

# NITTO DENKO CHALLENGE

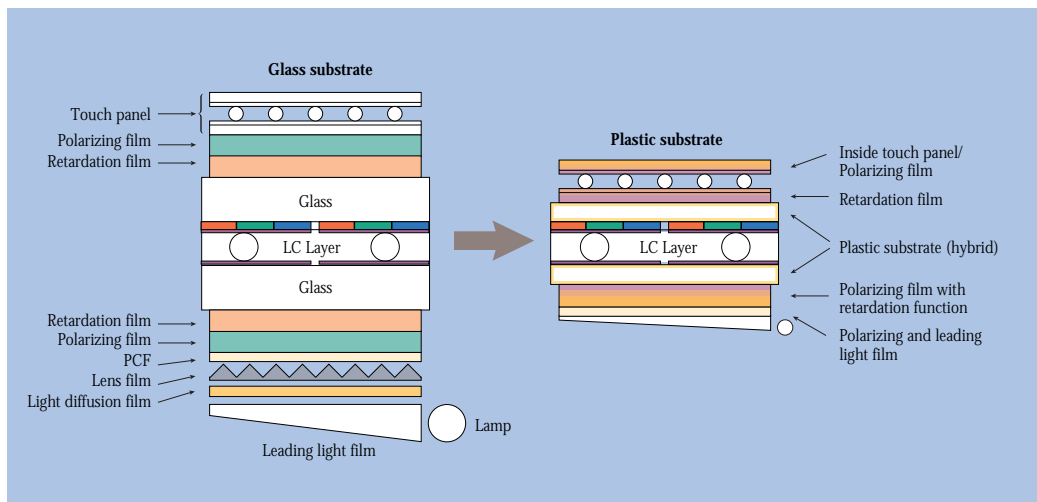
## ➤ 1. Launching Mass-production of the World's First Plastic Substrate

We have developed an advanced plastic substrate for use in LCD panels of mobile phones and will begin mass-production on a ¥2 billion, state-of-the-art production line within calendar 2001. This new substrate will allow the production of ultra-thin LCDs which are light, have excellent definition and are extremely durable.

In the substrate we use an original thermosetting resin instead of glass. This enabled us to reduce the LCD substrate's thickness by one-half and its weight by one-third, compared with conventional glass-based substrates. By utilizing our advanced thin-film processing techniques accumulated in the adhesive tape business, we developed a production process that

allows us to produce the substrate in a range of thicknesses, from film-type (200 microns) to sheet-type (1 millimeter). We have added the optical properties to the substrate itself, reducing the need for the optical film laminated onto glass substrates. Unlike glass substrate, this plastic substrate can be shipped in rolled as well as sheet form.

Our substrate has already attracted interest from LCD panel makers and others. In the future, we plan to expand the substrate's applications to general mobile equipment, including PDAs and PCs, organic electroluminescence (EL), the semiconductor field, solar-power equipment and others.



## ➤ 2. Introduction of Environment Accounting System

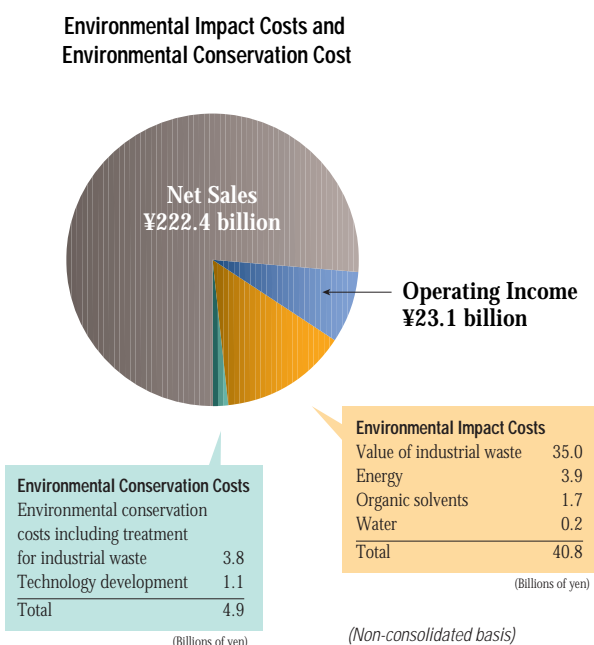
We place a high priority on environmental issues. In fiscal 2001, we launched our "environment accounting system," under which we identify all expenses related to our environment protection activities, and monitor costs and results. In fiscal 2001, we implemented this system on a non-consolidated basis. In fiscal 2002, we will begin to extend the system throughout the Nitto Denko Group's manufacturing operations. Our environment accounting system is distinguished by the following three characteristics:

1. We draw up an "environment budget" for each fiscal year.
2. Under environmental impact costs, we include the costs of raw materials used in processing industrial waste, and the costs associated with the purchase of energy, solvents and industrial-use water, in addition to the environmental conservation costs identified in the Ministry of the Environment's "Guidelines for Introducing an Environment Accounting System."

3. A reduction in environmental impact costs has brought benefits in terms of more efficient use of resources.

The purpose of our environmental accounting system is to promote conservation of the natural environment while allowing our business to grow. We are making efforts to gradually reduce the environmental impact cost, i.e., environment-related costs as a percentage of total sales. During fiscal 2001, the environ-

ment accounting system was adopted division by division. The environmental impact cost for fiscal 2001 was 18.3%. We will now proceed with technical development work designed to decrease the costs of industrial waste processing. Our aim is to bring the environmental impact cost ratio down to 13% by the end of fiscal 2006.



Non-consolidated Environmental Costs	
(Millions of Yen)	
Fiscal 2001	
Net sales	222,406
Sales value of own products	205,119
Environmental conservation costs	
General expenses	960
Waste disposal	949
Outsourcing	230
Salary and compensation	522
Depreciation and amortization	1,119
Technology development	1,115
<b>Total</b>	<b>4,895</b>
Environmental impact costs	
Waste costs	34,967
Energy	3,915
Solvent supply	1,693
Industrial water supply	227
<b>Total</b>	<b>40,802</b>
<b>Environmental impact cost ratio to net sales</b>	<b>18.3%</b>

### ➤ 3. Revitalization of Adhesive Tape Business

The industrial-use adhesive tape business is a mainstay business of Nitto Denko. The adhesive tape market has been expanding rapidly, due mainly to increased demand related to communications and information devices, including mobile phones, wafer protection tapes for the semiconductor manufacturing process, LCDs and PDP surface protection. We expect demand to continue to expand, for example in the household digital electric appliance field.

In response, we are planning an aggressive investment strategy. The Nitto Denko Group will invest a total of ¥30 billion in the tape business over three years. We intend to

increase the profit ratio by investing in facilities for the production of adhesive tape for information and communications devices, where we can add substantial additional value. We have identified our adhesive tape business as a source of strong future growth.

#### Investment Plans

##### • Europe

We are adding a "clean room" building at the factory operated by Nitto Europe N.V. in Belgium, with operations scheduled to start in the fall of 2001. Total investment in this facility will

amount to ¥4 billion over three years. Full-scale production of wafer protection tapes for the semiconductor manufacturing process and transparent double-coated adhesive tapes, for both of which we expect strong demand from major cellular phone manufacturers in Europe, will begin in the fall of 2001.

• **Asia**

We are constructing a new plant at Nitto Denko Materials (Malaysia) Co., Ltd.'s factory to produce adhesive tapes for electronic component application. We are also adding a new back-end processing line for sound-absorbing materials for HDDs at Nitto Denko Material (Thailand) Co., Ltd.'s factory. We will also establish processing and sales bases in Vietnam and The

Philippines. These investments in Asia will total ¥2.5 billion over three years.

• **Japan**

We will add a "clean room" building and five production lines to the Toyohashi Factory. We will also renew the factory's existing facilities. The new lines will start operations successively beginning in October 2001, and will eventually produce surface protection adhesive tape for displays, transparent double-coated adhesive tapes for optical films, and sound-absorbing materials and vibration-damping adhesive labels for HDDs. We will invest a total of ¥20 billion at Toyohashi over three years.



*New factory at Toyohashi Plant*

➤ **4. Bioscience and Optical Communications R&D Center Opened in U.S.**

In October 2000, Nitto Denko Technical Corporation, a new subsidiary engaged in R&D into advanced material technologies in the bioscience and optical communications fields, started operations in Oceanside, California. The main goal of this company is to develop technologies that can lead to the creation of new businesses in the next 10 to 20 years. Its focus is on gene

diagnosis and organic materials for use in optical communications terminal devices. The staff includes Japanese and U.S. researchers. Professors at the University of California (San Diego) and the University of Arizona participate in various projects as advisors.