

# MACHINERY & ENGINEERING

## Machinery & Engineering Group

### Strengthening Our Technology Capabilities to Reinforce the Competitiveness of the Fastening and AP Businesses

The Machinery & Engineering Group contributes to the growth of the YKK Group by developing and manufacturing machinery as the core of YKK Group technologies. The YKK Group has grown globally by developing an integrated production system that encompasses materials, manufacturing equipment, and products. The Machinery & Engineering Group supplies machinery specialized for the Fastening and AP businesses to YKK

Group plants all over the world by developing materials, machinery, and equipment, and manufacturing machinery parts, dies, and machinery. To strengthen the elemental technologies that are needed to supply specialized machinery, we are promoting the introduction of external technologies through cooperation with companies and universities while at the same time seeking to cultivate our own in-house development.



### Machinery and Equipment Development Suitable for Production Sites

#### Manufacturing Technology Development

The Machinery & Engineering Group develops and designs specialized machinery for zipper production suited to the Fastening business plants in each country and region. It also makes the production lines and systems for Architectural Products, especially for windows.

#### Machinery Manufacturing

The manufacture and supply of machinery developed by the Manufacturing Technology Development Division helps to support the high quality and cost competitiveness of both the Fastening and AP businesses. Furthermore, the Group manufactures the molds that support this quality using a wide range of precision processing technology.

### Mid- to Long-Term Engineering Development

#### Foundational Technology Development

We also develop materials used in products and innovative technology for manufacturing processes. Furthermore, we are engaged in development of materials for molds, which are essential for product manufacture, development of their processing technology, and of the elemental technology needed for machinery and equipment.

#### Analysis and Simulation

We support technological development for the YKK Group through material development and analysis essential for improving product quality, including trace components in materials and microstructures. Furthermore, we use simulation technology to forecast product capability and product quality, and develop our own systems to support improved speed in development within the business.

## The YKK Group's Integrated Production Philosophy

The YKK Group implements an integrated production system for in-house development and production encompassing everything from materials to manufacturing equipment and products. The YKK Group has achieved our characteristic worldwide standardized quality through

processes for the stable worldwide supply of high quality products. This involves elemental technology, such as development of various materials and processes; recycling technology suited to the environment; and even constructing logistics, sales, and manufacturing systems.

### Worldwide Standardized Quality



### Fifth Mid-Term Management Plan Execution Policy

At the Machinery & Engineering Group, which supports the integrated production system of the Fastening and AP businesses, we will adopt "reinforcement and evolution of foundational elemental technology" as the Fifth Mid-Term Management Plan execution policy, and aim to challenge for "high function" and "low price" in the Standard category.

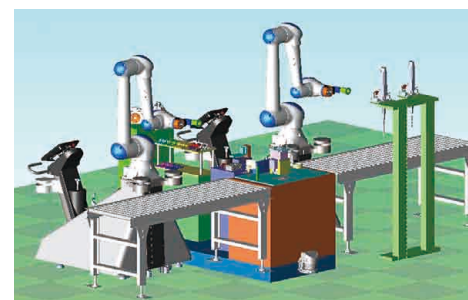
- |              |  |
|--------------|--|
| Key Measures | <ul style="list-style-type: none"> <li>• Second stage of machinery and equipment development suitable for production sites</li> <li>• Technology development with a mid- to long-term vision (strengthening robot utilization technological capabilities, etc.)</li> </ul> |
|--------------|--|

### Main Topics for FY2017

#### Strengthening Robot Utilization Technological Capabilities

To achieve further labor-saving, increase flexibility, and speed up the startup of production lines in manufacturing sites, we are creating an Advanced Robot Factory Automation Center and are strengthening our robot utilization technological capabilities. We have already begun to enhance our training of personnel capable of utilizing robots, as well as elemental technology development for

expanding the range of robot utilization. Through collaboration with technical personnel, we are developing differentiating technologies that handle zippers, tape (cloth), and various AP parts, as well as coordinating with outside partners. We continue to develop lines able to meet future changes in products and *monozukuri* through collaboration between humans and robots.



Strengthening robot utilization technological capabilities (conceptual image)