Ⅶ. Production activities that are friendly to the environment

Environmental action targets

● **10.4% reduction in energy unit requirement, 10.1% reduction in energy amount, and 3.3% reduction in CO_2 discharge compared with FY 1990 level at main bases in Japan by end of FY 2005**

Energy conservation (prevention of global warming)

We began getting involved in energy conservation when the first oil shock occurred in 1973 and by 1980 had succeeded in dramatically reducing energy unit requirement. Since then energy unit requirement has more or less remained the same.

In 1994 we settled upon environmental action targets for first intermediate five years and more or less achieved the targets for FY 1998.

New environmental action targets were set in FY 1999, and we began to pursue activities for saving energy by introducing high-efficiency equipment when buying new equipment or replacing old equipment and improving processes that consume precious energy to cope with production fluctuations.

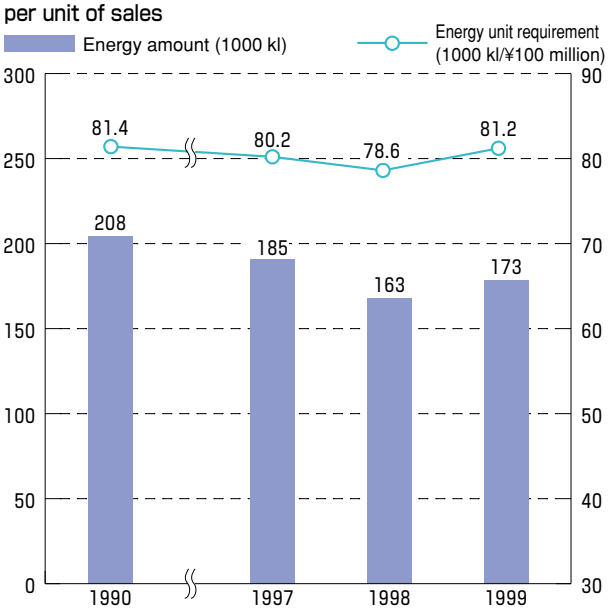
◆ Main efforts of FY 1999

Production process improvements	Fastening	Power reduced by abolishing hot rolling process.
	Building materials	Power reduced by controlling electrolytic set temperature.
	All business	Amount of heavy oil used reduced by enhanced combustion of incinerator.
		Power reduced by concentrating working machinery.
		Exhaust fans, cooling pumps, etc., changed to inverter type.
Introduction of high-efficiency equipment	Fastening Building materials	Hydraulic injection molding machines replaced with servomotor type.
		Energy-efficient air-conditioning and lighting system introduced for new buildings.

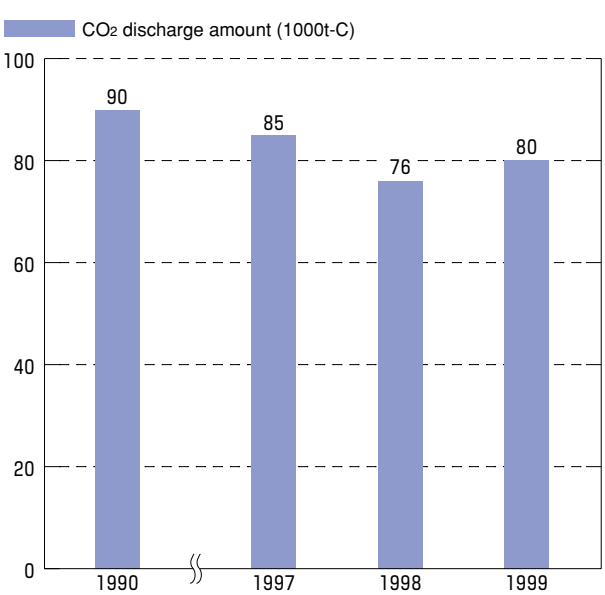
○ Achievements

Energy unit requirement for sales of FY 1999 increased by 3.3% in comparison to the previous year due to increase in energy required for new item development combined with suppressed production due to recession.

Transition of amount of energy used and energy consumption per unit of sales



Transition of CO_2 discharge



Environmental action targets

● Aiming to achieve zero emission for world's main bases by end of FY 2005

Reduction of waste and recycling of resources (zero emission)

At YKK we try to suppress production of waste and recycling and are engaged in efforts to completely eliminate landfill waste (zero emission).

Main efforts include recycling and granulation of PET scrap using our own original technology. By recycling the material into thread and film, it can be reused as recycled fasteners, company uniforms of the same material that can be recycled whole, PET bands for shipment, etc.

With wastewater treatment facilities of the building materials alumite process acids and alkalines are recovered. Because it has value, aluminum hydroxide is removed and the rest is incinerated. The sludge produced by this process is effectively used as raw material for cement.

Zero emission has progressed farthest at our Kyushu plant: sludge and waste plastic are used as raw materials for cement, recycled into glass and ceramic scrap for roadway subgrade material, or changed to wood compost.

We have reduced the amount of waste we incinerate by collecting and sorting used paper and collecting confidential papers.

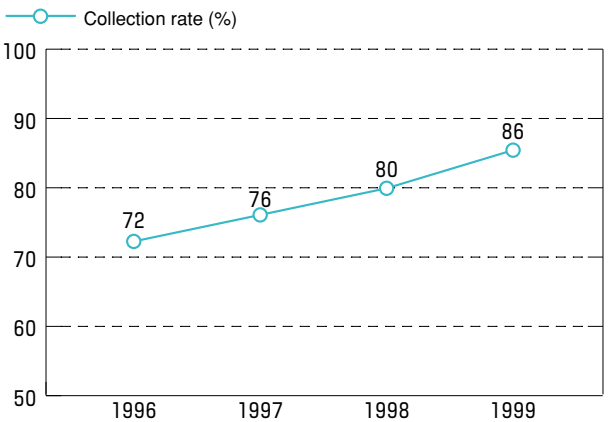
All of our factories turn wooden pallets and wooden crating material over to be turned into chips to be reused as fuel. Concrete waste produced when buildings are torn down is recycled as aggregate or reused as roadway subgrade material.

Kyushu factory: Glass was converted to roadway subgrade material and used on the YKK company grounds.

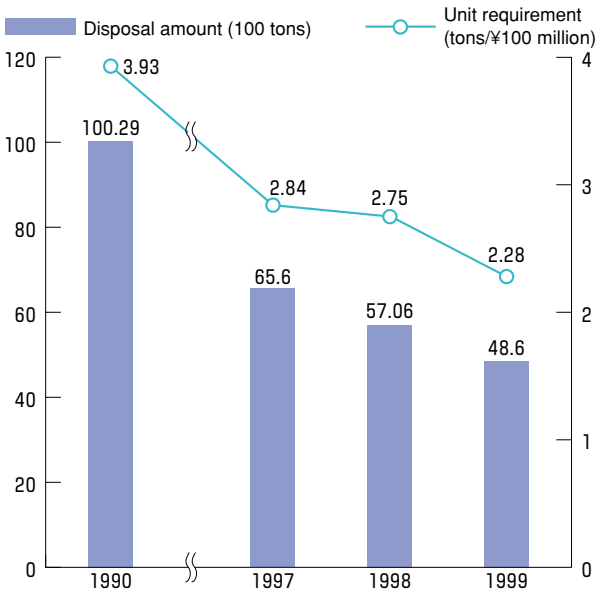
○ Achievements

Industrial waste disposal unit requirement for sales for FY 1999 was reduced by 42% compared with FY 1990, and 17% compared with the previous year. Collection rate for used paper was 86%.

Transition of used paper collection rate



Transition of industrial waste disposal amount and sales unit requirement



● Setting of voluntary management standards

Pollution prevention

● Ozone layer protection

Use of certain fluorine compounds for cleaning has been banned by 1994, and businesses have since switched over to substitute HCFCs. Use of HFCs as refrigerants for freezers, etc., must be discontinued by the end of FY 2001.

Concerning substitutes for HFCs used as refrigerants in air-conditioners, refrigerant is recovered when air-conditioners are removed. It is then either recycled or destroyed, thereby dramatically reducing stress on the environment. We used to use conventional substitute HFC for foam for thermal insulation, one of our building materials, but began switching to water foaming type in 1997. We hope to completely eliminate the use of fluorine compounds with polyurethane by the end of FY 2000.

● Prevention of air pollution

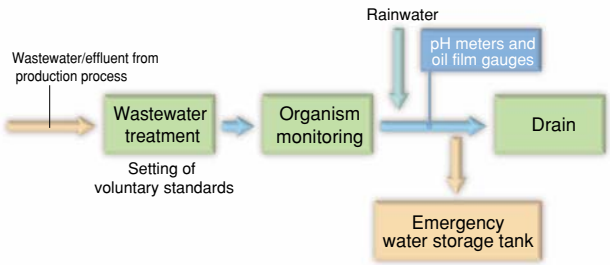
Concerning release of exhaust gas into the atmosphere, we are suppressing the production of sulfur oxides by using low-sulfur fuels. We also use low-nitrogen oxide burners to control discharge of nitrogen oxides.While we strictly observe laws, regulations, ordinances and agreements, we also use voluntary management standards.

● Prevention of water pollution

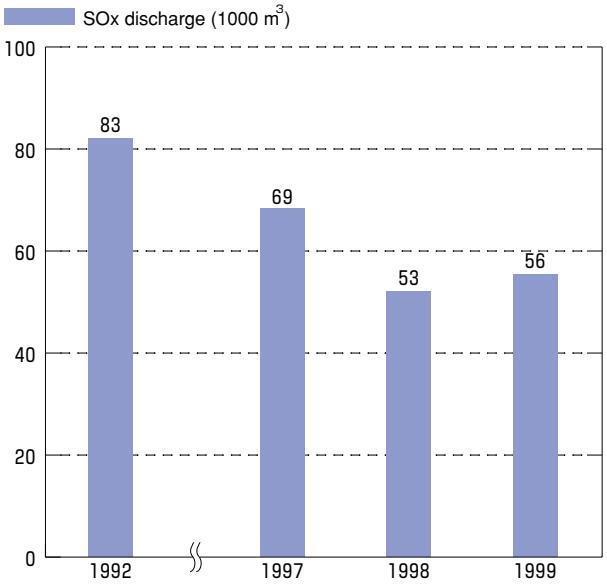
We have set voluntary standards that are even more stringent than the existing laws, ordinances and agreements, and use an advanced system of wastewater treatment.

Drainage from the factory (including rainwater) is constantly monitored by pH meters and oil film gauges installed at the drains. All drains are equipped with an emergency water storage tank to prevent water pollutants from being discharged from the factory. At the Kurobe plant, we are contributing to improving quality of the rivers the water drains off to by reducing BOD (biological oxygen demand) which is the index of water pollution.

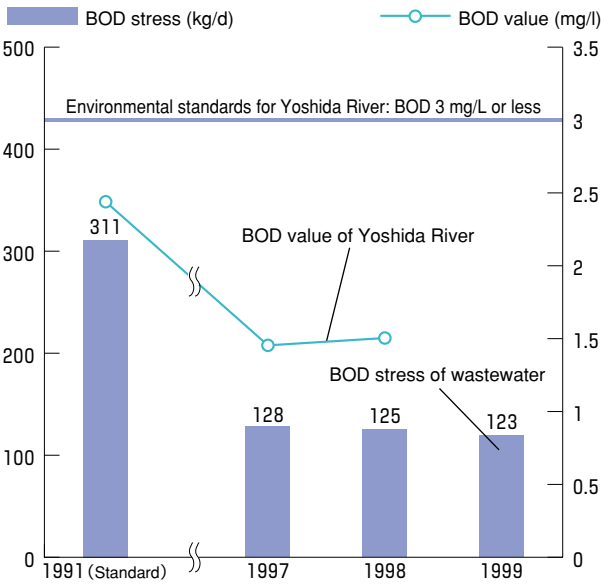
◆ Wastewater treatment route



Transition of SOx discharge



Transition of Yoshida River (river into which factory effluent drains) BOD value and BOD stress at YKK drains



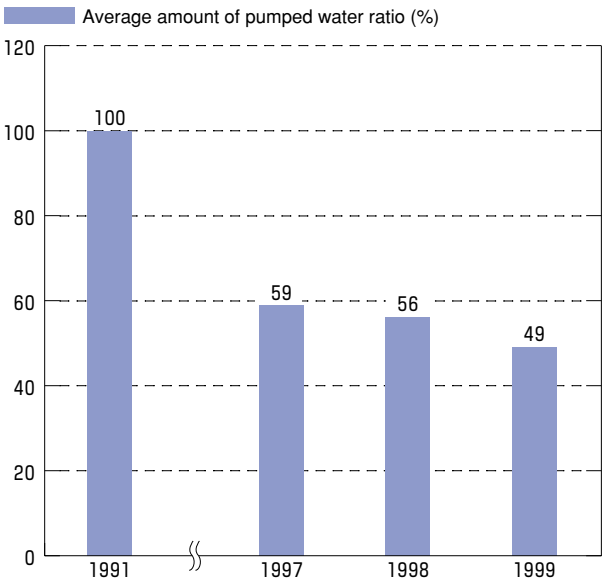
※Data from Toyama Prefecture white paper used for BOD value of Yoshida River

Underground water conservation

Recognizing water as an important resource, we are doing our best to use cooling water used in the manufacturing process efficiently and return rainwater to underground. As a result, the Kurobe plant located in Kurobe City of Toyama Prefecture, which is called the "home of delicious water," succeeded in cutting its pumping of underground water by half between 1991 and 1999.

Accepting the "Study and Countermeasures Guideline Concerning Soil and Water pollution" from the Environment Agency, no heavy metals or volatile organic compounds were detected as a result of a study of underground water conducted at our main places of business in Japan.

Kurobe plant Transition of average per-day amount of water pumped from wells



Environmental action targets

● Continued promotion of reduction of use of toxic substance at main production bases of the world

Management of chemical substances

In 1995 we began using a "pre-purchase chemical assessment system" that assesses safety, distaste prevention, and environmental aspects of any new chemical substances prior to purchasing. The system is designed to prevent environmental pollution by chemicals.

We are currently building a comprehensive chemical management system that complies with the Law Concerning Reporting, etc., of Releases to the Environment of Specific Chemical Substances and Promoting Improvements in their Management (PRTR Law).

In addition to 354 substances specified by the PRTR Law, the system determines the use and discharge amount of 573 controlled substances specified by YKK independently. We use this data to reduce use of chemical substances.

◆ Results of study of substances applicable to YKK Corp and PRTR Law study

Unit (t)

PRTR No.	Substance	Amount handled	Air	Water	Soil	Underground water	Amount consumed	Amount disposed of	Amount transferred	Amount recycled
18	Chlorine (gas)	79.144	0.158	0	0	0	0	78.986	0	0
21	Xylene (isomeric compound)	105.978	98.823	0	0	0	0.077	7.628	0	0
24	Chromic acid anhydride (Ⅵ)	1.081	0	0	0	0	0.327	0.171	0.114	0.469
37	Potassium cyanide	7.280	0.006	0.001	0	0	0	7.129	0.144	0
37	Sodium cyanide	32.845	0.051	0.003	0	0	0	30.999	1.792	0
37	Copper cyanide (Ⅰ)	3.795	0.003	0	0	0	0	3.712	0.080	0
50	Dichloromethane	100.122	64.848	0.001	0	0	0.578	0	34.695	0
79	Toluene	142.005	125.831	0	0	0	1.171	0	15.003	0
81	Nickel sulfate (7 hydrate)	43.456	0.009	9.244	0	0	26.241	0	2.326	5.420
86	Barium chloride (anhydride)	1.103	0	0	0	0	1.103	0	0	0
93	DOP	1828.159	0	0	0	0	1700.221	0	45.692	82.246
104	Boric acid	30.277	0	30.171	0	0	0.001	0	0.105	0
104	Boron	1.760	0	0.352	0	0	0	1.408	0	0
107	Manganese dioxide	1.177	0	0	0	0	1.082	0	0.095	0

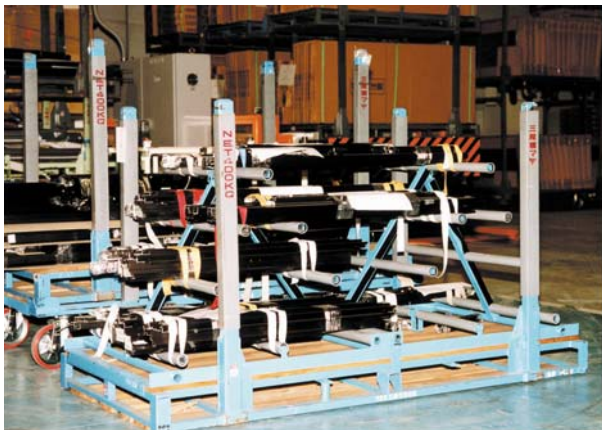
※Data given for substances which a minimum of 1 ton per year is handled.

Environmental action targets

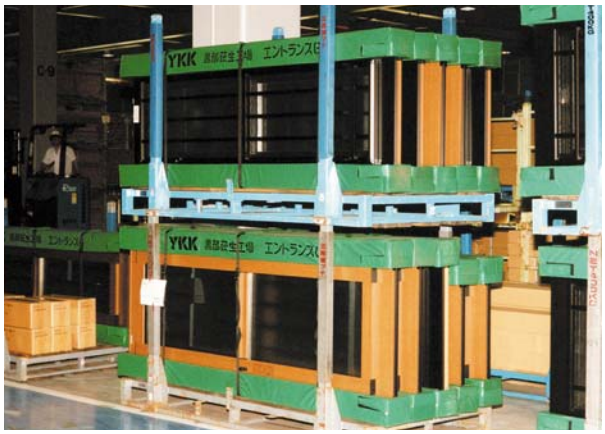
- 7% reduction of FY 1998 level of packaging material unit requirement by end of FY 2003
- Reduce amount of packaging and make packaging easier to recycle

Reduction of packaging

In order to reduce the amount of packaging used for product transport and transport among factories, we have reconsidered the type of packaging, and use instead simple packaging designed for safe transportation of the product, no packaging or returnable boxes. Concerning minimal packaging, we have switched to materials that place minimal stress on the environment when discarded, collect packaging from customers and recycle it.



● Unpackaged delivery of each house unit
Located in each building, places sashes on pallets for transport.



● Packaging material
Using cushions for builders as packaging, we ship products on pallets to eliminate packaging.

Environmental action targets

- Improvement of transportation efficiency
- Promotion of modal shift
- Promotion of use of regional ports

Transportation measures

Practices used in order to minimize the effect of transportation on air pollution and global warming include modal shift using railways instead of trucks and joint transportation that unifies management of both factory and distribution.

Concerning joint transportation, we succeeded in reducing the number of trucks used per day to 50 in FY 1999, and succeeded in dramatically cutting transportation cost as well as reducing emissions of CO_2 to 98,700 kg-C per year and NOx to 2,500 kg per year.

By using the nearest port, we have been able to reduce truckng distance and improve loading efficiency.