

Product Certification Criteria for “Products Using, Thinned-out Wood, Unused/Reused Wood, etc.”

Established: July 1, 2004

1. Environmental Background

According to the “State of the World’s Forests 2001” compiled by the Food and Agriculture Organization of the United Nations, forest over the world equals 3.87 billion hectares (ha) occupying 30% of the total land area.

While forests are increasing slightly in industrialized nations, they are decreasing in developing countries. Particularly, in tropical areas, 94 million hectares forests, equaling about 2.5 times the national land area of Japan had been disappearing every year for ten years until 2000. Consequently, it is important to reduce natural-forest utilization by afforestation and other means.

Forest in Japan occupies 25.12 million hectares (accumulation 4.04 billion cubic meters), equaling 67% of the land area (forest rate). Out of the total forest, artificial forest, 10.36 million ha, occupies 41% of the total forest in area, whereas its accumulation, 2.3 billion cubic meters, occupies 58%. Natural forest equals 13.35 million hectares in area, and 1.7 billion in accumulation. According to the UN Food and Agriculture Organization (FAO), the forest rates are 25% in the United States, 27% in Canada, 50% in Russia (37% in the former USSR), about 12% in the United Kingdom, and about 18% in China.

Concerning thinning in Japan, the 5-Year emergency thinning measures were taken from 2000 to promote immediate and planned thinning of about 1.5 million hectares of private forests. As a result, 300,000 hectares of forests were thinned every year between 2000 and 2002. Of the trees which are cut down for thinning in 2002, 40 to 50% (2.79 million cubic meters) were transported and utilized. The uses of thinned out wood are: 68% as raw wood for lumbering, 16% as logs, and 16% as raw materials such as chips. It is our challenge to promote effective utilization of these precious resources, while contributing to the improvement of forest conditions.

Various effect of forest conservation efforts would include: preventing mountain disasters (preventing soil and sand collapse, preventing soil washout, preventing erosion, etc.), recharging water resources (reducing drought, preventing flood, purifying water quality), preserving life environment (supplying oxygen, moderating temperature, maintaining humidity, preventing wind damage, preventing fire spread, etc.), health and cultural (places for recreation, places for welfare, places for artificial imagination, places for education, etc.) and natural environment preservation functions (protecting wildlife, preserving life environment for fish, preserving hereditary resources), and so on.

The stock of forests in Japan is growing by about 80 million cubic meters annually. (Wood increased 350 million cubic meters during the eight years from

1995 to 2002.)

2. Applicable Products

Outdoor and indoor equipment is defined as follows. Outdoor equipment is part of architecture that is located outdoors or in the outdoor conditions. Indoor equipment is part of architecture that is in conditions controlled differently from outdoor air. Ceiling and space under the roof are considered to be indoor. Where one wall material (single layer) separates outdoor and indoor, the wall is considered to be indoor.

Soil conditioners included in this Product Category are bark compost and charcoal as prescribed by cabinet ordinance based on Article 11 of the Improvement of Soil Fertility Law. Bark composts shall be “accumulated/fermented by adding livestock manure to the main ingredient tree bark”, following the definition of the Ministry of Agriculture, Forestry and Fisheries of Japan and. Main ingredient here means ingredients making up more than 50% of the total weight.

3. Terminology

New definitions of reused/unused wood have been provided to clarify the applicable scope of wood. Also in Product Category No. 111 “Board Made of Wood or the Like” (Established on July 1, 1998) (hereafter referred to as Version1.0), thinned wood was defined as wood (log) less than 14 cm in tip end diameter produced from plantation forests. However in Version2.0, criteria based on tip end diameter were omitted. When Version1.0 was first established, as thinned wood with comparatively large diameters was considered to have a relatively high market value, this product category was designed to target especially thinned wood with small diameters. However, with the forestry situation growing increasingly harsh over the past five years, profitability is decreasing due to sluggish wood prices and increasing management costs. Especially in Japan, there are concerns of declining management levels such as failure to implement the required thinning at the appropriate time in order to foster healthy forests. Giving priority to the further promotion of thinning activities necessitating forest maintenance, requirements based on tip end diameter were omitted because they contradict the actual situation.

Regarding certification of thinned wood, Version1.0 required the submission of documents certifying place of origin, forest management plans, and information on tree type, etc. From this present version, requirements such as indicating the year of planting in the document certifying place of origin as well as attaching photographs of the concerned forest to prove that thinning was carried out have been added. Forest management plans have however been omitted from requirements, considering the difficulty presented to applicants in submitting these plans. In place, applicants are now required to report where possible information on the thinning percentage, how many times thinning has

been carried out, as information on the thinning activities of the applicant, and to clarify their long term management plans. If the event of difficulty in providing this information, applicants may provide estimates of the year of planting based on the fact that the period of regenerating cutting for Japanese cedar and cypress is at shortest around 45 and 50 years respectively in Japan (though this can differ by region) and thinning is required before this.

For less useful wood, only those with relative marketability that are discarded or disposed were taken up in this product category. In Version1.0, they included abandoned lumber in the forest, shrubs, and tree roots. In Version2.0, wood obtained from lumber damaged by disease, pests, disasters, and bent or small caliber logs were added to these items. Logs whose relocation is prohibited by related laws such as logs damaged by pine weevils were excluded. It was reviewed if species that are difficult to use as materials in manufacturing due to quality, color, etc. should be included in the range of less useful wood. This however provided difficulty to determine owing to difference in regional conditions such as industrial level. Finally it was decided that such species shall not be determined as less useful wood based solely on characteristics such as quality and color.

Of less useful wood, small caliber logs were limited to logs obtained by thinning from plantation forests in Version1.0, however considering the existence of various national, regional, and natural conditions, all small caliber logs regardless of type of forest and logging method were adopted in Version2.0. Some small caliber logs are produced from clear-cutting over a wide area. Logging methods such as clear-cutting differ by situation, such as forestry measures of a country, geography, climate, characteristics of tree, etc., and thus cannot be handled in the same way. However, in the case of clear-cutting over a wide area, it may be inappropriate to recommend this logging method due to its risks of causing tremendous damage to the diversity of living things, as well as concerns of such problems as flowing out of soil, etc. For natural forests, this raises concerns of such problems as degradation of forest and deforestation due to illegal or excessive logging. It was therefore decided that timber produced from natural forests and wood produced by clear-cutting, patch logging, and strip logging would require certification that the forest is being sustainably managed by a neutral third party. For details on requirements that must be satisfied for forest certification, refer to criteria on “wood based panels”, and/or “furniture” in the Nordic Swan.

4. Environmental Criteria

4.1 Details of establishing environmental criteria

For setting up the criteria, environmental impact over the whole life cycle of a commodity was considered, using Chart for Selecting Environmental Impact at Each State of Product Life Cycle. As a result, impact items that are considered to be important to establish criteria for Eco Mark certification were selected in view of environmental impacts over the whole life cycle of the product. For these items,

qualitative or quantitative criteria were considered.

Environment impact items considered for the category of "Wooden Products Using Waste Wood, Thinned-out Wood, Small-diameter Logs, etc." are as shown in the life stage environmental load items selection table (marked with X and XX in the table). Out of these items were finally selected as the environment-related criteria: A-1, A-8, B-2, B-5, B-6, B-8, B-9, C-1, C-8, D-5, D-7, D-8, D-9, E-1, E-2, E-7, E-8, and F-9 (XX in the table).

The blank columns in the table show items that were out of the scope of review or that were reviewed in combination with other items. Following is the details of establishing the environment-related criteria.

Chart for Selecting Environmental Impact Items at Each Stage of Product Life Cycle

Environmental Impact Item	Life Cycle of Products					
	A. Resource Extrac-Tion	B. Manu-facturing	C. Distri-bution	D. Use/ Con-Sump-tion	E. Dis-posal	F. Re-cycling
1. Resource consumption	XX		XX		XX	
2. Discharge of greenhouse gases	X	XX	X		XX	
3. Discharge of ozone layer depleting substances						
4. Destruction of eco systems						
5. Discharge of atmospheric pollutants		XX	X	XX	X	
6. Discharge of water pollutants		XX				
7. Discharge/disposal of wastes				XX	XX	
8. Use/ discharge of hazardous materials	XX	XX	XX	XX	XX	
9. Other environmental Impacts	X	XX		XX		XX

A. Resource Extraction Stage

A-1 Resource consumption

The following points were reviewed under this item:

- (1) Use of as reused/unused wood as raw materials
- (2) Use of non-wood materials
- (3) Sustainable forest administration/management in cutting wood and producing chips

For (1), it is desirable to use by 100% thinned-out wood, small-diameter logs, waste wood, disassembled architectural wood, and rarely utilized wood as raw materials for products, from the viewpoint of contributing to forest conservation through effective utilization of wood, utilization of non-utilized resources, and reuse of wood.

Consequently, this item has been selected as an item for which criteria should be established.

The addition of bamboo to the product category was also reviewed. The area of bamboo groves in Japan is 156,000 hectares (2000), which is approximately 0.6% of the area of forests, and therefore small. In 1970, the total bamboo grove area was 167,000 ha, of which 92% was producing bamboo forests. In 2000, the percentage of bamboo-producing forests dipped to 37%, with many of these forests left neglected and not maintained. In recent years, proper management of bamboo groves is increasingly being neglected. This has resulted in overgrowth and invasion into forests and agricultural land, threatening proper growth and development. Poor growth of other plants due to the multiplication of bamboo groves also means a drop in the number of animal species. Furthermore, another land conservation problem brought on by neglected bamboo groves being pointed out is the tendency of the underground portion of the stem to extend about 50 cm into the ground, easily inviting the collapse of hillsides. Since bamboo grows in about two to three years and thus does not deplete as resources, its multiplication on the contrary prevents other agricultural products and trees from growing, thus requiring planned felling in order to protect forests. Furthermore, there are an increasing number of new products developed that use bamboo resources, along with improvement in the maintenance and management of bamboo groves. For these reasons, bamboo was acknowledged as being a raw material in the scope of "less useful wood". The method of proving that a concerned bamboo is "less useful" was reviewed. Due to the difficulty in setting quantitative criteria, it was decided that submission of the following shall be required: qualitative documents adequately describing the peripheral conditions of the bamboo grove and that logging is carried out for the purpose of appropriate maintenance and management in environment preservation, and photographs or maps showing peripheral conditions of the bamboo grove.

Also, use of board materials certified in Product Category No.111 "Board made of Wood or the Like Version2.0" as raw materials is allowed. Accordingly, in this Product Category, use of waste plant fibers as raw materials shall also be allowed.

In addition, products mixing waste plastic with wood, and using as the raw material of wooden areas were reviewed. For composite products, however, considering that separation and sorting are difficult after use, impact may increase during incineration, and that materials which look like wood may result in misunderstanding on the part of consumers, it was decided that composite products shall not be include in this product category which focuses on the use of recycled and unused wood. Certain composite products that satisfy the designated

criteria in Product Categories No.118 “Plastic Products Using Recycled Materials” and No.123 “Building Products Using Recycled Material” are included in the scope of applicable products of these categories.

For (2), although use of single material as a product may reduce the environmental load, this offers less possibility if durability and feeling are considered. This has been selected as an item for which criteria should be set up, provided that the use of non-wood materials, such as nails and metal fixtures, should be allowed to a certain extent.

Weight was calculated referring to No.111 “Board Made of Wood or the Like Version2.0”. For logs and lumber, considering that the balanced state cannot be reached in seven days of curing, air-dried requirement was excluded.

For (3), from the time when Version1.0 was established, more and more forests in the world are certified as being sustainable forests by third parties. In Japan, the acquisition of forest certification is gradually spreading even among national forests, since the acquisition of forest certification by one forest from the FSC (Forest Stewardship Council) for the first time in 2000. As of August 2003, the area of certified forests total 175,000 ha, equivalent to about 0.7% of the total forest area in Japan.

In the case of this Product Category, it was decided that the focus will be on promoting the use of reused/unused timber, considering that the unused rate of thinned wood in Japan is high, and the percentage of lumber generated in construction recycled for use as material is still low. However, it was decided that reviews will be continued regarding the inclusion of reused/unused timber, less useful wood, as well as wood produced from forests sustainably managed within the scope of raw materials. Still, there is increasing awareness worldwide for the need for adequate understanding and cooperation on both the side administering and managing forests as well as the side purchasing forest products in order to realize proper forest management. Another growing trend is the formation of international networks of companies aiming to produce, distribute, and sell certified timber and wood products. Reviews will be continued based on such trends as well as domestic trends like the investigative commission for “Ideal Forest Management System in Japan” established in March 2003.

A-2 Discharge of greenhouse gases

The following point was reviewed under this item:

(1) CO2 emission, in connection with evaluation of CO2 absorption by woody resources and energy consumption at collecting raw materials

For (1), the carbon storage function of timber was reviewed. Though there are formulas to calculate and assess carbon storage amount, it is difficult to convert carbon storage function into values which can serve as criteria in this stage. At the point when it becomes feasible to establish overall evaluation criteria including the manufacturing, use, consumption, and disposal stages, the selection of this item as a criterion shall be reviewed.

A-8 Use/discharge of hazardous materials

The following point was reviewed under this item:

(1) Use and inclusion of hazardous substances

For (1), the possibility of involving insect-proofing or anti-septic treatment, depending on the situation how waste wood, disassembled architectural wood or rarely utilized wood was used before they became raw materials. CCA, PCP and chlordane were particularly examined treatment agents.

The discharge of CCA processed timber, whose undesirable inclusion of heavy metals such as chrome and arsenic, etc. is a problem, is predicted to peak in 2010. Regarding wood injected with CCA to prevent sepsis and termites, inappropriate incineration may cause the generation of toxic gases including arsenic, and in addition, the ashes may contain toxic substances such as hexavalent chrome and arsenic. The Construction Material Recycling Act prescribes that these materials need to be sorted and disposed of appropriately. Prefectural guidelines also instruct/recommend sorting during dismantling work. Some of these guidelines also recommend that if material identification is difficult, all foundations of wooden constructions built after 1975 should be separated/sorted from other timber due to the possibility of CCA inclusion. Furthermore, as these materials may not be identifiable when mixed with other timber, the guidelines recommend that foundations be dismantled separately from other timber to ensure thorough separation. Other than CCA, it is also instructed that wood applied with chlordane (an organic chlorine termicides) or creosote oil, which contains the carcinogenic benzo(a)pylene, be separated and sorted from other portions.

As described above, separation and sorting are prescribed in the Construction Material Recycling Act and prefectural guidelines. In addition, even in dismantling work not subject to this Act, it is the most likely that such efforts are made by the companies handling the dismantling work and by manufacturers. For these reasons, the sorting and use of materials subject to septic agents, moths and insecticide was therefore selected as a criterion for the use of construction waste wood. For hexavalent chrome and arsenic contained in products, it was decided that verification should be carried out through content tests.

However, since possible inclusion of wood subject to antiseptic, pesticides and termicides wood from dismantled buildings cannot be excluded, the use of such demolition waste wood has been prohibited particularly for disposal products that are exposed directly to water and soil and are difficult to collect, as well as products used for food packaging. Specifically, it was decided that use of such waste wood shall be prohibited for charcoal which users directly burn, activated charcoal used for improving water quality, packaging materials for food, and soil

conditioners dispersed in soil.

A-9. Other environmental Impacts

The following point was reviewed under this item:

(1) Illegal logging

For (1), there is the opinion that the issue of illegal logging is not only the problem of the producing country, but also that of the importing countries to some extent. In July 2003, the Second Meeting of the Asia Forest Partnership (AFP) was held in Indonesia, and a framework was established to realize the goal of having various stakeholders jointly undertaking the issues of illegal logging, forest fires, and forest recycling. Prior to this, in June 2003, a joint declaration of Indonesia and Japan bilaterally working together to countermeasure the illegal logging problem in Indonesia and action plans were signed. In November 2002, the Japan Federation of Wood-Industry Associations announced their “Declaration on Illegal Logging”, which expresses the perspective of the timber industry based on various discussions carried out during the “Committee Meetings to Review Illegal Logging Issues” set up by the organization. Such efforts to prevent illegal logging jointly by the government, international organizations, and industrial organizations are therefore being attempted. In addition, there are a growing number of international NPO and civic activities aiming to recognize forests with high protection value, prevent illegal logging, and support management of sustainable forests. However, due to the difficulties involved in drawing up specific criteria owing to the ability to pinpoint the actual situation of illegal logging, this was not selected as a criterion. However, by requiring the submission of documents certifying the raw material used for wooden portions of products, manufacturers are called not to use illegally logged timber. This should also be effective for raising interest related to illegal logging among consumers. Such efforts by the government and industry are expected to heighten user interest as well as promote understanding and cooperation.

B. Manufacturing Stage

B-2 Discharge of greenhouse gases

The following point was reviewed under this item:

(1) CO ₂ emission, in connection with evaluation of CO ₂ fixing by woody materials and energy consumption at production

For (1), it has been concluded to include the item as an energy consumption reporting item, in order to enhance people's awareness of the needs for reducing energy consumption, considering that wooden products do not consume much

energy. However, considering the difficulty in transforming energy consumption levels into figures and setting down criteria for this, as in Version1.0, submission of reports clarifying the amount of energy used during manufacturing from reception of timber materials and drawings outlining the production process has been made mandatory as an indication that “efforts are made to save energy”.

B-5 Discharge of atmospheric pollutants

The following points were reviewed under this item:

- (1) Emission of NO_x, SO_x, etc. at production (installation of preventing equipment at each plant)
- (2) Emission of air polluting substances from adhesive

For (1) and (2), air-polluting substances emitted from product manufacturing processes, it has been concluded to include the item into this category because the observance of related environmental laws and agreements will contribute to reducing environmental load.

B-6 Discharge of water pollutants

The following point was reviewed under this item:

- (1) Emission of water-polluting substances from production processes

For (1), water-polluting substances emitted from product manufacturing processes, it has been concluded to include the item into this category because the observance of related environmental laws and agreements will contribute to reducing environmental load.

B-8 Use/discharge of hazardous materials

The following points were reviewed under this item:

- (1) Suppression of formaldehyde emitted from manufacturing processes (management according to environmental criteria and measures for reduction)
- (2) Use of termiticides and antiseptics (e.g. CCA)

For (1), explanation is given under B-5. This item has been selected as an item for which criteria should be set up.

For (2), some products contain anti-septic agent added to ensure increased durability; anti-septic processing may extend the life of wood which is useful in view of CO₂ absorption and other environmental effect. However, considering that certain anti-septic agents are hazardous with heavy metals, environmental impact related to use of these agents was reviewed in D-8.

As a result, it has been concluded to limit indoor use to under-floor use only. However, the item has been selected as a product for which criteria should be set up, because use of anti-septic agent is sometimes necessary for maintaining outdoor commodity functions. Nevertheless, those, which contain anti-septic agent as a natural component, such as a component contained in Japanese cypress are not applicable.

In anti-septic and insect repelling measures, the use of cypress, white-cedar leaves, etc. which have high anti-septic and insect-repelling effects in stead of chemicals is also considered a key point.

B-9 Other environmental impacts

The following point was reviewed under this item:

(1) Dust generated at production (installation of preventing facilities at each plant)
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For (1), it has been concluded to set us criteria for this item because environmental loads can be reduced by the observance of related environmental laws and agreements, which means work environment is well controlled.

C. Distribution Stage

C-1 Resource consumption

The following point was reviewed under this item:

(1) Lightweight packaging, and ease of recycling
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For (1), the focus of review was placed on if packaging materials are light, simple, or can be repeatedly used. Regarding A. Outdoor accessories and B. Indoor accessories, some side panels and protection panels are used to protect products. Plastic sheets may also be used to protect products against humidity, and plastic packaging materials for some types of products. Taking these facts into consideration, minimum use of packaging and use of reusable packaging were selected as criteria.

C-2 Discharge of greenhouse gases

The following point was reviewed under this item:

(1) Quantity of CO2 released by energy consumption during transportation of materials

For (1), the conclusion was reached that it would be desirable to reduce distribution channels, promote recycling activities closely related to the region that generates reusable resources such as waste wood and unused resources in

forests.

Given that about 80% of the timber consumed in Japan relies on imports, and the wood mile which multiplies the timber transportation distance with the timber volume (km-m³) is about four times that of the U.S., which ranks first in global timber imports, the shortening of the distribution route would serve as a means of reducing energy consumption in the distribution stage. The adoption of the transportation route distance as a criterion was therefore discussed. However, this item was eventually not selected as a criterion due to the difficulty in establishing criteria, which ultimately may impede trade.

C-5 Discharge of atmospheric pollutants

The following points were reviewed under this item:

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| (1) Discharge of air pollutants from transportation of materials.
(2) Reduction of packaging material volume and weight |
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For (1), this item was not selected as an item subject to criteria, because an alternative transportation method that releases less air-polluting substances is difficult to choose as criteria.

For (2), this item was selected as a criterion as explained in C-1.

C-8 Use/discharge of hazardous materials

The following points were reviewed under this item:

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| (1) Formaldehyde control during material storage
(2) Restriction on packaging material |
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Considering that the selection of the control of formaldehyde emissions from the material as a criterion will contribute to reduce the environmental load, it was reviewed in D-8.

For (2), considering that these plastic sheets and plastic packaging materials are disposed by incineration after use, prohibition of the use of organic halogenides was selected as a criterion.

D. Use/Consumption Stage

D-5 (Release of air polluting substances)

The following point was reviewed under this item:

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| (1) Release of air pollutants from adhesive agent |
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The release of formaldehyde at the use/consumption stage is carefully watched by the consumers because the indoor air pollution problem by the release of formaldehyde from the house using the product which contains formaldehyde

and so on is pointed out in recent years.

Regarding the emission of formaldehyde for interior finishing of living rooms, etc., the Amended Building Standard Law, which revised restrictions on construction materials, has been completely enforced since July 2003. It was therefore determined that environmental impact can be reduced by setting emissions of substances said to be potentially harmful substances from products used indoors as a criterion. Details of specific emission criteria were reviewed in D-8.

D-7 (Release/disposition of wastes)

The following point was reviewed under this item:

(1) Products shall not be of the disposal type
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Products intended for oneway purpose despite the availability of general alternative products increase wastes. The effective use of reused/unused wood and waste plant fibers should be promoted for some of these products, but it was decided that disposal shall be prohibited to avoid encouraging their use.

However, this does not apply to one-time use products which can only be used once due to the nature of their functions such as charcoal and soil conditioner.

D-8 (Use/release of harmful substances)

The following points were reviewed under this item:

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| <ol style="list-style-type: none">(1) Generation of formaldehyde from products(2) Emissions of indoor air pollutants during use/consumption(3) Harmful substances contained in non-formaldehyde adhesives(4) Other harmful substances(5) Use of wood preserving agents |
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(1) was selected as the item to establish criteria as explained in D-5. With the revision of JIS and JAS in March 2003, categories were established according to the amount of formaldehyde emitted, while in the Amended Building Standard Law, area restrictions of construction materials emitting formaldehyde used for interior finishing material were imposed according to the emission level. A new grade F**** (average 0.3mg/liter or less, maximum 0.4mg/liter or less) was installed. The grade is currently the highest grade in which emission level is even lower than E0 or FC0. Construction materials rated with the F**** grade can be used without limit in interior finishing material. The F*** grade (average 0.5mg/liter or less, maximum 0.7mg/liter or less) which is equivalent to E0 or FC0 limits use to less than two times the floor space, while the F** grade (average 1.5mg/liter or less, maximum 2.1mg/liter or less) which is equivalent to E1 or FC1 limits use to less than 0.3 times the floor space (when the number of ventilations performed is less than 0.5 to 0.7 times/hour). Based on these new

regulations, criteria were reviewed from the perspective of which grade should be chosen as a new criterion.

The grade of formaldehyde emissions shall be determined according to the size of the area being used. By differentiating use in this way, F*** grade products may also be used in some cases, or may be used at areas not facing living rooms such as mats, etc. Whether F*** grade products are also allowable based on formaldehyde concentrations in rooms was therefore reviewed. Since products serve as intermediate products, they are used not only as interior materials for houses, but also for furniture. There were comments that even if a product is F*** grade, it should be allowed if it becomes F**** grade finally after secondary processing. However, the F**** grade was eventually selected considering that F**** should be selected if the Eco Mark Program was aiming to be the top runner, that current social trends are towards realizing low formaldehyde levels, and that it is difficult for users to differentiate use between F*** products and F**** products, as well as bearing in mind the transition to F**** indoor-use products in the future.

Regarding the measurement method, it was decided that the JIS A 1460 "Building Boards Determination of Formaldehyde Emission -- Desiccator method", JIS A 1901 "Determination of the emission of volatile organic compounds and aldehydes for building products -- Small chamber method", or other appropriate "glass desiccator method" or "acryl desiccator method" specified JIS or JAS standards can be used. Furthermore, it should be noted that some of the products under application may not have corresponding JIS and JAS standards, and other products may be difficult to measure due to their shape. In this case, it was decided that these products can be certified to meet the required criteria by demonstrating that the emissions of formaldehyde from the main components (plywood, laminated lumber, boards, etc.), adhesives and coatings used are below the specified levels. In addition, JAS standards on plywood and laminated lumber allow labeling that non-formaldehyde adhesives are used without undergoing formaldehyde emissions tests if a domestic or abroad registration certifying entity certifies that no adhesives containing formaldehyde are used. In this case, documents indicating certification by JAS or copies of these documents shall be submitted.

For (2), the committee reviewing sick house syndrome problems of the Ministry of Health, Labor and Welfare set down guidelines on indoor air pollution in 2000 in addition to those on formaldehyde in 1997, prescribing indices on indoor concentrations of toluene and xylene in these guidelines. Thus, it was decided that criteria would be prescribed for these two substances as done in Version1.0. Some applicable products use paint and adhesives containing toluene and xylene that may be discharged. In 2002, JIS A 1901 was established, enabling the designated VOC measurement. Regarding toluene and xylene, "No emission during product shipment" was selected as a criterion, and the measured values shall be below the quantitative lower limit set down in JIS A 1901. Quantitative lower limit is a value indicating the minimum

concentration which can be accurately quantified using the concerned analysis method. However, measurement can be exempted for products not containing toluene and xylene as prescription constituents.

Currently a JIS standard prescribing the toluene/xylene emission grade is being established. This standard sets down grades such as F****, which is the same as the emission grade system for formaldehyde, as well as emission speed. In the indices for indoor air concentration set down by the Ministry of Health, Labor and Welfare, formaldehyde is set at $100\mu\text{g}/\text{m}^3$ (below 0.08 ppm) Products are taken to satisfy this index if they are of the F**** grade under the designated conditions. There are also guidelines restricting use of toluene to below $260\mu\text{g}/\text{m}^3$ and xylene to below $870\mu\text{g}/\text{m}^3$. As in formaldehyde, standards are being prescribed for emission grade. It was reviewed if emission grade can be taken as a criterion if its correlation with indoor air concentration can be clarified under the designated conditions. In addition, in the current JAS standards, toluene/xylene test methods and standards are being considered. Once these are set down as standards, it will be reviewed if they should be introduced into the Eco Mark Program. Furthermore, guidelines on indoor air pollution separately list indices for thirteen VOCs other than formaldehyde, toluene, and xylene. These are health indices based on risk assessment. It is assumed that below these concentrations, VOCs will have no adverse effects on health in normal use. Particularly, acetaldehyde is given as a VOC related to wooden materials. Because the correlation between the amount emitted from products and indoor concentration is still not clear, it is difficult to set down reference values for emissions from products. Consequently, this was not selected as a criterion. In the future, VOCs related to wooden materials including acetaldehyde shall further be reviewed based on guidelines proposed by the Ministry of Health and Welfare as well as revisions made in the Building Standard Law.

Regarding TVOCs (Total Volatile Organic Compounds), the guidelines of the Ministry of Health, Labor and Welfare sets down tentative targeted values, and so these were again reviewed in continuation from Version1.0. There exist numerous VOCs inside rooms for which no guideline values have been set. Even if VOC concentrations for which guideline values are set are individually met, air quality may not be completely pleasant and safe. The review committee of the Ministry of Health and Welfare has, with the aim of preventing the progress of pollution by harmful substances for which guideline values have yet to be set, proposed appropriate allowable VOC concentrations considering it important to complement individual VOC guideline values. Again, because the correlation between TVOC emissions from products and tentative targeted values for indoor concentrations is still unclear, no criteria was set down in this version for the TVOC emissions. It should also be noted that timber contains a natural VIC called terpenes, and that no individual guideline values have been set down for these. Like individual VOCs, TVOCs will continue to be reviewed in the future based on trends on TVOC guideline values set according to risk assessment results, etc.

For (3), the increasing use of non-formaldehyde adhesives as one countermeasure in response to rapid change into low-formaldehyde products was reviewed together with the concerns of emissions of harmful substances other than formaldehyde. In particular, the raw material monomer MDI (diphenylmethane-4,4'-diisocyanate) used in isocyanate adhesives was reviewed. MDI has long been known to be allergenic. Criteria set down for wooden construction materials in Germany's Blue Angel and Canada's Environmental Choice prescribe standards on monomer MDI emission levels in the use of isocyanate adhesives. Products made in Japan are increasingly using soluble polymer isocyanate adhesives; consequently, the selection of this item as a criterion was considered. Isocyanate adhesives used in wooden products on the Japanese market are mainly of the soluble polymer type. They are considered to completely react in the manufacturing process of the adhesives, which means low possibility of monomer emission from products. Considering that there exist no standard measuring method or standard values in Japan and the lack of knowledge and techniques related to MDI emissions, this item was taken as difficult to select as a criterion and was therefore not selected. However, it was decided that further reviews will be carried out when information on measuring methods and standard values becomes available.

For (4), harmful heavy metals which may be added were reviewed. Specifically, chrome, arsenic, and cadmium are sometimes contained in the coatings of products. Consequently, it was decided that the addition of heavy metals should be restrained by conformance to criteria on heavy metals and their compounds listed in Eco Mark Product Category No. 126 "Paints Version 1.0".

(5) was selected as a criterion as discussed in B-8. Wood preserving agents (wood antiseptics, termicides, pesticides, fungicides) are categorized as chemicals or sundries, and are not subject to regulations of national authorization and registration systems such as pharmaceuticals and agricultural chemicals. Wood preserving agents are however regulated by the Law Concerning the Examination and Regulation of Manufacture, etc. of Chemical Substances. Regarding the pooling of scientific findings and risk assessment, they are similar to agricultural chemicals which are regulated by the Agricultural Chemicals Regulation Law. For such reasons, wood preserving agents which can be used are those authorized by the Japan Wood Preserving Association.

Furthermore, it was decided that chemicals containing, as prescription constituents, substances listed as "Chemicals Suspected of Having Endocrine Disrupting Effects" under the Environment Ministry's "Strategic Program for Environmental Endocrine Disruptors '98 (SPEED'98)" should be prohibited in continuation to Version 1. These substances listed under the SPEED'98 initiative include pyrethroid chemicals: permethrin, fenvalerate, esfenvalerate, cypermethrin. Among them, permethrin was confirmed to be "not having influence on the evaluation of ADI (acceptable daily intake) from the viewpoint of endocrine disrupting effects by the pesticide residue investigation force of the pesticide residue workshop, established by the food sanitation committee of the pharmaceutical/food sanitation council, Ministry of Health, Labor and Welfare.

Despite such new findings that permethrin has no endocrine disrupting effects on humans, it is still included in the SPEED'98 list. Considering that public efforts are currently in process, it was decided that products containing permethrin as a prescription constituent shall be prohibited. The revision of SPEED'98 has been reviewed by the Ministry of the Environment since October 2003. If new findings are obtained, this item shall be reviewed again.

Regarding chemicals containing heavy metals that have been used in large amounts until recently, the reinforcement of wastewater restrictions has drastically reduced the use of chemicals including chrome or arsenic. The Japan Wood Preserving Association has to date never approved the use of chemicals containing chrome or arsenic. Consequently, the text "However, chemicals containing chrome or arsenic are excluded even if these chemicals are approved" of Version1.0 was deleted.

Furthermore creosote oil and chlorpyrifos were reviewed. Use of the former was prohibited in some public construction works in fiscal 2003 by the Ministry of Land, Infrastructure and Transport, and use was discontinued in the parks of Tokyo and Yokohama as well. Creosote oil has been used for cross ties, but because it contains the cancer-causing benzo(a)pylene, its toxicity is a problem. The Japan Wood Preserving Association currently approves use of only one item of chemical containing creosote oil for specific purposes. However, it was decided that the Eco Mark program shall not approve its use. For chlorpyrifos, the amended Building Standard Law enforced in July 2003 prohibits the use of construction materials containing this substance in buildings with living rooms. Chlorpyrifos became the main termiticide after chlordane was designated as the Class I Specific Chemical Substance, identified by the Law Concerning the Examination and Regulation of Manufacture, etc. of Chemical Substances. The Japan Wood Preserving Association decided to restrain the import, manufacturing, and sales of this substance, effective in April 2001, considering the decision by the U.S. EPA (Environmental Protection Agency) and Dow AgroSciences to gradually restrict use (total amount control) in 2000, and the "Review Committee on Sickhouse Issues" of the then Ministry of Health and Welfare. Furthermore the Association has not approved the registration of the chemical since March 31, 2002. It was confirmed that the chemical is no longer on the authorized chemicals list of the Association.

D-9 Use/Consumption

The following point was reviewed under this item:

(1) Conveyance of product information

For (1), the products taken up in this Product Category are diverse, ranging from products used by construction businesses such as structural engineering products and interior finishing materials, to products used by general consumers such as living and cultural products. It is therefore important to provide

information conveying that these products have been designed to reduce environmental impact. Specifically, it was decided that a manual providing information on related criteria should be compiled and distributed to users. Information should be conveyed extensively using methods that suit the individual products. Preferable means of conveying the information includes placing the information in product catalogues, and labeling the address of the homepage providing product information on the packaging of products.

E. Disposal Stage

E-1 Consumption of resources

The following point was reviewed under this item:

(1) Ease of disposal and recycling

For (1), some of the products in this Product Category may contain materials other than wood, such as metal and resin. It was reviewed that disclosure of information on materials used would facilitate consumers to consider the suitable disposal method and recycling. As explained in D-9, the provision of manuals containing information on related criteria was selected as a criterion.

E-2 Release of global warming substances

The following point was reviewed under this item:

(1) Release of global warming substances when incinerated

(1) was selected as a criterion for providing information to promote appropriate disposal, as discussed in E-1.

E-5 Release of air polluting substances

The following point was reviewed under this item:

(1) Release of air pollutants from product

For (1), this item was not selected as a criterion because it is difficult to control the exhaust gas processing equipment at the waste treatment plant of the products by the criteria.

E-7 Release/disposition of wastes

The following point was reviewed under this item:

(1) Release/disposition of wastes

(1) was not selected as a criterion because the needs to establish it as an environmental criterion were not confirmed at the time of review. However, the provision of information to promote appropriate disposal was selected as a criterion, as discussed in E-1.

E-8 Use/release of harmful substances

The following points were reviewed under this item:

- (1) Accumulation of environmental pollutants in the burned-up gas and ash from timber products subject to wood preserving processing
- (2) Consideration to impact reduction during incineration

For (1), the generation of harmful gases during incineration of products and harmful heavy metal residues in incineration ash were reviewed. As a result of a survey by the Japan Wood Preserving Association, incineration gas was deemed not a specific problem to be particularly taken up, and thus it was not selected as a criterion.

For (2), consideration to impact reduction during incineration was reviewed as with (2), and was selected as a criterion. Specifically with a view to controlling the generation of dioxins, it was decided that resins containing halogens such as chlorine should not be used for decoration work.

F. Recycling Stage

F-9 Other environmental impact

The following point was reviewed under this item:

(1) Recycling

For (1), used wood is usually recovered and recycled into raw material of wood chips and pulp, however, a large portion of such wood is often disposed in the unused state. Furthermore, the Construction Material Recycling Act requires wooden construction materials to be dismantled and recycled, and the provision of product information was reviewed as a means of facilitating sorting and recycling. As discussed in E-1, the provision of information on disposal and recycling was set down as a criterion.

5. Quality Criteria

Quality of general charcoal shall be treated in the same way as Version1.0, which was defined based on the opinions of the Japan Fuel Association. Quality of general activated charcoal was defined based on the hearing conducted on the Japan Inorganic Chemical Industry Association and the Japan Waste Water Association standards.

6. Others

(1) Product Category name

The name of this Product Category for Version1.0 was set as “Wooden Products Using Waste Wood, Thinned-out Wood, Small-diameter Logs, etc.”. For Version 2.0, this name was reviewed considering that the scope of applicable materials had broadened and clear definitions of reused/unused wood were achieved in the reviews for Version 2.0. Based on the fact that many of the products certified under this Product Category are made of thinned wood, in the aim to facilitate better understanding on the part of consumers by actively appealing that the products use thinned wood, the name was changed to “Products Using Thinned Wood and Reused/Unused Wood”.

(2) Indication below eco mark

- B. Interior accessories, C. Living and cultural commodities

It was decided that the first line shall indicate “100% reused/unused wood for wooden parts” following the clarification and definition of the scope of reused/unused wood and waste plant fiber, and to clearly indicate that 100% reused/unused wood and waste plant fiber is used for wooden portions and not for the entire product.

It was also decided that the second line shall provide information on the emissions of formaldehyde, one of the main items of this criteria in the form of “Mean amount of formaldehyde emission below 0.3 mg/l” or “The emission rate of formaldehyde below 5 μ g/(m²-h)” according to the test method implemented. For products requiring certifying of emissions from adhesives and coatings used, the line “The emission rate of formaldehyde in adhesives below 5 μ g/(m²-h)” shall be added. Products approved by JAS to label use of non-formaldehyde adhesives shall indicate “Non-formaldehyde adhesive used”.

The third line shall indicate “No wood preserving agent used”. However, this shall not be labeled for B. Interior accessories permitted to use wood preserving agents.

- A. Outdoor Equipment, D. Packaging material, and G. Other commercial products

As for B. Interior accessories, C. Living and cultural commodities, the first line shall indicate “100% reused/unused wood for wooden parts”. The second line shall indicate “No wood preserving agent used”, however, this shall not be labeled for A. Outdoor accessories permitted to use wood preserving agents.

- E. Charcoal (Including bamboo charcoal), F. Activated charcoal (Including humidity materials, water purifying agents, etc.), and H. Soil conditioners

Labeling shall be limited to one line, and it shall read “100% reused/unused wood for wooden parts” as with the other items above.