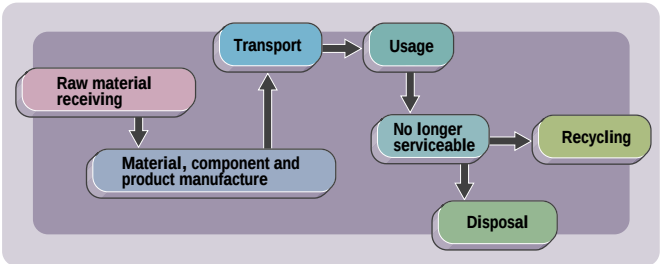
Product Assessment

To minimise the adverse environmental effects of our products throughout their life cycles (see diagram to right), Nikon formulated its own product assessment system in 1995. This system makes it possible to quantify the degree of reduction of environmental impact during product development.

From 1995 we implemented this system in all product development and design departments, in order to gradually decrease environmental loading caused by our products.

Nikon is constantly adding items and standards for assessment. In fiscal 2004, we have introduced a revised product assessment system (6th edition) that introduces stricter standards toward the improvement of harmful substance management. Our development and design divisions intend to redouble their efforts with the goal of a more favourable evaluation in the newest edition.

General life cycle for Nikon products



Features of Nikon Product Assessment System

- Priority placed on reducing consumption of resources and energy, recycling, long product life, reduction in use of harmful substances, reduction and simplified processing of waste, disclosure of material information.
- Anticipation of emerging environmental issues and regulations in each country, and development of Nikon standards that take the characteristics of our products into account.
- Formulated after thorough discussion among product development teams, material engineers and other related personnel.
- Make product assessment mandatory in design reviews and related phases of product development sequences, with procedures and standards clearly defined.
- Continuous revision through item addition and improvement; Version 4 is currently in use.
- Vigilance in product improvement from one model to the next.
- Support designers by building and maintaining an environmental database of material information (Eco-glass, flame retardants, etc.), explanatory text and documentation.

Contents of the Nikon Product Assessment

- Continuing reduction in product mass, volume, and part count.
- Assessment and improvement of energy consumption based on Nikon's "Power Consumption Efficiency" formula (product functionality/power consumed).
- Pursuit of extended product life and simpler repair.
- Reduction in amount of waste generated from consumables; appropriate customer guidance on waste processing.
- Promotion of recycling of secondary batteries (simplified removal, content marking and explanations).
- Simplified separation of plastics and metals.
- Elimination of specific brominated flame retardants (suppression of dioxin in waste processing).
- Reduce use of vinyl chloride (added chlorine and lead, cadmium and phthalates can cause problems after waste disposal).
- Elimination of ozone layer-depleting substances (specified CFCs and alternative substances).
- Reduction in use of harmful substances (heavy metals in materials such as metal, resin, electric wire, electronic components, etc.).
- Implementation of lead-free solder on boards for electronic components. (see page 13)
- Use of optical glass free of lead and arsenic in optical system components such as lens elements (see page 13).
- Strict observance of environmental laws and regulations.
- Overall assessment (comments on degree of improvement, overall assessment points, etc.).

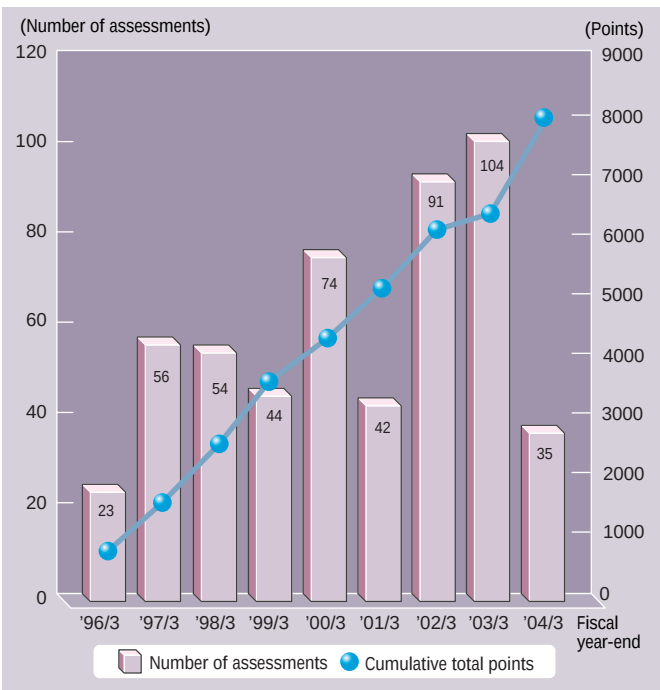
Nikon Product Assessment Record

If a product shows improvement in terms of environmental friendliness when compared with the prior model, assessment points are awarded. If the product is about the same, no points are given. If it has deteriorated, points are subtracted. The assessment point scale ranges from –100 to +100.

For the nine-year period from fiscal 1996 to fiscal 2004, a total of 523 assessments were made under this programme, with an average assessment of +14.7 points.

Nikon is continuing its efforts to improve and enhance the functionality and performance of all of its products, while releasing new products to world markets, and this assessment indicates that our environmental efforts are gradually being rewarded.

Product Assessment Results (through FY2004)



Activities in the Product Environment

Environmentally Sound Optical Glass (Eco-glass)

Targets

[Eco-glass usage ratio]
- **Use of Eco-glass in at least 95% of all optical designs for consumer products, and at least 91% for industrial products.**

Nikon began full-scale work on the development of lead- and arsenic-free Eco-glass in 1995. We are employing this new glass in all of our product categories that incorporate optical systems — IC steppers, cameras, microscopes and so on. Nikon is working to minimise the risk of environmental pollution (air, water, soil and waste disposal sites) caused by optical glass containing lead and arsenic, as far as possible throughout the entire product life cycle (raw material production, manufacturing, use and disposal).

History of Eco-glass Development

Since Nikon was established in 1917 as the first optical glass manufacturer in Japan, we have placed a high priority on the development and manufacture of optical glass designed for use in optical equipment.

As part of our anti-pollution efforts, in the 1970s we ceased the use of cadmium — a toxic material — in optical glass.

In the 1990s, we investigated countless optical glass compositions, bearing in mind the possible effects of each on the environment. Approximately 100 types of the optical glass contained lead or arsenic. We have recognised that this fact is one of the most significant environmental aspects of our business activities and products. Therefore, we decided to develop a new environmentally sound glass and employ it in our products.

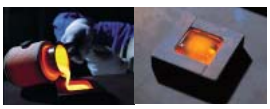
We demanded that the new glass offer optical performance at least equalling that of the glass in use. As such, the optical glass development department and the optical design department initiated a joint effort to investigate a variety of new compositions and design factors. After development was completed and the supply stance solidified, we began introducing Eco-glass into our products. In fiscal 1999, the new glass was used across the board in the optical design department.

Nikon offers an extensive range of optical equipment and, given this diversity, some products incorporate parts that may not accommodate Eco-glass. As far as technically possible, however, we intend to switch over to the new material.

Eco-glass Development Highlights

Fiscal 1996	Eco-glass development project launched full-scale.
Fiscal 1998	Eco-glass-related items added to Nikon product assessments.
Fiscal 1999	Eco-glass database completed; employed across the board in optical design.
Fiscal 2000	Development of Eco-glass composition about 80% complete.
Fiscal 2001	Development of Eco-glass composition complete.

The total cost for R&D to develop Eco-glass is 410 million yen during this term.



Eco-glass development

Rates of Eco-glass Utilisation in New Optical Designs

(Rates are calculated based on component units.)

Fiscal 2000	77.1%
Fiscal 2001	86.1%
Fiscal 2002	78.1%
Fiscal 2003	92.2%
Fiscal 2004	94.7%
	Consumer products 96.6% (Cameras, binoculars, etc.)
	Industrial products 94.5% (IC steppers, etc.)

Lenses and prisms made with Eco-glass

Activities in the Product Environment

Lead-free Solder, Reductions in Harmful Substance Usage

Targets

[Lead-free solder]
- **Introduction of lead-free printed circuit boards for electronic components in consumer and industrial (new boards) products**

[Hexavalent chrome, lead, cadmium, mercury, PBB, PBDE, PVC]
- **Increase in products shipped with reduced levels of the above hazardous substances**

To minimise the use of harmful substances, Nikon is promoting the usage of lead-free solder in our electronic equipment as well as that produced by our group and cooperative companies. We are also strongly encouraging the reduction of hexavalent chrome in surface treatment of metal, PVC wire sheathing, and reduced use of heavy metal in metal, plastic or electronic components.

Developments in Lead-Free solder

We have been installing new equipment on electronics production lines at our Yokohama plant, Sendai Nikon and other sites. We are also advancing experimentation, prototyping and evaluation of lead-free solder on electronics printed circuit boards in each product category. There have been considerable technical obstacles to overcome, and we are standardising and sharing the expertise we have gained with our product development and manufacturing technologies teams, as well as throughout the entire Nikon Group. Our objective is to ensure Nikon is fully prepared for utilisation of the new technology in products.

Our in-house training and technical certification system now offers a course on lead-free soldering, assisting employees in mastering the new technology.

The majority of the lead-free solder used at Nikon is the tin-silver-copper alloy that has been most widely used in the industry, but with our wide range of products we are also required to use low-temperature tin-silver-indium-bismuth solder.

High-performance reflow furnace at Yokohama Plant

Examples of Lead-free Solder Introduction and Implementation

Plans to utilise lead-free solder are being implemented under the Environmental Action Plan (see pages 10 and 11), and in fiscal 2004 lead-free solder was used on printed circuit boards for new products including the D2H high-grade digital SLR camera, the SB-800 camera Speedlight, and the LASER 800S portable laser distance meter, among others.

Based on our experimental preparation and consistent stance, from this point we intend to accelerate the full-scale use of lead-free solder in industrial products as well.

Lead-free PCB for confocal microscope

Cream-solder printing machine at Sendai Nikon

Reductions in Use of Other Hazardous Substances

Nikon is taking steps to reduce the amounts of hexavalent chrome, lead, cadmium, mercury, PBB, PBDE and PVC in our products, as far as is technically possible.

We are also developing new substances to replace hexavalent chrome in surface treatment, investigating technologies to replace PVC in cable and wire sheathing and camera cases, and investigating the potential of alternative materials for a wide range of metals, plastics and electronic parts. Our goal is to develop products which use none of these hazardous substances.