

**We are concentrating resources in the information and automotive safety product fields, for rapid development and marketing of new products using “fusion of research.”**



Director of Fine Chemicals Group  
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Managing Director

### STRATEGY 1

#### Improved profit-earning capacity with new products and new business areas

Harsh conditions for the Fine Chemicals Group continued throughout the year in FY 2002. The influence of the IT slump resulted in a large drop in the information field, one of our main strengths. In the area of automotive safety products, which we expect to be our main field in the future, we faced a bitter struggle as we were unable to completely comply with the strong demand from automotive parts manufacturers for lower prices. However, we are proceeding steadily with the strategic steps necessary for improving our profit-earning capacity in the future. In the inflator business, we have constructed a tripartite global system (Japan-U.S.-Europe), and are prepared to increase our market share. In addition, demand is growing rapidly for non-halogen grade epoxy resins for encapsulation of semiconductors, for which we hold the top market share in Japan. Our business involving production of colors for color inkjet printers has also grown rapidly. We have made a good start as well with new products related to liquid crystal displays, optics, and data storage. In FY 2003 we are planning to introduce a large number of new products, and strengthen our profit system by accelerating their entry into the market.

### STRATEGY 2

#### Concentrating on information and automotive safety product fields

In the fine chemicals business, we will continue to concentrate our resources into the automotive safety product field and information field, which we have determined to be growth areas for the future. Currently, conditions in the information field are difficult; however, high growth can still be expected in the mid-range. In addition, with the current deflationary economy, our group has enacted plans to improve cost competitiveness in order to secure a superior competitive position. We expect the results of these plans to be apparent in FY 2003.

### STRATEGY 3

#### “Fusion of research” that spans our whole organization

Our group has succeeded in bringing about a fusion of the technology in its possession. It has divided its research and development efforts into short/mid-range themes and long-range themes, and has established a clear system of responsibility for each, with the former being tied directly to business, and the latter intended to establish a technology base. Using this system, we are making solid progress in development of downstream products – basic materials, composite materials, processed materials, and assembly parts, while at the same time maintaining close links with our customers. In the future, we will proceed with commercialization of products including next-generation squibs which make use of the applied semiconductor technology that we are developing for practical use, new resins such as polyimide and polyamide resins, and a wide range of functional films.

## Topics in Functional Products Business

### Establishment of a system for expanding sales of NC-3000, a new environmentally-friendly resin

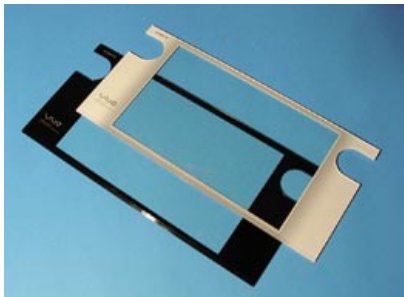
In June 2002, we completed a system for full-scale sales expansion of the new environmentally-friendly resin NC-3000 for use with next-generation semiconductors. Within 3 years, we aim to control a 20% share of the total market of epoxy resins used for encapsulation. There has been increasing need in recent years for environmentally-friendly products in the field of semiconductor encapsulation resins as well. NC-3000 is a biphenyl novolac resin with a molecular structure that yields high flame resistance. This product is suitable for lead-free solder package and high adhesiveness in addition to its heat resistance. We have completed expansion of our production facilities at the Asa Plant, which will be tasked with producing next-generation products. This reinforced production system will be capable of producing 4,000 tons/year, twice the previous capacity. It began full-scale production in March 2002.

### Construction of plant for production of resist ink materials in Wuxi, China

As Japanese resist ink manufacturers continue to relocate production facilities to China, we have decided to construct a plant for production of resist ink material (oligomer) for printed circuit boards at a 15,000-sq. meter site neighboring Wuxi Advanced Chemical (WAC), a consolidated subsidiary of Nippon Kayaku, in China. Test production is expected to begin in July 2003, with full-scale production of 1,800 tons/year expected to start in December 2003. We are aiming for sales of 1.0 billion yen in FY 2007.

### Front panel with anti-reflection film for Sony VAIO W

Previously, it was not possible to print on the surface of anti-reflection films. By changing its surface properties, we have succeeded in developing the industry's first printable-type anti-reflection film. A Nippon Kayaku front panel is mounted on the new Sony desktop series, the VAIO W. This front panel is an acrylic panel with anti-reflection film applied to both sides. It serves not only to prevent reflection, but also to protect the screen. We are proceeding with full-scale marketing of this new anti-reflection film, and are aiming for sales of 700 - 800 million yen in FY 2003.



Front panel for Sony VAIO W

### A successive introduction of new products, such as a new type of plate polarizer for projection systems

In September 2001, our consolidated subsidiary Polatechno introduced a new reflection-type plate polarizer for application to liquid crystal display (LCD) projection systems. Because the illumination in LCD projection systems has been made stronger and stronger in order to increase brightness, higher-durability polarizers have been increasingly required. This new reflection-type plate polarizer consists of aluminum ribs at nano-scale dimensions, and its durability is far superior to conventional film polarizers. In fact, it can withstand 5,000 hours at 200°C. Before the introduction of this new product, Polatechno acquired sales rights in Asia from its designer and developer, Moxtek Inc., a U.S. company. In the same month, Polatechno also introduced two new film polarizers for LCDs to be installed in cars. These polarizers feature higher transmittance and higher durability compared to conventional film polarizers.

### Increased capacity of polarizing film lamination for LCD projection systems to 12 million plates per year

In July 2002, Polatechno Co., Ltd. expanded its annual production capacity of polarizing film lamination from 7 million to 12 million plates. Polarizing films are precisely laminated onto optical components such as glass substrates and X-type prisms installed in LCD projection systems. Improvements to the film cutting and lamination processes contributed to the expansion of production capacity. It is intended that Polatechno Co., Ltd. will stay ahead of expected increases in demand for data projectors, home projectors and similar kinds of products on the global market. As the leading manufacturer in this field, Polatechno is stepping up the system to expand its sales to both Japanese and overseas customers.

#### [ Group Company ]

Polatechno Co., Ltd.

This company was founded in 1991 as a joint investment with Arisawa Mfg. Co., Ltd. After purchasing the polarizing film business (Nakatahara Factory) from Arisawa Mfg., and increasing capital investment, in FY ended March 1998 all accumulated losses were eliminated (capital at end of FY ended March 2002: 1.24 billion yen). In recent years this company has shown remarkable results in the field of polarizing plates used in the LCDs on computers and home electronic devices.

## Topics in Inflators Business

Our inflator business is engaged in fast-response business integrating manufacturing, sales, and development as a automotive parts manufacturer. The Toyota Production System was introduced and the purchasing system was improved. We believe all these efforts will lead our business to a profitable level for FY 2003. In addition, our two overseas consolidated subsidiaries, LifeSparc Inc. (U.S.) and Indet Safety Systems a.s. (Czech Republic), have started production of squibs and micro gas generators. With these two subsidiaries and Himeji, we have created a tripartite system and are aiming to obtain 30% share of the world squib market. Through fusion of our intellectual assets, we have entered full-scale development of semiconductor squibs, which will become the next generation of these high-demand products, and are making maximum use of our company's strengths.

### Creation of our tripartite system with start of new LifeSparc plant

In April 2002, the new production center for our consolidated subsidiary LifeSparc Inc. was completed and began full operation in Hollister, a suburb of Monterey, California. This represents the completion of our second overseas production center, after Indet Safety Systems a. s. in the Czech Republic. Together with the Himeji Plant in Japan, we have created a tripartite supply system and have completed a global network for squibs and micro gas generators, which are key inflator components. For the future, we are considering a production site in China, and are planning for further global development. In the summer of 2002, the new LifeSparc plant shifted into commercial production, with yearly production capacity of 7 million squibs and 8 million micro gas generators.



New LifeSparc plant

### Commercialization of semiconductor squibs

The decision to commercialize squibs using applied semiconductor technology for collision safety devices was made in July 2002. The bus systems (i.e., igniter circuit bus) being developed by automobile manufacturers involve

effective operation of a large number of squibs according to a range of collision patterns. This system requires the use of semiconductor squibs with special integrated circuits. Two years ago, Nippon Kayaku purchased the automotive parts division from the U.S. company Quantic Industries, which held key patents involving the use of semiconductor bridges (SCB). With the exclusive right to utilize these patents, we have been working on commercialization of this technology. Semiconductor squibs, compared to conventional squibs that use Nichrome wires, require between 1/10 and 1/100 of the electrical energy, and have reaction speeds that are approximately 10 times faster. With the FY 2004 commercialization of these semiconductor squibs, which will form the core of next-generation automotive safety devices, we aim for increased income for our Inflators Division.

### [ Group Companies ]

LifeSparc Inc.

This U.S. company has built a micro gas generator and squib facility in 2000 in Hollister, California as a joint investment between Nippon Kayaku and Nichimen Corp. This company is responsible for one branch of the Nippon Kayaku global network.

Indet Safety Systems a.s.

This company began operation in Vsetin, Czech Republic, in 1999. It was established as an independent company as the result of a joint venture between Nippon Kayaku and Nichimen Corp. It is responsible for one branch of the global network, primarily covering the European region.

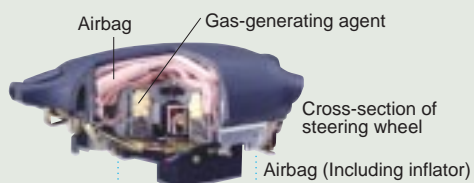
### Inflator and Micro Gas Generator

#### Inflator mechanisms

An inflator is a device, incorporated in safety airbags, that generates gas to instantly inflate the bag when a road collision occurs.

[Operating mechanism]

- (1) A sensor detects the collision, and sends a signal to the inflator.
- (2) The squib inside the inflator operates, igniting a gas-generating agent. The generated gas enters the airbag, instantly inflating it.



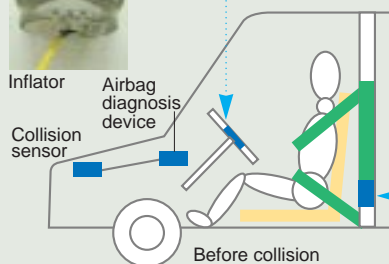
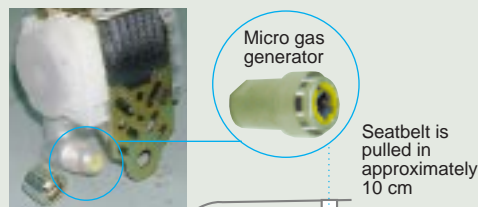
Squib

#### Micro gas generator mechanism

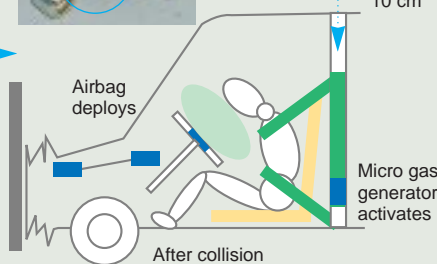
The micro gas generator for seatbelt pretensioner generates gas for the pretensioner device, which winds up the seatbelt and instantly restrains the occupant's body when a vehicle collision occurs.

[Operating mechanism]

- (1) A sensor detects the collision, and sends electric current to the micro gas generator.
- (2) The squib inside the micro gas generator ignites the gas generating agent. The generated gas pressure becomes the dynamic force that winds up the seatbelt.



Seatbelt pretensioner (Including micro gas generator)



## Topics in Color Chemicals Business

### Rapid growth of colors for color inkjet printers

In December 2000, Nippon Kayaku created a separate company comprising the Color Chemicals Division marketing group, in order to achieve more revenue balance, and to provide a powerful boost for our shift to advanced materials such as colors for color inkjet printers. With the successful commercialization of magenta ink, which had previously presented problems in obtaining high functionality, we began to enlarge our product lineup. These sales increased by approximately 17 times over just 3 years in FY 2001 and continued growing in FY 2002. With the construction of a production system including improved refining equipment at our Tokyo Plant, and the creation of a color variation lineup of six colors, we are expecting sales to climb to 3.0 billion yen in FY 2004.



### Introduction of new solventless liquid fluorescent whitening agent

In May 2002, Nippon Kayaku was the first in the industry to succeed in developing an environmentally-friendly solventless liquid fluorescent whitening agent for paper and pulp. We have since focused efforts on expanding the variations of this product. In June of the same year, we marketed KAYAPHOR JB LIQ. for whitening the special paper used with inkjet printers. Inkjet paper uses a chemical to increase water resistance; however, this chemical reacts with components of conventional dye materials, lowering the whiteness of the paper. KAYAPHOR JB LIQ. resolves this problem, and successfully produces noticeably superior whiteness.

#### [ Group Company ]

Nippon Kayaku Colors Co., Ltd.

This company received its start in December 2000 when the marketing group from our Fine Chemicals Group Color Chemicals Division was established as a separate company. It does not engage directly in sales, but operates on consignment from Nippon Kayaku. Its business includes sales planning and sales promotions related to color chemicals, as well as related technical service and product delivery.

### Strengthening our synthetic dye business in China

Nippon Kayaku's consolidated subsidiary Wuxi Advanced Chemical (WAC), which began operation in 1997, currently has an annual production capacity of 1,000 tons for dispersal dyes and under 500 tons for water-soluble dyes. With the increased shipments to local companies for use in automobile seats, and the growing demand in Europe and Japan, we have constructed an expanded production system for this plant. Specifically, we have enlarged the plant facilities at a site neighboring WAC, and will introduce the necessary

equipment by October. We are planning for a production capacity of 2,000 tons for disperse dyes and 1,000 tons for water-soluble dyes. Zhaoyuan Advanced Chemical (ZAC) is our consolidated subsidiary that manufactures fluorescent dye. At the same time, it is enacting plans to expand sales in China, and is working to greatly increase its supply capacity and improve profit performance.

## Topics in Catalysts Business

Catalyst sales have grown steadily to this point; however, because of the global recession, we can expect to be affected by a decrease in acrylic acid production in the first half of FY 2003. Nevertheless, we are planning to increase deliveries to plants, and expect sales to recover in the latter half of FY 2003.

## Topics in Explosives Business

Our explosives business continues to deliver steady profits, and has made a large contribution to the Fine Chemicals Group, which has on the whole faced severe competition. For FY 2003, when we will be operating with a shortage of general contractors, we are giving priority in our strategy to ensuring stability rather than making dramatic increases.

### Marketing of non-electric detonator I-DET

In March 2002, we began sales of our non-electric detonator I-DET. I-DET is suitable for worksites where electrical safety is required. It serves as a static electricity countermeasure when using ammonium nitrate and fuel oil (ANFO) explosives in tunnels, and as a lightning countermeasure during open pit blasting (blasting in locations with no roof, such as at civil engineering works, quarries, and limestone mines). Currently I-DET is imported for sale, however we will begin domestic production at our Asa Plant within the year.



I-DET

#### [ Group Company ]

Kayatech Co., Ltd.

In 1989, this company was started for the primary purpose of conducting the recommended United Nations tests related to evaluation of chemical hazards and the transportation of hazardous materials. In November 2000, it purchased business rights related to the sale of industrial explosives from the primary industrial explosives wholesaler Kawaguchiya, and together with the Nippon Kayaku Explosives Division marketing group, has made a new start as an industrial explosives dealer.