

# Toyota Industries Close-up

*Toyota Industries Corporation (“Toyota Industries”) is divided into four segments: Textile Machinery, Automobile, Materials Handling Equipment, and Others. These are further subdivided into a wide range of business/operation categories. The following pages give details of our range of business fields and product groups, our 75 years of history, and our corporate organization. We hope that this will give all of our stakeholders—including shareholders, investors, and customers—a deeper understanding of Toyota Industries.*

## ***Passion and Progress in Manufacturing***

*As a manufacturing company, our vital function is to craft products. Ever since our foundation, we have channeled our passion for manufacturing into our mission of bringing customers superior products at fair prices.*

*We constantly seek to improve and update our manufacturing facilities so that we can make products of superb quality in the most efficient way.*

*Henry Ford’s mass-production methods revolutionized automobile manufacturing and Toyota Motor Corporation’s “lean manufacturing” method enabled another huge leap in productivity. But just as important as these major revolutions are the many small improvements that add up to a large overall advance in productivity.*

*We, Toyota Industries, are a group of people devoted to the continuous improvement of productivity and the manufacturing of products.*

*While engineers and designers at Toyota Industries have developed new products and improved existing ones, our factory employees have made just as important a contribution to better productivity through their proposals for improving work processes and equipment. We recently embarked on an ambitious project to shorten development processes and improve productivity by revolutionizing development and manufacturing methods through the adaptation of IT.*

The Materials Handling Equipment Segment consists of TOYOTA Material Handling Company and BT Industries AB. TOYOTA Material Handling Company is divided into the industrial vehicle business and the materials handling system business.

## TOYOTA Material Handling Company

Moving into worldwide markets with industrial vehicles and other advanced industrial equipment products

### Industrial Vehicle Business

#### Reaching for success through superior R&D and customer satisfaction

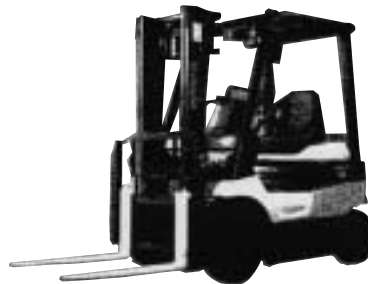
Toyota Industries' industrial vehicle business began in 1956 with the introduction of the LA model 1-ton forklift truck. Since then, we have developed a variety of superior industrial vehicles, such as electric tow tractors with an AC (alternating current) drive system and lift trucks boasting features such as Japan's first 4-wheel drive, standard power steering, which had a huge impact on the industry, and low-noise. Toyota Industries currently leads the world market with a full line-up of internal combustion and electric forklift trucks with capacities ranging from half a ton up to over 40 tons. In addition, we develop and manufacture numerous other industrial vehicles, including skid steer loaders, shovel loaders, and tow tractors for use at places such as airports.

Our emphasis in making lift trucks has been, and always will be, on making products that are safer and as easy as possible for the user to operate. In 1998, we introduced the GENE0 series (called the 7-Series outside Japan) of internal combustion, counterbalanced forklift trucks with capacities from 1 to 5 tons, which boasted our world-first System of Active Stability (SAS), a system for enhancing the stability of lift trucks. In 1999, we introduced the GENE0-B (called the 7FB outside Japan) electric counterbalanced forklift trucks with capacities from 1 to 3.5 tons. In addition to the highly rated SAS, the GENE0-B featured the AC control system as standard equipment.

We aim to continue being the world's leading manufacturer of industrial trucks as we continuously develop state-of-the-art products in order to satisfy customer needs worldwide.



**GENE0 (7FD25)**  
Internal Combustion Counterbalanced  
Forklift Truck (1 to 5 ton)



**GENE0-B (7FB15)**  
Electric Counterbalanced  
Forklift Truck (1 to 3.5 ton)



**GENE0-R**  
Electric Reach Truck



**Tow Tractor (2TD20)**



**Skid Steer Loader (4SDKL8)**

## Materials Handling System Business

### Creating materials handling systems that revolutionize the way goods are conveyed, stored, sorted and picked in warehouses and factories

In today's IT age, information travels instantaneously over networks around the world. This increased speed of information has necessitated greater speed and efficiency in the field of distribution. We offer customers improved efficiency in their distribution work by developing a variety of materials handling systems such as automatic guided vehicle systems and automated storage/retrieval systems. Our wealth of know-how in materials handling, which has been accumulated and developed based on the Toyota Production System (hailed as one of the world's most successful production control systems), helps us provide customers with optimal materials handling solutions. Examples of the remarkable materials handling systems equipment we've developed include the Road Sorter H, our high-end automatic guided

vehicle system that is easy to maintain and has a small turning circle, thanks to AC servo-motor controlled steering wheels, and the Rack Sorter BP, a building-type warehouse system that allows the storing of vast amounts of goods on shelves up to approximately 30 meters high. We also develop and manufacture automated storage/retrieval systems and automatic guided vehicle systems for clean rooms, which are indispensable for the production of electronic components. We employ our original non-contact power supply systems in our automatic guided vehicle systems and automated storage/retrieval systems for clean rooms. Because these systems use electromagnetic force to supply electrical power without physical contact to moving parts, they generate less dust and thus are ideally suited for use in dust-sensitive environments such as clean rooms.

*Note: Toyota Industries' automatic guided vehicle systems, automated storage/retrieval systems and certain other materials handling systems and products are generally sold only in Japan.*



**Rack Sorter P**  
Automated Storage and Retrieval System (Pallet Type)



**Rack Sorter B**  
Automated Storage and Retrieval System (Plastic Container Type)



**Rack Sorter BP**  
Automated Storage and Retrieval System (Building Rack Type)



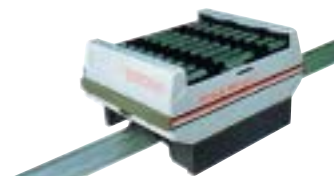
**Rack Sorter Clean**  
Automated Storage and Retrieval System for Clean Rooms



**2AFBR15**  
Automatic Guided Forklift Truck



**Road Sorter H (ACBH10)**  
Automatic Guided Vehicle System



**Mobile Sorter B (MS05)**  
Rail Guided Vehicle System



**Mobile Sorter Clean**  
Rail Guided Vehicle System for Clean Rooms

## BT Industries AB

### Developing warehouse trucks for the global market

BT Industries AB (“BT Industries”) is the world’s leading supplier of warehouse trucks and has a strong global customer base, particularly in Europe and North America. With its wide range of materials handling know-how, BT Industries helps customers improve materials handling efficiency and lower costs. Detailed analysis of customers’ sites allows BT Industries to offer the best materials handling solution possible. Customers’ needs are reflected in the development of

BT products that offer high performance, low maintenance and maximum cost performance.

BT Industries stays close to its customers through dedicated sales networks. BT Industries offers a wide range of warehouse trucks, including hand pallet trucks, reach trucks, order picking trucks, very narrow aisle trucks and others. The company offers counterbalanced lift trucks as well.



**BT MINIMOVER** (Electric Pallet Truck)

Launched in 2001, the MINIMOVER is a light and agile yet powerful aid for horizontal transporting. Its elegant style and ease of use make it perfect for use in places such as supermarkets.



**BT LIFTER** (Hand Pallet Truck)

BT has manufactured more than 2 million of these original hand pallet trucks to date. With a lift capacity of 2,300 kg, the BT LIFTER can be used wherever pallets need to be moved.



**BT ORION** (Electric Pallet Truck)

The ORION series of electric pallet trucks is intended for heavy-duty horizontal transporting. Combining large batteries, powerful motors and a driver platform with CAN technology, these pallet trucks offer high productivity and low maintenance.





**OPUS (Order Picking Truck)**

The extensive OPUS line of low-level order pickers is used for order picking of a multitude of items, from auto spare parts to consumer goods. The model shown here has extra-long forks for roll cages.



**REFLEX (Reach Truck)**

The REFLEX reach trucks are designed for intensive stacking and horizontal transporting. Ergonomics and performance have been combined into a superbly productive line of trucks.



**OPUS (Order Picking Truck)**

The OPUS line also includes models with elevating platforms, allowing the operator to work comfortably at first and second level shelves.



**COMBI (Very Narrow Aisle Truck)**

The COMBI line consists of high-lifting "man-up" machines for combined pallet handling and order picking. The trucks are engineered for intensive use—even around the clock—365 days a year.



**OPAL (Order Picking Truck)**

The OPAL order pickers are designed for order picking at medium heights, exceeding four meters. The model shown is equipped with a walk-through platform for handling of bulky goods.



**CARGO (Counterbalanced Truck)**

The CARGO line of counterbalanced trucks, comprising electric, diesel and gas-powered machines with lift capacities up to 5 tons, completes the BT product line-up.

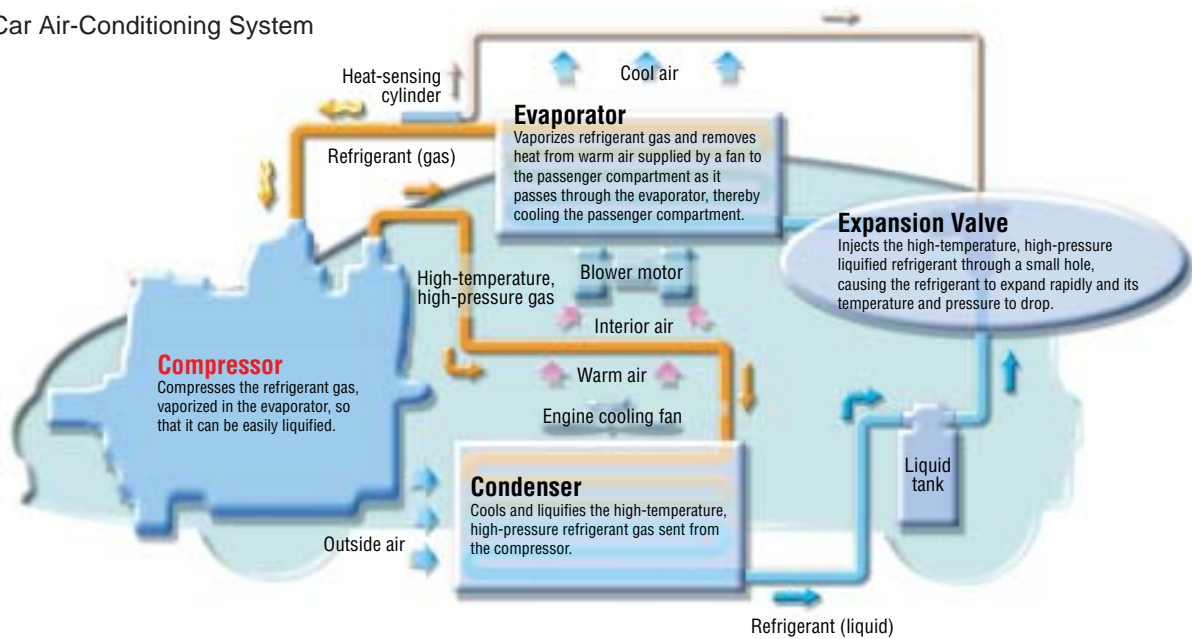
*A world leader in the manufacture of compressors, the core part of a car air-conditioner*

Car air-conditioners use the heat of evaporation of refrigerants to cool the inside of cars. The heart of a car air-conditioner is the compressor. Toyota Industries has been a leading manufacturer of car air-conditioning compressors with outstanding, unrivaled technologies such as compressors for electric vehicles and an external signal-controlled compressor with one-way swash plate continuous variable displacement, which automatically adjusts its displacement according to the cabin temperature and

the load on the engine, resulting in lower fuel consumption. We have a large market share, both in Japan and around the world, supplying car manufacturers with state-of-the-art, compact and lightweight products, way ahead of the competition.

The compressor is an important element in ensuring a comfortable drive. It's also important in determining the impact a car has on the environment. As part of our long-standing commitment to the environment, we develop compact, variable

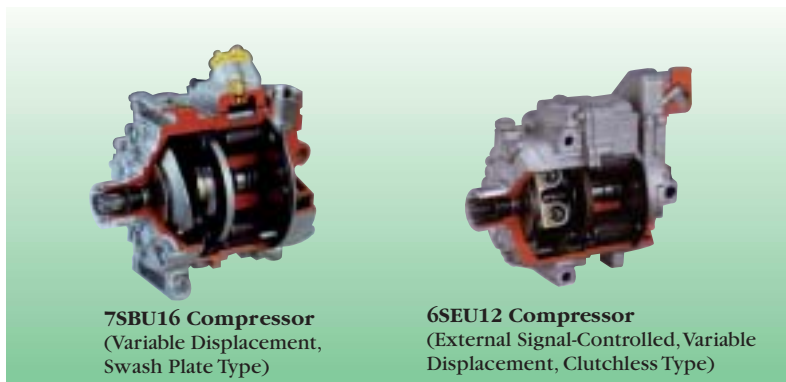
Car Air-Conditioning System



Fixed Displacement Type



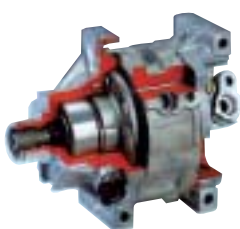
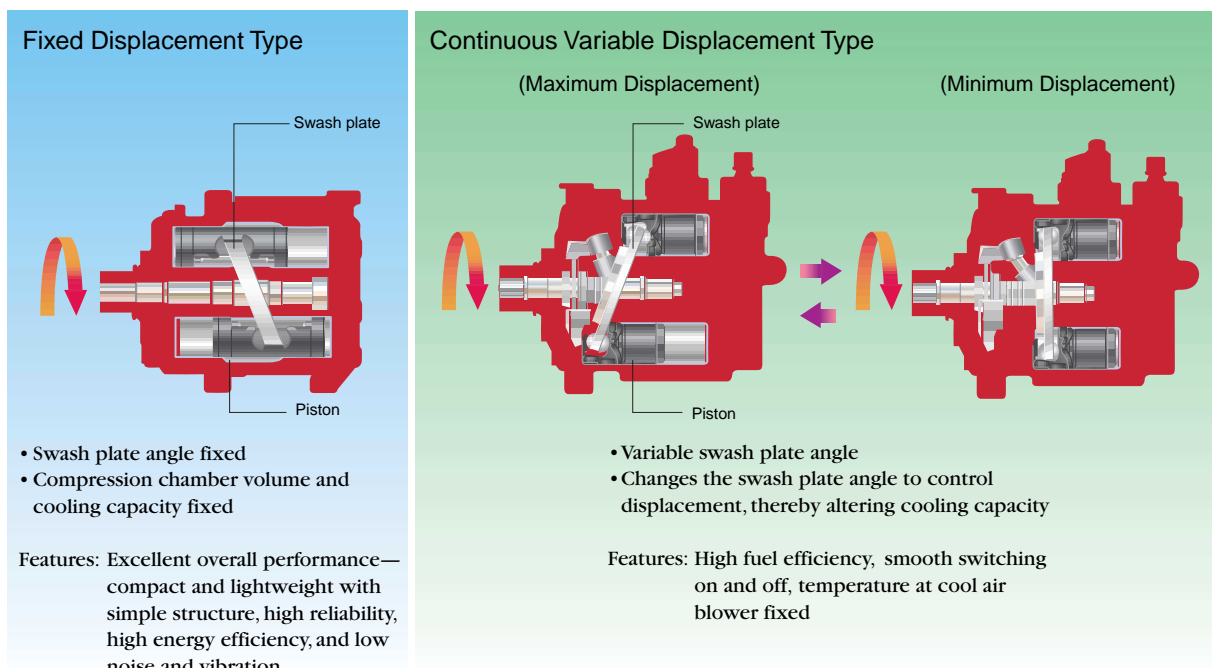
Continuous Variable Displacement Type



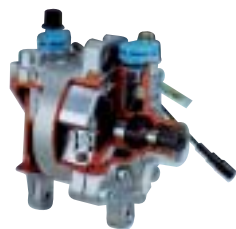
displacement compressors that contribute to fuel efficiency by placing minimum burden on the car engine and next-generation compressors that use new refrigerants such as carbon dioxide (CO<sub>2</sub>) as a substitute for CFCs.

Toyota Industries develops and manufactures various types of car air-conditioning compressors, our main type being the swash plate type. There are two types of swash plate compressors: a fixed displacement type with the swash plate angle fixed to keep the volume of the refrigerant compression chamber and the cooling capacity at a constant level; and a variable displacement type (one-way swash plate type) with the swash plate angle controlled automatically to change the volume of

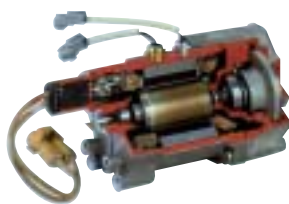
the refrigerant compression chamber and control the cooling capacity. Automatic displacement control can be achieved with two methods: an internally controlled variable displacement method that responds to the heat load of the compressor, thereby mechanically controlling the displacement; and an external signal-controlled variable displacement method, which uses sensors that detect various factors such as interior and exterior temperatures and humidity levels, enabling the magnetic valve to regulate the displacement of the compressor accordingly, thus contributing to higher fuel-efficiency and enhanced driving feel.



**SCS06 Compressor**  
(Scroll Type)



**SV07 Compressor**  
(Vane Type)



**ES25 Electric Compressor**  
(Hermetic Scroll Type)



**Viscous Type Power Heater**  
(Vehicle Cabin Supplementary Heater)

*Contributing to the Toyota Group by assembling high quality, environmentally friendly compact cars*

Today, safety and environmental concerns are important elements in developing cars. We currently manufacture the Vitz (Yaris in Europe), the production of which commenced in 1999, succeeding the Starlet. Having the lowest level of fuel consumption in its class, the Vitz (Yaris) is a strategic small car for Toyota Motor Corporation ("TMC") worldwide. In addition to being environmentally friendly, it's also equipped with

advances in safety technology such as EBD (electronic brake distribution), ABS (antilock braking system) and dual SRS airbags.

We also manufacture the Sprinter Carib (called the Corolla Wagon outside Japan) for TMC, and started production of TOYOTA's compact SUV RAV4 in May 2001 and the bB Open Deck, a new compact car, in June 2001.



Vitz (Yaris in Europe)



RAV4



Sprinter Carib  
(Corolla Wagon Outside Japan)



bB Open Deck  
(Available Only in Japan)



## Manufacturing a line-up of engines for small cars and large sport utility vehicles (SUVs)

Environmental concern in recent years has created a demand for environmentally friendly engines. Toyota Industries is striving to develop and manufacture, in collaboration with TMC, engines that offer power yet fuel efficiency and high output yet low noise.

We manufacture diesel and gasoline engines in classes ranging from 1.5 liters to 4.7 liters. The engines we produce are used in TOYOTA-brand

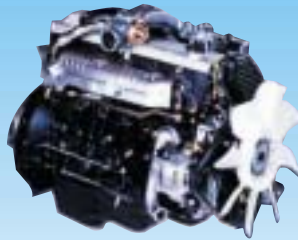
automobiles and forklift trucks. We are going all out in our joint efforts with TMC to develop environmentally friendly engines that offer power, quietness, and low vibration in a compact package.

Our flexible manufacturing system uses automatic guided vehicle systems to efficiently assemble approximately 200 engine parts, thus replacing conveyor belts.

### Diesel Engines



**1CD Diesel Engine**  
(Displacement: 2.0 Liters,  
Used in the Avensis and Corolla)



**1HZ Diesel Engine**  
(Displacement: 4.2 Liters,  
Used in the Land Cruiser and Coaster)



**3C-E Diesel Engine**  
(Displacement: 2.2 Liters,  
Used in the Corolla)

### Gasoline Engines



**2UZ Gasoline Engine**  
(Displacement: 4.7 Liters,  
Used in the Lexus LX470)



**1FZ-FE Gasoline Engine**  
(Displacement: 4.5 Liters,  
Used in the Land Cruiser)



**4Y Gasoline Engine**  
(Displacement: 2.2 Liters,  
Used in Industrial Vehicles)

## The key to the future growth of the company

*Our Electronics business consists of three separate operations: the Technology Development Center, ST Liquid Crystal Display Corp., and TIBC Corporation.*

### Technology Development Center

Taking cars into a new age of electronic control through the development of electronics equipment and devices

Our Technology Development Center conducts research and development in various fields. In July 2001, we integrated the center with our Semiconductor & Electronics Equipment Division and began aggressively developing and manufacturing electronic components for automobiles. The Technology Development Center manufactures mainly power supply- and communications-related products. In the field of car electronics, we develop and manufacture a variety of products, including DC-AC inverters (pre-installed type and portable type), which convert the DC 12V current from an auxiliary battery to AC 100V so that home electrical appliances (8V) can be used in the vehicle in Japan; inductive battery charging systems for electric vehicles; and DC-DC converters used in hybrid cars. We also manufacture semiconductors, SS wireless modems and the AC controllers built into the GENE0-B (called the 7FB outside Japan) electric counterbalanced forklift trucks.



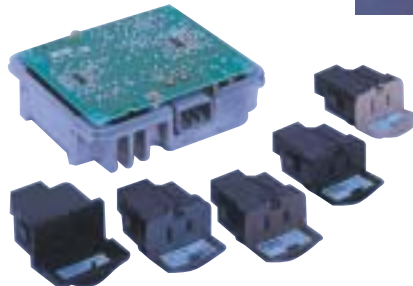
Battery Charging System for EV



Power MOSFET Module



DC-DC Converter for the Prius



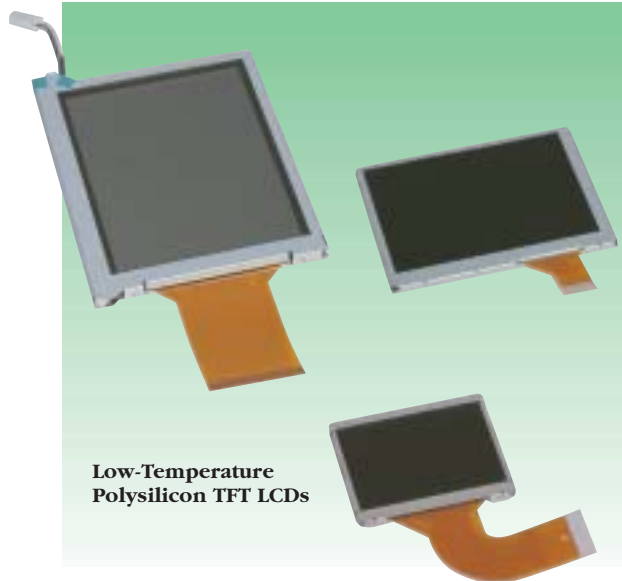
DC-AC Inverter (Pre-Installed Type)

## ST Liquid Crystal Display Corp.

The growing nucleus of Toyota Industries' electronics business holds high-tech promise

ST Liquid Crystal Display Corp. ("ST-LCD"), established as a joint venture with Sony Corporation, manufactures low-temperature polysilicon TFT LCDs, a next-generation display panel.

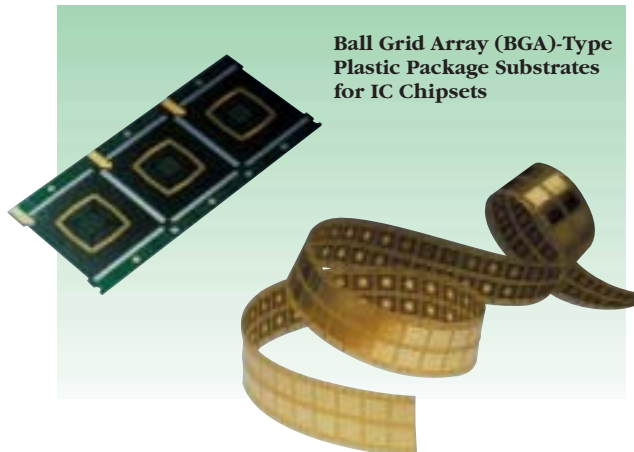
In addition to having a high aperture rate and consuming little power, low-temperature polysilicon TFT LCDs make possible miniaturization of the display unit because the display device and its driver circuits can be integrated onto the same TFT glass substrate. These compact, cost-reducing display panels thus hold promise for applications such as digital video and still cameras, as well as in-car monitors. With these characteristics predicted to create a huge demand for low-temperature polysilicon TFT LCDs, ST-LCD stands to play an important role in Toyota Industries' electronics business.



## TIBC Corporation

Manufacturing plastic package substrates for IC chipsets helps make electronics products smaller and lighter

TIBC Corporation ("TIBC"), a joint enterprise of Toyota Industries and Ibiden Co., Ltd. ("Ibiden"), entered the market for electronic substrates, which are used for IC modules that are vital for a range of products including PCs, digital video and still cameras, mobile phones and memory boards. TIBC mainly manufactures ball grid array (BGA)-type plastic package substrates, which allow ICs to offer maximum functionality with minimum size and weight, and flexible printed circuit (FPC)-type substrates for IC cards. These products are sold through Ibiden to chip manufacturers and other high-tech companies worldwide.



Flexible Printed Circuit (FPC)-Type Substrates for IC Cards

*Contributing to innovation in the global textile industry*

The roots of the Toyota Group go back to the renowned Japanese inventor Sakichi Toyoda and his invention of the automatic loom. Since then, the company has developed and manufactured textile machinery, the majority of which has been supplied to customers outside Japan. Toyota Industries manufactures two main categories of textile machinery: spinning machinery for spinning cotton fibers into yarn; and weaving machinery, on which yarn is woven into fabric in the directions of weft and warp. To keep up with the advancing needs of the market, we continuously incorporate the latest technological developments, including control technology, mechatronics and IT, into our textile machinery.

Our Textile Machinery Division's flagship product, the JAT610 air-jet loom, has garnered the number-one

share of the world market thanks to the high level of praise received from our customers. After taking over the water-jet loom business from Nissan Texsys Co., Ltd., we applied the proprietary electronics technology developed for our air-jet weaving machines and introduced the LW600 series water-jet loom in 1999. We also sell preparatory machinery for weaving, such as sizing machines.

Customers around the world also know and trust us as one of the leading manufacturers of ring spinning frames and roving frames.

The Textile Machinery Division aims to offer the world's leading brand by continuously developing products that meet customers' needs, thereby maximizing customer satisfaction.

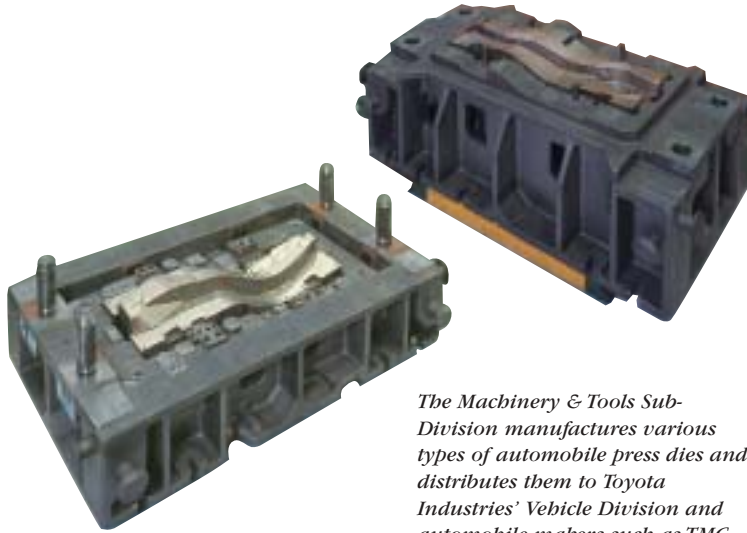




## Machinery & Tools Sub-Division

Excelling in press die manufacturing technology

The Machinery & Tools Sub-Division is involved in the design and manufacture of automobile press dies, mainly for TMC. These press dies are highly rated for their high quality and precision by automobile makers both in and outside of Japan. With its capability to produce higher quality press dies at a lower cost and achieve quick delivery times, the Machinery & Tools Sub-Division is helping automobile makers manufacture better cars.



*The Machinery & Tools Sub-Division manufactures various types of automobile press dies and distributes them to Toyota Industries' Vehicle Division and automobile makers such as TMC.*

## Mechatronics Engineering Sub-Division

Contributing to the improvement of process technology through the design and production of manufacturing equipment for intracompany business divisions

The Mechatronics Engineering Sub-Division is committed to promoting in-house manufacturing of key machining and assembling equipment. This includes manufacturing equipment for the Compressor Division and Engine Division as well as for ST Liquid Crystal Display Corp., which manufactures next-generation LCDs. The Mechatronics Engineering Sub-Division also designs and manufactures advanced manufacturing equipment to help improve production efficiency and labor savings in the company and its group companies, thus boosting Toyota Industries' competitiveness.



*Equipment developed and manufactured by the Mechatronics Engineering Sub-Division is utilized in Toyota Industries' compressor business and by ST-LCD, enhancing the productivity and competitiveness of these operations.*