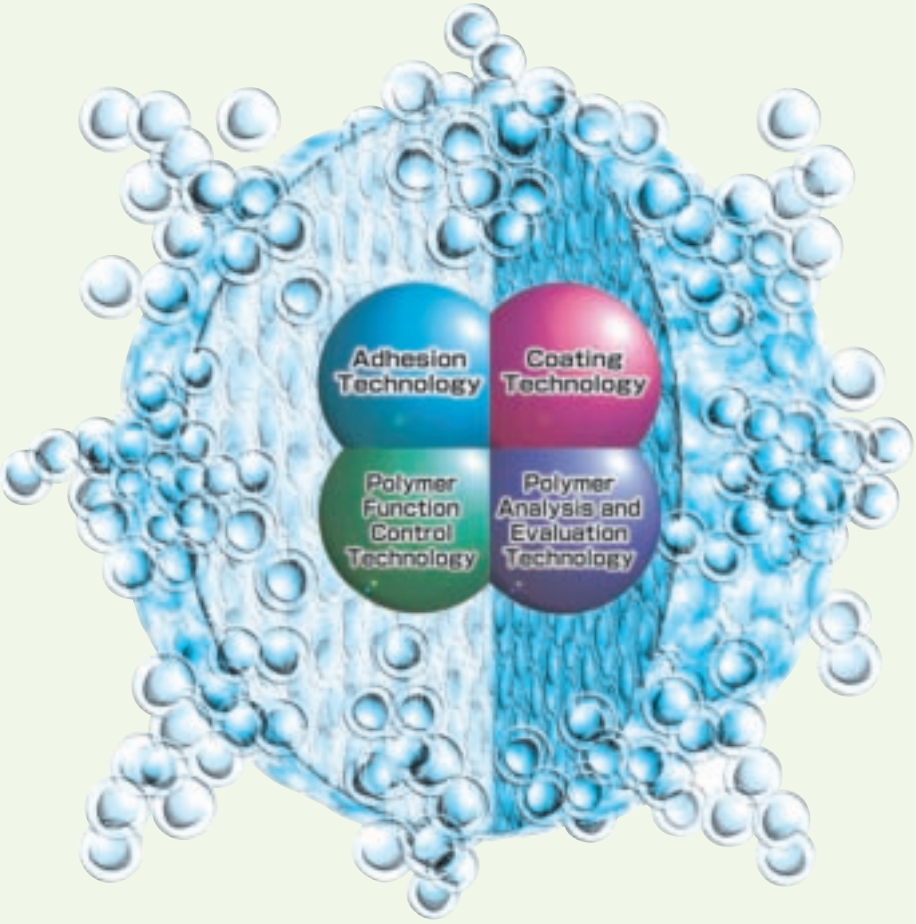
Research and Development of the Nitto Denko Group



The Nitto Denko Group manufactures products through combining over six hundred different types of technologies which have evolved from four fundamental technologies:
“Adhesion Technology”, “Coating Technology”, “Polymer Function Control Technology”, “Polymer Analysis and Evaluation Technology.”

It may be difficult to identify the common threads when comparing the Nitto Denko Group’s ten thousand products or more, however four core technologies lie at the basis of what we produce, with some six hundred different peripheral technologies also coming into play. The Nitto Denko Group aims to further develop and combine new technologies into manufacturing processes so that we can continue to produce useful high quality products.

Transdermal Drug Delivery Patch

"Transdermal Bronchodilator Therapeutic Patch for Asthma"

This product is produced from a combination of the following technologies:

- Pharmaceutical Adhesive Design Technology
- Pharmaceutical Carrier Design Technology
- Precision Coating Technology
- Punching Technology
- Foreign Matter Detection Technology
- Controlled Release Technology
- Crystalline Pharmaceutical Production Technology
- Pharmaceutical Permeability Simulation Technology
- Property Evaluation Technology
- Safety Evaluation Technology

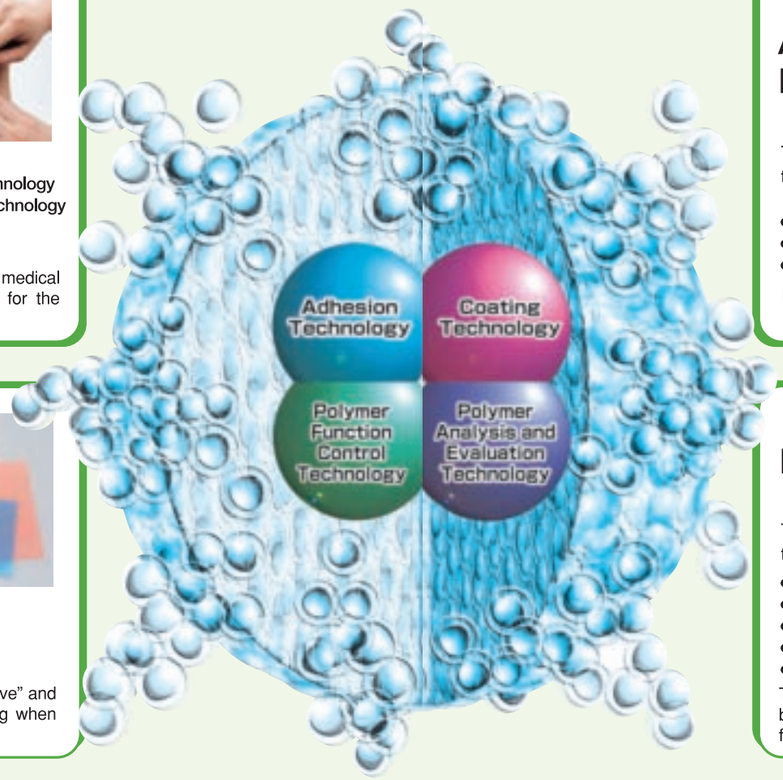
Transdermal bronchodilator therapeutic patch for asthma is an adhesive tape, which holds medical substances that are absorbed through the skin, when stuck on the body, as a treatment for the prevention of asthma attacks.

REVALPHA®

This product is produced from a combination of the following technologies:

- Temperature-Controlled Foaming Technology
- Foaming Agent Particle Size Control Technology
- Adhesive Property Control Technology
- Adhesion Control Technology
- Coating Technology
- Cutting and Punching Technology

The thermal release tape REVALPHA® includes a new feature allowing it to be both an "adhesive" and "exfoliating" tape, which adheres firmly when required and is easily removed through heating when necessary.



Automobile Paint Protection Films

This product is produced from a combination of the following technologies:

- Non-Contaminating Technology
- Weather-Resistant Technology
- Removable Technology
- Substrate Design Technology
- Coating Technology

It is a film that prevents damage to the paintwork of new cars from acid rain, scratches and dirt.

NIBCOM®

This product is produced from a combination of the following technologies:

- Optical Design Technology
- Material Design Technology
- Surface Treatment Technology
- Precision Coating Technology
- Optical Property Evaluation Technology
- Adhesive Technology
- Staining and Drawing Technology
- Polymerization Technology
- Adhesion Technology
- Polarization Control Technology
- Drawing Technology
- Punching Technology

The birefringence compensation film "NIBCOM®" is used for large-size LCD panels like LCD television, bringing high contrast, high viewing angle and high definition picture which is easily viewable and allows for beautiful LCD display.

Developing Polymer Carrier for siRNA Delivery System

Biodegradable polymer from the Nitto Denko Group has demonstrated itself to be useful in liver cirrhosis treatment jointly with Sapporo Medical University, Japan.

Collagen is thought to accelerate the progression of cirrhosis. By administering siRNA (short duplex RNA which has the same sequence as a part of the target gene) the function of genes which promote the production of collagen is inhibited. This in turn is thought to delay the progress of cirrhosis. Until now liposome (lipid cachet) coupled with vitamin A has been used as a carrier to deliver siRNA to causative cells. The formulation of it industrially has been our task.

With using the biodegradable polymer developed by Nitto Denko Technical Corporation instead of liposome, the delivery efficiency of siRNA to the affected site has become stable which has resulted in a treatment option for cirrhosis becoming available.

Biodegradable polymer is a gene carrier which administers medication effectively to an affected site. In the future we plan to advance the research we are doing on carriers that may assist with the treatment of other organs.

(Note) carrier: a substance which combines with various substances in vivo and carries the bound substance

World's First High-performance Rewritable Holographic Display Successfully Developed Jointly with the University of Arizona

We have succeeded for the first time in the world in developing a holographic display which has outstanding image longevity as well as an image updating capability made possible by taking advantage of utilizing a polymer material allowing for the world's highest quality picture brightness and a fast writing speed (a joint development with a research team led by Prof. N. Peyghambarian of the University of Arizona). We envisage that such technological developments, in the future could be applied to devices and equipment that require three-dimensional visualization in fields such as medical care, industrial operation and security assurance.

A hologram is an image, which is used in films and the like as a means of displaying an object in three-dimensional form. Holograms can also be applied to the use of credit cards or banknotes as a way of preventing forgery. Current hologram recording materials have the disadvantage that once an image is recorded, the image is not rewritable. However new holographic display technology has resolved this limitation and will make it possible in the future to play video and the like, making three-dimensional television no longer a dream.