

Environmental Protection Program

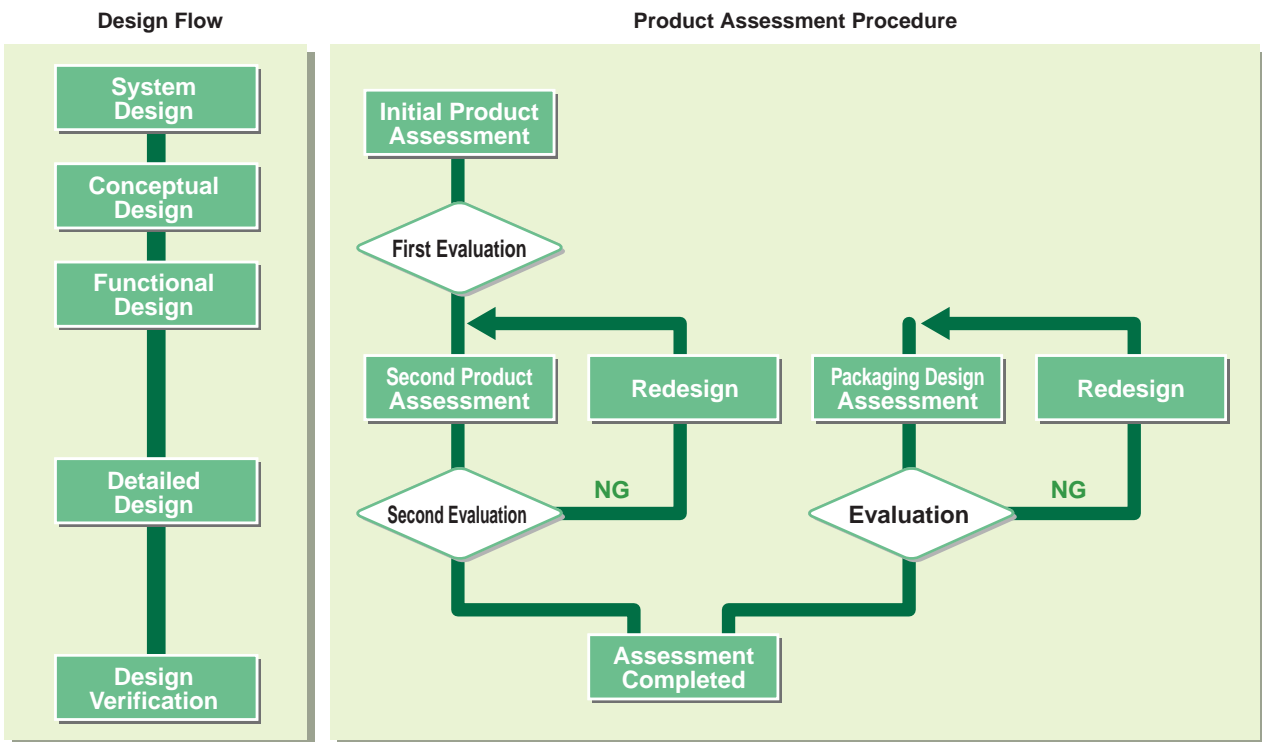
Environmental Impact Reduction in Product Design

During the long period in the life cycle of a product, a burden is imposed on the environment, starting from its production stage to its disposal. It is important therefore, that in order to provide products with a lesser burden on the environment, the overall product life cycle must be evaluated in terms of environmental burden, and all possible improvements made during the development and design stages of the product. Considerations include energy conservation, resource conservation, recycling characteristics and the use of harmful substances. Oki Electric conducts product assessments, to work towards reducing the environmental burden throughout the life cycle of the product.

1. Execution of Product Assessment

Product assessment procedure

During the product assessment, the improvement of its environmental burden is evaluated by comparing the designed product with the referenced product, according to the evaluation criteria (such as electrical power consumption, product mass and the ease of disassembly). If a designed product does not attain a certain level in the evaluation standard, then the product will be redesigned. A design flowchart and a product assessment procedure of Oki Electric are shown below. The product assessment procedure includes product assessment and packaging design assessment.



Results of product assessment performance

The product assessment at Oki Electric includes evaluation items, such as "recycling characteristics", "harmful substance limitations", "compatible plastics", "product size and weight reductions", and "energy saving". The table below shows the results of the product assessment of the Network Solutions Company for FY2000, and all applicable products have passed the assessment criteria as is evident by the figures:

Product Assessment Results

Product group	Number of applicable products	Reduction in product size/weight (average reduction rate)	Energy saving (average reduction rate)	Internal assessment evaluations
Telephone, switching and transmission equipment	8	39%	39%	PASS
Image transmission equipment	2	51%	40%	PASS
Computer telephony integrated equipment	5	25%	26%	PASS

(The average reduction rate is calculated using the reference environmental burden figures for particular functions of similar products.)

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Environmental Impact Reduction in Product Design

■ Utilization of product assessments (reduction of product size, weight and electrical power consumption)

The main distribution frame (MDF) is equipment that connects the internal equipment of a switching station to individual subscriber lines.

Continuous efforts, to reduce the environmental burden by implementing the product assessment process, are being conducted in the MDF design process.

Environmental Burden Reduction for MDF

	Volume(cc)	Mass(kg)	Power consumption(W)
AMDF (older type)	3,024,000	860	600
AMDF-ES (newer type)	143,000	70	140
Reduction rate (%)	95	92	76

The main measures taken to achieve these reductions to the environmental burden include the following:

[Product size/weight reduction measures]

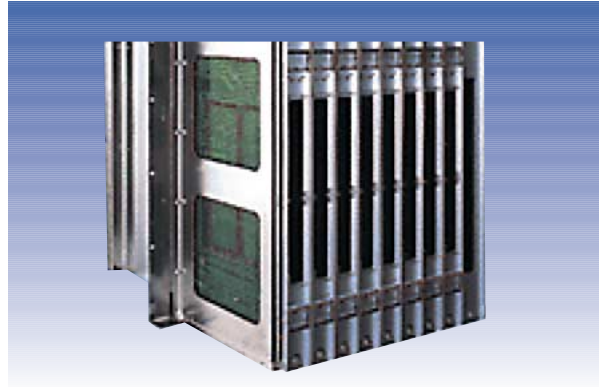
- Implement cross-mounting using twin-matrix boards.
- Incorporate high-density mounting.

[Operating power consumption reduction measures]

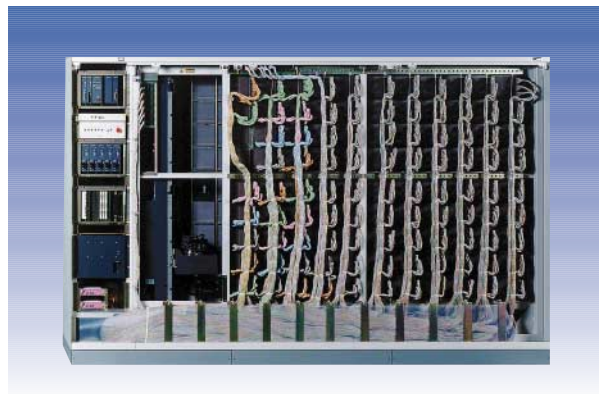
- Replace a large servomotor with multiple compact step motors.
- Reduce the motor operation time by reducing the operation range of the robot.

[Standby power consumption reduction measures]

- Reduce the current supplied to motor driving circuits while the MDF is in the standby mode.



Newer type MDF



Older type MDF

1. Development of Product Assessment Support Technologies

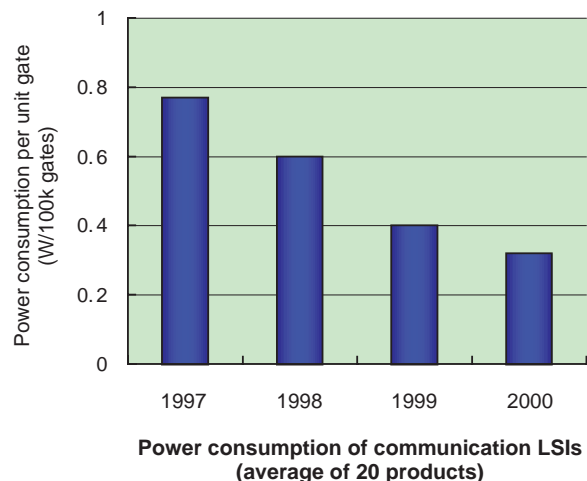
The product assessment system requires that a reduction in the environmental burden of products must be carried out on a continuous basis. In order to do this it is essential to continuously improve the technologies that support the product assessment activities. Oki Electric is conducting continuous improvements, such as reduction of power consumption in LSIs.

■ Power consumption reduction in LSIs

Many types of LSIs are used in various electronic products while consuming electrical power. Reducing the power consumption of these LSIs, therefore, would in turn greatly impact the power consumption of electronic products.

The graph on the right indicates the trend of the electrical power consumed by communication LSIs, in the power consumption per unit gate. As it shows the reduction is contributing to an increased reduction of power consumption by electronic equipment, year after year.

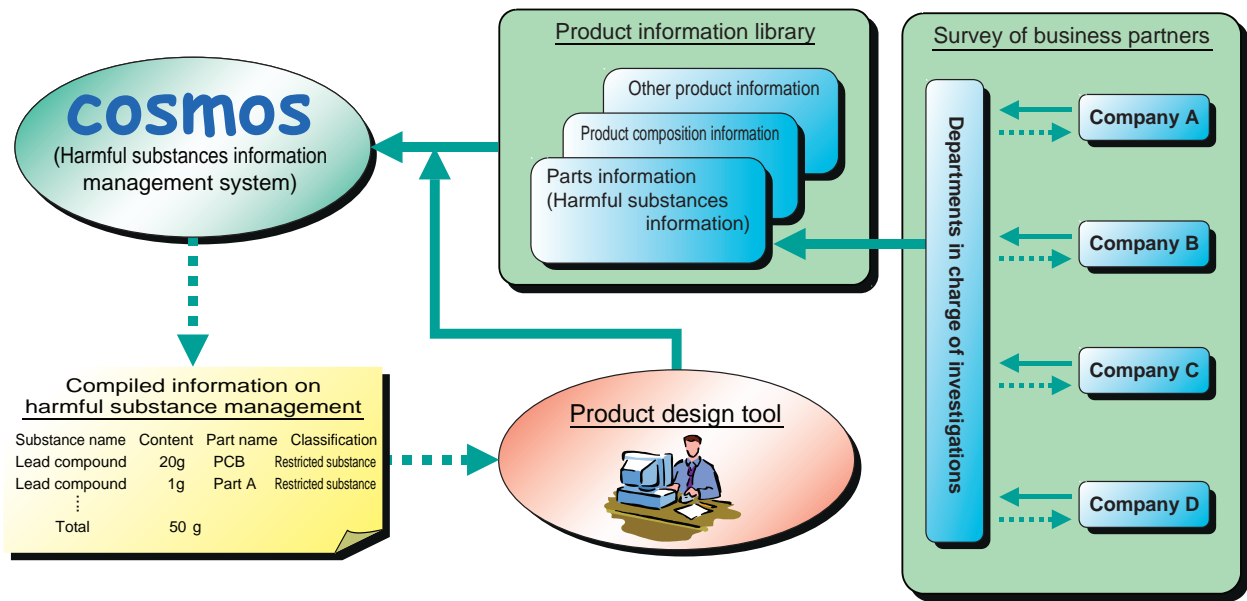
Oki Electric is also focusing on the SOI technology for future development and merchandising of the LSIs, as this technology makes possible the development of LSIs with a low power consumption, while maintaining the performance (processing speed) of the LSIs.



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Green procurement (establishment of a harmful substances information management system)

A harmful substances information management system (internally known as "COSMOS") has been developed to reduce possibly harmful chemical substances, included in parts and materials used in the configuration of products, during the development and design stage. This system operates in conjunction with the corporate internal networks and design tools, which makes it possible to select eco-friendly parts and materials for a product design. As a result of the continual upgrading of the system's database, the data of approximately 250 companies and 40,000 items had been stored by the end of FY2000.



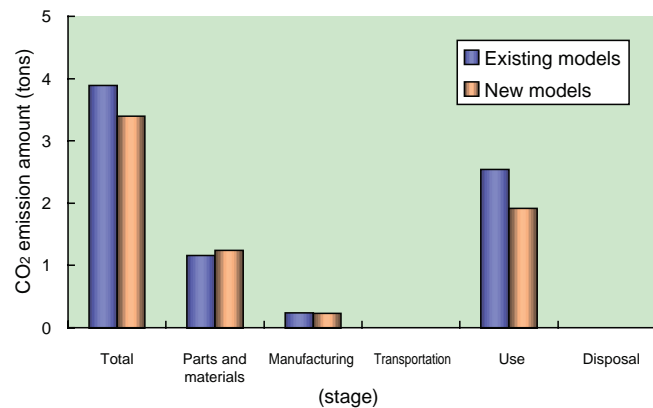
Harmful Substance Information Management System

Promotion of life cycle assessment (LCA)

Product assessment provides an easy means to evaluate products and is used by many companies. More sophisticated analysis, such as determining which stage of the product's life cycle presents the maximum burden on the environment, cannot be derived through this process. For this reason, it is often difficult to formulate effective measures, if the product assessment only is used.

In order to alleviate this problem, Oki Electric is implementing life cycle assessment (LCA). The graph on the right shows the LCA results of the new and old auto teller machines (ATMs). The LCA clearly indicates the environmental burden for each stage during the life cycle of a product, making it easier, as can be seen in the graph, for the product designer to prioritize each aspect of a product.

The drawback of the LCA is that it requires a lot of time and effort by the designers. In order to counter this problem, Oki Electric is examining the reduction of the assessment time through various means, including the utilization of existing databases.



LCA results of ATMs