

Examples of Environmentally Friendly Product Development

The entire Nikon group is implementing the “Nikon Product Assessment” to create new products which offer enhanced power consumption efficiency, are smaller and lighter, use less harmful

substances, and utilise eco-glass. We believe these improvements will be most beneficial to the global environment. Here are a few examples:

Precision Equipment Company Products

● KrF excimer scanning IC stepper NSR-S206D

Overall power consumption efficiency is improved thanks to the enhancements in resolution, total alignment accuracy and throughput combined with efforts to minimise the increase in power consumption.

Design modifications made it possible to change the supported wafer from 200mm to 300mm, providing new-generation semiconductor manufacturing capabilities without the need to replace equipment, and enabling continued use of existing assets.

<Power consumption efficiency> Increased by more than 120% over the NSR-S202A in exposure of a 200mm wafer (internal reference).

<Ozone layer protection> New HFC refrigerant with zero ODP (Ozone-depletion Potential) used for temperature control and air conditioning chillers.

<Global warming substances> New HFE refrigerant with low global warming potential used in equipment internal cooling.

Nikon steppers lead the IC industry with highly integrated circuits, greatly contributing to revolutionary improvements in resource usage efficiency.



NSR-S206D

Imaging Company Products

1. Film-based cameras and interchangeable lenses

● Nikon F55

Each component of the entire mechanism was redesigned to attain a product even more compact than the Nikon F65, which itself earned extensive praise for its small size and light weight.

<Product volume> 9% smaller than Nikon F65 <Product mass> 10% less than Nikon F65



F55

● Lite · Touch Zoom 130ED QD

Achieved major reductions in size, weight and component count by adopting a new single-motor design and smaller mechanisms.

<Product volume> 12% smaller than Lite · Touch Zoom 120ED QD

<Product mass> 10% less than Lite · Touch Zoom 120ED QD

<Component count> 7% fewer than Lite · Touch Zoom 120ED QD



Lite · Touch Zoom 130ED QD

● AF Zoom-Nikkor 28-100mm f/3.5-5.6G

New optical and mechanical systems feature a simple two-group zoom that significantly reduces the component count to achieve the world's lightest AF28-100mm class zoom lens (as of June 2002).

<Product volume> 45% smaller than AF Zoom-Nikkor 28-105mm f/3.5-4.5D IF

<Product mass> 46% less than AF Zoom-Nikkor 28-105mm f/3.5-4.5D IF

<Eco-glass usage> 100%



AF Zoom-Nikkor 28-100mm f/3.5-5.6G

2. Digital cameras

● D1x

Consumption of all circuits was reviewed and slashed substantially by moving to a finer ASIC design rule and switching to an LED backlight for the LCD.

<Power consumption efficiency> 50% higher than D1

● D100

Streamlined circuits, downed clock rate and components with lower operating currents provided a major reduction in power consumption.

<Power consumption efficiency> 200% higher than D1

● COOLPIX 5700

Lightest digital camera with a high-magnification lens and 5.0 effective megapixels. Energy-saving design features dedicated EN-EL1 rechargeable batteries that provide 90 minutes of continuous operation from a full charge.

<Eco-glass usage> 100%, including projection lens



D1x



D100



COOLPIX 5700

Targets

- Improvement in energy efficiency of 30% or greater for functions on products marketed during fiscal 2003, compared with products sold since fiscal 1998.
- Reduction of models using ozone layer-damaging HCFC, used as refrigerant for IC and LCD steppers to fewer than 30% of all products shipped in fiscal 2003, with ultimate goal of total elimination of use of HCFC by the end of fiscal 2005.



Instruments Company Products

• Biological microscope ECLIPSE TE2000

Offers a diverse range of options to satisfy a wide range of market needs, from laser system applications to use on electric drives for optical elements. Enhancing this versatility, users can upgrade their systems at any time by adding optional components — assuring them of a microscope that will serve their needs for years to come.

<Power consumption efficiency> 14% higher than the previous model TE300 (*observed field brightness/consumed power)

(Observed field brightness measured for various types of observation, with frequency of use factored in for each.)

<Eco-glass usage> 90% (0% in TE300)



ECLIPSE TE2000

• CNC video measuring system NEXIV VMR-3020

This high-precision, high-speed video measuring system features a newly developed objective lens with superior resolution and long working distance. The new eight-segment LED ring illuminator (previous model MZ-V250 used four halogen lamps) delivers optimum illumination to every workpiece while providing a long service life and reduced power consumption. Nikon's sophisticated optical system, high-speed stage and high-speed control technology have significantly boosted throughput, thereby greatly improving power consumption efficiency.

<Power consumption efficiency> 300% higher than MZ-V250

<Resin materials> No brominated flame retardants (PBDPE, etc.) used, ISO 11469 compliance label

<Consumables> Service life of light source extended approx. 30 times (1000 to 30,000 hours)



NEXIV VMR-3020

Nikon Group Products

• High-grade binoculars HG Series with four models, including 8x32HG DCF

The pinnacle of Nikon's binocular line, combining our most advanced optical technologies, including a proprietary wide-wavelength, low-reflection multi-coating, phase correction coating, high-reflection silver coated mirror and a field-flattener lens, with superior cold- and water-proofing. Smaller and lighter means less use of resources, and eco-glass is employed for the optics to safeguard the environment.

<Product mass> 27% less than the previous high-end model, the 8x42HG DCF

<Eco-glass usage> 100%



8x32HG DCF

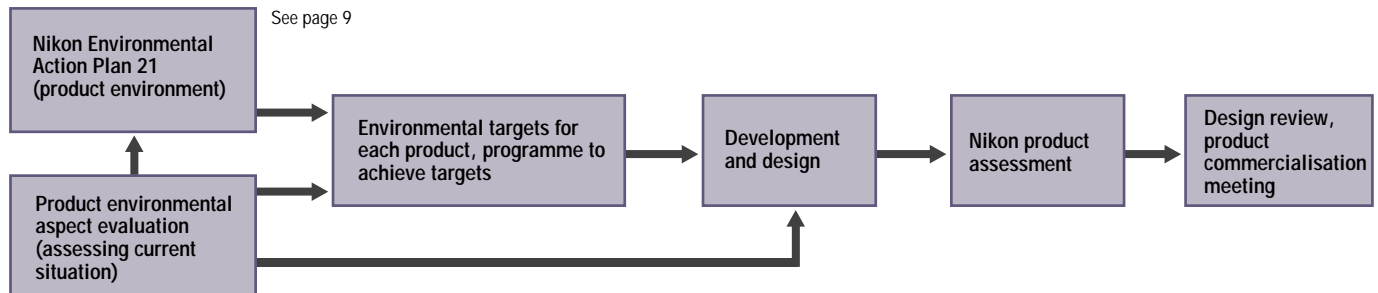
NOTE: Most of the products introduced here were released in Japan during fiscal year 2002.

Future Activities

We have established a rigorous system for environment-oriented design activities and enhancement of the ISO 14001-compliant environmental management system as shown below, and are applying this system to the development of products which will

display an entirely new level of environmental friendliness.

In addition to using lead-free solders, we are striving to develop products that are free of harmful heavy metals and vinyl chloride.



Activities in the Product Environment

Containers and Packaging

Targets

- 40% reduction in plastic containers used in consumer products in fiscal 2003, compared with figures for fiscal 1999.
- Total elimination of non-separable multi-material for new packaging from fiscal 2001 onward.



Nikon defined its “Environmental Policy Regarding Packaging Materials” in May 1998, and reviewed it in June 2000. This policy has seven main points:

1. Elimination of harmful substances
2. Reduction in volume and content
3. Recyclability
4. Safety and ease of separation of

materials

5. Use of recycled resources
6. Reusability
7. Marking regarding packaging materials and handling precautions

The activities implemented based on this policy are as described in the following chart:

Theme	Policy	Contents	Application
Non-vinyl chloride film	1. Elimination of harmful substances	Switch from use of vinyl chloride material, which is considered a major source of dioxin, to non-vinyl chloride materials such as polypropylene.	Wrapping materials for equipment such as steppers
Plant-derived filler materials	2. Reduction in volume and content	Plant-derived filler materials are made from bean and wheat husks. They are significantly safer and more environmentally friendly filler materials than those derived from crude oil. We also use biodegradable resins in packaging containing filler materials.	Gap filler (Instruments Company products)
Cushioning film	2. Reduction in volume and content	Support with elastic film enables significantly reduced consumption of cushioning material.	Cameras
Reinforced cardboard boxes	2. Reduction in volume and content 3. Recyclability 5. Use of recycled resources	Adoption of reinforced three-layer cardboard boxes has enabled a significant reduction in weight and volume of packaging in comparison with old-style wooden boxes.	Stepper body (for shipping to certain destinations)
Single-material presentation cases	4. Safety and ease of separation of materials	Use of film in presentation cases has been eliminated. Cases are now made from paper only, for ease of breakdown and decomposition.	Accessories
Assembly-type packaging	4. Safety and ease of separation of materials	The filler material and the cardboard are assembled manually for ease of separation later. Old-style packaging involved a fusing of different materials (cardboard and a crude-oil derived filler material).	Instruments Company products
Pulp moulding	5. Use of recycled resources	A paper filler material consisting of 55% recycled paper. This material is gradually being introduced as an alternative to crude oil derivatives.	Cameras, lenses, microscopes
Dedicated transport containers	6. Reusability	Dedicated containers are used for shipment to certain corporations.	Microscopes
Polyethylene bags	7. Marking regarding packaging materials and handling precautions	All packaging material is marked to facilitate separation. All bags, other than those of extremely small size, are marked with a warning of suffocation risk to infants.	



Cushioning film



Reinforced cardboard boxes



Pulp moulding

So far, we have achieved the following in our challenge to meet targets:

- Significant reduction in use of plastic containers and packaging for consumer products — 53% in weight against fiscal 1999 levels, through progressive use of pulp moulding and other techniques.
- Through the use of single-material presentation cases and assembly-type packaging, as well as other methods, from fiscal 2001 through 2002 we achieved our target of eliminating the use of non-separable multi-material for new packaging in fiscal.

Activities in the Product Environment

Examples of Implementation in Sales and Distribution

Nikon is working tirelessly to reduce the total and long-term environmental impact of its products and services. Since Nikon supplies products worldwide, we must also pay strict attention to

1. Sales of used steppers for reuse

Nikon has been collecting used steppers discarded by customers, and reconditioning and reselling them for new users, with the appropriate services supplied. This is an example of Nikon actively reusing its own products.

Not many steppers have been resold to date, but this business is still in its developmental stage, with consideration being given to marketability, dedication to environmental conservation, profitability and customer satisfaction.

sales and distribution activities. The following are some examples of our reuse and recycling efforts in these areas:

2. Recycling of packaging materials and batteries in Europe

(1) Packaging materials

Our overseas subsidiaries have contracted the services of DSD (Duales System Deutschland) to collect and recycle packaging materials used during the sale of Nikon products.

(2) Batteries

Our overseas subsidiaries have contracted the services of GRS (Stiftung Gemeinsames Rücknahmesystem Batterien) to collect and recycle batteries for cameras and other products discarded by consumers.