RESEARCH AND DEVELOPMENT

Guided by the business philosophy of "providing innovative products to the world and generating new trends to contribute to the creation of an affluent society," THK continually strives to create original products as a creative development-driven enterprise.

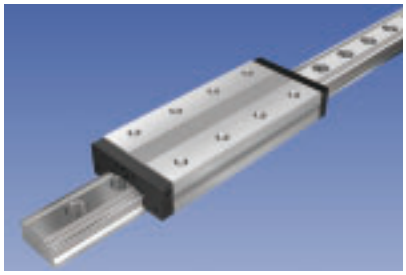
THK Product Development as a Contributor to Industrial Development

THK's business philosophy is based on the idea of "providing innovative products to the world and generating new trends to contribute to the creation of an affluent society." This thinking has guided our drive to be a creative development-driven enterprise, enabling us to develop a varied stream of products since our establishment in 1971. Besides contributing to industrial development, these efforts have also resulted in THK steadily accumulating technical expertise that has been a primary source of growth.

THK developed the world's first linear motion (LM) guide. For the first ten years after we started production and sale of these products in 1972, LM guides were primarily used in machine tools. During this period we developed a series of new products to fulfill our customers' needs for increased precision and lower cost. In the 1990s, other industries such as manufacturers of semiconductor production equipment and industrial robots began to adopt THK products. We responded by developing various new products that were optimized for customer-specific applications and operating environments in these sectors.

In 1996, we pioneered the development of the world's first-ever LM guide using caged ball technology, an advance that enabled LM guides to operate without maintenance for much longer periods. Although such technology was already common in rotary bearings at the time, the problem was the need to cope with both linear and circular movements. This made it extremely difficult to develop ball cages with sufficient durability to move along straight lines or curves. THK successfully took steps to overcome this issue. LM guides based on caged ball technology not only provide the benefit of long-term maintenance-free use, but have also made a significant contribution to the development of high-speed, low-noise industrial machinery with longer productive lives, particularly in the machine tool and semiconductor production equipment sectors. The advance also paved the way for the development of LM guides for additional applications. Today, we continue to develop products that use caged ball technology. Besides LM guides, this range has expanded to include ball screws, ball splines and hybrid units.

MAJOR NEW PRODUCTS DEVELOPED IN FISCAL 2010



Super-Low Waving and Super-High Rigidity LM Guide:
SPR/SPS

The Caged Ball LM Guide SPR/SPS models offer high precision, high rigidity, high speed, long-term maintenance free and ecological friendly performance, all features required in the latest machine tools. These guides which use eight rows of raceways, a small-diameter ball and a super long block provide low waving superior to existing LM guides as well as higher rigidity.

Ultra-Small Ball Spline:
LTS

The LTS ultra-small ball spline delivers a single reduction in size in outer tube, outer diameter compared with existing models without altering rated life and length measurements. In addition to its compact design, the LTS model significantly enhances shaft rigidity by allowing a thicker axle compared with similar outer diameter of the outer tube products.

Compact Caged Ball Screw:
SDA

The SDA model is a high-speed, compact ball screw compliant with the Deutsche Industrie Normen (German industrial standards). Utilizing a newly developed end-cap circulation system, this ball screw realizes outstanding speed and substantial reductions in size. Moreover, through the use of a ball cage, the SDA model delivers long-term maintenance free, low noise as well as smooth and stable motion with low fluctuation operations.

A Global R&D System for the Next Generation

Drawing on the elite minds from each of the ACE, FAI and IMT divisions, with a particular focus on the Engineering Division, a task force engages in research and development activities, primarily out of the Technology Center located in Tokyo, in such wide-ranging products as LM systems, a core THK products, and diverse markets including mechatronics, consumer products and automobiles.

In April 2010, operations commenced at an R&D facility established within the head office of THK (CHINA) CO., LTD., in Dalian, Liaoning Province, the Group's first such overseas base. Amid a Chinese market that continues to enjoy growth, the THK Group is committed to developing products that address local needs both in terms of product specifications and price in a timely manner by locating this R&D facility at the point of demand.

Product Development in Fiscal 2010: Realizing the "cubic E" Concept

Leveraging creative ideas and the Group's proprietary technologies, the main theme of THK's current R&D activities is the "cubic E" concept, which embraces the three keywords Ecological, Economical and Endless. Based on this theme, we continued throughout fiscal 2010 to speed up development with the aim of extending the range of applications for our technologies while at the same time seeking to develop highly original and attractive products for launch five or ten years in the future. Major achievements in fiscal 2010 included the development of products for a number of original applications.

As outlined below, the Group developed a variety of new models in its mainstay LM guide lineup as well as new ball spline-, ball screw- and actuator-related products in industrial equipment field.

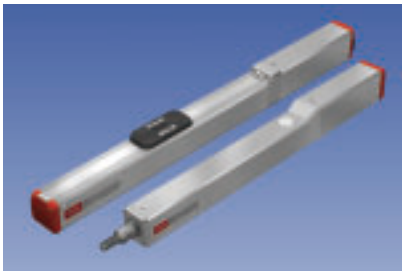
In transportation equipment field, the Group introduced environmentally conscious cycle testing equipment that has attracted high praise for closely simulating actual vehicle conditions. At the same time, successful efforts were made to develop and bring to the market higher quality products in the context of extremely cold climates. Moreover, the Group promoted the development of new crafting techniques, products for use in electric vehicles and more compact and lightweight products as a part of efforts to further enhance cost competitiveness.

Fiscal 2011 Policies and Initiatives

Based on the revamped R&D system, we plan to focus our efforts in fiscal 2011 on the efficient development of new products with the aim of expanding applications for THK technology further. Specifically, we will pursue themes such as customer convenience while promoting designs that incorporate the potential for enhanced productivity and quality. Moreover, by conducting in tandem basic and applied development activities, we will focus on developing products that can quickly generate commercial returns. Complementing these endeavors, and while strengthening our global development capabilities, the R&D base established within THK (CHINA) CO., LTD. will serve at the center of efforts to actively promote product development that addresses local Chinese market needs.

Linear Motor Actuator:
GLM20AP
In addition to realizing higher speed, speed adjustability and precision performance, this linear motor actuator is compliant with international safety standards. Compared with the existing GLM20 model, the GLM20AP increases thrust force by a maximum 19%. Moreover, this increase in thrust force increases the potential for tact improvement.

Stepping Motor Driver Controller:
TSC
THK successfully developed a stepping motor driver controller that integrates the driver and controller functions in a slim case while offering a host of functions. Easy-to-operate, this product is deal for first-time users.



New economy series electric actuator:
ES/EC
THK developed a new economy series electric actuator which contributes to improved functionality and performance of ES- and EC-type electronic devices. Unlike existing products, this electric actuator features a built-in stepping motor and smart body. Easy-to-operate, compact and boasting multiple functions, this electric actuator comes at a reasonable price.