Executive Summary of Product Assessment Manual for Electric Home Appliances, 4th edition in Japan

(Japanese Version is attached)

January 2007

Association for

Electric Home Appliances

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This document was produced by the Working Group for Product Assessment Manual Revision of Product Assessment Expert Committee of Association for Electric Home Appliances in Japan.

＜To Our Readers＞
Refer to the following Web page for information on the product assessment initiatives of the Japanese electric home appliance industry.
Web: http://www.aeha.or.jp/assessment/en/english_flame.html

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Introduction

Electric home appliances that have various functions are produced with the development of science and technology, leading to widespread use around the world more and more every year for civilized life.

However, the increase of products also becomes a cause of increase of environmental impacts to earth, so the environmentally conscious design is getting necessary for product development. When we think about the lifecycle of product, there are a lot of impacts on environment such as utilization of limited earth resource, consumption of energy etc. at production and use, treatment after use, so the manufacturers have to consider "from the cradle to the cradle" of products that is "from the resource to the use of recycled materials" for manufacturing products. For this, the manufacturer or designer have to evaluate the environmental impacts of product according to the plan as organization when developing products and implement the product assessment (assessment in advance) setting up the improvement goal.

The Association for Electric Home Appliances (AEHA) configured with electric home appliances manufacturers has recognized the importance of design for which environment was considered for 15 years or more, and issued "Product Assessment Manual for Electric Home Appliances in Japan" in October 1991 ahead of other industries. Then accompanied by the active legislation* on products in the late 90s, the content of assessment was reviewed and the 3rd edition was issued in March 2001.

* "Revised Energy Conservation Law " aiming to the development of energy-saving equipments, "Law for the Promotion of Effective utilization of Resources" which integrates the viewpoint of 3R (reduce, reuse, recycle), and "Home Appliance Recycling Law" aiming to recycle.

When we refer to overseas, the legislations relevant to environment of products have been progressing in Europe, U.S. and China as well. Especially, as for the chemical substances, the use of specific chemical substances (6 substances) became prohibited or restricted by the EU RoHS directive since July 1, 2006. In Japan, revised "Law for Promotion of Effective Utilization of Resources" since July 1, 2006 obligates the marking of these 6 chemical substances. In China, the legislation relevant to RoHS was issued in March 2006. In addition, EuP (Energy-using Products) directive which considers lifecycle of products including resources and mainly energy use was issued in July 2005, and it is currently being prepared for implementing measures as a standard.

Considering these global trends of legislations, IEC (International Electrotechnical Commission) has started to develop an environmental international standard relevant to products. IEC guide 114 which considers lifecycle of products was issued in May 2005. A part of the Japanese proposal to IEC contributing to the development of the guide was based on "Product Assessment Manual for Electric Home Appliances in Japan (3rd edition)" developed by AEHA. Further more, aiming to create the cross-sectional standard of electricity and electronics, Japan leads the promotion of the international standardization of environmentally conscious design through WG2 (established in 2005) under TC111. Product Assessment Manual of AEHA has been introduced to and recognized by to IEC/WG2.

The 4th edition of “Product Assessment Manual for Electric Home Appliances in Japan” was issued in May 2006, and it included the wide results of research activities through product assessment committees and working groups of AEHA, international and domestic progress on necessary information regarding environmentally conscious design. This executive summary version of the 4th edition combines both English and Japanese versions, and sums up the contents of approximately 150 pages of the 4th edition in order to be utilized at overseas bases of the member companies of AEHA and for the promotion of environmentally conscious design.

January 2007

Association for Electric Home Appliances
Product Assessment Expert Committee
Working Group for Product Assessment Manual Revision

Contents

1. Purpose of product assessment and this manual

(1) Purpose of product assessment

The environmentally conscious design is to implement planning and design assembling the ingenuity and consideration for 1) reducing the quantity consumed of natural resources, 2) improving the possibility of use of recycled resources, 3) reducing the energy consumption, 4) restriction of the use of substances of environmental concern, 5) reducing the generation of waste material etc. at the phase of planning and design of product for reducing the environmental impacts in all lifecycle stages of product "installation of resource －production－distribution－use－collection / transportation－recycle－appropriate process".

The product assessment is the method to confirm (check) the content of environmental impacts reduction by environmentally conscious design and evaluate the degree of improvement at the design phase of product.

The target product for which product assessment is implemented is every electric home appliance that is newly designed and produced. The product assessment is mainly implemented for mass-produced products used by general consumers, but the preproduction prototype and demo product are not the target.

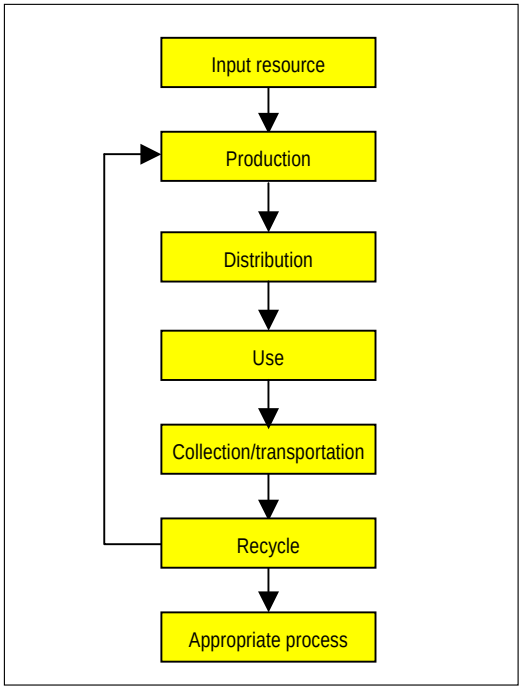


Figure 1. Life cycle stages of product

And for the implementation of product assessment, try to improve the continuous effectiveness based on order of priority of process below ruled by "Fundamental Law for Establishing a Sound Material-Cycle", judgment standard of "Law for the Promotion of Effective Utilization of Resources", evaluation of difficulty of appropriate process in "Waste Management Law", requirements ruled by statutes and utilizing the knowledge gained from home appliance recycle plant based on "Home Appliance Recycling Law".

[Order of priority of process]	1) Generation control (reduce)
	2) Reuse
	3) Recycle use (material recycle, etc.)
	4) Heat collection (thermal recycle)
	5) Appropriate process

(2) Purpose of this manual

This manual is aiming at the contribution to the following items when the product assessment is implemented by associated companies of AEHA.

1) Providing the relevant information with person in charge who consults on product assessment newly
2) Showing the guideline (check list) relevant to the content to be implemented
3) Showing the orientation to the business organization who promotes more positive activity

2. Using method

(1) Setting the evaluation items and standard for each product

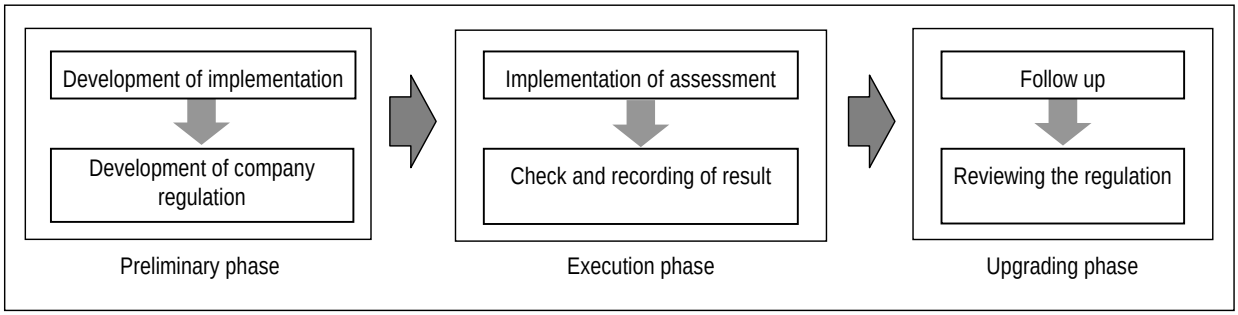
The manufacturers have to set the proper evaluation items and standard according to the characteristics of each product or product group based on Chapter 5 "Product assessment guideline (check list)" taking the safety and durability of product into account.

(2) How to implement the product assessment

The manufacturers have to establish the product assessment enforcement regulation of their company in which following items are included and implement the product assessment.

It is desirable to set up the purpose and goal of environmentally conscious (material, configuration, performance, function etc.) product at the phase of design of new model using the International Standard ISO14001 relevant to environmental management system, and try continuous improvement by Plan, Do, Check, Action.

1) Position the product assessment in development regulation of product.
2) Implement the product assessment at one of or multiple phases of design, prototype, and mass production prototype.
3) The evaluation standard should be quantified as much as possible, and it should correspond to the characteristics of that company and product in addition to the evaluation items and evaluation method.
4) Decide the evaluation items, evaluation standard and evaluation method according to the degree of newness of product (comparison of material, configuration, performance, function etc. with existing product etc.) and degree of incidence to environment, and implement the general evaluation consolidating the results of individual evaluations.
5) Check the implementation state of product assessment and implement the measure based on the result of product assessment and record it.
6) Review the product assessment enforcement provision of their company as occasion demands based on the follow-up and feedback of product assessment, trends of environment and advancement of technology.
7) At the beginning of implementation, implement the item that can be supported immediately in series.



3. Organization / structure

(1) Organization / structure of manufacturer

The manufacturer places the responsible official for implementing product assessment for each business establishment and head quarters to arrange the structure for implementing the product assessment and storing its record.

(2) Role of Association for Electric Home Appliances

1) AEHA comprehends the implementation state of product assessment as electric home appliances Industry for promoting the implementation of product assessment.
2) Each associated company meets to exchange themes and sets the theme considering the importance, immediacy, relativity and commonality with other industries etc., and implements the survey and research. That result will be reflected to the revision of Product Assessment Manual in the future.
3) Try the exchange of opinions with central government, local government, consumers, academic expert, manufacturers of material and parts, recycler etc., and directs its eye to social situation, environmental trends and improvement of technology, and revises this manual once a year, and revises it as occasion demands.
4) Implement the PR educational activity positively for implementation state of product assessment and other.

4. Evaluation method

In Chapter 5 "Product assessment guideline (check list)", the evaluation method that can be quantified as easily as possible is shown for individual evaluation item so that the comparison with standard product (existing equivalent product or model etc.) is simplified.

There are two evaluation methods; "individual evaluation" that is implemented for each evaluation item and "general evaluation" that is implemented integrating evaluation results of every item. Each company can select the evaluation item for each product and set the point system of each evaluation item and weighting between evaluation items arbitrarily.

4-1. Evaluation items

Here shows the general description of hierarchic structure and evaluation items in Chapter 5 "Product assessment guideline (check list)".

(1) Hierarchic structure of guideline

Make an arrangement with the following hierarchic structure.

Evaluation items (large items－small items) － evaluation standard － evaluation method

The content of description and purpose of each hierarchy are shown in Table 4-1-1.

Table 4-1-1. Content of description of hierarchy structure and each hierarchy of product assessment guideline

Hierarchy	Content of description of each hierarchy
Evaluation items	- Lay out the list of items for implementing the product assessment completely. - Show the purpose and orientation for implementing product assessment.
Evaluation standard	- Show the viewpoint and concept for implementing evaluation for each item. - Describe the standard in the form of interrogative sentence that can be replied by Yes/No.
Evaluation method	- Show the concrete evaluation method (evaluation index, comparison target etc.). - Evaluation method is largely divided into two as shown below. a) Make a comparison with standard product (existing equivalent product or model etc.) b) Check whether certain condition is fulfilled (whether the statutes etc. are preserved, whether the possibility of implementation is examined etc.) - Multiple methods may be described at the same time (lay out multiple options).

(2) Configuration of evaluation items

The evaluation items of Chapter 5 "Product assessment guideline (check list)" and its purpose are shown in Table 4-1-2, the diagrammatic representation of evaluation items of guideline contrasting them with various concept of cyclical society and lifecycle of consumer durable is shown in Figure 4-1.

Table 4-1-2. Evaluation items and purpose of product assessment guideline

No.	Evaluation items	Purpose
1	Weight/volume reduction	- Reduction of consumption of limited resources - Control of generation of waste materials
2	Usage of recycled materials and parts	- Promotion of recycling resources
3	Improvement on possibility of recycled materials, etc.	- Promotion of recycle and reuse by applying materials that are easy to process used products
4	Promotion on long term use	- Effective utilization by using the product for long term, reduction amount of waste material generation
5	Ease of collection/ transportation	- Efficiency of collection/transportation of used product
6	Ease of manual disassembling /separating process	- Ease of reuse and recycle of used product
7	Ease of crushing/classification process	- Preventing the damage to crusher by strong parts, oil leak or magnet, adverse affect on process - Selection of blended material after crushing
8	Packaging	- Promotion of resource saving and recycle etc. for packaging material - Reduction of environmental impacts by reduction of weight and volume of packaging material at the phase of distribution
9	Safety	- Assurance of safety and reduction of risks such as danger or burn from explosion, injury
10	Environmental protection	- Prohibit, reduce, and manage use of chemical substances based on regulations and industry's voluntary standards, etc.
11	Conservation of energy and resources at usage phase	- Reduction of electric power consumption and control generation of greenhouse effect gas - Reduction of quantity consumed of consumable materials
12	Distribution of information	- Provide necessary information in relevant method and implement appropriate use/repair/proess
13	Reduction of environmental impacts in production phase	- Reduce hazardous substances and waste materials, environmental impacts and electric power consumption in production phase
14	LCA (Life Cycle Assessment)	- Evaluate environmental impacts in lifecycle of products quantitatively in advance, try to improve at designing phase, and reduce environmental impacts

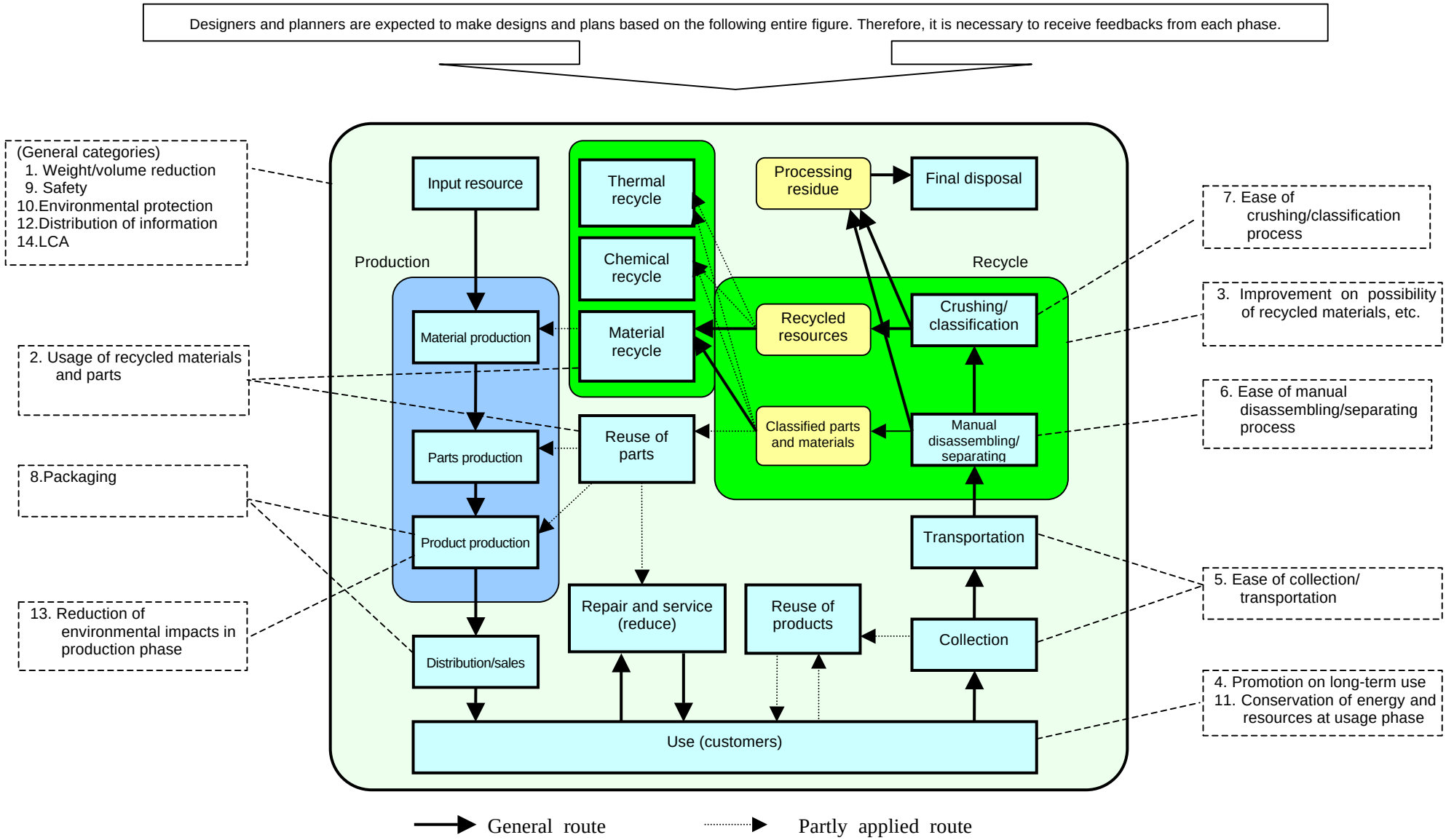


Figure 4-1. Concept chart of recycling social system in relation to evaluation items of this guideline

4-2. Individual evaluation

The individual evaluation is to implement evaluation for each adopted evaluation item.

For the evaluation items, there are 14 large items from "1. Weight/volume reduction" to "14. LCA", and total 47 small items below each large item.

When implementing the individual evaluation, if you focus attention on specific item only, new product may have no advantage over existing product. It is necessary to decide the degree of permitted negatives in development regulations etc. in advance. The negatives may not be permitted in some evaluation items by the judgment of business organization (e.g. energy conservation of product etc.).

The comparison for each individual evaluation item is generally easy, however, the tradeoff with other item sometimes occurs, and slightly advanced judgment is required at that time.

4-3. General evaluation

The general evaluation is to integrate the individual evaluation in some method and evaluate the environmentally conscious of product in its entirety.

First of all, tally the points of individual evaluation simply and calculate the overall points, and then make a comparison of points with existing model. If the improvement is implemented focusing on overall points without placing an emphasis on individual evaluation, it is OK. Next, add the inspection to individual evaluation, and create the figure of incomings and outgoings of points for each evaluation item as a radar chart etc., for example, and implement the improvement for the item with remarkable negatives (refer to Figure 4-3).

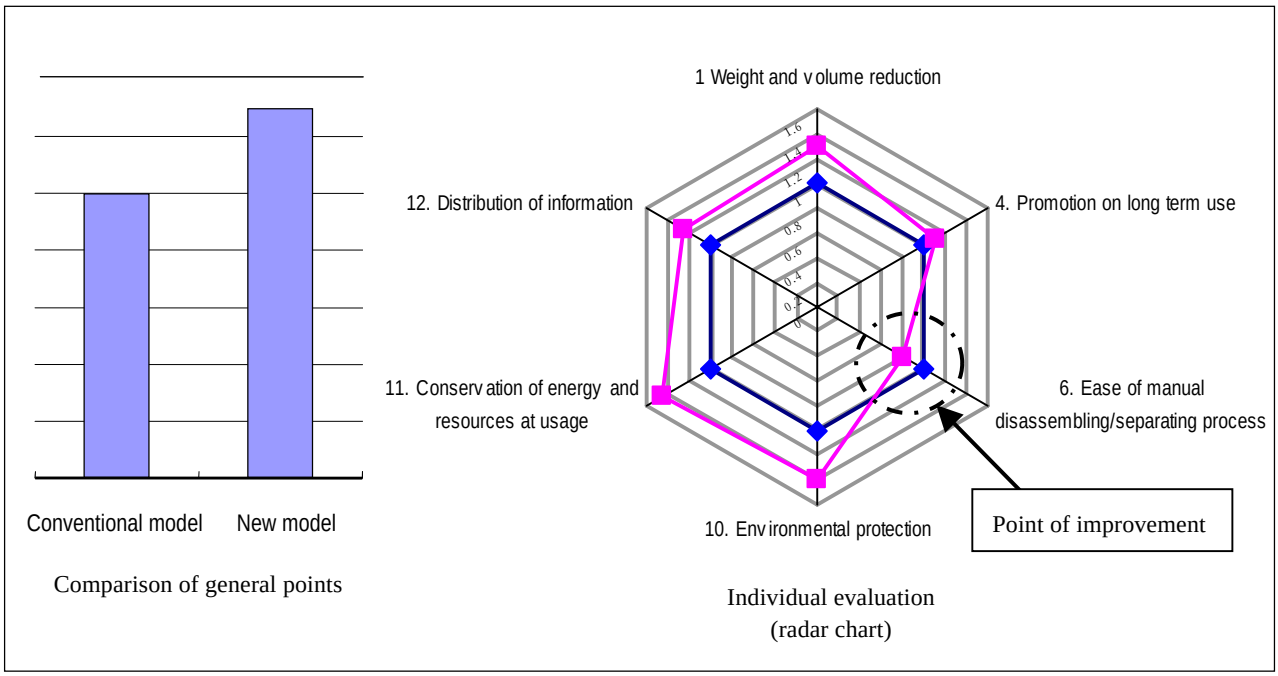


Figure 4-3. Example of general evaluation/individual evaluation

For the result of general evaluation, the application from comparison of overall points to parallel usage of individual point score is available. The skilled designer can implement these evaluations at full and link it to improvement.

The important sense of general evaluation is to feature the new product utilizing which item when there is a tradeoff between evaluation items. Sometimes you may find that the weighting for each item is not proper from the overall points that inappropriate overall points, and it may be linked to review of evaluation sheet.

And the utilization of general evaluation for planning phase of new product is also considerable. That is, set up some goals to improve how many overall points before designing to make it an encouragement of designing.

5. Product assessment guideline (check list)

Classification		Evaluation items		Evaluation standard	Evaluation method
Lifecycle process	Target				
Production	Product design	1 Weight/volume reduction	1-1 Weight/volume reduction of products	1-1-1 Are the weight and volume of the product reduced?	For the weight and volume (content) of whole product, make a comparison with the existing / equivalent product or model.
			1-2 Weight/volume reduction of main raw materials and parts	1-2-1 Is the weight of raw materials reduced?	For the weight of main materials, make a comparison with the existing / equivalent product or model.
				1-2-2 Are the weight and volume of the parts reduced?	For the weight and volume (content) of main parts, make a comparison with the existing / equivalent product or model.
				1-2-3 Is the yield ratio of raw material use or parts improved?	For the amount of mill ends of main material or parts generated, make a comparison with the existing / equivalent product or model.
			1-3 Weight reduction of rare materials	1-3-1 Is the weight of rare materials reduced?	For the weight of rare materials, make a comparison with the existing / equivalent product or model.
Production	Product design	2 Usage of recycled materials and parts	2-1 Usage of recycled materials	2-1-1 Is the recycled materials (reprocessed material /recycled material) used?	For the number of parts for which recycled resource is used, make a comparison with the existing / equivalent product or model.
				2-1-2 Is the index for recycled materials improved?	For the index etc. of recycled materials, make a comparison with the existing / equivalent product or model.
	Product marking		2-2 Indication of the usage of recycled materials	2-2-1 Is the use of recycled materials (reprocessed material /recycled material) indicated on the parts?	Whether the mark enabling proper judgment / treatment at recycling. (Check if marked or not).
Reuse of parts	Product design		2-3 Usage of recycled parts	2-3-1 Is a recycled part (reused part) used?	For the number of recycled parts, make a comparison with the existing / equivalent product or model.
				2-3-2 Is the part standardized?	For the rate of parts that are standardized for other models and products, make a comparison with the existing / equivalent product or model.
Production	Product design	3 Improvement on possibility of recycled materials, etc.	3-1 Improvement on usage of recycled materials and parts	3-1-1 Has the possibility for increasing use of recycled resource been studied?	For the rate of materials that can be used as recycled materials in the weight of whole product, make a comparison with the existing / equivalent product or model.
				3-1-2 Has the possibility for increasing use of recycled parts been studied?	For the rate of parts that can be used as recycled parts in the weight of whole product, make a comparison with the existing / equivalent product or model.
			3-2 Improvement of possible recycle rate of resources	3-2-1 Is the possible recycle rate (recyclable rate) improved for whole product?	For the possible recycle rate, make a comparison with the existing / equivalent product or model.
Service			3-3 Usage of recycled parts upon repairing	3-3-1 Is it possible to use the recycled part at maintenance and repairing?	Check whether the possibility of use of recycled parts at maintenance and repairing has been studied.
Reuse of parts	Information distribution		3-4 Distribution of information on recyclable parts	3-4-1 Is the information about unit or part that can be reused indicated?	Check whether the target unit or parts are specified, and whether the specifications are fixed.
Production	Product design	4 Promotion on long term use	4-1 Improvement of pruduct durability	4-1-1 Has the durability of product improved?	For the durability seen from the aspect of configuration etc., make a comparison with the existing equivalent product or model.
			4-2 Improvement of durability of parts/materials	4-2-1 Is the part or material with high durability used?	For the durability of parts and materials, make a comparison with parts and material of existing equivalent product or model.
Use				4-2-2 Has the wear resistance and resistance to staining considered on surface of visible part considered?	Consider the use environment and then evaluate the wear resistance and resistance to staining.

Classification		Evaluation items		Evaluation standard	Evaluation method
Lifecycle process	Target				
			4-3 Improvement in exchangeability of consumable stores	4-3-1 Is it possible to replace the consumable stores easily?	Check whether the consumable stores (parts and unit that should be replaced at use) can be removed or attached by user easily.
					For the replacement of consumable stores, make a comparison with the existing equivalent product or model.
	Product marking			4-3-2 Has the information for how to replace consumable stores labeled properly?	Check whether the information distribution relevant to replacement of consumable stores on main unit or instruction manual etc. is improved.
Service	Product design		4-4 Improvement on possibility and simplicity of maintenance/repairing	4-4-1 Is the part with high necessity of maintenance and repairing identified?	Check whether the possibility of generation of failure etc. is considered, and the parts that should be able to be replaced easily for maintenance and repairing are clearly specified.
				4-4-2 For the part with high necessity of maintenance and repairing, are the parts standardized?	For the number of parts and materials relevant to appropriate part, whether the standardization rate with existing product is same or more than existing product.
				4-4-3 Can the part with high necessity of maintenance and repairing be removed or assembled easily?	For the removal time of part relevant to appropriate part, make a comparison with the existing equivalent product or model (check with actual item of production prototype etc.)
					For the following causes that affect on easiness of removal of part, make a comparison with the existing equivalent product or model - Number of parts, connection method, number of connected points etc.
	Product information distribution		4-5 Distribution of information for long term use	4-5-1 Is the information that is useful for long term use such as maintenance and repairing distributed to user or repair shop?	Content (availability), mode of expression, mode of display (location) of information.
					For the conditions relevant to repairing, whether the information is prepared for repair shop.
				4-5-2 Is there a route for distributing information about failure diagnosis, its measures, security etc. to repair shop?	
Collection/transportation	Package design	5 Ease of collection/transportation	5-1 Improvement of operation upon collection/transportation	5-1-1 Is the weight balance of front and rear / right and left proper, and is it possible to implement collection and transportation safely and easily?	From the viewpoints below, check the operability for collection and transportation. - Weight and volume of whole product - Weight balance of front and rear / right and left etc.
				5-1-2 Are the handle and wheels allocated properly for the product with large weight and volume?	From the viewpoints below, check the operability for collection and transportation. - Expediency of position of handle, assuredness of grabbing - Expediency of position and rotation direction of wheel, balance at transportation or loading on body etc.
			5-2 Improvement of loading upon collection/transportation	5-2-1 Is it possible to improve the load efficiency easily, and is it hard to cause collapse of cargo?	Check the loading capacity at the state of product main unit only (bare cargo). Or, make a comparison with the existing equivalent product or model.

Classification		Evaluation items		Evaluation standard	Evaluation method
Lifecycle process	Target				
Use	Product design	6 Ease of manual disassembling/separating process	6-1 Ease of processing target items for manual disassembling/separation	6-1-1 When compact rechargeable battery is used, does the product structure enable users to remove it easily?	For the time required for removal of compact rechargeable battery, make a comparison with the existing equivalent product or model.
	Product marking			6-1-2 Is there a label relevant to the product that uses compact rechargeable battery proper?	Check whether the use of compact rechargeable battery, type of battery, and location of battery etc. are labeled on main unit or described in instruction manual.
Recycle	Product design			6-1-3 Is the target object that should be disassembled or sorted manually identified?	Check whether the target objects of manual disassembling and sorting are specified clearly comprehending and considering the process of recycle.
				6-1-4 Does the product structure enable to remove the target object that should be disassembled or sorted manually easily?	For the time required for manual disassembling and removal of object to be sorted, make a comparison with the existing equivalent product or model.
	Product marking			6-1-5 Is it possible to identify the target object that should be disassembled or sorted manually easily?	Check whether the easy identification of target object and comprehension of location for manual disassembling and sorting operations are considered.
	Product design		6-2 Ease of disassembling	6-2-1 Does the product employ structure and assembling method which enable manual disassembling?	For the time for manual disassembling and sorting operation, make a comparison with the existing equivalent product or model (check with actual item of production prototype etc.)
					For the causes that affect on easiness of sorting, make a comparison with the existing equivalent product or model. - Connection method, number of connections, attachment direction etc.
					Check the tools and degree of proficiency etc. required for manual disassembling and sorting operations.
				6-2-2 Has the quantity of manually removed screws decreased?	Compare the number of screws removed at disassembly with that of existing equivalent model.
	Product marking			6-2-3 Is the information for simplifying the disassembling distributed?	Check whether the recycle mark etc. for improving disassembly property is effectively displayed.
	Product design		6-3 Device for usage material considering recycle	6-3-1 Is the material recycle possible for parts?	Check the necessity of use of complex material and easiness of manual disassembling and sorting.
					For the total weight of parts for which complex material that cannot be separated easily is used, make a comparison with the existing equivalent product or model.
					For the weight of part that cannot be removed as simple material, make a comparison with the existing equivalent product or model.
					Check whether the metal insert for plastic parts is reduced.
					Check whether the coating for plastic parts is reduced.
					Check whether the additive (fire retardant etc.) that damages recycling efficiency is not added for plastic parts.
				6-3-2 Are the materials standardized?	For the number of types of dissimilar material that has similar physicality, make a comparison with the existing equivalent product or model.
	Product marking			6-3-3 Is the material marking of parts appropriate for sorting?	Material should be displayed on the plastic part of 100g (if possible, 25g) or more in weight, if it is not difficult to display.
					Marking should be proper and easily viewable.

Classification		Evaluation items		Evaluation standard	Evaluation method
Lifecycle process	Target				
Recycle	Product design	7 Ease of crushing/classification process	7-1 Ease of crushing process	7-1-1 Is the crushing process by crusher easy?	For the material, configuration and intensity, make a comparison with the existing equivalent product or model.
					Consider the affect of damage etc. of crusher comprehending the crushing performance etc.
				7-1-2 Is it the size that can be installed in crusher?	Set the installation bore diameter (indication) of crusher, and check if it is not exceeded.
				7-1-3 Isn't there a material that may damage or stain equipment or recycled resource?	From the viewpoint of affect on equipment and recycled resource, check whether there is no disincentive of crushing process.
			7-2 Ease of classification process	7-2-1 Isn't the dissimilar material that has similar physicality used at the same time?	For the number of types of dissimilar material that has similar physicality, make a comparison with the existing / equivalent product or model.
Production	Product design	8 Packaging	8-1 Weight/volume reduction and simplification of packaging materials	8-1-1 Is the weight, volume of packaging material reduced and is it simplified?	For the weight, volume of packaging material and content when it packed, make a comparison with existing packaging material.
				8-1-2 Can the used packaging material be broken small, and is it possible to collect and delivery the material easily?	Easy collection of corrugated fibreboard and expanded polystyrene after unpacking should be considered.
					For the rate of volume reduction (volume after volume reduction/volume of packaging material), make a comparison with the existing equivalent product or model.
			8-2 Improvement on possibility of recycle	8-2-1 Is the use of complex material reduced?	For the weight of packaging material for which complex material is used, make a comparison with existing packaging material.
				8-2-2 Are the materials standardized?	For the number of used materials for packaging material, make a comparison with existing packaging material.
				8-2-3 When multiple materials are used, is it possible to separate them for each material?	Check whether the expanded polystyrene and corrugated fibreboard etc. can be separated.
				8-2-4 Are the reuse and recycling efficiency of packaging material considered?	For the reuse and recycling efficiency of packaging material (material, dissolubility, material labeling etc.), make a comparison with the existing equivalent product or model.
					For the possible recycle rate for weight and volume of packaging material, make a comparison with existing packaging material.
			8-3 Hazardness/toxicity	8-3-1 Is there any material that influences human health, or prevents proper processing or recycling being used?	Check whether the substance that generates harmful gas during incineration disposal is not used.
					Check whether the printing ink does not contain azo color or colorant that forms heavy material or specific amine etc.
			8-4 Usage of recycled resources	8-4-1 Is the packaging material that uses recycled material used?	Check whether the recycled material such as recycled expanded polystyrene and recycled plastic is used.
					Check whether the reused packaging material is used.
	Package labeling		8-5 Identification labeling of packaging materials	8-5-1 Is there an identification labeling based on statutes etc. on packaging material?	Check whether the identification labeling fulfills the statutes relevant to Law for the Promotion of Effective Utilization of Resources (Specified Labeled Products) and guideline of industries.
					Check whether the material labeling of plastic packaging material is based on JIS K 6899, and the size and location of labeling are proper.

Classification		Evaluation items		Evaluation standard	Evaluation method
Lifecycle process	Target				
Production	Product design	9 Safety	9-1 Safety of production phase	9-1-1 Is the safety for production considered?	For the safety of production process, make a comparison with the existing equivalent product or model.
Collection/delivery			9-2 Safety of distribution phase	9-2-1 Is the safety considered when transporting product?	Check whether the precautions for removing dangerousness of explosion can be known easily.
Use			9-3 Safety of usage phase	9-3-1 Is the safety for usage considered?	Check whether the applicable statutes (Electrical Appliance and Material Safety Law), industry standard, in-house standard are fulfilled.
Service			9-4 Safety of service phase	9-4-1 Is the safety for maintenance and recycling considered?	Check whether the maintenance and repair operations can be implemented safely (check with actual item of production prototype etc.)
					Check if there is no point that may pose a hazard to worker by touching metal edge and burr etc. at maintenance and repair.
Recycle			9-5 Safety of recycling phase	9-5-1 Is the safety for recycle process considered?	Consider the process of recycle, and then evaluate the dangerousness of explodability, inflammability and corrosiveness etc.
				9-5-2 Is the security for manual disassembling and sorting considered?	Check whether the manual disassembling and sorting operations can be implemented safely.
General	General	10 Environmental protection	10-1 Mechanism to guarantee adaptation of legal restrictions against substances of environmental concern	10-1-1 Is there a mechanism to guarantee various legal restrictions against substances of environmental concern?	Check whether the legal restraints applied in each phase of production, transportation, use, disposal of product and package are clarified, and the mechanism and division of roles that can guarantee the adaptation of legal restraints are clear, and the operation is implemented.
Production	Product design		10-2 Prohibition, reduction, management of substances of environmental concern included in products	10-2-1 Is the product compliant with statutes relevant to substances of environmental concern included with product?	Check the following statutes are preserved. - Chemical Investigation Law (first type/second type/specific chemical substance) - Labor and Safety Law (substances prohibited to be produced) - Ozone Layer Protection Law (ozone depleting substance)
				10-2-2 Is the voluntary standard of industry or company relevant to substances of environmental concern included with product fulfilled?	When there are voluntary standards etc. (prohibition/reduction/management), check the relevant standards etc. are preserved.
				10-2-3 Is the weight of material that may be a disincentive of recycling such as substances of environmental concern reduced?	For the weight of substances of environmental concern, make a comparison with the existing equivalent product or model.
	Manufacturing process		10-3 Prohibition, reduction, management of substances of environmental concern used in manufacturing process	10-3-1 Are the statutes relevant to substances of environmental concern used in production process preserved?	Check the following statutes are preserved. - Ozone Layer Protection Law, Global Warming Prevention Law - PRTR Law - Air Pollution Control Law (and air quality standards) - Water Pollution Control Law (and ambient water quality criterion) - Environmental quality standards for soil, Waste Management Law etc.
				10-3-2 Are the voluntary standards by industry or company fulfilled?	When there are voluntary standards etc. (prohibition/reduction/management), check the relevant standards etc. are preserved. - Check whether the chemical substances specified by JGPSSI are properly managed - Upper limit of amount of emission of global warming substance for each specified product

Classification		Evaluation items		Evaluation standard	Evaluation method
Lifecycle process	Target				
Collection/delivery	Product design		10-4 Environmental protection in recycling/disposal phase	10-4-1 Isn't there a leakage of substances of environmental concern or danger on operation for disassembling?	Check whether the measure to prevent leakage of refrigeration medium and refrigerant oil etc. at disassembly and to implement the disassembly operation safely are taken.
Recycle				10-4-2 Is it considered not to have an adverse impact on recycling plant?	Consider the process of recycle, and then evaluate the melting performance, heat buildup, corrosiveness etc.
				10-4-3 Is the material that may be a cause of environmental impacts at the stage of recycling or later reduced?	Check whether the quantity consumed of chemical substance etc. that may be a cause of environmental impacts in the process of recycle, proper process of residue, use of recycled resource etc. for the substances other than the target substances in evaluation items "10-2" and "10-3" is comprehended, and it is properly managed.
				10-4-4 Can the part that contains substances of environmental concern be removed easily?	Check whether it can be removed before crushing process.
					Check whether it can be removed easily by standard tool.
Sales	Product marking		10-5 Distribution of information to concerned parties of life cycle	10-5-1 (For users) Is there an information referenced by user when purchasing product?	For the specified product that uses specific chemical substances specified by statutes, check whether the specified labeling is implemented.
Use				10-5-2 (For users, repair shop etc.) Is the information on the items that should be noted on environment and hygiene when the user uses, repairs or moves the product distributed properly?	Check whether the labeling specified by statutes is implemented.
					Check the content (availability), mode of expression, mode of display (location) of information.
Recycle				10-5-3 (For users) Are the items that should be noted on environment and hygiene when the user scraps the product described on instruction manual an easily understood manner?	Check whether the labeling specified by statutes or labeling by voluntary standards is implemented.
					Check whether the precautions required for disposal is described on main unit, accessories or instruction manual in a straightforward manner.
					Check the content (availability), mode of expression, mode of display (location) of information.
				10-5-4 (For dealer, shops of installation, collection, transport) Is it possible to know the precautions for collecting and transporting used product easily?	Check whether the labeling specified by statutes is implemented.
					Check whether the precautions for collection and transportation, the method of disassembly if it is necessary, information on necessity etc. of dedicated tools are described on main unit and accessories in a straightforward manner.
					Check the content (availability), mode of expression, mode of display (location) of information.
				10-5-5 (For recycling shop, waste disposer) Are the items that should be noted especially for environment conservation at the stage of recycling and disposal described on the equipment main unit?	For the specified product that uses specific chemical substances specified by statutes, check whether the specified labeling is implemented. - Law for the Promotion of Effective Utilization of Resources (3R Law), voluntary action plan for preventing global warming etc.
					Check the content (availability), mode of expression, mode of display (location) of information.

Classification		Evaluation items		Evaluation standard	Evaluation method
Lifecycle process	Target				
Use	Product design	11 Conservation of energy and resources at usage phase	11-1 Introduction of functions on conservation of energy and resources	11-1-1 Are the function of energy saving and resource saving added?	For the types of functions of energy saving and resource saving, compare the quantity with that of existing model.
			11-2 Conservation of energy at usage phase	11-2-1 Is the energy consumed when using product reduced, or is the energy consumption efficiency improved?	For the amount of electric power consumption (or CO_2 reduced quantity), or COP etc., make a comparison with the standard value by statutes etc. or existing equivalent product or model.
				11-2-2 Is the energy consumed during waiting reduced?	For the standby power consumption (or CO_2 reduced quantity), make a comparison with the standard value by statutes etc. or existing equivalent product or model.
			11-3 Reduction on consumption of consumable stores	11-3-1 Is the consumption of material consumed when using product reduced?	For the amount of consumption of material consumed for unit hour of use, make a comparison with the existing equivalent product or model.
General	Information distribution	12 Distribution of information	12-1 Clarification of information distribution targets, etc.	12-1-1 Is the target to which information is distributed clearly comprehended and labeled?	Check whether the target and destination of information distribution are clarified in company, and those are described clearly.
				12-1-2 Are the items, content, display method (location) etc. of information distribution proper?	
Production			12-2 Products/parts, instructions, labeling of packaging materials	12-2-1 Is the labeling on products / parts, instructions, packaging material etc. that is implemented at production stage implemented properly based on display guideline etc.?	Check whether the labeling for information distribution described in following "evaluation standard" is implemented and it is improved than existing one "2-2-1", "3-4-1", "4-3-2", "4-5-1", "4-5-2", "6-1-2", "6-1-5", "6-2-3", "6-3-3" "8-5-1", "10-5-1", "10-5-2", "10-5-3", "10-5-4", "10-5-5"
Sales			12-3 Distribution of information through product catalog, website, etc.	12-3-1 Is the information on function of energy saving, resource saving etc. distributed to users?	Make a comparison with statutes (Energy Conservation Law top runner approach) and industry standard.
					For the information distribution on homepage and catalogue etc., make a comparison for improvement with existing material.
Recycle				12-3-2 Are the documents (processing manual etc.) on which the information relevant to promotion of recycling and environment conservation, ensuring safety at processing prepared or published for users, recycle shop or waste disposer?	Check whether the processing manual etc. in which following items are described are prepared or the information is released on homepage. Or compare the quality and volume of information with those of existing model. - Configuration of product - Names of main materials and how to remove them - Parts that contain specific substances of environmental concern - Used points of material, number of materials etc.
					For the specific product that uses specific chemical substances specified by statutes (Law for the Promotion of Effective Utilization of Resources), whether the specified marking is implemented.

Classification		Evaluation items		Evaluation standard	Evaluation method
Lifecycle process	Target				
Production	Manufacturing process	13 Reduction of environmental impacts in production phase	13-1 Waste materials, etc.	13-1-1 Are the statutes relevant to substances of environmental concern included with byproduct preserved?	Check whether the statutes relevant to byproduct (industrial discharge etc.) are preserved.
				13-1-2 Is the amount of emergence of byproduct reduced?	For the amount of emergence of byproduct, make a comparison with production process of existing / equivalent product or model.
				13-1-3 Is the byproduct properly processed or recycled?	For the proper processing and recycle of industrial discharge etc., make a comparison with production process of existing / equivalent product or model.
			13-2 Energy conservation	13-2-1 Are the statutes relevant to energy saving preserved?	Check whether the statutes relevant to energy saving is preserved.
				13-2-2 Is the energy consumed in production process reduced?	For the quantity consumed of electric power, fuel and other energy, make a comparison with production process of existing equivalent product or model.
General	General	14 LCA	14-1 Identification of environmental impacts of each life stage of products	14-1-1 Are the environmental impacts at the stage of material, production, transportation, use, disposal comprehended?	When the inventory date though product's lifecycle is not exhaustively complete. (1) Check whether the LCA that sees each phase partially can be implemented (2) Check whether the LCA that sees aspect of environment partially can be implemented
					When the inventory date though product's lifecycle is exhaustively complete. (3) Check whether the degree of incidence can be seen for each phase (4) Check whether the LCA can be implemented seeing various aspects of environment
			14-2 Consideration on methods to reduce environmental imacts for product life cycle	14-2-1 Is the method to reduce the environmental impacts through lifecycle of product considered?	When the inventory date though product's lifecycle is not exhaustively complete. (1) Environmental impacts reduction that sees each phase partially is also available (2) Environmental impacts reduction that sees aspect of environment partially is also available
					When the inventory date though product's lifecycle is exhaustively complete. (3) Check whether the environmental impacts can be reduced generally for each phase (4) Check whether the environmental impacts can be reduced seeing various aspects of environment

6. Design guideline for marking and labeling

This chapter is prepared as a design guideline for details on "Marking on Products and Labeling on Packing Materials" to consider and to be kept in mind during design. It will provide target persons (especially recyclers) with information on the products in the stages of sales, use and recycling processing in appropriate expressions (for the sake of clarity) and in an appropriate marking system (locations of marking) .

6-1. Identification coding system of plastic parts

Identification coding system for plastic parts for the purpose of using resources effectively is described below.

The information should be used as criteria for judgement in disassembling and separation of scraps for recycling without special analysis.

6-1-1. Identification coding of polymer, filling materials, plasticizers, flame retardants

(1) Marking symbols and abbreviated terms

Symbols and abbreviations specified in JIS (Japanese Industrial Standard or ISO) as shown below should be used.

○JIS K 6899-1 (ISO1043-1) …"Plastics - Symbols and abbreviated terms - Part 1: Basic polymers and their special characteristics"

○JIS K 6899-2 (ISO1043-2) …"Plastics - Symbols and abbreviated terms - Part 2: fillers and hardeners"

○JIS K 6899-3 (ISO1043-3) …"Plastics - Symbols and abbreviated terms - Part 3: plasticizers"

○JIS K 6899-4 (ISO1043-4) …"Plastics - Symbols and abbreviated terms - Part 4: flame retardants"

(2) Items to be marked

Plastic parts having a mass of 100 grams or more should be marked. It is desirable that marking should also be made on plastic parts with a mass of 25 grams or more and less than 100 grams. It is allowed to perform marking on plastic parts of 25 grams or less if possible. However, if marking is impossible despite changes of marking locations and sizes, marking does not have to be performed.

Notes: Marking sizes and locations may be changed in the following cases. However, marking should be as visible as possible.

(a) When the marking size or location would cause loss of function
(b) When there is not enough space
(c) When it would be difficult due to the way of manufacturing such as the opening and closing direction of the plastic molding die
(d) When it would not be suitable for the product design

(3) Marking method

Based on JIS K 6999 (ISO11469, put separation marks “>” and “<”on both sides of a mark to be placed using molding, inscription or embossing.

(4) Examples of marking size and location

Although JIS K 6999 (ISO11469) does not define marking sizes and locations, it is desirable to follow "(4) Marking size" and "(5) Marking location" of "6-1-2:" Identification Coding System of Recycled Plastic Materials which do not include flame retardant materials"

6-1-2. Identification coding system of recycled plastic materials which do not include flame retardant materials

Described below is Resin Identification Coding System for plastic parts to indicate "Flame retardants are not included" and "Use of plastic recycled materials and their ratios." The description below is excerpts from the draft of JIS standards " The marking for identification of plastic parts for electrical and electronic equipment" as of December, 2006. When it is established as JIS C 9912 in the future, marking shall be made in compliance with the standards.

(1) Definition of terms

1) Flame retardants

Flame retardants are materials that inhibit or resist the spread of fire remarkably.

The flame retardants mentioned here mean the substances in the list of flame retardants of JIS K 6899-4-5 (Flame retardant code number) (Refer to "Table 6-1-5 Flame retardant code") and those incorporated in prepolymer is included.

2) Preconsumer materials

Materials removed from waste disposed of during the manufacturing process. However, materials unsuitable for processing or polishing or scraps should be excluded because they can be reused in the same process.

3) Postconsumer materials

Materials generated from used equipment such as disposed products from households and equipment which can be no longer used for their intended purpose by commercial, industrial, and other facilities as endusers. This includes materials returned from the distribution channel.

4) Controlling resources recycling in-house

It means "equipment manufacturers themselves control resources recycling" and they are supposed to satisfy all the following requirements.

A) The equipment manufacturers should understand and grasp the following facts on products in which postconsumer materials and recycled parts were originally used, or products for which preconsumer materials were intended to be used.

a) Based on requirements of the product, demand characteristics (strength, durability, material grade, material composition) of materials and parts of the product should be understood.

b) Degradation degrees of material composition, part characteristics and quality of materials and parts which were used or were intended to be used for the product should be grasped.

B) When designing equipment in which postconsumer materials, recycled parts or preconsumer materials are intended to be used, the equipment manufacturers should keep in mind that parts and materials are repeatedly recycled and reused to request their vendors for specifications of parts and materials and make decisions on them. They should give the drawings specific item numbers of materials to be recycled and/or of parts to be reused to indicate their use based on the purchase specifications.

“Controlling resources recycling in-house” means that conditions of the figure 6-1-2-1 a)-1)**,** 2) and b) are satisfied.

5) Resources recycling

At the time of designing equipment, the equipment manufacturers should consider that resources should be recycled two rounds or more.

6) Recycled plastic materials (Refer to the figures 6-1-2-2.)

Plastic materials which are worked into parts from precomsumer materials or postconsumer materials and incorporated into equipment

7) Recycled plastic materials whose resources recycling is controlled in-house

Of recycled plastic materials, those which comply with the definition that manuracturers themselves control resources recycling in-house.

8) Closed recycled materials (Refer to Figures 6-1-2-2.)

Of the recycled plastic materials whose resources recycling is controlled in-house, postconsumer materials removed from used electric and electronic equipment in recycling plants involved in organizations which have jurisdiction over electric and electronic equipment fields.

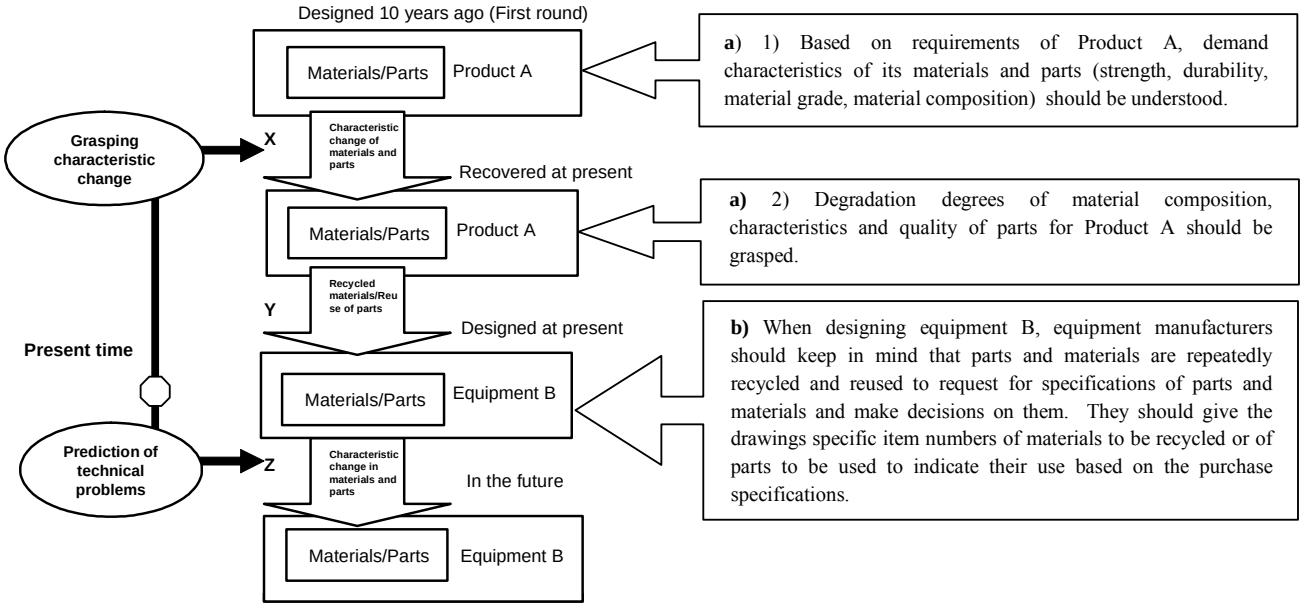


Figure 6-1-2-1. Resources recycling is controlled in-house

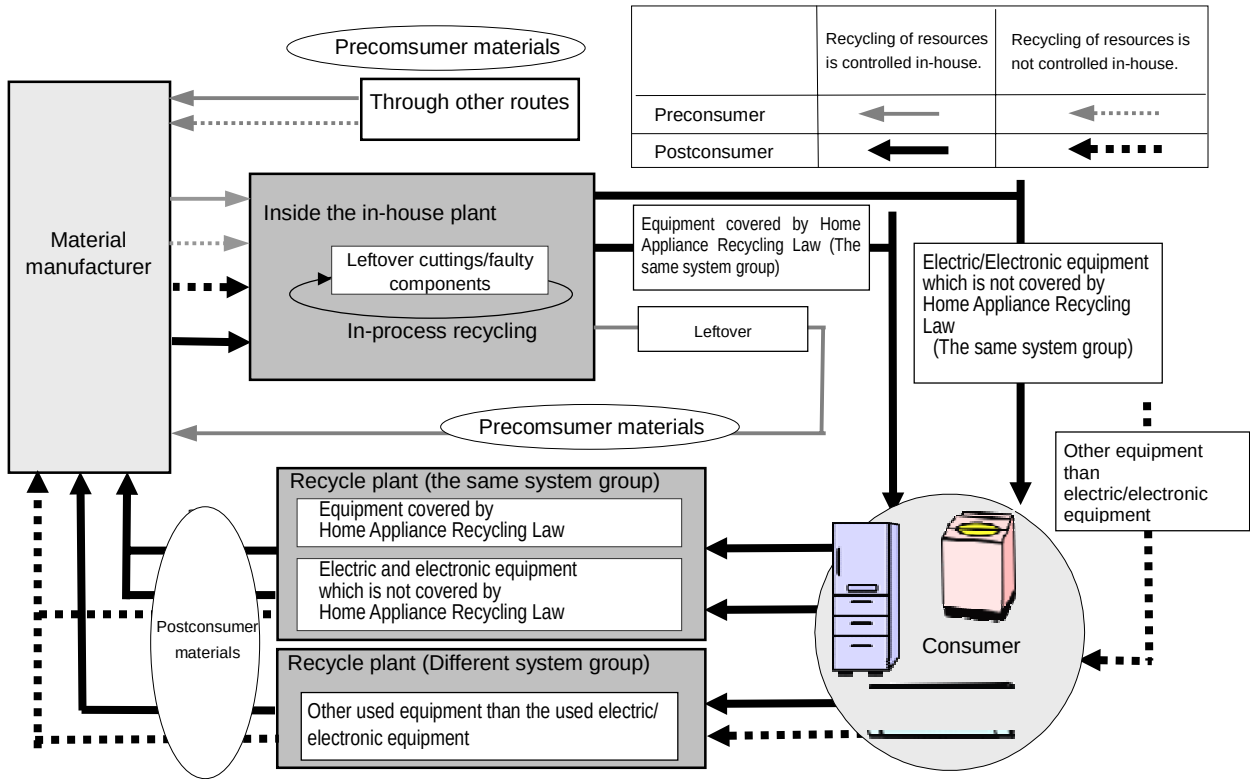


Figure 6-1-2-2. Routing of recycled materials and recycled parts

(2) The marking symbol to indicate that flame retardant is not contained.

1) Distinguish method

When recycling collected plastic parts, in order to make it easy to separate them into "plastics containing flame retardants" and plastics containing no flame retardant", "FR0" with "0" placed after the FR (Flame Retardant) meaning no flame retardant is marked.

Containing no flame retardant shall mean that the percentage of flame retardant is 0.1% (mass fraction) or less. However, even if the percentage of flame retardant is 0.1 % or less (mass fraction), when flame retardant is added to the part or material intentionally, "FR0" is not marked.

2) Items to be marked

Marking should be performed on plastic parts with a mass of 100 grams which are used in electric and electronic parts and contain no flame retardants. It is desirable to perform marking on plastic parts of 25 grams or more and less than 100 grams. It is desirable to perform marking on plastic parts of less than 25 grams if possible. However, when it is not possible to perform marking even if marking locations and sizes are changed, it is not necessary. The following a) - d) give examples of cases where marking is difficult.

a) When Marking would cause loss of function
b) When there is not enough space
c) When it would be difficult due to a way of manufacturing such as the opening and closing direction of the plastic molding die.
d) When it would not be suitable for the product design

Example 1 An example for marking: Plastic parts which are used in electric or electronic parts and do not contain flame retardants because of other flame prevention measures such as using a metallic cover to cut off out - side air.

Example 2 An example where marking is not necessary: Plastic parts which do not need to contain flame retardants as they are located away from electric or electronic parts: vegetable case in a refregirator

3) Marking Method

In addition to 5.1.1 (Marking on Products) of JIS K 6999, (Refer to "6-1-1" (3) Marking Method), "FR0" should be marked on the right of the separation mark "<" with one letter space after "<". Marking should be performed by molding on to the product by a mold engraved with the symbol, polymer embossing and the melt - in process and the marking should be performed in the way it may be as visible as possible and should not disappear easily.

Example: When a materil is acrylonitrile - butadiene - styrene and does not contain flame retardants.

>ABS< FR0

(3) Use of recycled plastic materials and marking symbols which indicate the ratio of their use

1) Distinguish method

A) Symbols to indicate content of recycled plastic materials

"R" is used when recycled plastic materials are contained. "DR" is used when only recycled plastic materials controlled in-house are contained. Of them, "CR" is marked when only closed recycled materials are included. (Refer to Figure 6-1-2-3.)

Note: DR is an abbreviation for "Material Design for Recycling" meaning in-house control of resources recycling.
CR is an abbreviation for "Closed-loop Recycling" meaning closed recycling.

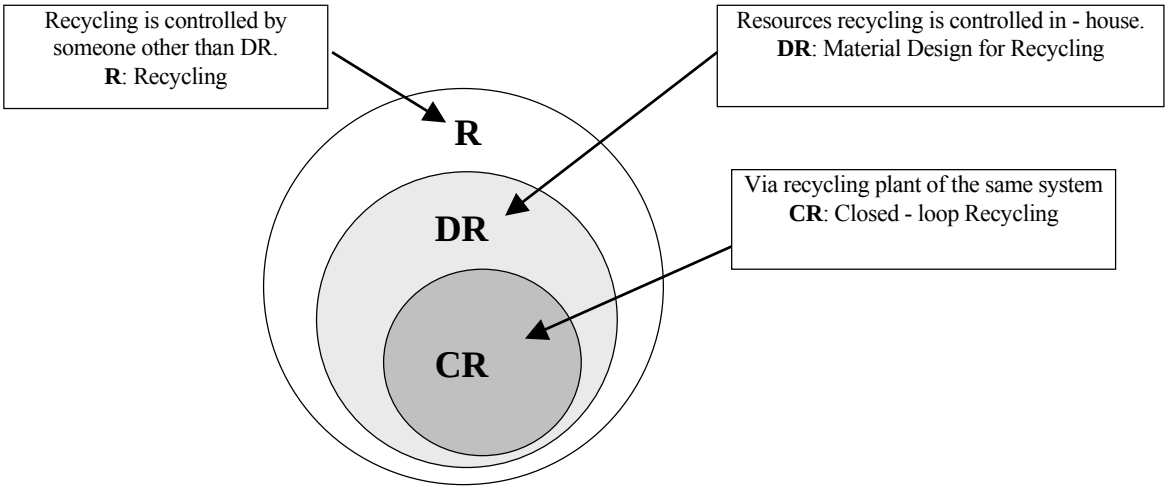


Figure 6-1-2-3. Inclusive relation of marks of recycled plastic materials (R／DR／CR)

B) Marking of content of recycled plastic materials

Please refer to the following formula for calculating mass fraction (%) of content.

$$P = \frac{m_r}{m} \times 100$$

By substitution of the following values

- P : Rate of recycled plastic material content whose mass fraction is marked (%)
- m_r: Mass of recycled plastic material (g)
- m : Mass of plastic parts containing recycled plastic materials (g)

a) When percentage of content of recycled plastic materials is marked: If it can be fixed within (Rate of content ±10) % (Mass fraction), the rate of content itself should be marked using the mass fraction.

b) When marking the range of content rate of recycled plastic materials: If it cannot be fixed within (Rate of content ±10) % (Mass fraction), the range of the rate should be marked with " - " between the beginning value and the end value.

c) When content rate of recycled plastic materials cannot be marked: When it cannot be marked using rate of content or the range, just "R", "DR" or "CR" should be marked.

2) Items to be marked

Marking should be performed on plastic parts with a mass of 100 grams or more. It is desirable to perform marking also on plastic parts of 25 grams or more and less than 100 grams. It is desirable to perform marking on plastic parts of less than 25 grams if possible. However, when it is not possible to perform marking even if marking locations and sizes are changed, it is not necessary. The following a) - d) give examples where marking is difficult.

a) When Marking would cause loss of function

b) When there is not enough space

c) When it would be difficult due to the way of manufacturing such as the opening and closing direction of the plastic molding die.

d) When it would not be suitable for the product design

3) Marking Method

In addition to 5.1.1 (Marking on Products) of JIS K 6999, "Marking of recycled materials" and "Rate of content" or "Range of content rate" should be marked on the right of the separation mark "<" with one letter space after "<" in succession. Marking should be performed by molding on to the product by a mold engraved with the symbol, polymer embossing and the melt-in process and the marking should be performed in the way it may be as visible as possible and should not disappear easily. Please refer to JIS K6899-1 for abbreviations for materials.

Example 1: When the product material is polypropylene and it contains recycled plastic materials whose rate of content is within (rate of contents ±10)%, and its rate of content is marked;

>PP< R50 [Rate of content of recycled plastic materials 40 - 60% (Mass fraction)]

>PP< CR30 [Rate of content of only the recycled plastic materials from closed recycling 20 - 40% (Mass fraction)]

Example 2: When the product material is polypropylene and the rate of content of recycled plastic materials cannot be fixed within (rate of content ±10) %, but the range will be marked;

>PP< CR0-30 [Range of rate of content of recycled plastic materials only from closed recycling 0 - 30% (Mass fraction)]

Example 3: When the product material is polypropylene and the rate of content of recycled plastic materials or the range of the rate can not be marked;

>PP< R [Containing recycled plastic materials]

>PP< CR [Containing recycled materials only from closed recycling]

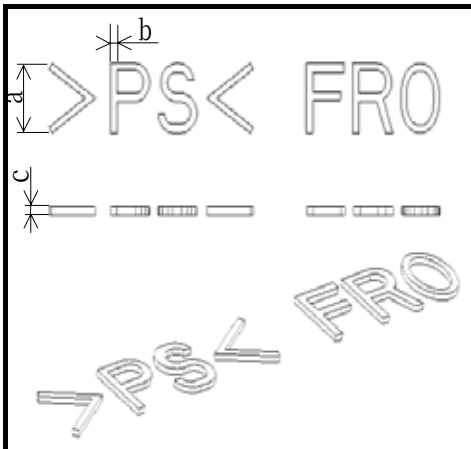
Example 4: When the product material is polypropylene and both the flame retardant and rate of content of the recycled plastic materials will be marked side by side;

>PP< FR0 R50 [No flame retardant is contained; rate of content of the recycled plastic material: 40 - 60% (Mass fraction)]

(4) Marking size

Please refer to the table 6 - 1 - 2.

Table 6-1-2. Marking size Unit/mm



Example of marking: An example of molding when the product material is polystylene and does not any contain flame retardants.

Parts weight:	25 to 99 grams	100 grams and up
a: Text height	4.2 (12 points) or more	10.5 (30 points) or more
b: Text thickness	0.5 or more	0.8 or more
c: Separation from text portion	0.3 or more	0.3 or more

Note 1 The size of printing type is usually measured in points, which is a unit to indicate the size.
1 point = 0.3514mm (Refer to JIS Z 8305.)

Note 2 It should be as large and as visible as possible. Larger symbols for larger parts are preferred.

Note 3 Nothing is specified for items of less than 25 grams.

Note [1)] When marking (2) 2) and (3) 2) fits into the case of the difficult marking, sizes may be changed.

[2)] c indicates separation from text portion in the case of marking by molding.

(5) Marking location

Following 1) - 5) below, marking should be performed on as visible locations as possible when disassembling products manually and separating materials. Visible locations are for example a front face of a product and a convexed area of the uneven surface. Marking should not be performed on invisible locations.

1) To be shown in locations not hidden by stickers, etc.

2) Priority should be given to the right rather than the left side for plastic parts.

3) Priority should be given to the back rather than the front for plastic parts.

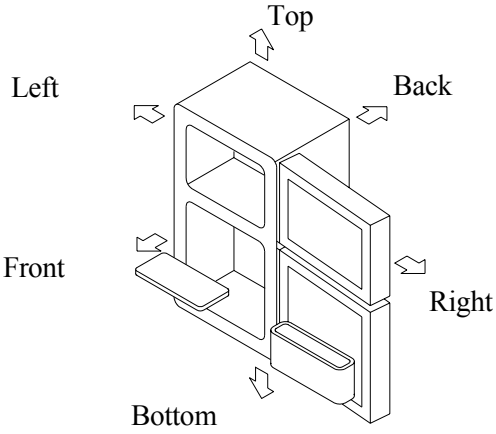
4) Priority should be given to the bottom rather than the top for plastic parts.

5) For container - shaped plastic products, symbols should be placed on the outside, whenever possible.

The names of symbol locations are shown in the picture below.

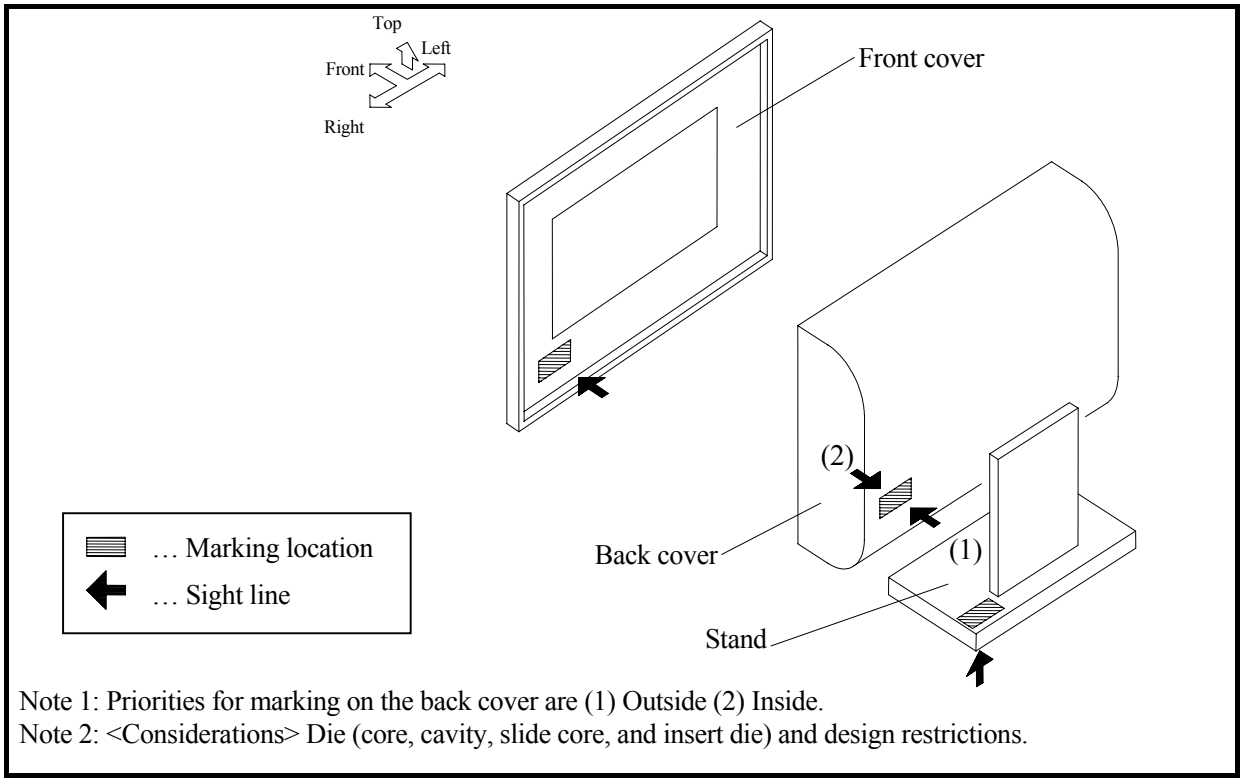
a) The names of symbol location names are: “Left/Right", “Front/Back", “Top/Bottom".

b) For products with doors like regrigerators, the basic positions for parts such as door pockets, which are removed with the door open, are given with the door open. However, for the door itself or parts that are removed from the outside of the door, the basic positions are given with the door closed.



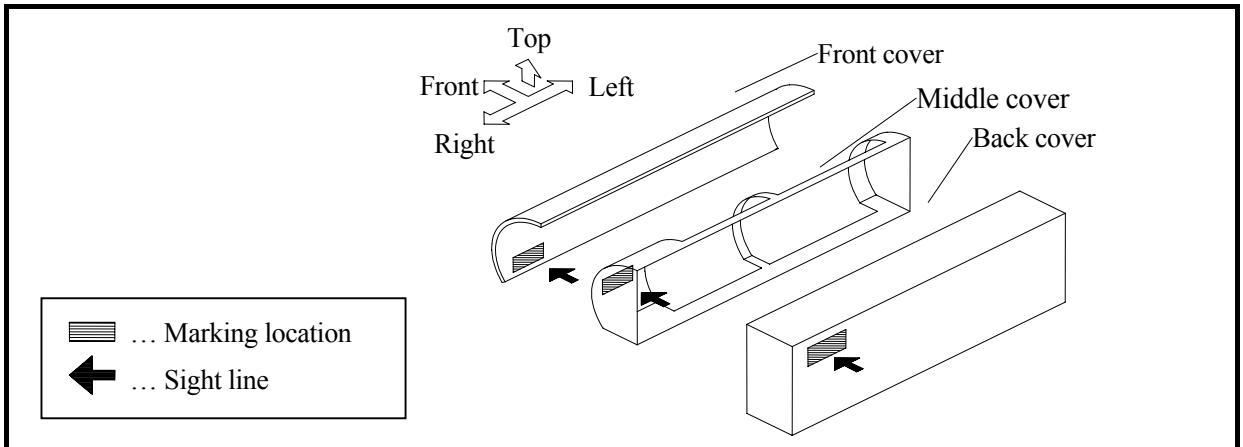
(6) Examples of marking locations

1) TV example



Note 1: Priorities for marking on the back cover are (1) Outside (2) Inside.
Note 2: <Considerations> Die (core, cavity, slide core, and insert die) and design restrictions.

2) Air conditioner example



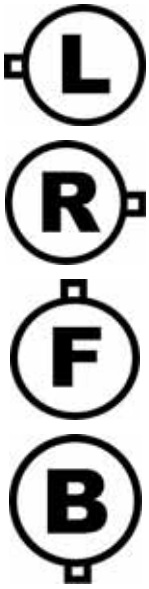
Note: Marking should be performed considering as follows: design restrictions on the front cover; part shape (location of the opening) and design restrictions on the middle cover; restrictions on parts to be installed and affixed items on the back cover.

6-2. Recycling symbols for ease of manual disassembling and separating operations

A written questionnaire survey was conducted among 16 home appliance recycling plants (some plants surveyed by on-the-spot surveys) concerning effective or necessary marking and symbols for increasing the efficiency of manual disassembling and separating operations. Then the "Working Group for Electric Home Appliance Recycling Symbol Standardization" further examined the types of marking that received the higher request rates.

As a result, the working group recommended the following new marking as recycling symbols for ease of manual disassembling and separating operations. This content is scheduled to be standardized under JIS.

(1) Recycling symbol types and details

No.	Symbol	Meaning	Objective	Target parts and symbol location
1		Metal has been inserted into the plastic parts	To provide information on metal inserts at the time of plastic parts separation for recycling	To be placed near the material symbol on plastic parts of at least 100 grams 【Marking example】 ＞PP＜ 
2		Hole puncture location	To provide information on locations for puncturing a hole to let out the saltwater from the balancer of a spin tub in a washing machine	Indicates the recommended positions (two locations, in opposite corners) for puncturing a hole to let out the saltwater from the balancer in a spin tub of a washing machine. Structural features should also be added to facilitate the puncturing of holes and draining of saltwater from the balancer.
3		Symbols to show the direction of the compressor's refrigerant enclosing pipe	To provide information on the direction a refrigerator should be laid down in order to collect the refrigerant and oil from the compressor. To provide information before removing the mechanical compartment cover on the back of the refrigerator, on which way to lay down the refrigerator in order to collect the refrigerant and oil efficiently from the compressor's refrigerant enclosing pipe	The corresponding symbols indicate the direction of the compressor's refrigerant enclosing pipe (L=left, R=right, F=refrigerator front, B=refrigerator back), when looking down on the compressor standing behind the refrigerator. The marking should be located on the back of the refrigerator, or on the mechanical compartment cover at the back of the refrigerator. Marking is not necessary for refrigerators that do not have back mechanical compartment covers.

(2) Marking method

The basic marking method is to engrave the symbol into the die and mold the parts. However, if it is difficult to produce the marking through molding due to the location of the marking concerned or the material involved, marking may also be made by engraving, embossing, printing, or labeling. The symbols should be made as large and visible as possible, and also should be over 10mm in height, over 0.5mm in thickness, have over 0.3mm spacing from the text.

6-3. The marking for presence of the specific chemical substances for electrical and electronic equipment

Due to the amendment of the standards of judgment of "Specified Reuse-Promoted Products" on "Law for the Promotion of Effective Utilization of Resources", when using more than reference percentage content of specified target chemical substances (6 substances including Lead, Mercury, Cadmium, Hexavalent chromium, PBB, PBDE) in target products (7 items including television sets, refrigerators, washing machines, unit-type air conditioners, microwave ovens, clothes driers, and personal computers), the "content mark" is required on equipments, equipment packaging boxes, and catalogs, based on "Marking for presence of the specific chemical substances for electrical and electronic equipment"(J-Moss) of JIS C 0950:2005, and the information of applied substances and contained parts must be published on manufacturers' websites.

Moreover, according to the same JIS, when the content amount of specified target substances is less than the reference percentage content, or when applicable to "matters exempted from content marking", optional "green mark" is appearing on "Annex D (informative)". When the content applies to "matters exempted from content marking", it is required to provide this information on their company's website.

(1) Explanation on "content mark" and "green mark"

Specified target chemical substances and their reference percentage content required by "Marking for presence of the specific chemical substances for electrical and electronic equipment" of JIS C 0950:2005 are presented in Table 6-3-1, and the outline of "content mark" and "green mark" in Table 6-3-2.

As the green mark is not a mark which is designated under the law, the Japan Electronics and Information Technology Industries Association (JEITA) has made a trademark registration (registration No. 4972757) due to clarify its foundation. The logo of the content mark can be downloaded from the websites of Japanese Industrial Standards Committee (JISC) and JEITA.

Table 6-3-1. Specific chemical substances and reference percentage content

Specific chemical substances	Chemical substance symbol	Substances to be calculated	Reference percentage content wt%
Lead and lead compounds	Pb	Lead	0.1
Mercury and mercury compounds	Hg	Mercury	0.1
Cadmium and cadmium compounds	Cd	Cadmium	0.01
Hexavalent chromium compounds	Cr(VI)	Hexavalent chromium	0.1
Polybromobiphenyls	PBB	Polybromobiphenyls	0.1
Polybromodiphenyl ether	PBDE	Polybromodiphenyl ether	0.1

Table 6-3-2. Outline of "Content mark" and "Green mark"

Item	Content mark (Orange mark)	Green mark (Marking for absence of specific chemical substances)	
Logo mark			
Meaning	- The percent content of the specific chemical substance to be calculated is exceeding the reference percentage content.	- The percentage content of all the substances to be calculated is not exceeding the reference percentage content. Or some of the substances to be calculated fall into the category of the exception of content marking and percent content of the other substances are not exceeding the reference percentage content.	
Marking location	- Marking should be made on equipment body (every pieces of equipment body, if there are more than one), catalog, instruction manual and your own website. - The marking shall be located on a position when description of equipment type or the like can be confirmed at the same time.	- Not specifically sitipulated.	Refer to (3) for marking examples of equipment body recommended by this committee.
Size	- The size of marking shall be adjusted appropriately according to sizes of objects to be marked so that it may be accurately confirmed. - Width should be 15 mm or more.	- The size of the marking shall be adjusted appropriately according to sizes of objects to be marked so that it may be accurately confirmed.	
Color	- The color of the mark shall be yellow-red (representative color code is 2.5YR 5.5/13) specified in the table 1 of JIS Z 8102 and care shall be taken for distinction from the background color. - If it is impossible to use the specified color due to limit on printing or the like, an easily distinguishable color (complementary color of background or the like) may be used other than green system.	- The color of the mark shall be green (representative color code is 2.5G 6.5/10) specified in the table 1 of JIS Z 8102 and care shall be taken for distinction from the background color. - If it is impossible to use the specified color due to limit on printing or the like, an easily distinguishable color (complementary color of background or the like) may be used other than yellow red system.	
Marking on the catalogues, etc and the instruction manual	- In marking on catalogue and the like, names of contained chemical substances should be marked as a part of the mark at the bottom (or on the right). The height of chemical substance symbol shall be not less than 1/6 of the mark height using chemical symbols.  - Markng URL providing information on contents of specific chemical substances	- Marking can be performed freely.	
Marking on website	1) The content conditions in coarse classification by unit (cabinet, mounting substrate, etc) or the like shall be described for each chemical substance symbol. 2) The situation of contents of chemical substances shall be described according to the followings. a. When the percentage content of the substance is exceeding the reference percentage content, "numerical value of percentage content (wt %)", "exceeding 0.1wt%" or "exceeding 0.01wt%" shall be described. b. When the situation falls under the category of the exempted items specified in JIS C 0950, "exempted item" should be marked. c. Standard number: JIS C 0950 3) When percentage content of the substance is not exceeding the reference percentage content, "○" or "Below the reference percentage content" can be marked. 4) When use website is impossible, use other media such as FAX and CD-ROM to provide information.	- When the situation corresponds to the exemption, follow the items 1) and 2) on the left and "exempted item" shall be entered.	
	(2) is an example of information given on website.		

(2) Examples of offering information on website

Example 1. Example of marking content conditions when the substances to be calculated have a value exceeding the respective percentage contents

Equipment name: Television receiver Type designation: ○○-AAA

Coarse classification	Chemical substance symbol					
	Pb	Hg	Cd	Cr(VI)	PBB	PBDE
Mounting substrate	Exceeding 0.1 wt%	○	○	○	○	○
Cabinet	○	○	Exceeding 0.01 wt%	○	○	Exceeding 0.1 wt%
Cathode-ray tube	Exemption	○	○	○	○	○
speaker	○	○	○	Exceeding 0.1 wt%	○	○

NOTE 1 "Exceeding 0.1wt%" and "Exceeding 0.01wt%" indicate that the percentage content of the substance to be calculated is exceeding the reference percentage content.

NOTE 2 The "○" indicates that the percentage content of the substance to be calculated is not exceeding the reference percentage content.

NOTE 3 The "exemption" indicates that the substance to be calculated corresponds the exemption from content marks

JIS C 0950

Example 2. Example of marking on table for such case that some substances to be calculated correspond to exemption from content mark and percent contents of other substances to be calculated are not exceeding the respective reference percentage contents.

Equipment name: Television receiver Type designation: ○○-BBB

Coarse classification	Chemical substance symbol					
	Pb	Hg	Cd	Cr(VI)	PBB	PBDE
Mounting substrate	○	○	○	○	○	○
Cabinet	○	○	○	○	○	○
Cathode-ray tube	Exemption	○	○	○	○	○
speaker	○	○	○	○	○	○

NOTE 1 The "○" indicates that the percentage content of the substance to be calculated is not exceeding the reference percentage content.

NOTE 2 The "exemption" indicates that the substance to be calculated corresponds the exemption from content marks

JIS C 0950

Example 3. Example of such case that some of substances to be calculated correspond to exemption from content mark and that percentage contents of other substances to be calculated are not exceeding the relevant reference percentage contents; is marked by writings

Equipment name: Television receiver Type designation: ○○-BBB

Only Pb included in cathode-ray tube corresponds to exemption from content mark (**JIS C 0950**)

(3) Example of the marking of green mark on equipments (face plate)

Following is the example of recommended marking of the green mark on the equipment (face plate) for the purpose of providing information on recycle to recyclers (home appliance recycling plants).

[Marking parts] (1 to 3 in order of priority)

1. Towards the right or lower part of the marking of equipment model (face plate*)
2. Optional part on face plate
3. Near the face plate on equipment body

・However, in case of refrigerators, it is recommended to have labels with environmental information (face plate with types of cooling or insulating blowing gas sealed in the back of the equipment body) also.

・As for air conditioners, it is recommended to put labels on both indoor and outdoor units.

・As for other products, it is recommended to put a label on each unit when the products are composed by several units and each unit has a face plate.

* Represents various types of labels such as product quality label plate which describes technology or quality of equipments, or specification and information on environment, etc.,

[Marking methods] (Any of the following method should have specification will not easily allow the printing to disappear until disposal stage)

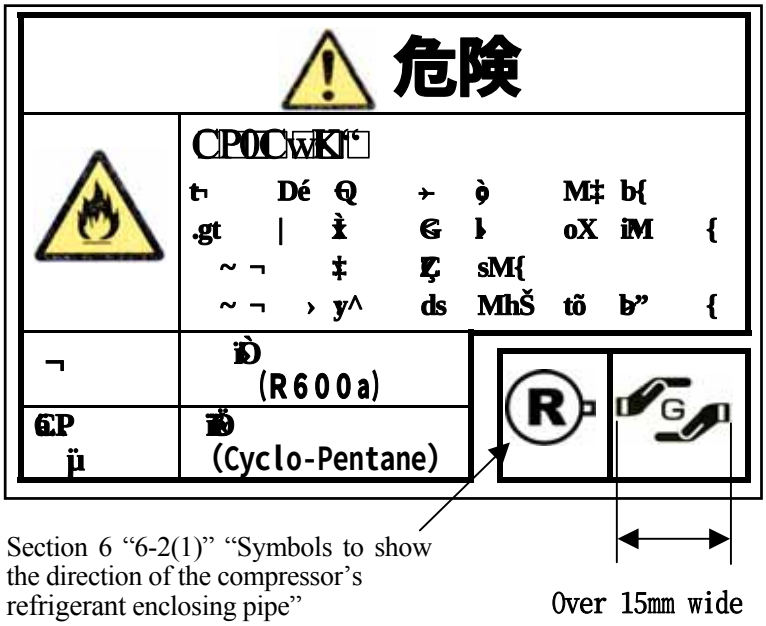
1. Print 2. Mold 3. Label, etc.

[Marking dimensions]

The size of symbols should be large enough to be confirmed precisely depending on the size of the target item.
Over 15mm wide (same as JIS C 0950 "content marking") is recommended.
However, the size should be large enough to be visually observed accurately in case of molding.

[Example of marking]

Example 1. Example of marking on the face plate of outdoor unit of air conditioner
(It is recommended to mark the face place on indoor unit also.)

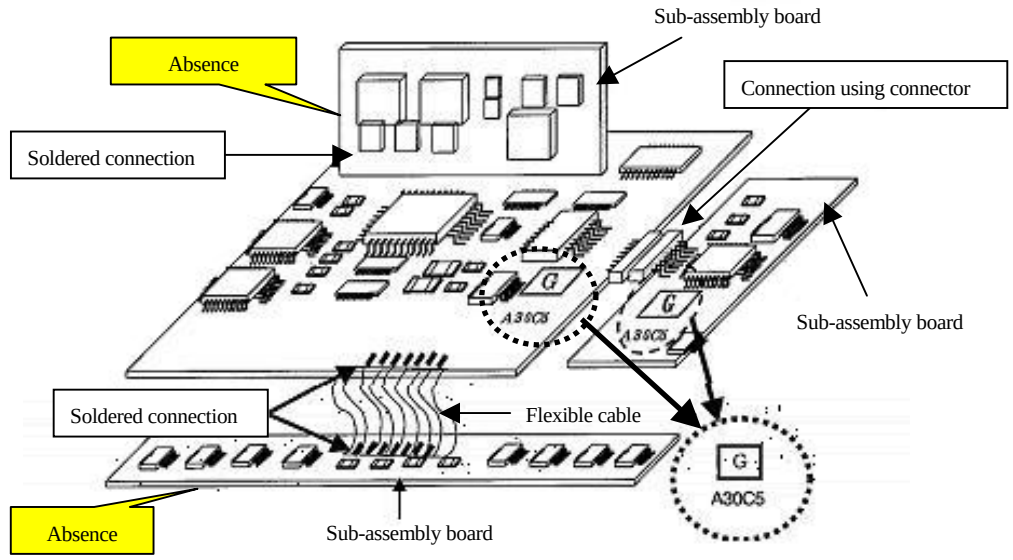


Example 2. Example of marking on the face plate on the back of refrigerator

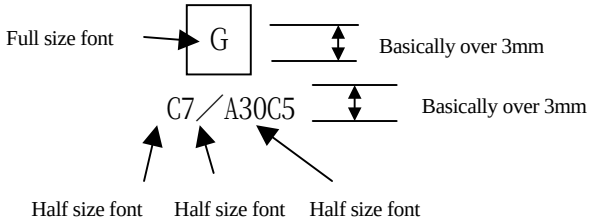
6-4. Presence and absence of the specific chemical substances in mounted boards

Japan Electronics and Information Technology Industries Association(JEITA) issued JEITA standard ET-7001, "The marking for presence and non-presence of the specific chemical substances in materials, components and mounted boards use in electrical and electronic equipment" in July 2005

This standard is for "the marking for presence and non-presence of specific chemical substances" targeting "materials", "components", and "mounted boards" as stated in the title but it has been summarized into "the AEHA guideline for presence and absence of the specific chemical substances in mounted boards" in order to be applied effectively at home appliance recycling plants, etc., and also for further unification of marking method on mounted boards. Following is the summary.



- Marking shall be on the mounted board with a size larger than $10cm^2$
- Marking shall be made on the representative main board when the mounted boards are soldered to one block.
- Marking shall be made on each board for the boards that are connected using connectors.
- Marking method (in order or priority): (1)Silk printing (2)Labeling (3)Stamping/imprinting
- Color: basically single color
- The designation of solder shall be in order of the applied amount.



- Solder designation shall be used as stated in the standard of IEC 61190-1-3.
- The marking (the marking for presence and non-presence of the specific chemical substances, exemption) of the above G mark is based on JIS C 0950 "The marking for presence of the specific chemical substances for electrical and electronic equipment".

Figure 6-4-1. The AEHA guideline for presence and absence of the specific chemical substances in mounted boards

Table 6-4. Comparison of presence and absence of the specific chemical substances in mounted boards

<table>
<tr><th colspan="2">Classification</th><th>AEHA's guideline</th><th>JEITA standard ET-7001</th></tr>
<tr><td rowspan="5">Requirement for marking</td><td>Marking method</td><td>[Order of priority]
(1) Silk printing
(2) Labeling
(3) Stamping/imprinting</td><td>Methods such as printing, stamping, molding, and engraving(emboss), etc., that should not allow the printing to disappear until disposal stage.</td></tr>
<tr><td>Marking size</td><td>Height of fonts: basically over 3mm</td><td>Presumption is that the marking should be easily recognized visibly or by corrective vision but the size is arbitrary.</td></tr>
<tr><td>Exempt category</td><td>Based on Annex B of JIS C 0950</td><td>Based on exempt category stated in ET-7001※</td></tr>
<tr><td>Marking color</td><td colspan="2">Basically a single color</td></tr>
<tr><td>Marking font</td><td colspan="2">Any fonts and arrangements are accepted but consider the available space and maintain some grouping consistency</td></tr>
<tr><td rowspan="3">Marking contents of the specific chemical substances</td><td>Example of marking of presence of the specific chemical substances</td><td>Pb</td><td>Pb or [[Pb]]</td></tr>
<tr><td>Example of multiple marking examples of the specific chemical substances</td><td>Pb, Hg or Pb
Hg</td><td>Pb, Hg or Pb
Hg
or [[Pb、Hg]]</td></tr>
<tr><td>Case of absence of the specific chemical substances</td><td>G</td><td>G or [[G]]</td></tr>
<tr><td rowspan="3">Marking for solder materials</td><td rowspan="3">Marking of designation of solder
(Solder designation: IEC 61190-1-3)</td><td colspan="2"><table><tr><td>Type of solder</td><td>Marking</td></tr><tr><td>Sn96.5Ag3Cu0.5</td><td>A30C5</td></tr><tr><td>Sn89Zn8Bi3</td><td>Z80B30</td></tr></table></td><td colspan="2"><table><tr><td>Type of solder</td><td>Marking</td></tr><tr><td>Sn96.5Ag3Cu0.5</td><td>A30C5 or Sn96.5Ag3Cu0.5</td></tr><tr><td>Sn89Zn8Bi3</td><td>Z80B30 or Sn89Zn8Bi3</td></tr></table></td></tr>
<tr><td>Multiple marking</td><td>If two or more solders are used in different soldering processes, it is recommended to mark all solders in use, in the order of more amount used to less amount.
Each marking should be separated with "／", "／" for full size fonts, and others in half size fonts.

[Marking example]
A30C5／A30B30C7／C7
(bottom flow) (top refflow) (point dip)</td><td>If two for more solders are used in different soldering process, it is recommended to mark all solder in use. And it should be in order from more amount used to less amount used. Each marking should be separated with "/" or",".

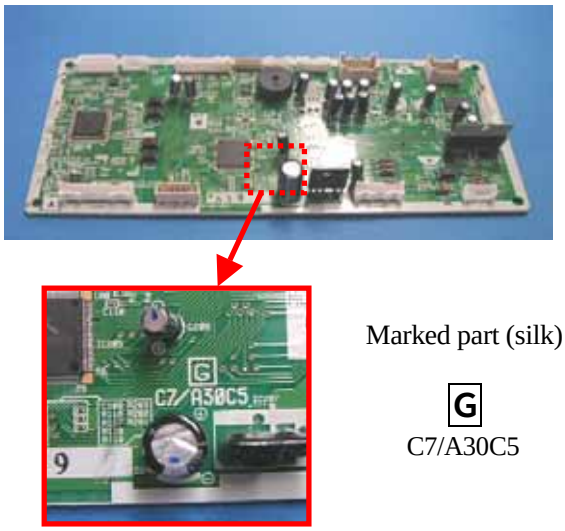
[Marking example]
A30C5/Z80B30/C7
top reflow bottom reflow bottom flow

or A30C5, Z80B30, C7
top reflow bottom reflow bottom flow</td></tr>
<tr><td colspan="2">Exampled of combined marking</td><td>G
A30C5</td><td>G or [[G]]
A30C5 A30C5</td></tr>
<tr><td colspan="2">Marking unit</td><td colspan="2">Applies to mounted board with a size larger than10cm$^{2.}$ Marking does not apply to boards smaller than this</td></tr>
<tr><td colspan="2">Marking location</td><td colspan="2">Arbitrary place available on the board.</td></tr>
</table>

Marking of multiple mounted boards/solders	a) In the case of multiple mounted board 1)Marking shall be made on the representative main board when the boards are soldered to one block. 2)Marking shall be made on each board the boards are connected using connectors. b)In the case different types of solders are used It is recommended to mark all solders in use when it is necessary to mark the solder designation. c)In case it cannot be confirmed from the top Marking shall be made on arbitrary position each board where it can be confirmed.

※Exempted categories of JEITA ET-7001 were limited to exempted categories of RoHS directive prioritizing the proposals to IEC TC91. ET-7001 is scheduled to be modified upon the international acceptance of the exempted categories of JIS C 0950.

Marking example 1



[Specification of mounted board]

- Presence and absence of the specific chemical substances
- Board size 190cm^2
- Top reflow Sn-3Ag-0.5Cu
- Bottom flow Sn-0.7Cu

Marked part (silk)

G

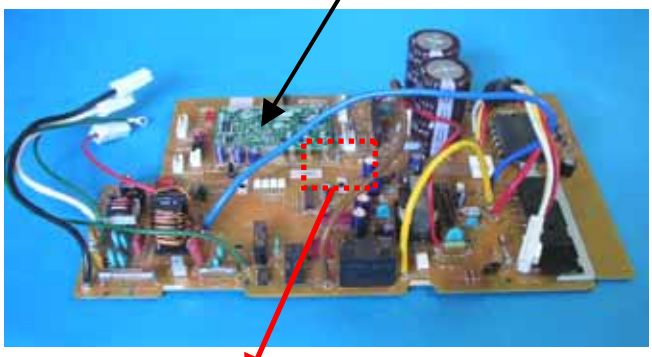
C7/A30C5

- Use of more than 2 types of solders
- There is more solder on top flow than solder on top reflow

  Mark → C7/A30C5

Marking example 2

Sub-assembly board



[Specification of mounted board]

- Presence and absence of the specific chemical substances
- Board size 600cm^2
- Main assembly board: bottom flow Sn-0.7Cu
- Sub-assembly board with reed:: hand solder Sn-0.7Cu
- Sub-assembly board: both sides reflow

  Sn-3Ag-0.5Cu／Sn-3Ag-0.5Cu

Marked part (silk)

G

C7／A30C5

- Sub-assembly board is solder connected

  → No marking on sub-assembly board
- Sub-assembly board differs to main assembly board solder is used

  → Mark solder designation on main assembly board together

Example of absence

[Specification of mounted board]

- Presence and absence of the specific chemical substances
- Board size: 5.4cm^2
- Top flow Sn-0.7Cu

Board size under 10cm^2

→ No marking

Figure 6-4-1. Example of presence and absence of the specific chemical substances in mounted board

6-5. Labeling of equipment in which compact rechargeable battery is used

In the old Law for the Promotion of Utilization of Recycled Resources, for the compact rechargeable battery, the target of first type designated product (product for which recycle conscious design and production are required) is only the equipment in which nickel cadmium battery is used, and the second type designated product (product for which labeling for separate collection is required) was only nickel cadmium battery.

Since April 2001, the content of "Law for the Promotion of Utilization of Recycled Resources" was widely revised, and the name was changed to "Law for the Promotion of Effective Utilization of Resources", and it was enforced, and the equipment in which four types of compact rechargeable battery; nickel hydride battery, lithium-ion battery, small control valve type lead storage battery were specified in addition to nickel cadmium battery as specified reuse promotion product (product for which reuse and recycle friendliness design and production are required), and four types of compact rechargeable battery were also specified to specified labeling product (product for which labeling for separate collection is required).

In addition, the four types of compact rechargeable battery and the equipment in which compact rechargeable battery is used are also specified to

6-5-2. Labeled items

The labeled items are (1) to (3) below.

(1) That the compact rechargeable battery is used for equipment

(2) The configuration of equipment in which compact rechargeable battery is used and how to remove the compact rechargeable battery

(3) Information for promoting use of recycled resources

Note 1) Article 2 of ministerial ordinance No. 93 of METI (2001) (partial revision of the 1994 ministerial ordinance No. 34 of MITI) reads that

"The entrepreneur has to display or describe the information that the relevant equipment uses the sealed type storage battery and other item relevant to promotion of use of sealed type storage battery as a recycled resource on power supply unit, its included instruction manual and other items to contribute to the promotion of use of sealed type storage battery that is used for power supply unit etc. as a recycled resource."

And article 6 reads that

"The entrepreneur has to distribute the information such as configuration of power supply unit and a method to remove the used sealed type storage battery to contribute to the promotion of use of sealed type storage battery that is used for power supply unit etc. as a recycled resource.

Note 2) In the ministerial ordinance No. 1 of MHLW and METI (2001) (partial revision of the 1994 ministerial ordinance No. 1 of MOH and MITI), there is similar description as article 2 and article 6 (Note 1).

6-5-3. Target of labeling and content of labeling

The items to be labeled and content of labeling are shown in Table 6-5-2. And the recycle mark of battery frame that recommends labeling and recycle mark are shown in Figure 6-5-1 and Figure 6-5-2, respectively.

Table 6-5-2． Target and content of labeling of equipments using compact rechargeable battery

Target item / Labeled item	Equipment main unit	Instruction	Other accessories (packaging material etc.)
1) That the compact rechargeable battery is used for equipment	◎	◎	◎
2) The configuration of equipment in which compact rechargeable battery is used and how to remove the compact rechargeable battery	×	◎	△
3) Information for promoting use of recycled resources	△	◎	△

◎: Item demanded by statutes, △: Recommended item, ×: Not necessary

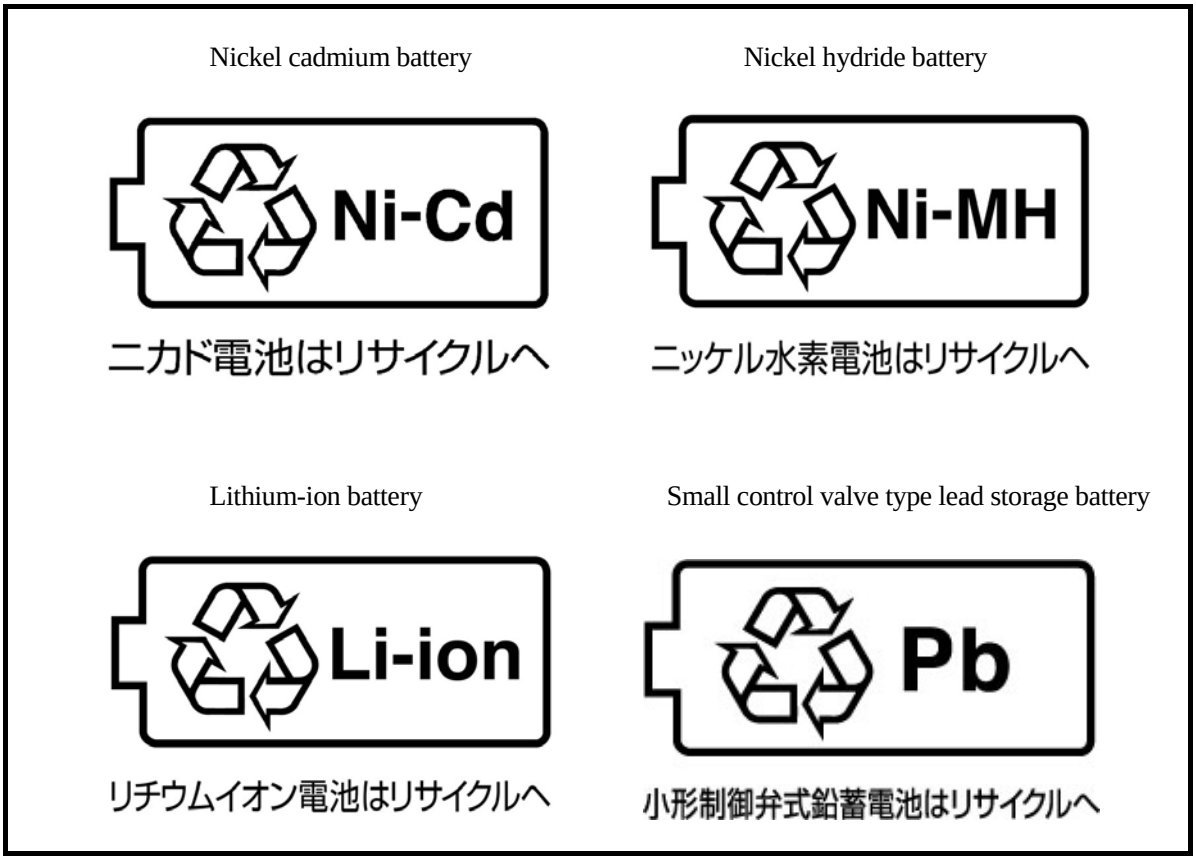


Figure 6-5-1. Mark of battery frame (example)

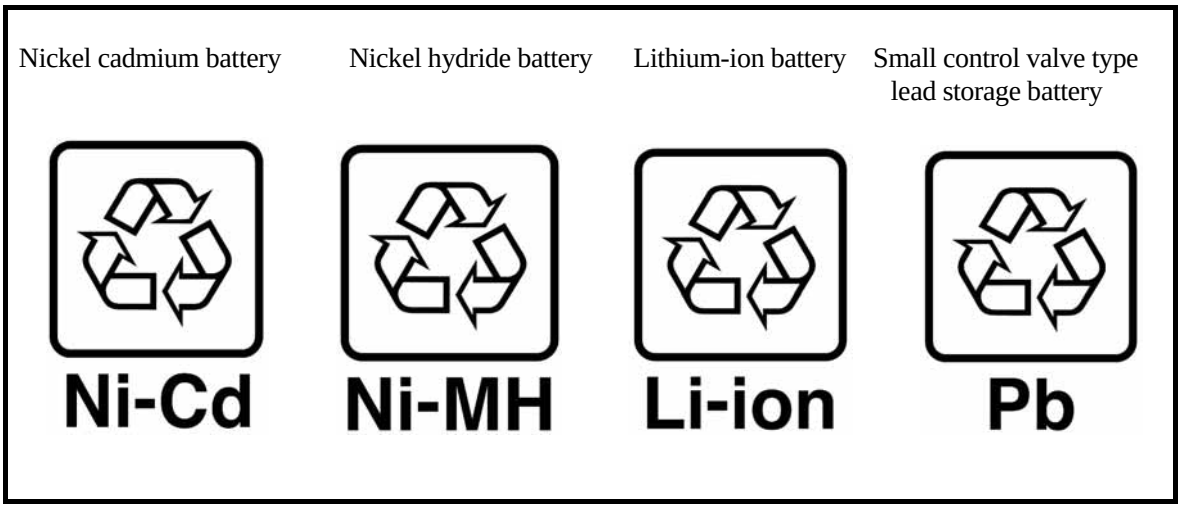


Figure 6-5-2. Three arrow mark (example)

6-6. Container packaging identification labeling of electric home appliances

"Guideline of electric home appliances industry relevant to containers and packaging identification labeling etc. -2nd edition-" was issued by container packaging recycle law expert committee of AEHA with the cooperation of packaging committee of the Japan Electrical Manufacturers' Association (JEMA) and packaging technology small committee of Japan Business Machine and Information System Industries Association (JBMIA) in April 2005 as a guideline that was convenient for the people other than specialist of packaging by clarifying the definition of container packaging and legal descriptions and precautions in a way easy to understand for operator and describing the recommended smallest size of identification mark.

6-6-1. Notes on this guideline

(1) Background

The identification labeling of container packaging simplifies the separate discharge by consumers that is decided by "Containers and Packaging Recycling Law", which is obligated in law for more efficient use of resources for promoting the separate collection by local authority.

(2) Container packaging of electric home appliances

Many container packaging used for electric home appliances is "multiple container packaging" configured with multiple parts. And the size of product and figuration of packaging include many things, so easily understandable integrated labeling method that does not confuse customers is needed.

6-6-2. Notes on multiple container packaging and timing of disposal

When seeing the container packaging used for electric home appliances at the timing of disposal, there are assembly packaging (hereafter, multi-pack) in which multiple same products are collected such as battery and video tape, and individual packaging with which one item is packed such as TV and refrigerator. The disposal timing of these packages is defined as below.

a. The container packaging used for individual packaging whose disposal timing is different is the target of individual labeling.
   Example of container packaging whose disposal timing varies:
   - Storage bag of guarantee card, case of lubricating oil included with shaver, cartridge of printer etc.

b. It is defined that the product parallel to the following products is disposed at the same timing.
   Example of product: multi-pack of video tape, multi-pack of battery etc.

6-6-3. Definition of term

The terms used in this guideline are compliant with JIS Z 0108 packaging term and JIS Z 0104 corrugated fibreboard term, and the words used for the description for consumers are defined in collective labeling.

A. Container packaging: Material, parts configured with paper, plastic and metal etc. to which functions to protect the product in it and assist the storage are added
B. Parts: Individual packaging that configures a part of container packaging
C. Individual labeling: Identification labeling for each part that configures container packaging
D. Collective labeling: When the parts that configure the container packaging do not have the process of printing and molding etc., the individual labeling is not possible, so the collective labeling on container packaging on which it can be implemented is required. This labeling is called collective labeling.
   (1) Whole collective labeling: Collective labeling that displays complete parts of every container packaging in addition to the complete parts of container packaging for which individual labeling is omitted including the container packaging for which individual labeling is implemented
   (2) Partial collective labeling: Collective labeling that displays only the complete parts of container packaging for which individual labeling is omitted, or complete parts of container packaging except a part of container packaging for which individual labeling is implemented additionally

E. Definition of labeling on container packaging:
   - Molding: Three-dimensional process that uses die such as projection molding and vacuum molding. Spot examination such as primary pressing process is not included.
   - Printing: label without physical restriction and seal included
   - Plain: Container packaging for which printing, stamping, emboss, sealing labeling is not implemented at the phase of production, use, import and sales of container packaging, that has no molding process in which stamping and emboss can be implemented at the phase of production of container packaging

F. Complex material: Material configured with multiple materials such as paper and plastic by adhesion that cannot be separated easily

6-6-4. <Legal description> Method of identification labeling

(1) Basic items

a. The method of identification labeling should be individual labeling as a general rule.
b. When the individual labeling is difficult, implement the collective labeling.
c. For the consumer friendly labeling, "whole collective labeling" that displays every container packaging including the items with individual labeling is recommended if there is a display space.
d. For the mark displayed on container packaging configured with complex material (composite paper and plastic), display the mark of material with large mass ratio.

(2) Handling of plain container packaging

Including the case when the disposal timing is not same, the plain container packaging is eliminated from target of individual labeling, and it can be omitted, however, when there is other container packaging that enables collective labeling, implement the collective labeling on it.

6-6-5. Method of collective labeling for each packaging type

When implementing the collective labeling by necessity, implement the collective labeling depending on the packaging type as shown below.

For the position of collective labeling, consider the following points regardless of packaging type.

- Consider the consumer friendly identification.
- When the environmental performance display, PL display, explanation of product and recycle mark etc. are printed, it is recommended to implement the labeling on the same face.

(1) Corrugated fibreboard container packaging

The corrugated fibreboard is not the target of container packaging of identification labeling. However, for the corrugated container packaging for electric home appliances, the object that attracts consumer's attention for the first time is the outer corrugated box, so the collective labeling is implemented on corrugated box as a general rule. And it is recommended to display the instruction text that clarifies the classification of "corrugated fibreboard" and "other paper and boxboad materials" additionally for the customer.

- Display it at the point on outer box where the consumer's attention is attracted at disposal.

(2) Board container packaging

- Display it at the point on outer box where the consumer's attention is attracted at disposal.

(3) Film container packaging

The film container packaging is used not only for individual packaging but also for collective packaging. And printed film and plain film are used for packaging, and these films are combined for a lot of packages, so the consumer friendly labeling is necessary.

a) When every film is printed
   - Display it at the point on exterior film where the consumer's attention is attracted at disposal.

b) For totally plain film
   - When there is a mat board: collective labeling on mat board
   - When there is no mat board etc. and the label without physical restriction is affixed: collective labeling on label
   - Plain film only: labeling can be omitted

c) For collective packaging of printed exterior film (collective packaging) and plain interior film (individual

packaging)

- Display it at the point on exterior film where the consumer's attention is attracted at disposal.
- The labeling on interior film (plain) can be omitted.

d) For collective packaging of plain exterior film (collective packaging) and printed interior film (individual packaging)

- Display it at the point on interior film where the consumer's attention is attracted at disposal.
- The labeling on exterior film (plain) can be omitted.

(4) Film shrink container packaging

a) For printed shrink film

- Display it at the point on film where the consumer's attention is attracted at disposal.

b) For plain shrink film

- When the mat board or label without phys

6-6-7. Case examples of labeling for each product for packaging electric home appliances

In "Guideline of electric home appliances industry relevant to containers and packaging identification labeling etc. -2nd edition-", "case examples of labeling for each product for packaging electric home appliances" was newly described in addition to the "case examples of labeling for electric home appliances packaging" described in 1st edition, however, here describes only the case exampled of TV and refrigerator of latter case.

Example of the pakage label of FPD (liquid crystal TV)

Parts	Material	Classification	Print	Mold	Fundamental response
Outer box	corrugated fibreboard	–	○	–	voluntary marking
Base tray	corrugated fibreboard	–	–	–	voluntary marking
Cushioning material	PS	plastic	–	○	プラ
Warranty bag	paper	paper	○	–	紙
Main body bag	PE	plastic	–	–	default (whole collective labelling)
Stand bag	PE	plastic	–	–	default (whole collective labelling)
Joint	Labelling is not necessary because it is not a wrapping package				

Labeling examples

Legal description:

プラ：緩衝材 >PS<
：袋 >PE<

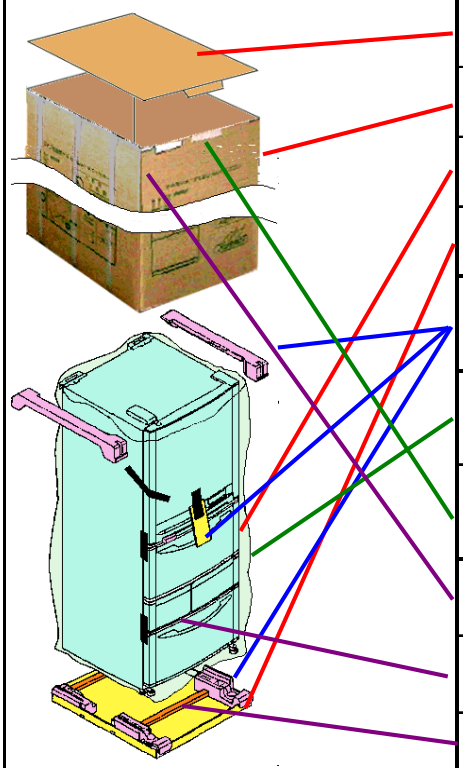
紙：保証書袋

* Individual marking is necessary for warranty bag due to its different timing for disposal.

Voluntary marking:

：箱
：トレイ
ダンボール

Example of package label of refirigerator



Parts	Material	Classification	Print	Mold	Fundamental response
Top pad	corrugated fibreboard	–	○	–	voluntary marking
Tube					
Protector pad					
Tray					
Cushioning material	PS	plastic	–	○	プラ
Bag (product, accessories, instruction)	PE	plastic	○	–	プラ
Bag (warranty)	paper	paper	–	○	紙
Band	Labelling is not necessary because it is not a wrapping package				
Tape	Labelling is not necessary because it is not a wrapping package				
Wooden material	Labelling is not necessary because it is not a wrapping package				

Labeling examples

ダンボール：箱
プラ：緩衝材>PS<
：袋>PE<

Note 1: Individual marking only for warranty bag due to its different timing for disposal
Note2: Plastic marking is legal description Corrugated fibreboard marking is voluntary

7. References

7-1. Activity of product assessment of electric home appliances industry in Japan

The electric home appliances industry in Japan has recognized the necessity of "environmentally conscious design at production development phase", and created and managed the product assessment voluntarily before the establishment of various environmental laws in 2000. The associated companies (electric home appliances manufacturers) of AEHA consult on activity with strong recognition, and the executing rate of product assessment is 100%, and the case example of that implementation is posted on homepage of AEHA in addition to the report, and the number of examples is increasing from year to year.

7-1-1. History of activities of product assessment of Association for Electric Home Appliances

AEHA issued " Product Assessment Manual for Electric Home Appliances " in October 1991 ahead of other industries to support the activity of associated companies. And it was used as a reference for development of product assessment manual for other industries.

And we issued " Product Assessment Manual for Electric Home Appliances (2nd edition)" in which general evaluation etc. was added to evaluation for each item in October 1994.

In June 2000, "Fundamental Law for Establishing a Sound Material-Cycle Society" was established and "Law for the Promotion of Effective Utilization of Resources" (partially revised version of "Law for the Promotion of Utilization of Recycled Resources" established in 1991, and name was changed) was also established around the same time, and the judgment standard for considering the design to promote 3R (reduce, reuse, recycle) was also decided in electric home appliances to strengthen the content. And "Home Appliance Recycling Law " was established in June 1998, and the recycle of four items; used TV, refrigerator, washing machine, air conditioner was obligated to manufacturers etc. The role of product assessment become wide and important because of these laws, so AEHA reviewed the content widely based on the knowledge of 3R, and issued " Product Assessment Manual for Electric Home Appliances (3rd edition)" with which concept of quantities evaluation for implementing objective evaluation than index was included in March 2001 to promote and strengthen the product assessment. And "Revised Energy Conservation Law" in which top runner approach was adopted was executed in April 1999 for developing equipment with superior energy consumption efficiency for preventing global warming, and the energy saving design was also obligated to electric home appliances, so this point was added to 3rd edition. The products whose year to attain the goal is 2003 have completed the target value of energy saving already and shifted to the inspection of next goal, and the energy saving design is making progress step by step.

In addition, we issued the digest version of 3rd edition, " Executive Summary of Product Assessment Manual for Electric Home Appliances (English version / Japanese version)" in January 2003 considering the globalization of development and production of associated companies.

On the other hand, the recycle process for 4 items was started in home appliance recycling plants in Japan from April 2001 based on the Home Appliance Recycling Law , and the production of products that can be recycled easily (feedback of recycle process know how to product design) based on actual condition of that process became important issues common for electric home appliances manufacturers. Therefore, we issued " Product Assessment Manual for Electric Home Appliances (3rd edition supplement version) " in which electric home appliances industry original “material marking” and “recycle mark” were plotted out and recommended marking size and marking point were decided for simplifying manual disassembling and sorting by sending out questionnaires and implementing door-to-door survey for home appliance recycling plants in September 2004, and issued its English version in February 2005.

And we issued " Product Assessment Manual for Electric Home Appliances (4th edition) " in May 2006 including the demand information of environmentally conscious design relevant to the product that makes progress in Japan and overseas and the result of wide research study of Product Assessment Expert Committee and Working Groups in AEHA and renewing the content by describing the trends of environment in Japan and overseas and relevant information in addition to enriching product assessment check list.

Table 7-1-1. History of activities of product assessment of Association for Electric Home Appliances

	Issue	Activity of electric home appliances industry	Characteristics / changes
1st edition	October 1991	Resolving the problem of waste material of electric home appliances	- Focusing on reduce and recycle - Specification of specific parts for simplifying separation and disassembly process - Integrating the material labeling for plastic
2nd edition	October 1994		- Adding the difficult prior evaluation to process - In addition to the evaluation for each item, promoting the general evaluation - Integrating the labeling of equipment for which nickel cadmium battery is used
3rd edition	March 2001	Reducing the environmental impacts considering the whole lifecycle	- Supporting 3R / earth's environment problem - Adding the evaluation item for which lifecycle is considered - Promoting the quantitative evaluation, describing the legal aspect of energy saving
Digest version	January 2003		- Digest version of 3rd edition (document of English version / Japanese version)
Supplement version	September 2004		- Adding the new material marking and recycle mark - Clearly specifying the recommended marking size and marking point
English version	February 2005		- Document of English version / Japanese version of supplement version of 3rd edition
4th version	May 2006		- Enriching the product assessment check list - Describing various design guidelines relevant to

Figure 7-1-2-1. “Efforts toward environmentally conscious products, Association for Electric Home Appliances' efforts through product assessment” website

評 価 項 目

番号	評価項目	取組
1	減量化・減容化	◎
2	再生資源・再生部品の使用	○
3	再資源化の可能性の向上	○
4	長期使用の促進	○
5	収集・運搬の容易化	◎
6	手解体・分別処理の容易化	○
7	破砕・選別処理の容易化	○
8	包装	◎
9	安全性	○
10	環境保全性	◎
11	使用段階における 省エネ・省資源等	○
12	情報の提供	○
13	製造段階における 環境負荷低減	○
14	LCA（ライフサイクル アセスメント）	○

◎: 主な取組項目

評価項目は 2006 年発行の家電製品協会「家電製品 製品アセスメントマニュアル 第 4 版」に基づいています。

製品アセスメントの概要

液晶テレビの開発において、環境に配慮した製品開発に取り組んでいる。その結果、製品や梱包材の軽量化・省資源化・部品点数削減による解体作業の効率アップなどの環境改善を実現させた。

改善等の具体的内容（従来製品との比較）

［ ］の中の数字は関連する評価項目の番号です。

1. 減量化・減容化［1］

・2005 年度当社従来製品に比べてスタンド部材における回転構造部品点数を削減して簡素化し、またシャーシ（ボス等）構造の全体見直しを行いセット寸法のミニマム化により製品の軽量化（質量 5kg 減で 19%減、容積で 9%減）を実現した。
・2005 年度容積 206,116 mm^3→186,946 mm^3（約 9%減）
セット寸法 幅 926 mm→919 mm
奥行き 324 mm→312 mm
高さ 687 mm→652 mm
・2005 年度製品質量を 26.5 kg から 21.5 kg へ 19%削減し収集運搬性を向上させた。

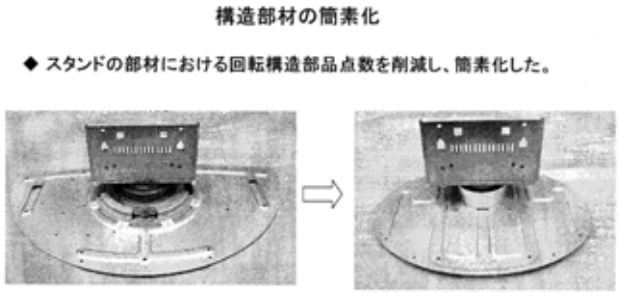
2. 包装［5，8］

・包装材料の質量削減により、2005 年度包装状態質量を 33kg から 25.5kg に質量で 23%削減し輸送による環境負荷を削減させた。

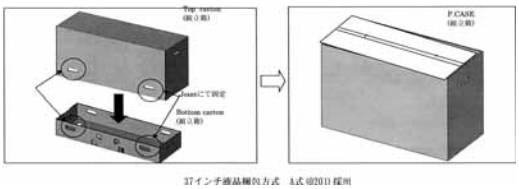
3. 環境保全性［10］

J-Moss 対応済み。

構造等の図



スタンド部の構造部材の簡素化



包装事例

Figure 7-1-2-2. Example of implementation of product assessment on TV.

評 価 項 目

番号	評価項目	取組
1	減量化・減容化	○
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6	手解体・分別処理の容易化	○
7	破砕・選別処理の容易化	○
8	包装	○
9	安全性	○
10	環境保全性	◎
11	使用段階における省エネ・省資源等	◎
12	情報の提供	○
13	製造段階における環境負荷低減	○
14	LCA（ライフサイクルアセスメント）	○

◎: 主な取組項目

評価項目は 2006 年発行の家電製品協会「家電製品 製品アセスメントマニュアル 第 4 版」に基づいています。

製品アセスメントの概要

使用時の省エネルギー、環境負荷物質の削減、再生資源の使用を中心に商品開発に取り組んだ。
新真空断熱材・高効率コンプレッサーなどの採用により冷却効率をアップし、消費電力をセーブした。
環境負荷物質の削減として、ノンフロン冷媒、無鉛はんだを採用するなど、J-Moss 対応を図るとともにクローズドリサイクル材の再生プラスチックを採用した。

改善等の具体的内容（従来製品との比較）

[ ] の中の数字は関連する評価項目の番号です。

1. 省エネ設計 [11]

以下の改善により、従来機に省エネ性能を向上させた。
（1）「ワイドリニアインバータ制御」の採用
（2）「高効率コンプレッサ」の採用
（3）従来の硬質ウレタンフォームの約 10 倍（※1）の断熱性能である、「新真空断熱材」を採用。
（※1）従来の硬質ウレタンフォームのみの場合は熱伝導率 0.020W/mK に対し、新真空断熱材では熱伝導率 0.002W/mK。

2. 再生資源・再生部品の使用 [2]

再生プラスチックの採用
凝縮器カバー・ドリップトレイなどの部品に、クローズドリサイクル材の PP 再生プラスチックを採用した。

3. 環境保全性の向上 [10]

（1）ノンフロン冷媒の採用
従来の代替フロン冷媒(R134a)からノンフロン冷媒(R600a)への変更により、地球温暖化への影響を約 1/400 に低減した（オゾン破壊係数もゼロ）。
（2）J-Moss 対応
本体の全制御基板の実装に無鉛はんだ（すず-銀-銅）を採用した。

構造等の図

冷蔵庫背面にある電装 Box 内の電装基板（緑色の部分）のはんだに無鉛はんだを採用。

無鉛はんだ採用基板

冷蔵庫内背面にある蒸発器の霜取り水を受けるトレイにクローズドリサイクル材を採用。

クローズドリサイクル

Figure 7-1-2-3. Example of implementation of product assessment on refrigerator

製品アセスメントの概要

洗濯だけでなく乾燥まで残り湯を利用し、7kg の洗濯～乾燥までの水道水使用量を当社前年機種よりも 62%削減した。
「節水ホットビート洗浄」により、9kg洗濯時の水道水使用量を当社 1996 年機種と比べ 73%節水、CO_2排出量も年間 63%削減し、大きく省エネルギー効果を高めた。
「ダブルビートウィング」により、温風の通りを高め、乾燥時間を当社前年機種より 30 分短縮し、消費電力量も 30%低減した。
また、資源の有効活用のため、プラスチック部品に積極的に再生材（クローズドリサイクル材）を使用した。

改善等の具体的内容（従来製品との比較）

［ ］の中の数字は関連する評価項目の番号です。

1．洗濯使用水量の削減［11］

本製品で開発した「湯サイクルエンジン」は、世界初※の変速可能なインバーター風呂水ポンプ「洗乾お湯取ポンプ」を搭載し、洗濯時だけでなく、乾燥時の水冷除湿（衣類から出る湿気を水で冷やし、水に変えて排出）にも残り湯を利用することで、7kg の洗濯～乾燥までの水道水使用量を当社前年機種より 62%節水（102L→39L）、「節水ホットビート洗浄」により 9kg 洗濯時の標準使用水量を当社 1996 年機種と比べ 73%節水（284L→77L）した。

※ 2006 年 5 月 30 日時点、家庭用洗濯乾燥機において

2．洗濯／乾燥時間の短縮と消費電力量の低減［11］

新たに「ミニウィング」を採用した新開発の大型羽根「ダブルビートウィング」により、衣類の舞い上げ効果を高め、シワつきを抑えながら、温風の通りを高め、さらに、「速乾ビート乾燥」により、乾燥ダクトに水をゆっくり流すことで効率よく除湿し、ヒーターの最適制御とあわせ乾燥時間を当社前年機種より 30 分短縮し、消費電力量も 30%低減した。

3．プラスチック再生材の使用［2］

資源の有効活用のため、外槽やベース等、5 部品に PP のプラスチック再生材（クローズドリサイクル閃繆 9

評 価 項 目

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6	手解体・分別処理の容易化	◎
7	破砕・選別処理の容易化	○
8	包装	○
9	安全性	○
10	環境保全性	◎
11	使用段階における 省エネ・省資源等	◎
12	情報の提供	○
13	製造段階における 環境負荷低減	○
14	LCA（ライフサイクル アセスメント）	○

◎: 主な取組項目

評価項目は 2006 年発行の家電製品協会「家電製品 製品アセスメントマニュアル 第 4 版」に基づいています。

製品アセスメントの概要

室内機の防塵フイルターが目詰まりすると性能が低下する。これを防ぐために、フイルターの埃を自動的にクリーニングする新開発した機能を搭載し、性能を落とさずに長期にわたる省エネ運転を可能にした。また、製品包装材にリサイクル・再生材の段ボールを使用し再生資源活用を図ると共に、脱臭フイルターに、10 年間ノーメンテのフイルターを採用する等、省資源化を図った。さらには、RoHS 指令、J-Moss 規制に従って、特定の化学物質不使用の対応を完了した。

改善等の具体的内容（従来製品との比較）

［ ］の中の数字は関連する評価項目の番号です。

1．省エネ運転の長期持続［11］
フイルターの埃を自動でクリーニングする機能を搭載することにより、フイルターの目詰まりによる効率低下の防止を図り、長期にわたる省エネ運転を可能にした。1 年間フイルター掃除をしない場合に比べ、暖房時で約 25%の省エネを達成した。
（算定基準：（社）日本冷凍空調工業会の JRA4046-2004 ）

2．再生資源の活用［2］
包装材は、リサイクル・再生材を使用した段ボール材を使用し、再生資源の活用を図っている。

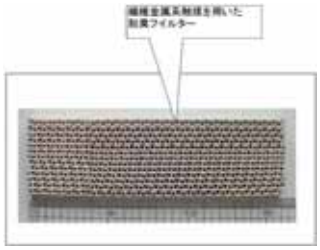
3．樹脂のリサイクルの容易化［3，6］
PP、PS 等のリサイクルしやすい樹脂への統合や室内機裏面の断熱材の貼り付けを接着剤から超音波溶着による方式に変更する等、分離分別の容易化を図っている。

4．脱臭フイルターの長寿命化［4］
繊維金属系触媒を用いた 10 年間ノーメンテで交換不要の脱臭フイルターを採用することにより、交換部品の削減を図った。

5．環境改善［10］
J-Moss 規制（RoHS 6 物質不使用）に従って、構成部品から特定の化学物質不使用を実現した。

構造等の図

お掃除ロボット



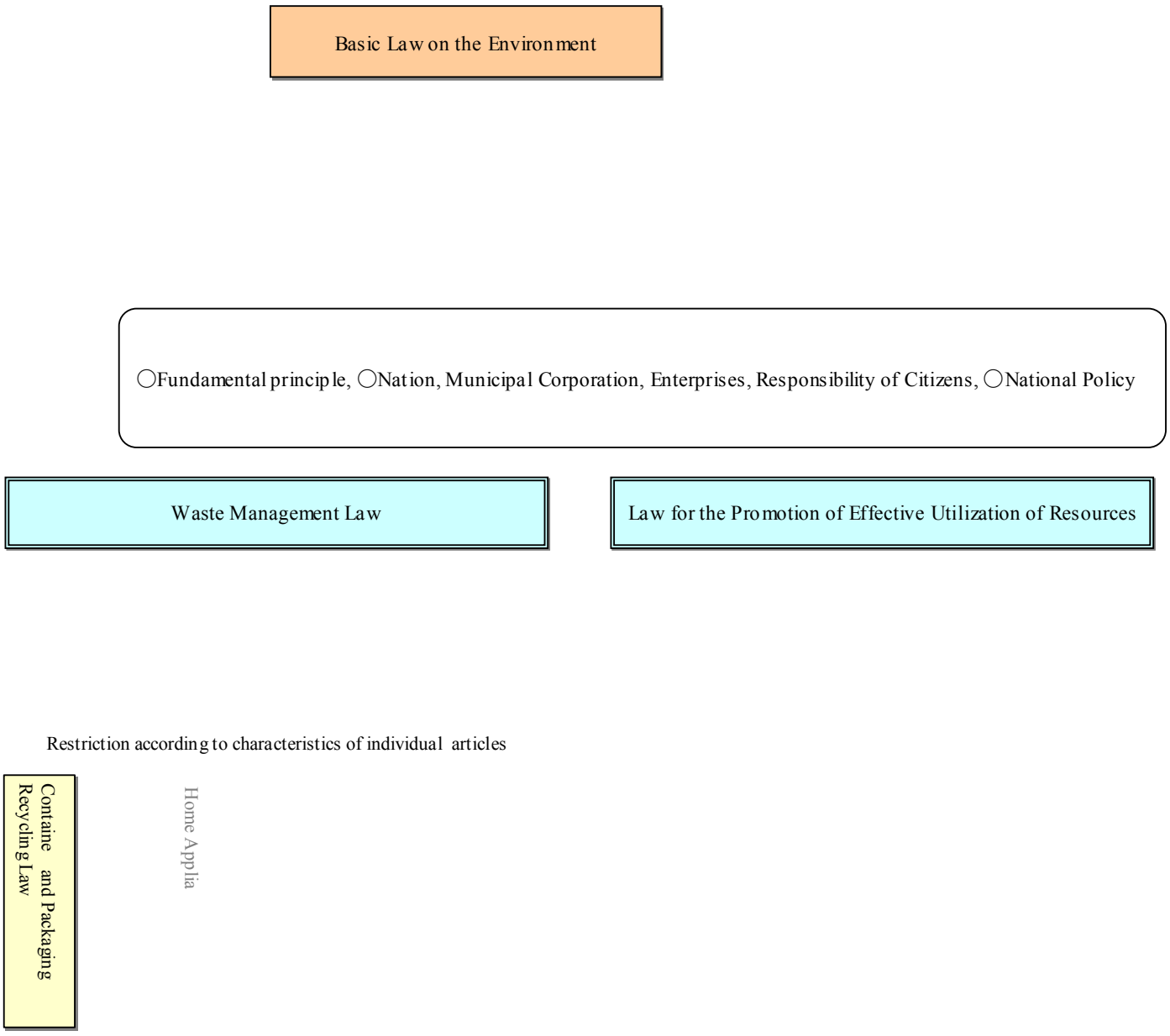
フィルタ

Figure 7-1-2-5． Example of implementation of product assessment on air conditioner

7-2. Relation between the Japanese legislation and product assessment manual

7-2-1. Major relevant legislations

The legislative system to promote creation of a 3R-oriented society in Japan is shown in Figure 7-2-1-1 and major legislation relevant to life cycle of electric home appliances is shown in Figure 7-2-1-2.



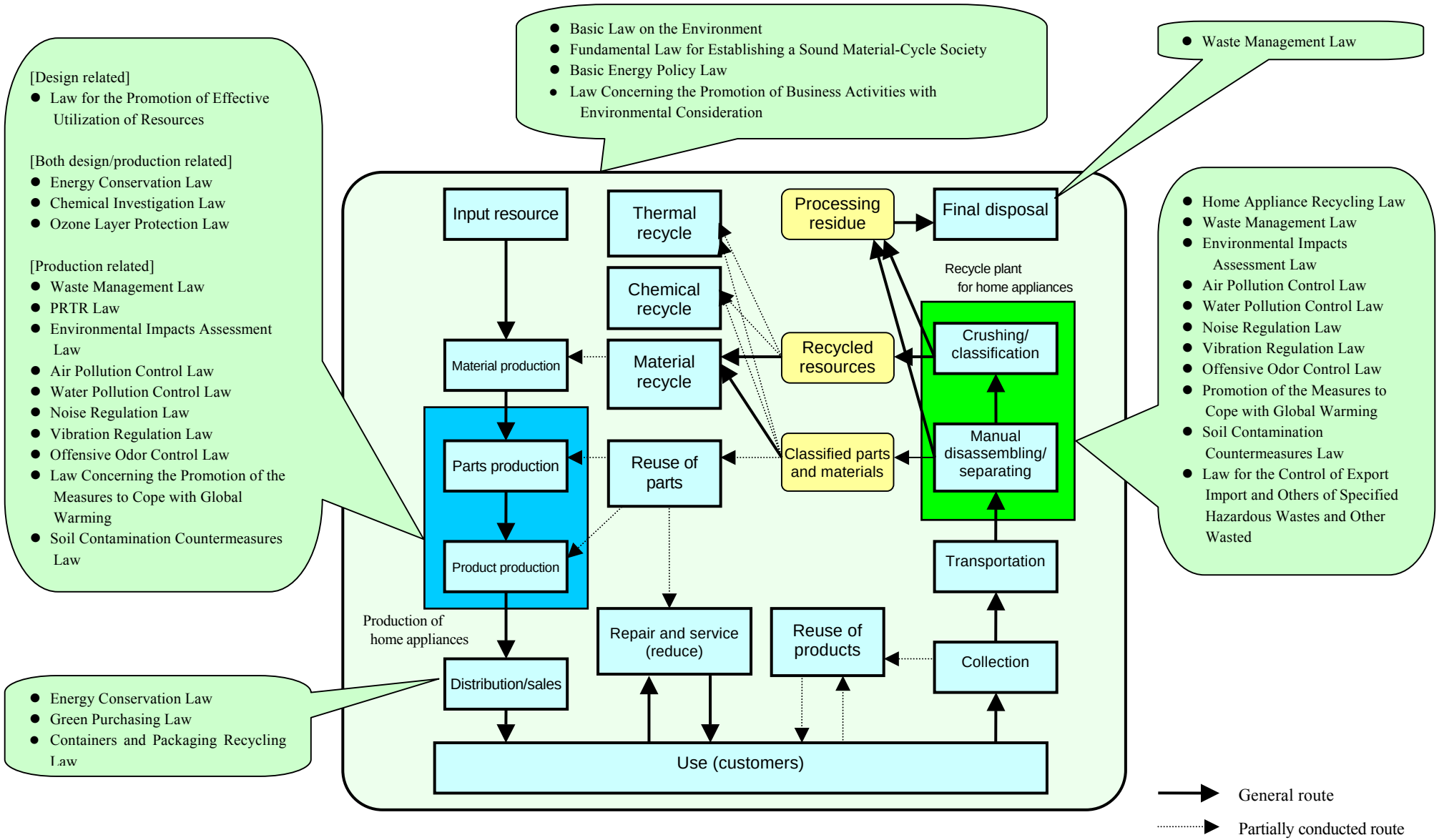


Figure 7-2-1-2． Figure of relevant legislation for different life cycle of electric home appliance

7-2-2. Outline of Law for the Promotion of Effective Utilization of Resources and ministerial ordinance providing matters to be judgment criteria

The aim of "Law for the Promotion of Effective Utilization of Resources" is to promote integrated initiatives for the 3Rs (reduce, reuse, recycle) that are necessary for the formation of a sustainable society based on the 3Rs. In particular, it uses cabinet orders to designate the industries and product categories where businesses are required to undertake 3R initiatives, and stipulates by ministerial ordinances the details of voluntary actions that they should take.

Ten industries and 69 product categories have been designated as shown on Table 7-2-2-1, and actions stipulated as "Matters to be Judgment Criteria" include 3R policies at the product manufacturing stage, 3R consideration at the design stage, product identification to facilitate separate waste collection, and the creation of voluntary collection and recycling systems by manufacturers, among other topics.

Table 7-2-2-1 Specified products and designated industries listed on Law for the Promotion of Effective Utilization of Resources

Category		Details	Specified products / industries
Products	Specified Resource-Saved Products	Required to ensure rational use of raw materials, prolong product life and reduce generation of used products	Electric home appliances (television sets, refrigerators, washing machines, air conditioners, microwave ovens, clothes driers), personal computers, gas and oil appliances, automobiles, metal furniture, pachinko machines
	Specified Reuse-Promoted products	Required to promote the use of recyclable resources and products	Electric home appliances (television sets, refrigerators, washing machines, air conditioners, microwave ovens, clothes dryers), personal computers, devices using compact rechargeable batteries, gas and oil appliances, bathroom units and kitchen systems, metal furniture, copiers, automobiles, pachinko machines
	Specified Resource-Recycled Products	Required to promote self-collection and recycling	Personal computers, compact rechargeable batteries (including devices in which compact rechargeable batteries are used)
	Specified Labeled Products	Required to be labeled to facilitate selected collection	Plastic containers and packaging, paper containers and packaging, compact rechargeable batteries, PET bottles, steel cans, aluminum cans, PVC construction materials
	Specified Byproducts	Required to promote the use of byproducts as recyclable resources	Coal ash generated by the electricity industry, soil and sand, slabs of concrete and asphalt, and lumber generated by the construction industry
Industries	Designated Resource-Saving Industries	Required to reduce generation of byproducts	Automobile manufacturing, iron-making and steel-making/rolling, primary copper smelting and refining, Pulp and paper, Inorganic chemical manufacturing and organic chemical manufacturing
	Designated Resource-Reusing Industries	Required to use recyclable resources and parts	Paper manufacturing, construction, glass container manufacturing, copier manufacturing, rigid PVC pipes and pipe fitting manufacturing

*Source: Excerpts from"3R Policies" on the website of Ministry of Economy, Trade and Industry
http://www.meti.go.jp/policy/recycle/main/english/law/promotion.html

(1) Matters to be judgment criteria for "Specified Resource-Saved Products"

The excerpts of ministry ordinance which stipulates, for manufacturers of washing machines, the items to be used as judgment criteria for reducing generation of used products, etc. are listed on Table 7-2-2-2 for use as the matters to be judgment criteria for "Specified Resource-Saved Products" on "Law for the Promotion of Effective Utilization of Resources". The matters to be judgment criteria for five other items of electric home appliances that are stipulated as the "Specified Resource-Saved Products" are similar to those for the washing machines in terms of contents, except for changes in product names (single-underlined) on Table 7-2-2-2 and part names (double-underlined) on Articles 1 & 2 as shown below.

Item	Product name (single-underlined)	Part name on Articles 1 & 2 (double-underlined)
Television set	television sets	CRTs
Refrigerator	refrigerators	compressors
Air conditioner	unit-type air conditioners	compressors
Microwave oven	microwave ovens	microwave output units
Clothes drier	clothes driers	drive units

Table7-2-2-2. Standard of judgment of washing machines as "Specified Resources-Saved Products"

Article 1 (Rationalization of the Use of Raw Materials, etc)

For the purpose of reducing generation of used products, etc. pertaining to washing machines, businesses that engage in the manufacturing of washing machines (hereinafter referred to as the "Manufacturers") shall rationalize the use of raw materials, etc., by using downsized or light-weight drive units, housing, or other Parts, etc. (referring to both parts and components; the same shall apply hereinafter) and taking other relevant measures.

Article 2 (Promotion of Long-Term Use)

For the purpose of reducing generation of used products, etc. pertaining to washing machines, the Manufacturers shall promote long-term use of washing machines by adopting highly durable drive units or other Parts, etc. that can be used over the long term, facilitating easy repair by standardizing substrates and other Parts with those for different models, etc. and taking other relevant measures.

Article 3 (Ensuring Safety in Repair, etc.)

For the purpose of reducing generation of used products, etc. pertaining to washing machines, the Manufacturers shall ensure safety in repair of washing machines, by taking into account toxicity and other characteristics of the raw materials.

Article 4 (Ensuring Opportunity for Repair, etc.)

For the purpose of reducing generation of used products, etc. pertaining to washing machines, the Manufacturers shall take measures necessary to secure opportunities for consumers to have their washing machines repaired, by taking the following and other relevant measures, in cooperation with businesses that engage in the repair and sales of washing machines.

(i) Provision of information on conditions pertaining to repair of the washing machines and other relevant information

(ii) Securing of technical experts for repair of the washing machines

Article 5 (Considerations for Safety, etc.)

When reducing generation of used products, etc. pertaining to washing machines by making the efforts prescribed in the preceding Articles, the Manufacturers shall consider the safety and durability of the washing machines and other necessary circumstances.

Article 6 (Technological Improvement)

For the purpose of reducing generation of used products, etc. pertaining to washing machines, the Manufacturers shall strive to improve their necessary technologies.

Article 7 (Assessment in Advance)

(1) For the purpose of reducing generation of used products, etc. pertaining to washing machines, the Manufacturers shall, when designing washing machines, conduct assessments in advance on the washing machines with regard to efforts prescribed in Articles 1 to 4.

(2) For the purpose of the assessment set forth in the preceding paragraph, the Manufacturers shall establish the items, standards and methods of assessment for the respective types of washing machines.

(3) When making the assessment set forth in paragraph 1, the Manufacturers shall compile the necessary records.

Article 8 (Provision of Information)

The Manufacturers shall provide information on the structure of washing machines, safety in repairing washing machines, and other information that may contribute to reduction in generation of used products, etc. pertaining to washing machines.

Article 9 (Efforts relating to Packaging Materials)

With regard to packaging materials for washing machines, the Manufacturers shall strive to use simple and light-weight packaging materials, for the purpose of reducing generation of used products, etc., while giving consideration to safety, functionality, economic efficiency and other necessary circumstances.

*Reference: Ordinance of the Ministry for Providing the Matters that Shall be Used by Businesses Engaged in Manufacturing, etc. of Washing Machines as the Standards of Judgment concerning Reduction in Generation of Used Products, etc. ,(Ordinance of the Ministry of Economy, Trade and Industry No.54 of April 27, 2006), Chapter 1 "Standards of Judgment for the Manufacturers"

(2) Matters to be judgment criteria for "Specified Reuse-Promoted Products"

The excerpts of ministry ordinance which stipulates, for manufacturers of air conditioners, the items to be used as matters to be judgment criteria for promoting the use of recycled resources are listed on Table 7-2-2-3 for use as the matters to be judgment criteria of "Specified Reuse-Promoted Products" on "Law for the Promotion of Effective Utilization of Resources" which requires provision of information on management and inclusion of specific chemicals. Article 8 stipulates "Control of Materials Contained" and Section 2 of Article 9 stipulates "Provision of information based on JIS C 0950". The matters to be judgment criteria for five other items of electric home appliances stipulated as the "Specified Reuse-Promoted Products" are similar to those for air conditioners in terms of contents, except for changes in product names (single-underlined) listed on Table 7-2-2-3 and part names (double-underlined) on Article 1 as shown below.

Item	Product name (single-underlined)	Part name on Article 1 (double-underlined)
TV set	television sets	manufacturing CRTs, housing
Refrigerator	refrigerators	manufacturing insulation, housing
Washing machine	washing machines	manufacturing housing
Microwave oven	microwave ovens	manufacturing housing
Clothes drier	clothes driers	manufacturing housing

Table 7-2-2-3. Standard of judgment of unit-type air conditioners as"Specified Reuse-Promoted Products"

Article 1 (Efforts relating to Raw Material)

For the purpose of promoting utilization of recycled resources pertaining to unit-type air conditioners, businesses that engage in the manufacturing of unit-type air conditioners (excluding those for packaging; the same shall apply hereinafter) (hereinafter referred to as the "Manufacturers") shall use those raw materials that can be used as recycled resources for manufacturing housing or other Parts, etc. (referring to both parts and components; the same shall apply hereinafter) of unit-type air conditioners, reduce the kinds of the raw materials used in the Parts, etc., reduce the number of the Parts, etc. in which raw materials that can be used as recycled resources are difficult to separate from other raw materials, and take other relevant measures.

Article 2 (Efforts relating to Structure)

For the purpose of promoting utilization of recycled resources pertaining to unit-type air conditioners, the Manufacturers shall facilitate easy treatment of unit-type air conditioners by reducing the number of screws or otherwise facilitating easy removal of the Parts, etc., fitting handles on or otherwise facilitating easy collection and transport of them, and taking other relevant measures.

Article 3 (Efforts relating to Sorting)

For the purpose of promoting utilization of recycled resources pertaining to unit-type air conditioners, the Manufacturers shall enable easy sorting for utilization of recycled resources pertaining to the unit-type air conditioners by indicating the name of materials used in the Parts, etc. that are made of synthetic resin and have a weight of more than 100 grams and make other sorting-related efforts that may facilitate the said purpose.

Article 4 (Ensuring Safety in Treatment)

For the purpose of promoting utilization of recycled resources pertaining to unit-type air conditioners, the Manufacturer shall ensure safety in their treatment by taking into account toxicity and other characteristics of the raw materials.

Article 5 (Considerations for Safety, etc.)

When promoting utilization of recycled resources pertaining to unit-type air conditioners by making the efforts prescribed in the preceding Articles, the Manufacturers shall consider the safety and durability of the unit-type air conditioners and other necessary circumstances.

Article 6 (Technological Improvement)

For the purpose of promoting utilization of recycled resources pertaining to unit-type air conditioners, the Manufacturers shall strive to improve the necessary technologies.

Article 7 (Assessment in Advance)

(1) For the purpose of promoting utilization of recycled resources pertaining to unit-type air conditioners, the Manufacturers shall, when designing unit-type air conditioners, conduct assessments in advance on the unit-type air conditioners with regard to efforts prescribed in Article 1 to Article 4.
(2) For the purpose of assessment set forth in the preceding paragraph, the Manufacturers shall establish the items, standards and methods of assessment for the respective types of unit-type air conditioners.
(3) When making the assessment set forth in paragraph 1, the Manufacturers shall compile the necessary records.

Article 8 (Control of Materials Contained)

For the purpose of promoting utilization of recycled resources pertaining to unit-type air conditioners, the Manufacturers shall manage the materials specified in the appended table by identifying and understanding the kind and quantity of such materials contained in the Parts, etc. and taking other relevant measures.

Article 9 (Provision of Information)

(1) The Manufacturers shall provide information on structures of unit-type air conditioners, methods for removing the Parts, etc., the names of materials used in the Parts, etc., and other information that may contribute to utilization of recycled resources pertaining to unit-type air conditioners.
(2) For the purpose of promoting utilization of recycled resources pertaining to unit-type air conditioners, the Manufacturers shall provide information on the kinds and quantity of materials specified in the appended table and contained in the Parts, etc., in addition to the information provided for in the preceding paragraph. In this case, the provision of information shall be made according to JIS (Japan Industrial Standard) C0950.

Article 10 (Efforts relating to Packaging Materials)

(1) With regard to packaging materials for unit-type air conditioners, the Manufacturers shall use raw materials that are easily usable as recycled resources or raw materials in which recycled resources are utilized, while giving consideration to safety, functionality, economic efficiency and other necessary circumstances.
(2) For the purpose of promoting utilization of packaging materials for unit-type air conditioners as recycled resources, while giving consideration to safety, functionality, economic efficiency and other necessary circumstances, the Manufacturers shall, with regard to packaging of unit-type air conditioners, adopt structures that enable easy separation of packaging materials that can be utilized as recycled resources from other

packaging materials, adopt structures that enable their easy collection and transport, and take other relevant measures.

Appended table (Re: Arts. 8 and 9)

(i) Lead and lead compounds
(ii) Mercury and mercury compounds
(iii) Hexavalent chromium compounds
(iv) Cadmium and cadmium compounds
(v) Polybromobiphenyls
(vi) Polybromodiphenyl ether

*Reference: Ordinance of the Ministry for Providing the Matters that Shall be Used by Businesses Engaged in Manufacturing, etc. of Unit-type Air Conditioners as the Standards of Judgment concerning Reduction in Generation of Used Products, etc., (Ordinance of the Ministry of Economy, Trade and Industry No.56 of April 27, 2006), Chapter 1 "Standards of Judgment for the Manufacturers"

(3) Relationship between "Law for the Promotion of Effective Utilization of Resources" and Product Assessment Manual

In Article 7 (Assessment in Advance) of the Ministerial Ordinance Providing Matters to be Judgment Criteria for "Specified Resources-Saved Products" and "Specified Reuse-Promoted Products" stipulated on "Law for the Promotion of Effective Utilization of Resources". It is obliged to specify, in the design stage of relevant products, the evaluation items, evaluation standard and evaluation method for actions (rational use of raw materials, prolong product life, securing safety relating to repair, securing opportunity for repair, devising raw materials, devising structure, devising for separate waste collection) stipulated in Articles 1 to 4, perform the evaluation and take necessary records, by type of the relevant products, to reduce generation of used products and promote use of recycled resources.

This manual is the newest version of the "Product Assessment Manual of Electric Home Appliances" that reflects the product assessment actions taken so far by AEHA and the trends of product environmental regulations. "5. Product Assessment Guidelines (Check List)" in Chapter 5 describes specific evaluation items, evaluation standard and evaluation method for assessment in advance in the designing stage of the electric home appliances.

7-2-3. Energy Conservation Law top runner standard and energy-saving labeling program

7-2-3-1. Top runner standard of Energy Conservation Law

This top runner approach is the activity to decide the products with which dramatic effect can be expected for reduction of CO_2 release by reducing the amount of energy consumption by law and set the items of "definition of energy consumption efficiency", "category / target standard value" and "target year (achievement target year)" for each product with a aim of exceeding the performance of No. 1 energy-saving product in that product category, and aim for the achievement of target standard value before the target year.

(1) Target items (total 21 items)

Air conditioners, fluorescent lighting fittings,

(3) Judgment standard of achievement and non-achievement of target standard value

For the judgment of achievement and non-achievement of target standard value, the example of TV sets is shown below.

1) Achievement and non-achievement are decided for each category.
2) Decide certain model (product name and type) belongs to which category and check (a) volume of shipments and (b) energy consumption efficiency for one unit for each model.
3) Find the product of (a) and (d), "total energy consumption efficiency".
4) Use (c) TV size for each model, and find "standard energy consumption efficiency" (d) by calculating formula.
5) Find the product of (a) and (d), "total standard energy consumption efficiency for each model".
6) Find the total (f) of total volume of shipments (e) in this category and "total energy consumption efficiency", and find "weighted average energy consumption efficiency" by (f)/(e).
7) In the same way, find the total of "total standard energy consumption efficiency for each model" (g), and find "weighted average standard energy consumption efficiency" by (g)/(e).
8) When the calculated "weighted average energy consumption efficiency" is below "weighted average standard energy consumption efficiency", the target value is achieved.

For the refrigerators, freezers and fluorescent lighting fittings etc., the values and calculating formulas are different, however, the achievement and non-achievement are decided in the same way of TV sets. Accordingly, the weighted average of volume of shipments and energy consumption efficiency becomes the target, so it is necessary to ship the model with superior energy consumption efficiency more.

7-2-3-2. Energy-saving labeling program

For the top runner approach of "Energy Conservation Law", the energy-saving labeling program is instituted. This is the program established to make the energy-saving performance of product clearly understandable for consumer and expand the energy-saving product widely by displaying the achievement rate for target standard value of category with which the product is included on catalog, package, product main unit etc. for the top runner target products.

The content of concrete labeling and method are described in JIS C 9901 "Method of calculation and representation of energy efficiency standard achievement percentage of electrical and electronic appliances". Figure 7-2-3-1 shows an example of energy-saving label.

The "target fiscal year" of that product, "energy conservation standard achievement percentage" (displayed in %) for target standard value and "energy consumption efficiency" (annual energy consumption etc.) in top runner approach should be described in catalog collectively. They can be displayed in a prominent place such as package, product main unit and tag. The product that achieved the target value (standard achievement percentage 100% or more) and the product that did not achieve the target value (standard achievement percentage less than 100%) are distinguished by attaching the green energy-saving symbol and orange symbol respectively as shown in Figure 7-2-3-2.

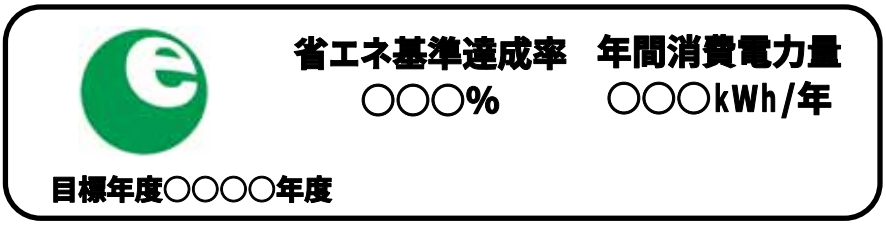


Figure 7-2-3-1. Example of energy-saving labeling

Attainment symbol (100% or more)

Not attained symbol (less than 100%)

Figure7-2-3-2. Energy-saving symbol

In addition, the establishment to display energy-saving information of product actively by retailer has been started since October 1, 2006. This is the labeling form called "Uniform Energy-Saving Label ", which make the energy-saving label clearly understandable, and it is started with air conditioners, TV sets and refrigerators.

The items are planned to be expanded in the future, and the manufacturers have to register the data on web of The Energy Conservation Center, Japan for distributing data to retailers.

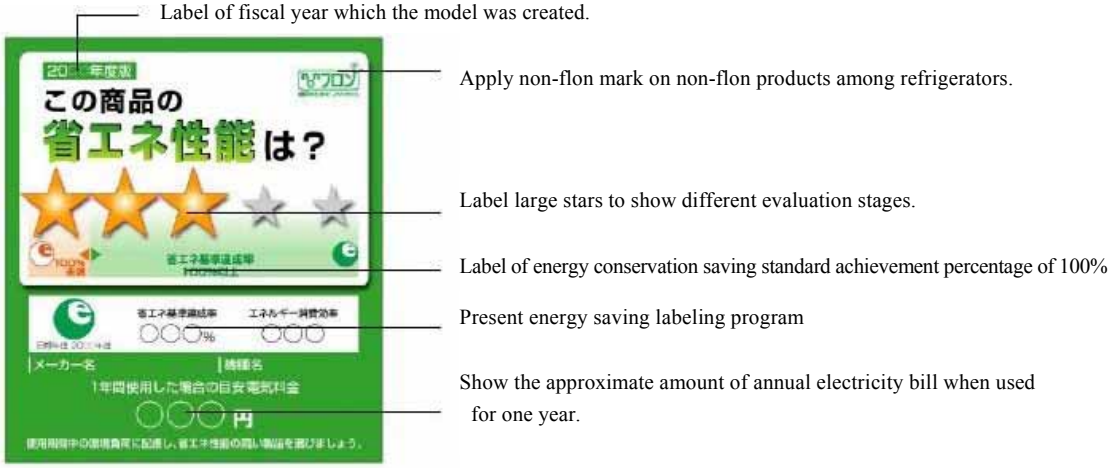


Figure 7-2-3-3. Example of Uniform Energy-Saving Label

7-2-4. Outline of Home Appliance Recycling Law and its correspondence condition

Concerning the collection of waste material of electric home appliances by retailer and manufacturer etc. and recycling, “Home Appliance Recycling Law” was established in May 1998 and executed in April 2001 for assuring proper process of waste material and effective use of resource by taking measures for implementing it properly and smoothly and contributing to conservation of life environment and healthy development of nation's economy.

(1) Target equipments of Home Appliance Recycling Law and recycling rate

As electric home appliances that meet the following conditions, four items; TV, refrigerator, washing machine, air conditioner became the target, and freezer was added in the same category of refrigerator since April 2004.

(1) Those which cannot be recycled easily by local authority etc.
(2) Those which have high necessity of recycling etc.
(3) When the selection of design and parts etc. affects on recycling heavily
(4) As it is the delivered item, the collection by retailer is economic

The "recycling" is separating the parts and material from scraped target product and reusing it as parts or primary material for new product by yourself or put it in assignable with charge or without charge for the people who reuse it as parts or primary material, and the recycling rate is decided for each target equipment. The "recycling etc." contains the heat collection (thermal recycle) that the collected item can be used as fuel, however, only "recycling" that uses the collected item as parts or primary material is specified in the current regulation, and the following rate (recycling rate) should be accomplished.

	TV	Refrigerator / freezer	Washing machine	Air conditioner
Target equipment	- CRT type TV - CRT type AV monitor - (with tuner) - CRT type VTR built-in TV	- Refrigerator - Refrigerator/ Freezer - Wine cellar - Freezer	- Washing and drying machines - Automatic washing machine - Dual bath washing machine	- Wall ornament type - Floor type - Window type
Recycling rate	55% or more	50% or more	55% or more	60% or more

(2) Role of involved parties for Home Appliance Recycling Law

The promotion of recycle with a collaboration of involved parties; "proper generation (delivery to retailer) and burden of expense" by generator, "taking-over from generator and delivery to manufacturer etc." by retailer, "taking-over from retailer etc. and recycle" by manufacturer etc. is the basic concept of “Home Appliance Recycling Law”, and the role of each involved party is decided as below.

	Role
generator (consumer)	- Release the used target home electric appliances to retailer (appliance store) - Pay the fare relevant to collection, delivery, recycling etc.
Retailer (appliance stores)	- In the following cases, take back the target equipment from generator (consumer) (1) When the retailer is demanded to take back the target equipment that was sold by themselves (2) At the sales of target equipment, when the retailer is demanded to take back the same type target equipment - Release the taken target equipment to the manufacturer etc. of that target equipment
Manufacturer etc.	- Proper installation of specified acceptance place and recycle plant (recycling facility) - Take back the target equipment produced or imported by themselves from retailer (appliance stores) - For the taken target equipment, implement the recycling (recycle) etc. of certain standard or more - At the recycle, collect the chlorofluorocarbon for refrigerant included with refrigerator, freezer and air conditioner and insulation chlorofluorocarbon* of refrigerator and freezer, and implement the proper process
Local authority (autonomous body)	- Possible to release the waste material of target equipment collected by themselves to manufacturer etc. - Possible to recycle collect the waste material of target equip

(3) Collection and recycle system based on Home Appliance Recycling Law

For executing "Home Appliance Recycling Law", manufacturer etc. established the recycle system by constructing 190 specified acceptance places for groups A and B collectively, total 380 places in Japan and constructing the recycle plant by them or by utilizing existing recycle plant.

In group A, the specified acceptance place mainly based on existing place was constructed, and in addition, new dedicated facility was constructed as core of recycle plant, and it was developed through Japan with a combination of existing plant. In group B, the specified acceptance place mainly based on major transportation company was constructed, and in addition, the development through Japan was implemented in the form of new construction of home appliance recycling dedicated facility in collaboration with material relevant company. As of March 2006, recycling etc. of 4 items is implemented in total 47 home appliance recycling plants of groups A and B.

(4) Actual achievement of electric home appliances recycling

The number of accepted and processed units of 4 items increased steadily from year to year, and it achieved approximately 52,000,000 units for 5 years, the recycling rate that exceeds recycling standard was accomplished from the first year of act enforcement, and as a result of activity for more improvement such as expansion of manual disassembling process, the recycling rate increased steadily, and it contributed to establishment of cyclical society and reduction of amount of final disposal remarkably (Table 7-2-4-1). For the amount of recycling for each material, "Other valuable resource" increased approximately seven-time (2005/2001 ratio), and the reuse of plastic increased steadily (Table 7-2-4-2).

And the recovered amount of refrigerant chlorofluorocarbon in 2005 was 311 ton (111g/unit) for refrigerator and freezer, and 1,122 ton (564g/unit) for air conditioner, and the recovered amount of insulation chlorofluorocarbon in 2005 was 608 ton (217g/unit).

Table 7-2-4-1. Number of recycled units and recycling rate (unit: 1000 units, % in [ ])

	2001	2002	2003	2004	2005	Total of 5 years
TV	2,981[73]	3,515[75]	3,548[78]	3,777[81]	3,852[77]	17,674
Refrigerator / freezer	2,143[59]	2,556[61]	2,653[63]	2,807[64]	2,807[66]	12,966
Washing machine	1,882[56]	2,409[60]	2,656[65]	2,791[68]	2,950[75]	12,688
Air conditioner	1,301[78]	1,624[78]	1,579[81]	1,809[82]	1,990[84]	8,303
Total of 4 items	8,307	10,104	10,437	11,184	11,599	51,631

Table 7-2-4-2. Amount of recycling of 4 items for each material (unit: ton)

	2001	2002	2003	2004	2005	Total of 5 years
Iron	110,555	127,171	135,769	143,321	145,034	661,850
Copper	5,423	7,901	8,791	10,028	11,883	44,026
Aluminum	965	1,845	1,875	2,298	3,324	10,307
Mixture of nonferrous and iron etc.	41,406	56,035	55,671	61,790	69,334	284,236
CRT glass	45,153	55,075	55,975	60,818	53,727	270,748
Other valuable resource	7,462	14,785	25,400	32,799	50,761	131,207
Total	210,964	262,812	283,481	311,054	334,063	1,402,374

(5) Research study on recycle design of electric home appliances

Product Assessment Expert Committee and Working Groups in AEHA have visited 4 home appliance recycling plants to implement Qs and As and exchange of opinions for surveying the issues at recycle process in home appliance recycling plant and reflecting them to product design, and added the inspection to the orientation of each issue, and summarized it as "Research study report on recycle design of electric home appliances – design demanded from home appliance recycling plant and its improvement-", and issued it for associated companies.

(1st report: June 2005, 2nd report: October 2005, 3rd report: February 2006, 4th report: November 2006)

7-2-5. Upgrading of product 3R area

In the area of electric home appliances in Japan, since the enforcement of "Home Appliance Recycling Law" in April 2001, more than 10,000,000 used electric home appliances was actually collected and recycled in a year, the effective use of resource has made progress by using the used product-derived recycled resources. As a result, the information from home appliance recycling plant is fed back to design and production phases accurately, and the activity for world-beating environmentally conscious design and production is making progress at the upstream phase of product development of electric home appliances manufacturer. However, it is necessary to strengthen the activity between involved parties such as consumer and government in addition to electric home appliances manufacturer so that these trends may function as a system as the entire society.

Based on these situations, "Product 3R system upgrading WG" was established under the Ministry of Economy, Trade and Industry Industrial Structure Council Environmental Division waste material and recycle small sub commission in January 2005. In addition to the government, expert, consumer representative, the representative of electric home appliances manufacturers participated in it, and the result of study subtitled as proposal for concretizing upgrading of product 3R area "Toward the realization of Green Product Chain" was summarized in August of the same year (Table 7-2-5).

The electric home appliances manufacturers will standardize the index, definition and labeling method etc. by voluntary system JIS for the voluntary effort such as use of recycled resource, promotion of use of primary material that can be recycled (tendency to heighten the added value of self-environment-conscious product-derived recycled resource), original material marking for simplifying the separating of plastic parts, recycle mark labeling for simplifying the manual disassembling and separating etc. At the same time, against a background of actual achievement of these activities, the technology and intellectual property strategy is added and the proposal on concept of environmentally conscious design and method to international standard is also examined.

Table 7-2-5. General description of report "Toward the realization of Green Product Chain"

<table>
<tr><th>Aimed society image for upgrading product 3R system</th><th>Orientation of upgrading of product 3R system -environmentally conscious design for which lifecycle is considered</th></tr>
<tr><td>(1) Innovative change to lifecycle thinking type society
Incorporate the system of "from the cradle to the cradle" that keeps not only the disposal of product but also the use of recycled material and parts firmly in mind so that the consumption of natural resources, generation of waste material and environmental impacts can be minimized for entire lifecycle of product.
(2) Utilization of environmentally conscious information for creating new value from quantity to quality
The content of "environmentally conscious information" becomes a new evaluation axis of product in market in addition to the existing function and price, and the effort for environmental consciousness by company is evaluated properly and it also becomes energy for creating new innovation.
(3) Realization of green product chain
Incorporate the environmental consciousness correspondence in economy system by promoting "green manufacturing" in manufacturer and being evaluated by the consumer (green consumer) and market (green market).</td><td>Examining the concretization and unionization of environmentally conscious design
a) Measure of environmentally conscious design
• Promotion of 3R-friendliness design and production
- Definition and labeling of recycled resource use rate etc.
- Material marking of recycled plastic, unionization of marking of screw position and disassembling position etc., quality standard of recycled plastic material and the part for which it is used etc., cooperation between relevant manufacturers
• Correspondence to contained material in product
- Management and containing marking of specific chemical substances
b) Orientation of utilization of environmentally conscious information
• Information distribution to consumers and customers
- Product environmentally conscious information and environment communication
• Mechanism of information distribution between supply chains (procedure for disclosing contained materials, standardization of specification of provided information etc.)</td></tr>
<tr><td colspan="2">↕ Securement of international transmission and compliance relevant to 3R system upgrading in Japan ↕</td></tr>
<tr><td>(4) Securement of international compliance
The economic society that the lifecycle thinking is incorporated in product should be established in the runup to world, and the establishment of similar society in other countries should be promoted in the collaboration with other countries and regions.</td><td>c) Utilization of standard such as JIS and securement of international compliance
- Proposal to international standard in IEC etc. and its correspondence should be implemented in the collaboration with industry and government and by corporative creation.</td></tr>
</table>

[Supplement (comparison of 3R between Europe and Japan)]

○ Framework

In Japan, reduce, reuse and recycle are tackled for establishing cyclical society, and the order of precedence is in this order. With the recycle, material recycle, chemical recycle and thermal recycle are included. On the other hand, in EU (European Union), inhibition of generation (prevention), reuse and recovery are promoted.

○ Prevention

For the prevention, it is used as a concept with which longer lasting and energy saving are included in addition to the primary meaning of control of generation of waste material in Japan, however, in EU, it is used as a primary meaning that generation is controlled through recycle of waste material (EU waste material directive). And the prevention relevant to design phase etc. is introduced by the directives etc. relevant to environmentally conscious design such as EuP directive.

○ Recycle and recovery

The recycle in Japan is generally synonymous with recovery in EU. However, for the recycle in Japan, the definition varies for each recycle method characteristically.

On the other hand, recovery is clearly defined (EU directive 96/350/EC Appendix II B), however, specific item in recovery items of individual act may be prioritized. For example, Directive on Waste Electrical and Electronic Equipment (WEEE) and EuP directive etc. in EU say that the reclamation and recycle in recovery should be accomplished.

7-3. Relationship with international standard and specification

In Japan, sure and steady activity makes progress under “Law for the Promotion of Effective Utilization of Resources” that promote 3R of product, “Energy Conservation Law” that promote energy saving, and “Home Appliance Recycling Law” targeted to electric home appliances such as refrigerator and air conditioner etc., however, the registration of recycle and environmentally conscious design targeted to electric and electronics devices is advanced surely and steadily in the various regions such as North America and Asia in addition to Europe (Table 7-3).

Table 7-3. Recent movement of main controls etc. relevant to electrical and electronic equipment in each region

Region	Control etc.
Japan	- Law for the Promotion of Effective Utilization of Resources - Energy Conservation law (top runner standard) - Home Appliance Recycling Law etc.
Europe	- Directive on Waste Electrical and Electronic Equipment (WEEE directive) - Directive for Restriction of the use of the certain Hazardous Substances (RoHS directive) - Directive for a framework for the setting of ecodesign requirements for Energy-using Products (EuP directive) - Regulation for the Registration, Evaluation, Authorization and Restrictions of Chemicals (REACH regulation)
US	- California electronics waste material (display) recycle law (Maine, Maryland also established the recycle law) - Confederative energy policy law (established in 2005) - Mercury regulation (Vermont etc.)
China	- Regulations on Promotion of Utilization of Recyclable Resources - Administration on the Control of Pollution Caused by Electronic Information Products (Chinese RoHS) - Regulations on Recycling and Disposal of Waste and Used - Household Electrical Appliances (China WEEE）*
Korea	- The Act for Resource Recycling of Electrical and Electronic Products and Automobiles - Resource conservation and facilitation of the recycling law

* Legislation process on the march

These regulations do not fit with Japanese control necessarily, accordingly, the Japanese electric home appliances industry is expected to face a individual support for each country and region.

In the flow of globalization of control like this, the necessity of international standardization relevant to environmentally conscious design was recognized, and ISO (International Organization for Standardization) issued ISO TR14062 (Environmental management -Integrating environmental aspects into product design and development. JIS TR Q0007 "design for environment") in 2002. Then, IEC (International Electrotechnical Commission) that tables international standard relevant to electrical and electronic equipments issued IEC guide 114 (Environmentally conscious design-Integrating environmental aspects into design and development of electrotechnical products) in May 2005. At the same time, the new technical committee TC111 (environment) that began in October 2004 decided the establishment of international standard (IEC 62430: Environmentally Conscious Design for Electrical and Electronic Products and Systems) of environmentally conscious design from the existing phase of guideline, and its operation is advanced by TC111/WG2.

The product assessment manual of AEHA was introduced at the place of inspection of IEC, and became reputable. At the same time, "Product Assessment Manual 4th edition" that was issued in May 2006 was established based on the trends of international standardization relevant to environmentally conscious design of electrical and electronic equipment above, and the characteristic of Japanese electric home appliances area is considered in addition to the basic content of IEC guide 114 etc.

7-3-1. International standardization of environmentally conscious design

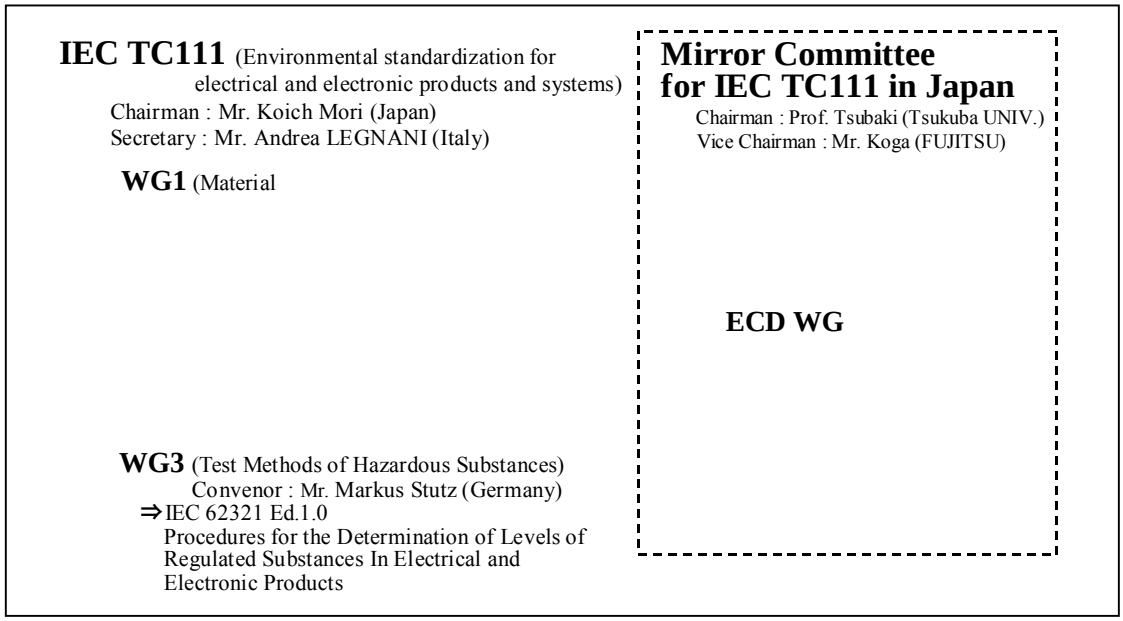
While the control relevant to environmental consciousness of product is expanded globally, new technical committee TC111 that examines environmental technology issue for whole electrical and electronic equipment and inter-product horizontal standard was established under IEC in October 2004. In TC111, the organizer country is Italy, and the presidency holder is Japan, and the activity was started establishing three working groups (WG1: procedure for disclosing information of MD-containing chemical substance, WG2: environmentally conscious design, WG3: test methods of hazardous substances) under it at the moment (Figure 7-3-1).

In Japan, the correspondence committee in Japan that supports TC111 was established in Japan Electronics and Information Technology Industries Association(JEITA) in March 2005, and for WG2, Japan Electrical Manufacturers' Association (JEMA) takes charge of bureau of correspondence committee in Japan.

In TC111/WG2, NWIP (new work item proposal) proposed by Japan relevant to the creation of environmentally conscious design standard was accepted on May 13, 2005, and that work is being advanced.

The schedule of standardization is shown below.

- CD (committee draft): August 2006 ⇒ CDV (international vote): February 2007 (5 months vote)
- FDIS (specification draft): October 2007 (2 months vote)
- FDIS acceptance: end of 2007 ⇒ Issuing IS (international standard)



7-3-2. EuP directive

The framework directive for setting environmentally conscious design requirement on energy-using product (EuP framework directive: Directive for a framework for the setting of ecodesign requirements for Energy-using Products) was published in the official journal of the EU on July 22, and taken effect on August 11, 2005. As a legal basis, free distribution in European region was considered for this directive, and the Treaty establishing the European Community Article 95 was applied. Article 95 was also applied to RoHS directive, and the ecodesign unification in region is positioned.

The Commission launched concrete implemented criteria are decided by implementing measures that is studied hereafter.

(1) Purpose of directive

- Directive of environmentally conscious products based on IPP (Integrated product Policy) of EU
  - Reduction of environmental impacts through lifecycle of product (Life cycle thinking)
  - Especially, the improvement of energy efficiency is emphasized (European Climate Change Action Programme)
- Amsterdam Treaty Article 95 is applied as legal basis (securement of free distribution in region)
  - Adoption of new approach (conformity assessment by harmonized standard)
- Framework directive for setting ecodesign requirement for energy-use product
  - Ecodesign requirements is specified in the implementing measures (comitology process)

(2) Target products for establishing implementing measures

The energy-using product means a product which is depent on energy input (electricity, fossil fuels and renewable energy sources), and the EuP with relevant European Climate Change Programme is selected by priority.

[Introduced prior products as examples]

Heating and water heating equipment, domestic appliances, office equipment, consumer electronics, electric motor systems, lighting

(More products will be added in the future)

[Judgment standard of target product]

a) The EuP shall represent a significant volume of sales and trade, indicatively more than 200 000 units a year within the Community according to most recently available figures.
b) The EuP shall have significant environmental impact within the Community.
c) The EuP shall present significant potential for improvement in terms of its environmental impact without entailing excessive costs.

(3) Implementing measures

At the establishment of implementing measures, consider the lifecycle of EuP, every significant environmental aspect, especially, energy efficiency. The analysis of environmental aspect through lifecycle should be implemented according to the level of importance.

There are two design requirements; "generric ecodesign requirements" and "specific ecodesign requirements" shown below.

1) Method for setting generic Eco-design requirements (Annex1)

A) Ecodesign parameters for EuPs

a) Significant environmental aspects are identified with reference to the following phases of the life cycle of the product:

Raw material selection and use, manufacturing, packaging, transport, and distribution, installation and maintenance, use, end-of life

b) For each phase, the following environmental aspects are to be assessed where relevant:

Predicted consumption of materials, of energy and of other resources such as fresh water, anticipated emissions to air, water or soil, anticipated pollution through physical effects such as noise, vibration radiation, electromagnetic fields, expected generation of waste material, possibilities for reuse, recycling

and recovery of materials and/or of energy.

c) The following parameters will be used for evaluating the potential for improving the environmental aspects:

Weight and volume of the product; use of materials issued from recycling activities; consumption of energy, water and other resources throughout the life cycle; emission, etc.

B) Requirements relating to the supply of information

- Information for consumers on the significant environmental characteristics and performance of a product
- Information for treatment facilities concerning disassembly, recycling, or disposal at end-of-life

C) Requirements for the manufacturer

- Establish the EuP's ecological profile
- Throughout the product life cycle it wil be expressed in physical quantities that can be measured (inputs/outoputs)
- Evaluate the achieved environmental performance of the product against benchmarks

2) Method for setting specific ecodesign requirements (Annex II)

Specific ecodesign requirements aim at improving a selected aspect of the product.

a) Specify ecodesign requirements = requirements for reduced consumption of resource

b) Specify the improving level by taking into account representative models of EuP through a technical, environmental, and economic analysis

- Energy consumption in use (such as: water or detergent)
- Concerning energy consumption in use, the level of energy efficiency or consumption will be set aiming at the life-cycle cost minimum

  Sum of the variations in purchase price and in operating expenses

c) The date of entry into force of the requirement will take the redesign cycle for the product into account.

3) Conformity assessment

- New approach: The CE marking system (CE mark application by self declaration of conformity)
  - The internal design control or the environmental management system (EU EMAS may be used for the Conformity assessment)
  - Establishment and information of the ecological profile and the declarations of conformity
  - Presumption of conformity by awarding the EU eco-label

(4) Future schedule

- Preparatory Studies: pre-studyies for each product
- Consultation forum: collection of opinions of stake holders
- Regulatory Committee: committee that decides legal implementing measures
- Implementing measures: The measures for ecodesign requirements.They will be decided for each product and implemented in series

(5) Relevant information

- Commission of European Communities " DG Enterprise & Industry" website
  http://ec.europa.eu/enterprise/eco_design/index_en.htm
  - EuP framework directive
  - Consultation forum
- Commission of European Communities "DG Energy & Transport" website
  http://ec.europa.eu/energy/demand/legislation/eco_design_en.htm
  - Preparatory Studies
  - Implementing measures

Working Group for Product Assessment Manual Revision: Members

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※1 Concurrent post of vice chairman of product assessment expert committee
※2 Chairman of product assessment expert committee