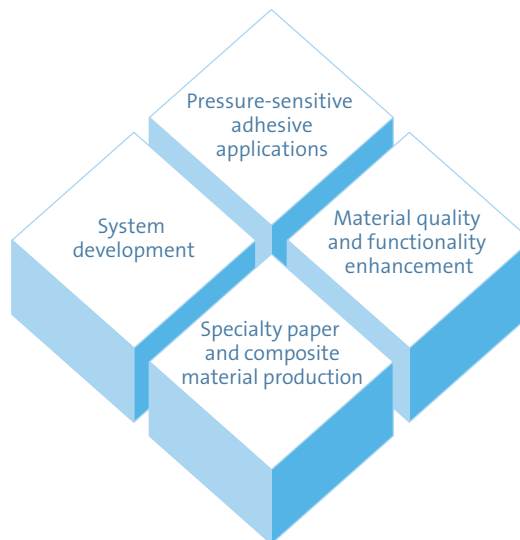


# R&D Activities and Intellectual Property

## Basic R&D Policy

By developing functional materials and related processing technologies that fuse our four core technologies in a sophisticated manner and conducting research that emphasizes dialogues with markets regarding user needs, we are working to resolve customers' technological issues and through this process are developing many innovative, market-leading products.

As a technology-centered company, we realize that strengthening R&D capabilities is one of our most important strategies for achieving sustainable growth. Therefore, we are developing new high-value-added products with a particular focus on growth businesses and environmentally friendly products while also working to accelerate LINTEC's globalization.



## R&D System

LINTEC's R&D function is focused in the Research Center within the Research & Development Division, which has approximately 200 research personnel. With a complete array of the very latest research equipment, pilot coaters, and clean-room facilities, the Research Center collaborates closely with production engineering divisions to develop a range of coating agents and other products. Our Ina Technology Center, also part of the Research & Development Division, develops a wide variety of equipment in relation to label printers and labeling machines, with a particular focus on semiconductor-related equipment. Moreover, the Group has an R&D base in Boston, in the United States, which conducts research and development in such areas as industrial-use multilayer materials and new coating technology. We are not only conducting in-house R&D but are also proactively initiating technological alliances with industry, government, and academia. Our goal is to develop new technologies and products by integrating different technological areas.

## Successful R&D Initiatives in the Fiscal Year under Review

In the fiscal year under review, the R&D expenses incurred by the Group amounted to a total of ¥6.2 billion. The following is an overview of the principal R&D activities conducted by each operational segment.

### Printing and Industrial Materials Products

#### Printing- and information-related products

We developed a new addition with printability, and included it in our line of glossy lamination films that feature unique changes in color of labels depending on the viewing angle and offer a metallic finish. The improved printability of this film is a result of the fact that only the lower layer of the film undergoes the color changes,



thus enhancing the design of seals and labels. In addition, we developed seals for face masks that continually emit fragrances. Refreshing menthol fragrant particles that help clear one's nose and throat are emitted from these seals when applied to the outside of masks made from nonwoven fabrics or gauze.

Moreover, in printing equipment-related products, we are developing printing machines that are optimally suited to the special characteristics of the Company's label materials. In the year under review, we continued to improve the LPM-300 intermittent letterpress and develop low-priced printing machines for the Chinese market. We also worked to develop equipment that combines roll-to-roll web handling technologies and processing technologies.

### Commercial- and industrial-related products

We developed a new window film for buildings that responds to the needs for electricity and energy saving through its ability to adjust sunlight penetration and permit electromagnetic radiation penetration to a high degree. Not only does this film help shatter-proof glass, it also cuts UV rays, is highly transparent, and has high reflectivity for near infrared rays, thus enabling it to boost air-conditioning efficiency while keeping a room amply lit. The high degree of electromagnetic radiation penetration prevents interference when using mobile phones.

In industrial equipment-related products, meanwhile, our development activities are centered on labeling systems for the automated application of adhesive labels using LINTEC's label materials. In the fiscal year under review, we continued to focus on the development of equipment for the automobile, distribution, and mail-order industries.

### Electronic and Optical Products

#### Electronic and optical devices products

We continued to advance development of the DBG + LE system that combines dicing before grinding (DBG) system technology, which supports the production of thinner large-scale integration (LSI) chips, with LE tape technology, which can create tape that functions as both dicing tape and die bonding tape. By making possible multilayer LSI chips, this system contributes to the realization of higher-density LSI packages. In this way, the system supports the creation of higher-capacity memory cards.

In electronic equipment-related products, our development activities are centered on application equipment that facilitates the efficient use of the protection films for wafer surfaces and dicing tapes used during semiconductor chip manufacturing back-end processes. In the fiscal year under review, we focused development efforts on equipment compatible with ultrathin silicon wafers as well as on processing methods and environmentally friendly equipment.



Glossy lamination films



Building equipped with sunlight-adjusting window film

### Optical-related products

In the fiscal year under review, we worked to improve our specialty adhesive agents with significantly increased stress-relieving properties that have the ability to adhere to uneven surfaces, a feature that is currently in high demand. In the functional coating field, we are continuing to advance the development of completely unique light control film by fusing our antiglare coating technology with new manufacturing technologies.

### Paper and Converted Products

Continuing our innovation of oil- and moisture-resistant papers for food packaging, we have developed a new high-value-added product that is more easily released and features an appropriate level of slipperiness, which sparked the interest of major convenience stores and fast-food restaurants. In addition, we successfully developed new papers for envelopes and printing that employ a newly established acid-free paper formulation containing calcium carbonate.

In release materials, with the goal of enhancing our lineup of environmentally friendly products, we developed two new non-solvent formulations for release papers. We also introduced a new coated film for MLCC production that features both incredibly high levels of surface smoothness and an optimal level of release resistance.

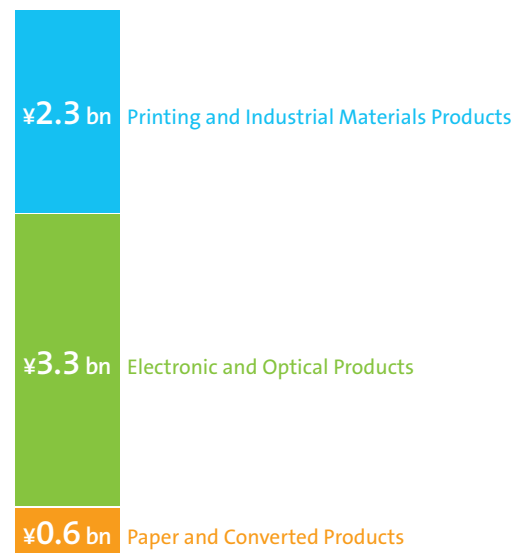
### Intellectual Property Activities

The LINTEC Group aims to increase corporate value by developing original products that meet customer needs. We therefore realize that intellectual property, such as patents, trademarks, and design rights, are important management resources. Further, we have established the Intellectual Property Department within the Research & Development Division. This department promotes strategic Company-wide intellectual property activities that are absolutely essential to our existence as a technology-centered company by handling patent application processes as well as vigilantly monitoring these rights to prevent the infringement of rights, and also seeks to uncover new invention candidates at R&D sites.

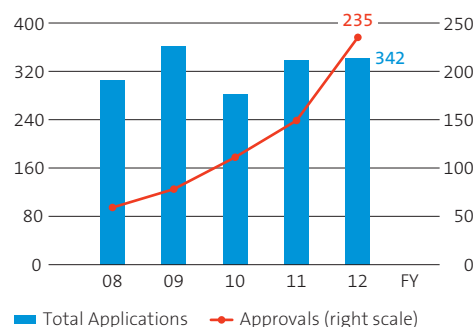
The Company places the utmost emphasis on observing the intellectual property rights of other companies as well as increasing the number and quality of patent applications and rights acquisitions. Accordingly, we are working to expand and build our portfolio of patents for growth businesses and foundation businesses, to provide intellectual property support for operations shifting to overseas locations, and to train more employees with a view to advancing and accelerating development processes. Through those efforts, we aim to improve profitability based on our intellectual property.

Total R&D Expenses in FY2012

¥6.2 bn

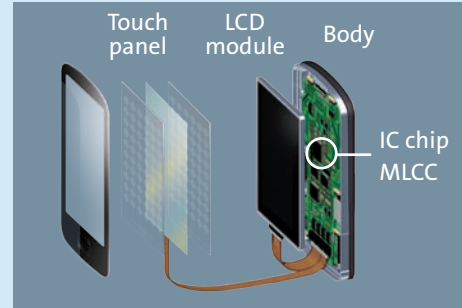


Patent Applications and Approvals (Japan)



# LINTEC's Products That Support Smartphones

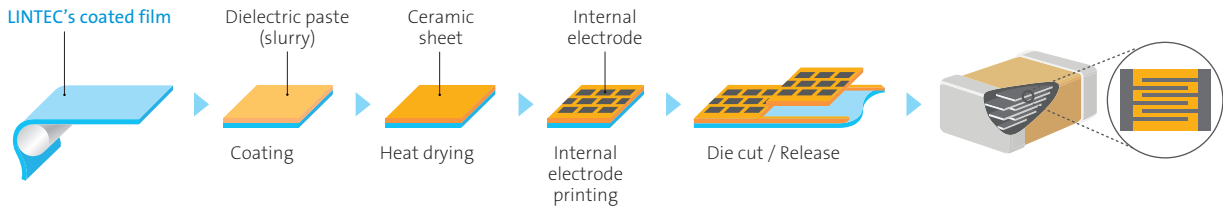
In smartphones, the use of which has been rapidly increasing in recent years, large quantities of components are used, and manufacturers are constantly striving to make each one of these components smaller, thinner, and more sophisticated. LINTEC's products are contributing to this endeavor in a number of ways.



For example, MLCCs, which have the function of temporarily storing electricity and cutting flows of DC electricity, consist of hundreds of layers of alternating ultrathin ceramics and electrodes contained within a 1mm square. One smartphone contains approximately 500 MLCCs. LINTEC's coated films play an indispensable role in the production of the ultrathin

ceramic layers of these capacitors. In particular, our coated films have established a strong reputation in the market among customers dealing in capacitors smaller than a 0.5mm square, some of the smallest in the industry, due to their incredibly high levels of surface smoothness and an optimal level of release resistance.

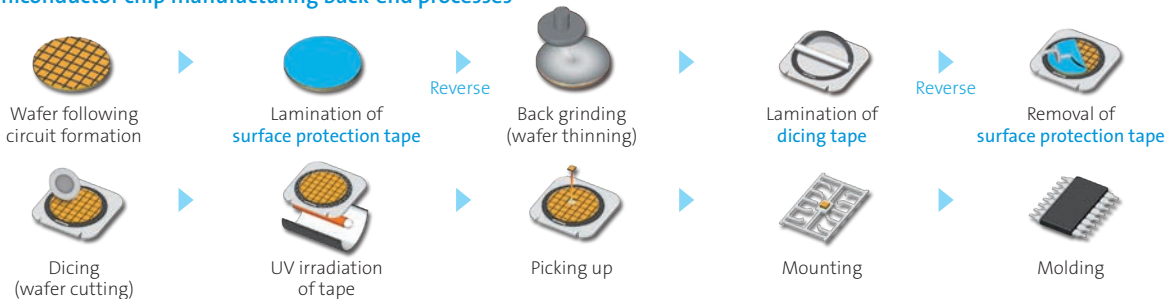
## Production processes for MLCC



We also develop and manufacture semiconductor-related tapes as well as equipment for attaching and releasing these tapes. These are used in the process of making IC chips for flash memory, processors, and DRAM, all of which could be considered the brains of smartphones. For flash memory

that contains several layers of chips to increase memory capacity, our specialty adhesive tapes for chip mounting and layering as well as LINTEC's unique semiconductor back-end processes and related equipment that utilize these tapes are commonly used.

## Semiconductor chip manufacturing back-end processes



We also conduct adhesive processing for the bonding of polarizing films and retardation films used to make LCD modules and antiglare hard coat processing, which reduces reflectivity and protects films from scratches. Further, we develop and provide optically clear adhesive sheets that are used to connect the various functional films contained in touch panels, anti-shatter films that prevent dispersion of glass

shards when glass panels break, ultra-hard coat films that are resistant to scratches from styluses, and fingerprint-resistant hard coat films that enable fingerprints to be easily wiped off.

Going forward, LINTEC will continue to utilize proprietary technologies to develop products that help make smartphones more sophisticated and contribute to the miniaturization of their components.