylon with transparency and strength equivalent to those of acrylic was developed by adding liposomes filled with a modifier to nylon.

