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

● IC stepper NSR-S307E

Featuring a projection lens with an ultra-high N.A. of 0.85, this state-of-the-art lens-scanning ArF excimer stepper can handle volume production of advanced 80nm or finer line-width devices. The stepper's newly developed body enables enhanced throughput and alignment accuracy, and power consumption efficiency has also been optimised.
<Power consumption efficiency> 71% higher than the NSR-S306C in exposure of a 300mm 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 have introduced a new era in design rule shrink IC manufacture, and made major contributions to continuing improvements in resource utilisation efficiency.

NSR-S307E

● Liquid crystal display stepper FX-63S

This large-plate exposure system supports 5th- and 6th-generation plate sizes for LCDs, thanks to Nikon's sophisticated technological innovations such as multilens projection optics and a scanning exposure system. The FX-63S also features improved throughput and higher power consumption efficiency.
<Power consumption efficiency> 208% higher than the FX-21S in large-panel exposure (internal reference)
<Ozone layer protection> New HFC refrigerant with zero ODP (Ozone-Depletion Potential) used for air conditioning.
Large-size high-definition liquid crystal display (LCD) panels have a significantly lower environmental impact than CRT monitors, particularly regarding resource and energy conversation. In this way, Nikon LCD steppers are playing a prominent role in environmental preservation in the 21st century.

FX-63S

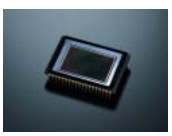
Imaging Company Products

● Digital SLR camera D2H

Incorporates Nikon's new, proprietary "LBCAST" JFET image sensor to provide high-quality, high-resolution images. This professional digital SLR camera offers continuous shooting at 8 frames per second for up to 40 consecutive images*1, with the world's shortest*2 shutter release time lag of approximately 37ms.

*1 For JPEG images at 2464 x 1632 pixels
*2 As of Nov. 1 2003, for interchangeable-lens digital SLR cameras

<Power consumption efficiency> 34% higher than the D1H, thanks to the "LBCAST" low-dissipation sensor and power-efficient circuit design.
<Reduced product mass> 110g lighter than the D1H, due to the employment of a magnesium body and slimmer batteries.
<Lead-free solder> Most electronic component boards use lead-free solder.
<Reduction of hazardous substances> Wire sheathing almost entirely PVC-free.
<Eco-glass usage > 100%



"LBCAST" sensor slashes power consumption to 1/6th that of the D1H

D2H

Board using lead-free solder

Magnesium body

PVC-free electrical wiring

● Digital camera COOLPIX 3200

This camera is designed to enable even first-time digital camera users to easily capture great images. The compact, lightweight grip-type body design is packed full of handy functions, and the intelligent button layout on the body rear contributes to superb operability.
<Longer battery life> 100% longer than the COOLPIX 3100 thanks to power-efficient circuit design.
<Reduced product mass> 7% less than the COOLPIX 3100.
<Eco-glass usage> 100%

COOLPIX 3200

● Digital camera COOLPIX 5200

This compact, lightweight digital camera offers 5.1 million effective pixels and a 3x optical zoom Nikkor ED lens. The high-class, grip-type aluminium body design is easy to handle, and visibility and operability are excellent thanks to the mode dial on top and the intelligent control layout on the rear of the body.
<Power consumption efficiency> 18% higher than the COOLPIX 5000 thanks to power-efficient circuit design, and use of smaller, lower-voltage batteries
<Reduced product mass> 57% less than the COOLPIX 5000.
<Eco-glass usage> 100%

COOLPIX 5200

Targets

[Energy consumption efficiency]
• Improvement in operational energy consumption efficiency of 10% or greater for newly released products, compared with figures for fiscal 2001.
[Ozone layer-damaging substances]
• Reduction of IC and LCD steppers using HCFC to fewer than 15% of all products.

● Interchangeable lens AF-S DX Zoom-Nikkor ED 18-70mm f3.5-4.5G IF

This standard zoom lens was developed specifically for use with Nikon digital SLR cameras. The optical system and mechanisms are super light, and resolving power has never been higher. The Silent Wave Motor (SWM) delivers fast, quiet auto-focussing drive performance.
Since March of 2004, this lens has been packaged with the D70, the winner of the TIPA* Best Consumer Digital SLR Camera in Europe 2004 award. The lens is also sold separately.
<Reduced product mass> 14% less than the AF Zoom-Nikkor 28-105mm f3.5-4.5D IF.
<Eco-glass usage> 100%

AF-S DX Zoom-Nikkor 18-70mm F3.5-4.5G IF-ED

● Film scanner SUPER COOLSCAN 5000 ED, COOLSCAN V ED

The SUPER COOLSCAN 5000 ED is a high-resolution, 4000-dpi film scanner employing a Scanner Nikkor ED lens, and features unsurpassed resolving power, delivering scans as fast and crisp as any scanner in its class. The COOLSCAN V ED, an affordable, user-friendly film scanner offering fine quality and enhanced speed, won the TIPA* Best Film Scanner in Europe 2004 award.

* TIPA (Technical Image Press Association) is composed of editors from major European camera and imaging specialty magazines, and selects the best imaging products in a number of categories every year.

<Power consumption efficiency> SUPER COOLSCAN 5000 ED: 50% higher than the SUPER COOLSCAN 4000 ED thanks to reduced scan times; COOLSCAN V ED: 13% higher than the COOLSCAN IV ED.
<Eco label> Certified under International Energy Star Programme.
<Eco-glass usage> 100%

SUPER COOLSCAN 5000 ED

COOLSCAN V ED

Instruments Company Products

● Biological microscope for medical and clinical use ECLIPSE 55i

The ECLIPSE 55i employs white LED illumination as its light source — this enables lower-temperature operation than with conventional halogen lamps, and a drastic reduction in power consumption, from 48W to a mere 6W. The microscope can also be operated using lithium-ion batteries (optional). As with prior models, Köhler illumination is used for the aperture. The life of the light source has also been significantly extended, minimising waste and making the product more environmentally friendly.
<Power consumption efficiency (brightness per power consumption) > 800% higher than the ECLIPSE E400.
<Light source service life> About 80 times longer than the ECLIPSE E400.
<Eco-glass usage> 100%

ECLIPSE 55i

● Overlay measurement system NRM-3100

With low aberration, high-S/N imaging system and high rigidity for more accurate stage positioning, this high-speed, high-resolution overlay measurement system accommodates 300mm wafers at throughputs of up to 150 wafers per hour in 90nm lithography process. User-friendly software minimises the time required to create recipes, contributing to superb operability. While throughput and power consumption have been maintained from the prior model, the supported wafer size has been improved from 200 to 300mm, and measurement resolution from 130 to 90nm. As a result, the new system can process 4.7 times more ICs per unit of power consumed.
<Power consumption efficiency> 370% higher than the NRM-1000A.
<Reduction in hazardous substances> No PBDE or PBB used as flame retardant in resin materials or wire sheathing.
<Eco-glass usage> 89%

NRM-3100

Targets

[Energy consumption efficiency]
• Improvement in operational energy consumption efficiency of 10% or greater for newly released products, compared with figures for fiscal 2001.
[Ozone layer-damaging substances]
• Reduction of IC and LCD steppers using HCFC to fewer than 15% of all products.

Nikon Group Products

● Portable laser rangefinder LASER 800S

The LASER 800, which has already earned high marks as a laser rangefinder for outdoor activities and sports such as golf, features a sophisticated fusion of telescope and electronics. Now it has been completely revamped for improved performance, and enhanced portability and environmental friendliness. Battery life has been significantly extended by reducing power consumption in standby and operation, and reducing measurement time.
<Power consumption efficiency> 250% higher than the LASER 800.
<Reduced product mass and volume> 22% less mass and 40% less volume than the LASER 800.
<Longer life> Nitrogen-filled waterproofing prevents equipment malfunction caused by moisture.
<Lead-free solder> Lead-free solder used on all circuit boards.
<Reduction in hazardous substances> No PVC used in wire sheathing, body, case or strap.
<Eco-glass usage> 100%


LASER 800S


Smaller, lighter components, lead-free board and PVC-free wiring


PVC-free case, strap

● Binoculars 8x42HG L D CF/10x42HG L D CF

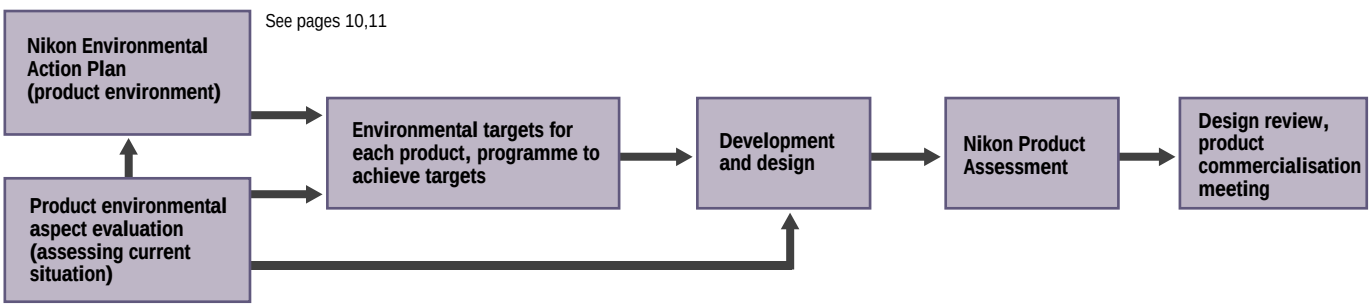
Nikon's High-Grade binoculars deliver unrivalled performance. The body is tough yet lightweight, made from magnesium alloy and other low specific-gravity materials, with carefully crafted contours. The industry's first non-PVC elastomer was used in the body, eyepiece caps, case and strap. The lenses are 100% Eco-glass.
<Reduced product mass> 8x42HG L D CF: 18.9% less than the old HG Series; 10x42HG L D CF: 19.4% less.
<Reduction in hazardous substances> No PVC used in internal or external components, case or strap.
<Eco-glass usage> 100%


8x42HG L D CF


10x42HG L D CF

Future Activities

We have established a rigorous system for environment-oriented design activities with continual enhancement. We are applying this system to greater energy efficiency improvement, full-scale usage of lead-free solders and Eco-glass, and the reduction of harmful heavy metals and polyvinyl chloride. We are confident that our activities will result in an entirely new level of environmental friendliness.



Containers and Packaging

Targets

[Plastic containers and packaging]
• Reduction of at least 30% compared with figures from fiscal 2001.

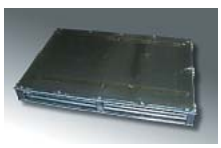
Nikon defined its "Environmental Policy Regarding Packaging Materials" in May 1998, and reviewed it in June 2000. This policy has seven main points:
1. Elimination of harmful substances. 2. Reduction in volume and content. 3. Recyclability. 4. Safety and ease of separation of materials. 5. Use of recycled 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.	Microscopes
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).	Microscopes
Steel pallet	4. Safety and ease of separation of materials 6. Reusability	Smoke sterilisation process used with wooden pallets is no longer necessary. This also contributes to conservation of the forests.	Stepper
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, interchangeable 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


Steel pallet


Pulp moulding

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

- In fiscal 2003, use of plastic containers and packaging for consumer products increased to 159% in weight against fiscal 2001 levels due to the dramatic growth of the digital camera business. Despite our best efforts to reduce the use of plastic, the figure rose to 240% in weight in fiscal 2004.
- Through the use of single-material presentation cases and assembly-type packaging, as well as other methods, from fiscal 2002 through 2003 we achieved our target of eliminating the use of non-separable multi-material for new packaging in fiscal 2004.

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

1. Sales of used steppers for reuse

Nikon Tec Corporation 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's willingness and capability to reuse its own products. Fiscal 2004 saw 46 significant achievements (compared to 12 in fiscal 2003), both domestically and abroad, contributing to a dramatic expansion of our business. The manufacturing department, which lends its efforts to the reproduction and control process, shortens the work period and supports business expansion by promoting the improvement of industrial tools and machines, standardising of the workflow and improving its efficiency and putting in place a framework for technical troubleshooting.

Nikon is conducting in-depth research on the needs of the semiconductor industry, in order to help companies in the field to expand their businesses. This is another area in which our dedication to environmental preservation, profitability and customer service shines through.

2. Recycling of packaging materials and batteries in Japan

(1) Packaging materials

Nikon have contracted the services of JCPRA (Japan Containers and Packaging Recycling Association) to collect and recycle packaging materials used during the sale of Nikon products.

(2) Batteries

Nikon and many other companies have engaged in cooperative efforts with JBRC (Japan Battery Recycling Center) to collect and recycle rechargeable batteries for digital cameras and other products discarded by consumers.

3. 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.