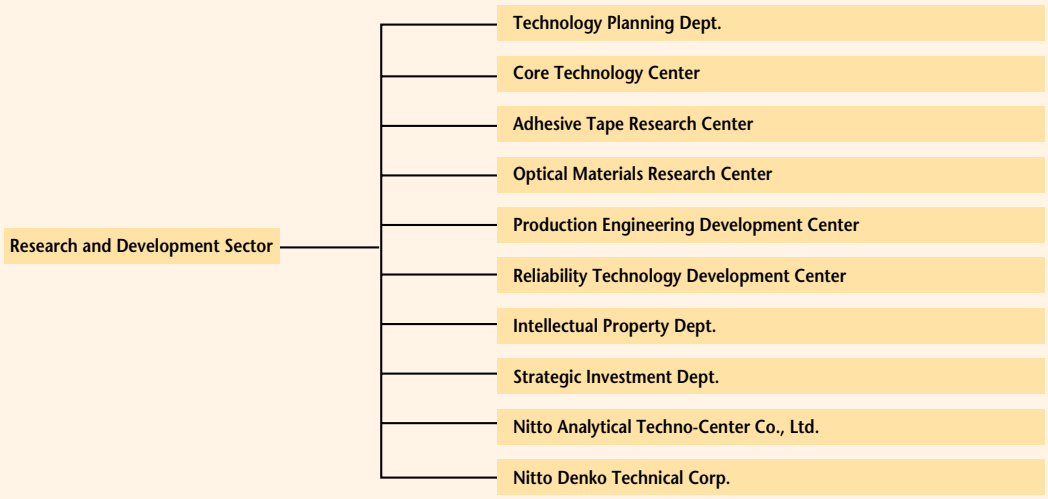
Nitto Denko considers itself to be technology-oriented company, and accordingly, has been making continuous investment in R&D. R&D expenses for fiscal 2003 amounted to ¥13,851 million, and R&D expenses to net sales was 3.7%. Nitto Denko's driving force is our R&D capability in creating global niche products. In realizing this objective, we have established an R&D system for the purpose of promoting speedy and timely R&D to bring new products to market sooner.

R&D Organization

The R&D activities of the Nitto Denko Group are aimed at developing new technologies and enriching existing core technologies. The individual R&D sectors focus considerable effort on refining core technologies in line with product development.

Organization of Research and Development Sector (as of April 2003)



● *Core Technology Center*
In order to create new business and expand existing businesses, the Center is engaged in developing new core technologies focusing on biotechnology, ecology and energy, optronics and electronics markets in which growth is anticipated.

● *Adhesive Tape Research Center*
As an operational base at the Toyohashi Plant, the Center develops fundamental technologies related to adhesive tapes. It is currently focused on research into the manufacture of adhesive tapes and tape materials without using organic solvents like toluene. The technologies it develops are helping to reduce the environmental load.

● *Optical Materials Research Center*
The Center, located inside the Onomichi Plant, is equipped with the latest testing and evaluation equipment. It is engaged in the development of LCD optical film products, mainly polarizing films for LCDs.

● *Production Engineering Development Center*
The Center promotes development of manufacturing technologies for the Toyohashi Plant and other manufacturing facilities through the Nitto Denko Group.

● *Reliability Technology Development Center*
The Center develops technologies for assessing reliability in terms of physical properties and equipment analysis with the ultimate aim of helping to create new and next-generation products with high added value.

● *Nitto Denko Technical Corp.*
This subsidiary was established in Oceanside, California to conduct R&D in the field of advanced materials for organic materials for use in optical communications terminal devices and bioscience focusing on genetic diagnosis.

R&D System

An Integrated Technology Strategy Meeting is held monthly by the chief technical officer (CTO), whose duties are currently assumed by the president, to decide the priority areas of R&D and allocate R&D resources for maximum efficiency and effect. Group-wide R&D Projects have been defined as an initiative of high strategic significance and urgency to be pursued under the direct control of the CTO. Nitto Denko's group-wide R&D project system enables implementation of concentrated investment spending to maximize synergies beyond the management resources framework.

Latest R&D Results

Optical communications

Two promising breakthroughs in optical communications materials have emerged from the joint research initiative between the University of Arizona and Nitto Denko Technical Corp., the company's R&D arm in the United States.

- *Organic photorefractive material*

To say that a material is "photorefractive" means that its optical characteristics change with the amount of energy applied to it from the outside. With a diffraction efficiency of 50% and a response speed of 10-plus milliseconds, the newly developed organic photorefractive material ranks at the top by global standards, plus has the additional advantage of superb compositional stability. It is expected to find applications in the next generation of optical communications elements and systems.

- *Photosensitive polyimide material for waveguide*

This material boasts a list of outstanding properties that starts with high transparency in the optical communications wavelength band and continues with world-class propagation loss performance, solder heat resistance and simple fabrication. The need for a reliable waveguide material that is easy to fabricate has increased as the spread of optical communications into the home has made efficient transmission of optical signals more important than ever before.

Technology tie-up yields new product for LCD panels

Nitto Denko and 3M of the United States have succeeded in developing a film for LCD panels that integrally combines the functions of a polarization film and a brightness-enhancing film. Marketing is to start from July 2003. This new film selectively reflects the light emitted by the LCD panel backlight so that it can be reused to boost the panel's brightness, with no sacrifice of viewing angle or color rendering. The film, which is markedly superior to existing products in brightness, viewing angle characteristics, thickness and other properties, was developed through a technology tie-up aimed at melding 3M's advanced expertise in brightness-enhancing film with Nitto Denko's leading-edge polarization film technologies.