

**In the Nitto Denko Group we place an emphasis on “Green, Clean and Fine” as we carry out research and development into products that will reduce social costs, are environmentally friendly and help to make the lives of people more healthy and comfortable.**

### **Collaborative Research Center Established at Osaka University**

In October 2011, Nitto Denko Corporation established the Nitto Denko Advanced Technology Cooperative Research Center in the Techno-Alliance and Photonics Center buildings of Osaka University's Suita Campus.

Research concerning organic light emitting diode (OLED) lighting and thin film solar cells is being carried out in the Techno-Alliance building, while biosensor-related research is being carried out in the Photonics Center. As of the end of March 2012, 32 people were working in the Research Center full-time.

By establishing a collaborative research center within the university the company aims to complete major research themes and create new fields of business through inter-disciplinary collaboration. It is also hoped that interaction with university-based researchers and students from overseas will lead to the development of new research themes.



Techno-Alliance building



Photonics Center, Osaka University

### **Intellectual Property Strategy Results in Top 100 Global Innovator Award**

#### **(1) Thomson Reuters Top 100 Global Innovator Award**

In December 2011, Nitto Denko Corporation received the Thomson Reuters Top 100 Global

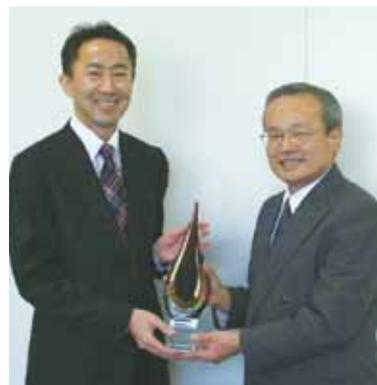
Innovator Award.

Thomson Reuters, which is based in New York, selects companies for the award from throughout the world based on four criteria: Success, Global, Influence and Volume. Such companies invent on a significant scale and have outstanding intellectual property management strategies; are working on developments which are acknowledged as innovative by patent offices across the world, and by their peers; and, their inventions are so important that they seek global protection for them. They are also known to have inventions with the potential to influence world markets.

#### **(2) No.5 on Patent Board Chemicals Ranking in WSJ**

Nitto Denko Corporation rose one place to 5th position on the Patent Board's Chemicals Patent Scorecard published in The Wall Street Journal (WSJ) on February 17, 2012, making it the top-ranking listed Japanese company. The company had maintained 6th position for some time, but is pleased to see that its efforts have been rewarded with its new position.

Both the Thomson Reuters Top 100 Global Innovator Award and the new 5th place ranking come as a result of the Nitto Denko Group's persistent efforts in the realm of intellectual property management over many years.



Intellectual Property Division GM Shozo Inoue (right) receiving the award from Toshiyuki Tomii, Thomson Reuters Professional Representative Director.

## Renewed Participation in Japan's NEDO Research & Development Project

The Nitto Denko Group had previously participated in 11 government research and development projects and in FY2011 participated in a New Energy and Industrial Technology Development Organization (NEDO) project to develop and commercialize a process for the manufacture of flexible CIGS (copper indium gallium diselenide) solar cells.

In this project, high-efficiency, low-cost next-generation flexible solar cells will be manufactured using a ribbon-like substrate in a high-speed thin film manufacturing process conducted in a vacuum. The commercialization of this process is expected to expand the range of applications in which solar cells can be used and make a major contribution to the realization of a low-carbon society.

## Nitto Denko Develops New Optical Touch Screen Sensor for "Smart" Stationery Using Optical Waveguide Technology

### (1) Handwriting Digitization

Many kinds of electronic stationery are sold in an attempt to meet the need for handwriting digitization. However, most of these devices require special pens or paper or need to be input with a scanner or camera, making them clumsy and difficult to use, which is one reason they have never really become that popular.

The Nitto Denko Group has developed "smart" stationery with optical touch screen sensors using their optical waveguide technology. Consisting of what looks merely to be a thin frame, when placed on top of a piece of paper and written on, the device instantly transmits wirelessly what is written to any designated computer, etc., in the form of digital data. No special pen or paper is required.

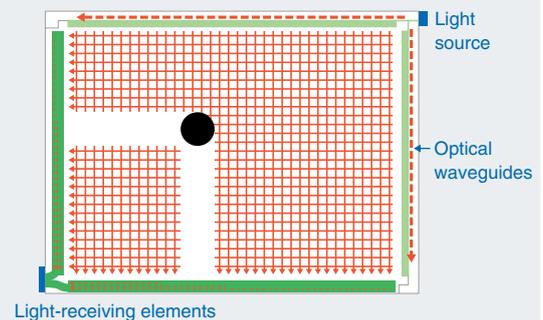
### (2) Position Detected by Interrupting Beams of Light

Optical waveguide technology is used in this optical touch screen sensor. The way this works is that light is emitted from a light source within the frame and

passes along two sides of the frame and through optical waveguides, traveling in a lattice form to the light receiving elements along the other two sides of the frame. When the screen is touched, light passing through the optical waveguides is blocked in that area. This is detected by the light receiving elements, thus enabling the detection of the position touched (see Figure 1). By employing the latest in cutting-edge technology, such as fine-pitch pattern formation technology, lens molding technology and optical design technology, we have managed to create a thin, compact device that is able to accurately detect fine things such as the tip of a pen.

The technology was well received when it made its debut at the 22nd International Stationery & Office Products Fair Tokyo that was held at Tokyo Big Site in July 2011.

(Figure 1) Character recognition mechanism



The device is compact enough to fit in a small diary

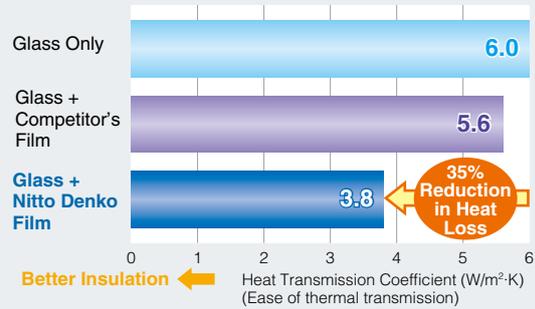
## Energy-Saving Transparent Window Insulation Film

In recent years, one of the energy-saving measures that have been gaining some attention is the development of energy-efficient types of films for windows, which account for much loss and gain of heat. Although various kinds of energy-efficient window film have been brought to market, many merely reduce the amount of incoming solar energy, which while effective in summer does little to help the outward flow of heat during winter.



Transparent Window Insulation Film

### Insulation Comparison: Heat Transmission Coefficient



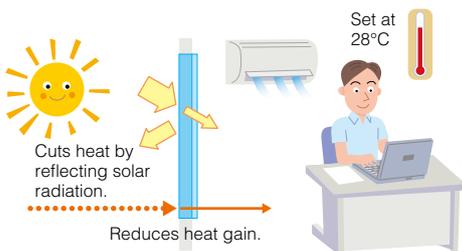
**Industry-Leading Insulation Properties for Transparent Film**

The Nitto Denko Group has therefore developed a transparent window insulation film that improves energy efficiency not merely in the summer, but right throughout the year. This film keeps rooms cool in summer by blocking solar radiation and warm in winter by reducing heat loss. Furthermore, rooms do not become noticeably darker and the film is resistant to scratching.

From FY2012 the company aims to expand the range of applications from the windows of homes and offices to include display chillers and transportation vehicles.

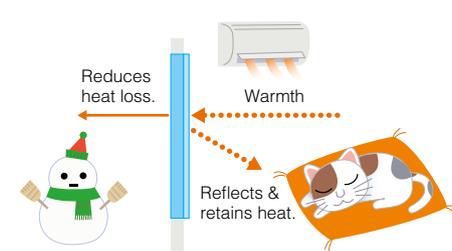
### Four Characteristics of Transparent Insulation Film

#### 1. Cool in Summer (Shielding, Insulation)



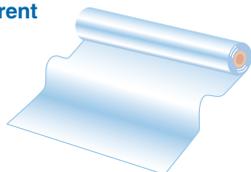
**Cuts solar radiation by 40% to block out heat.**

#### 2. Warm in Winter (Insulation)



**Reduces heat loss by 35%.**

#### 3. Transparent



**Lets through more than 70% of visible light to maintain brightness.**

#### 4. Easy to Apply & Durable



**Not easily damaged by scratching.**