

VIII. Environment-friendly product development

YKK Group philosophy concerning development of environment-friendly products

Business play a large role in forming a sustainable recycling society, and society therefore places a lot of demand on them. In order to cope, companies must convert their manufacturing processes to use a minimum of resources and recycle resources (environment-friendly).

By engaging in total production (minimal resource and energy consumption plus recycling) including product

planning, design, procurement, manufacture, distribution, sales, use and recovery, the YKK Group hopes to help build a resource recycling society. (YKK supplies people with environment-friendly products that contribute to resource and energy conservation, and are collected when they have outlived their usefulness to be used as raw materials for the next products to be produced.)

Environmental action targets

● Development of environment-friendly products

Environmental considerations in machinery engineering

The Machinery Engineering division develops and manufactures high-performance machinery to be used at all YKK Group operations, including overseas operations.

Not only is cost performance demanded of machinery manufacturers, but there is also a movement to produce machinery that is friendly to the environment. When

developing and manufacturing machinery, our Machinery Engineering division considers not only cost, but also harmony with the environment through use of standardized parts, concentration, longer life, and shared use.

○ Development of electric injection molding machine for fasteners

Divided into various types according to material, Vislon fasteners (injection molded resin type), a type of resin fastener, are made by injection molding thermoplastic resin.

Up to now, most injection molding machinery has been hydraulically powered, but machines powered by AC servomotors have gained a lot of attention in recent years. By switching from hydraulic to electric power, you get environment-friendly machinery that features energy efficiency (electricity consumption), safety (fire), and improved working environment (low-noise, clean).

In its second year, the Machinery Engineering division, which is charge of developing, designing and manufacturing fastener production equipment, began developing an electric fastener chain injection molding machine and now finished evaluating the first machine.

The YKK Group plans to replace all hydraulic fastener chain injection molding machines now operating the world over with new model machines starting in FY 2000.



Features

- 1/4 existing electric consumption.
- Uses no oil cooling water.
- Doesn't use hydraulic fluid.
- Because it doesn't use hydraulic pumps, it offers quiet operation and a clean working environment.

Environmental considerations in Fastening division

The Fastening division manufactures and sells various metal and plastic products.

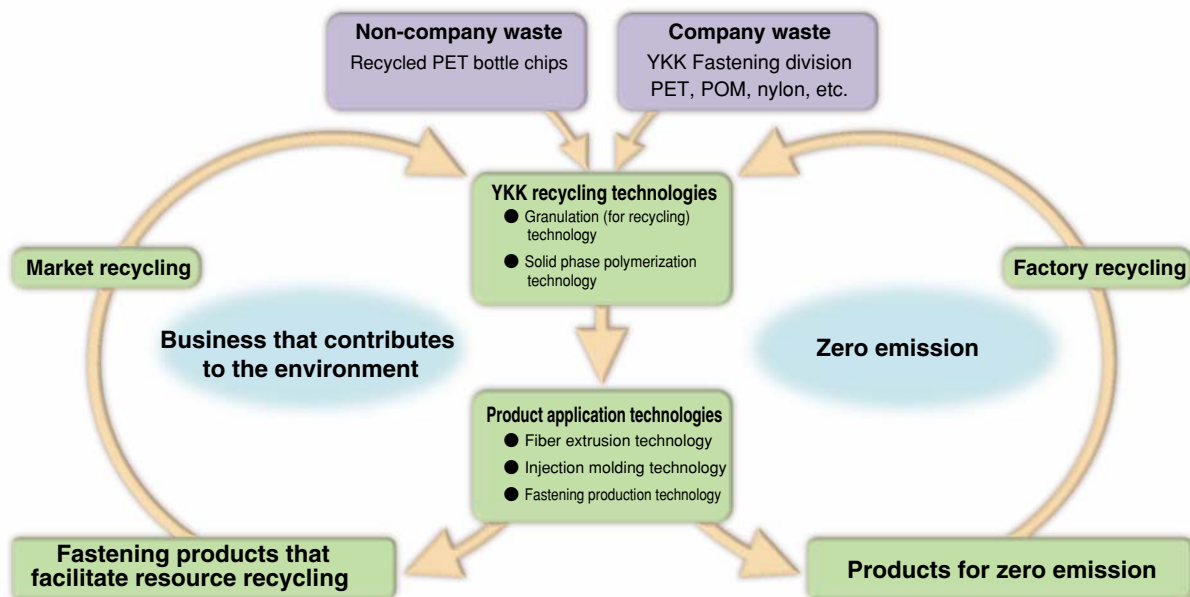
Loss and excess material that occurs during production results in massive quantities of industrial waste. Based on the "YKK Group Environmental Charter," the Fastening division is working on various ways to recycle

waste plastic in order to reduce the amount of industrial waste produced.

We have developed recycled uniforms made of recycled waste plastics such as thread, tape and chain cuttings that used to be incinerated or disposed of as landfill.

○ Recycling technologies

Aiming to help build a resource recycling society based on the YKK Group Environmental Charter



The world's first product made completely of recycled products, this "recycled uniform" adopts polyester resin for basic design of all parts.

Originally developed for YKK employees, the uniform acquired the eco mark of the Japan Environment Association in November 1999. We hope the uniform contributes to local green procurement.

○ Main material and type of recycled uniforms

Material fabrics	● Uses thread recycled from waste plastic. A small amount of carbon fibers are mixed in to prevent buildup of static electricity.
Fasteners	● Just like material fabrics, uses recycled thread. Uses polyester resin for sliders, etc.
Buttons, etc.	● Uses newly developed thermoplastic polyester resin.
Front hook	● Uses newly developed polyester resin.
Types	● Blouses, slacks, vests, skirts, etc, available in a variety of types and sizes.



Environment-friendly building materials

Having adopted the philosophy of creating environment-friendly products, our most pressing concerns are for effective use of resources through recycling and reducing output of industrial waste. The YKK group develops its building materials along the concepts of "development of

environment-friendly products designed to reduce stress on the environment at all stages, from design to disposal," and "development of resource-recycling products designed for recycling or reuse after being discarded."

○ APSWORD 70 (went on sale in March 2000) (resource-recycling thermal insulation)

Insulated sash "APSWORD 70" employs snap-together, slide-together construction to join aluminum and plastic parts that's also easy to take apart. The sash is designed so that plastic and aluminum parts can be easily sorted to facilitate recycling when the sash has outlived its usefulness.

The concept of "sash-to-sash" (recycling discarded sashes into new sashes) used for this product is destined to become the standard for the future.



○ Garden Club Espalier series (went on sale in April 1999) (greenery products)

Espalier series products provide greenery for walls that allows air to pass through while blocking out direct sunlight. The products keep the temperature of the wall from rising throughout the year to maintain a comfortable environment inside while saving energy. Espalier series products are effective for providing extra greenery and reducing CO₂ (carbon dioxide) that causes the "heat island" phenomenon for cities and global warming. The products are also help realize an eco-house that uses resources effectively, is aesthetically appealing and is in harmony with the surrounding environment.



Coexistence of building and nature

○ La Foresta New E series (went on sale in June 1999) (health products)

Adhesives used for plywood and other wood materials contain formaldehyde. While formaldehyde disinfects, it can also affect people by causing dizziness, headache or atopy. La Foresta New E series products are our version of Fc0 (low-formaldehyde standard) of the Japan Agricultural Standard (JAS) for minimizing release of formaldehyde into the atmosphere. From surface sheeting to molding and plastic products, non-vinyl chloride La Foresta New E series products are use safe materials that do not give off toxic fumes when burnt.

