

Research and Development

Creating “New Value” in Research and Development

Research and Development Conducted by the Nitto Denko Group

The Nitto Denko Group has conducted R&D activities in the fields of optronics, electronics, energy and ecology. In fiscal 2006 the Nitto Denko Group spent a total amount of 21,733 million yen on such R&D activities. These R&D activities have centered on the use of fundamental technology relating to the synthesis, denaturation and processing of wide polymeric materials under our R&D management system led by Chief Technology Officer (CTO). In the U.S.A. our research facility, the Nitto Denko Technical Corporation (NDT) aims to create new business in the fields of photology, biotechnology and nanotechnology.

Research Findings from Our Industrial Materials R&D

The Nitto Denko Group has conducted R&D activities in the electronics, automobiles and home building fields, creating products that are commercially sold and which boast high precision and high performance yet at the same time are environmentally responsible. One such product range that became available on the market in fiscal 2006 was our optical film surface protection material (GE300). Also released in fiscal 2006 were our environmentally conscious “SPV series” tapes or non-PVC protection material (401K and 4001K) which protect surfaces like metal from being scratched when going through production processes.

Research Findings from Our Electrical Materials R&D

Along with the immense increase in LCD television popularity, demand for high-grade panels offering a high standard in contrast quality has also increased. In order to meet this demand, we have developed a new wide viewing angle polarizing film for LCD-TV panels that we are able to produce in large quantities. Our new thinner polarizing film is also being utilized in the production of many products such as cellular phones which are becoming thinner and thinner.

The Nitto Denko Group’s halogen free and flame retardant flexible printed circuits are products that are environmentally friendly. The Nitto Denko Group’s GE series of semi conducting encapsulating materials also fall into this category and have an ever increasing number of applications.

Research Findings from Our Functional Materials R&D

We have steadily increased our sales of our RO membrane, PROC10 designed for seawater desalination which has been commercially marketed at boiler markets in China where water shortage is a serious concern.

Demand for the polyimide belt, NITOMID® used in laser beam printers has been firm as has been the progress made in relation to the development of colorization components for copy machines. Demand for our fluoroplastic porous film “TEMISH®” has expanded from initially being used by automobile manufacturers as an inner pressure controlling membrane in car lights to consumer-electronics makers using it for dust-proof and waterproof filters.

New Drug Delivery Technology Using Polymeric Materials



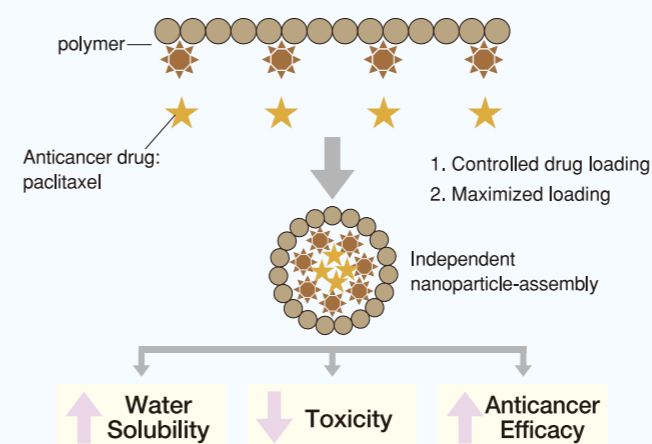
Dr. Stephen B. Howell

In commenting on the progress made by NDT, Dr. Stephen B. Howell, an expert in the development of cancer therapeutics, notes: “The drug delivery system holds great promise for improving the effectiveness of many classes of drugs. The fact that it can direct cancer drugs to the tumor and away from normal tissues is of particular importance, and its ability to enhance drug solubility is expected to result in superior formulations of novel therapeutics.” (Dr. Stephen B. Howell, University of California, San Diego, Moores Cancer Center)

Nitto Denko Technical Corporation, one of the Nitto Denko Group’s overseas local subsidiaries in the U.S.A., has jointly developed with the University of California, San Diego, polymer-based carrier technology which differs from percutaneous absorption technology.

The Nitto Denko Group engages in advanced technological research into biomedical materials and their applications. Part of this research has involved investigating polymer synthesis processes such as “gene delivery reagent” using biodegradable cationic polymers. This technology utilizes Nitto Denko Corporation’s polymer synthesis expertise to create a biodegradable, hydrophilic material that can be used in conjugation with traditional therapeutic agents. The use of this polymer material will enable significantly greater solubility of drug compounds, resulting in greatly enhanced ease of administration. In addition, while most chemicals used as therapeutic agents have extremely small particle sizes, the particles resulting from combining the agents with the NDT carrier have a relatively large particle size of 100nm. This allows the therapeutic agents to remain in the bloodstream for a longer period of time, resulting in greater efficacy, while at the same time reducing side effects by preventing their migration to normal tissues.

NDT-1213 Carrier Platform



NDT-1213 drug carrier platform is a novel biodegradable polymer based anticancer drug delivery carrier technology.



Nitto Denko Technical Corporation is a research institution located in California, U.S.A., established in 2000.

The Nitto Denko Technical Corporation’s Laboratory

It is a substantial facility allowing for not only experiments relating to chemical synthesis and biology but also the analysis of equipment used for testing the chemical and physical properties of materials.



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Intellectual Property

Do inventors have invention rights? Is intellectual property appropriately protected? These are issues of corporate concern?

Compensation for Inventors

When an employee joins the Nitto Denko Group it is part of the work agreement that any invention or intellectual property that is developed as part of any work related activity, remains the property of the Nitto Denko Group. An employee is only not bound by intellectual property restrictions if his/her idea neither falls within the area of the Nitto Denko Group’s actual or anticipated business interests and did not result from, nor was inspired by any work assignments linked to the Nitto Denko Group. All new developments and/or inventions depending on their significance and impact on improved business performance are rewarded through testimonials and/or extra prizes depending on the award system of the individual employees group.

To prevent conflicts between inventors and the corporation, inventors are able to receive a compensation payment for the transfer of any intellectual property in addition to an award. In Japan how and when an employee is compensated for an invention or new development is governed by Patent Law legislation, whereas each overseas company relies on its own rules in managing intellectual property situations.

Measures Taken Against Similar Products

It is nothing unusual from time to time for products to enter the market place that are similar to those that the Nitto Denko Group manufactures. Such occurrences may have the potential to cause inconvenience to our stakeholders. To prevent this from happening we apply and obtain patent rights, design rights and trademark rights for each new product we develop, in each country that we operate in.