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Special Feature:

The Source of the Tsubaki Group's Competitive Edge

Constantly Upgrading the Production Worksite



We believe the source of any manufacturer's competitive edge should be its capabilities in technology, development and manufacturing, and its production worksite. In this feature, we will explain how our differentiation strategy separates us in these areas from other companies, differences which are often obscured by marketing data on markets, products, background conditions, and levels of sales.



1. Basic Technological Capabilities

Among the many elements that determine which manufacturers will survive and which will fail, we believe that “basic technological capabilities” is the most essential factor. Based on this belief, the Tsubaki Group seeks to differentiate itself from other companies by maintaining high levels of investment in basic technologies.

Three Main Elements of our Distinguished Basic Technologies

Basic technological capabilities comprise three main elements. Materials technology relates to continuously improving products through R&D based on advanced materials science in order to create superior products in terms of durability, wear, quietness, and environmental preservation. Assembly technology recognizes ideal sectioning and surfacing requires not only proper production processes, but also hinges directly on manufacturing costs and price competitiveness. Technological assessment is best illustrated by referencing our work with power-drive chains, targeted to become the second core product in our Automotive Parts operations. By carefully assessing, through advanced simultaneous simulations, how chain and sprockets mesh, the tension put on chains, and the noise produced, we have created products that have won the confidence of our customers.

Focusing on Basic Technology, Better Scope for Investment

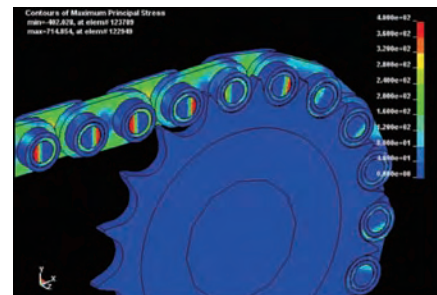
While “basic technology” is the lifeblood of any manufacturer, companies often tend to only passively invest in the basics as it is hard to measure or see the contribution to short-term earnings. However, the Tsubaki Group has continued to invest proactively in basic technology even during periods of weak earnings. For example, the 14,000m² technical center at the Kyotanabe plant is equipped with the resources to allow cutting-edge analysis and simulation, and with image-processing equipment to allow ongoing analysis, simulation, and high-precision inspection and analysis. In the chain industry, the Tsubaki Group continues to expand its global reach and further widen its earnings edge over its peers. The resulting gap in investment capacity should strengthen Tsubaki’s competitive edge in basic technology.



Technical center at the Kyotanabe plant

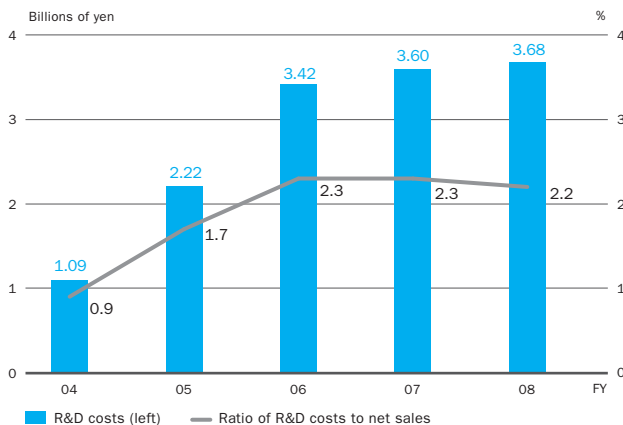
The Tsubaki Group’s “analysis & simulation” and “image processing” technologies help to maintain its competitive strength.

Simultaneous analysis of chain transmission behavior and stress performance



R&D investment

Tsubaki Group investment in technological development



2. Manufacturing Engineering Capabilities

No matter how good a product may be, developing efficient, high-quality offerings that are economically priced and that win the absolute trust of customers is essential for increasing profits. The Tsubaki Group maintains a competitive edge here.

Introducing the Cell Manufacturing System

The operating environment for the Tsubaki Group was extremely challenging in 2001 and 2002 as we transferred our main plant from Tsurumi, Osaka, to Kyotanabe City, Kyoto Prefecture. Earnings were hobbled by a decline in overall demand coupled with high depreciation charges. Nonetheless, Chain operations could not stop unprofitable product lines or turn to outsourcing during this difficult operating phase. Instead, the Group took on the challenge of drastically reforming its manufacturing system by introducing the cell manufacturing system, which has lowered costs while also improving quality. It has been the cornerstone behind the strong growth that we enjoy today. In the system, a single worker or a group of employees form a cell and are entrusted with an entire manufacturing process from start to finish, which affords them considerable autonomy for completing the task at hand. Compared with lot manufacturing using belt conveyors and other equipment in which workers oversee only a certain portion of product assembly, cell manufacturing is a motivating force for employees that instills in them a sense of responsibility. It has led directly to higher productivity and quality.

Reaping Major Rewards from Cell Manufacturing

Labor productivity has risen more than 20% since the cell manufacturing system was introduced, and inventory turnover has also improved sharply. Raising employee awareness about improving productivity and product quality has stimulated the number of employee-generated proposals submitted for improving work processes, and has greatly reduced the number of product quality complaints. Our Kyotanabe plant has expanded the scope of this manufacturing method from assembly processes on the factory floor to its office units. Looking ahead, we intend to further broaden its scope to sales and customer services, upgrading to a synchronized cell manufacturing system using the “just-in-time” ideal of making only what can be sold as fast as it can be sold.

Measures for cell synchronizing production activities

From worksite reforms to management reforms

FY2005 Assembly-level reforms

- Benefits for assembly operations on the introduction of the cell manufacturing system
- Increased productivity
- Improvement in process quality

The first stage of cell synchronization production activities

FY2006 Plant-level reforms

- Benefits from synchronization of parts processing and assembly operations
- Reduction in lead times
- Reduction in inventory

FY2007 Operational-level reforms

- Benefits from synchronization of machinery maintenance
- Reduction in lead times
- Decrease in total equipment shut-down time

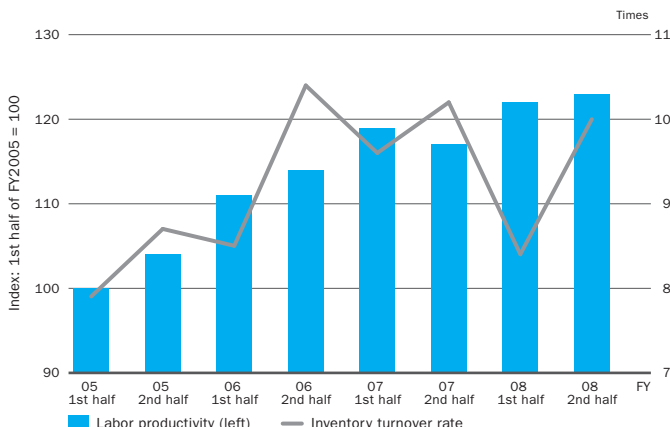
The second stage of cell synchronization production activities

FY2008 Domestic and international management and customer level reforms

- Increased synchronicity with customers
- Manufacturing according to speed products are sold
- Realizing 100% reliability for deliveries
- Cutting inventory by half

Labor productivity and inventory turnover rate

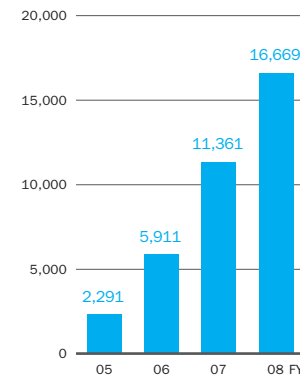
Continuously improving labor productivity and the inventory turnover rate



Note: Results for the Chain operations division at the Kyotanabe plant

Number of improvements proposals

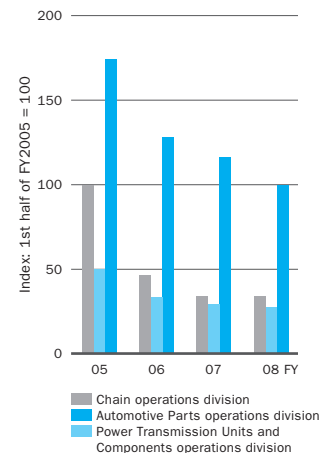
Increase in the number of improvements proposals after the introduction of the cell manufacturing system



Note: Results for the Chain operations division at the Kyotanabe plant

Number of claims

Remarkably declining trend in the number of external manufacturer quality claims



Legend:
 ■ Chain operations division
 ■ Automotive Parts operations division
 ■ Power Transmission Units and Components operations division

3. Product Development Capabilities

The Tsubaki Group constantly strives to gauge contemporary needs to develop products that take full advantage of its competitiveness.

Many Popular Products Created Using Our Impressive Product Development Capabilities

The Tsubaki Group's Autran Vanguard® overhead conveyor, an unmanned system used in factories worldwide, is essential machinery for efficient materials handling at production plants. It has subsequently been upgraded, enabling it to supply electricity to conveyors without directly touching current collectors. The system is gaining widespread use at semiconductor plants and other facilities that require especially clean environments. The Tsubaki Group's extensive product development capabilities have also yielded a number of other successful products. These include NEP Chain, which raises corrosion resistance from 1.4x achieved by the earlier product to 2.3x through the use of special coatings; Silent Chain, which is used in camshaft drives for extremely quiet engine operation; and the precision machinery products Power Cylinder and Power Lock.

Notable Growth in Tsubaki Group Patents

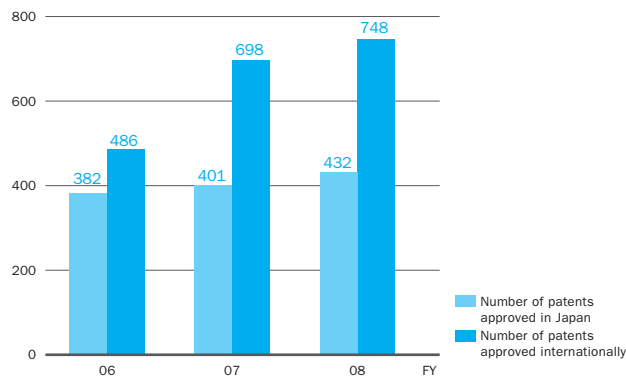
While we cannot yet divulge the details of our product development plans, as they are the source of our strong competitive position, the basic approach entails identifying what technologies must be updated or created based on an objective analysis of current core technologies and assessment of technologies and products for which a future demand is expected to exist. It is this approach to product development that has seen the number of patents we have obtained grow significantly over the past several years.

Module Products for Key Future Areas

The Tsubaki Group's strength lies in its ability to integrate the supply and assembly of parts, devices, and modules into entire systems. Our focus going forward, therefore, will continue to center on the use of modules within product development, a strategy adopted with the Zip Chain Lifter. The Zip Chain Lifter can lift items 3–10 times faster than conventional hydraulic equipment with pinpoint accuracy. In the future, we expect it to gain wide use in applications, including auto assembly lines.

Number of patents approved

The number of Tsubaki Group approved patents is trending upwards



An extensive product lineup from parts through systems

Parts

- Chains
- Sprockets
- Toothed belts

Devices

- Reducers
- Power cylinders

Modular Products

- Autran Vanguard®
- Roll paper feeding AGV

System Products

- Conveyance systems
- Sorting systems



An important area of development in the future: Module products

Highly anticipated new product: Zip Chain Lifter



The zip chain makes possible what is impossible using conventional lifting equipment



Two chains interlock like a zip, creating a single, strong pillar-shaped body able to directly transmit thrust for lifting and lowering. This enables the kind of high-speed, high-precision operations that are impossible with conventional lifting equipment.