

**Guideline for
Evaluating Environmental Claim
Conformance in Construction Material**

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**Japan Testing Center for Construction Materials
(JTCCM)**

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Preface

To build “an economic society that has less environmental load and is based on recycling”, as an economical society system of sustainable development, various measures including laws and standards have been taken on the basis of common recognition as an international problem in the 21st century.

In Japan, following the “Environmental Basic Law” established in 1993, the “Waste Disposal and Public Cleaning Law” and “Law for Promotion of Effective Utilization of Resources” have been revised, and the “Basic Law of Establishing a Recycling-based Society”, “Construction Materials Recycling Act” and the like have been established, by which a legal system relating to environmental preservation and resource recycling has been built up.

Furthermore, the “Law Concerning the Promotion of Procurement of Eco-friendly Goods and Services by the States and Other Entities (hereinafter referred to the Green Purchase Promotion Law)” which obliges the states etc., to procure goods manufactured in conformance with the aforementioned laws (hereinafter referred to as an “eco-friendly goods”) as the duty of the states etc. has been established. In this law, eco-friendly goods to be procured are specified, and a “standard for judgment” in procuring the goods is given, and thereby it presents a technical target in developing, manufacturing, and distributing the eco-friendly goods in the future while insuring the conformance and quality of eco-friendly goods.

In the above-described situation, this guideline was prepared as a system for evaluating the validity of environmental claim product objectively, engineeringly, and quantitatively by being regarded as a support tool used in evaluating and judging the conformance of the environmental claim product to the requirements of the aforementioned laws, relating ISO standards, etc.

In this system, the evaluation items are set by being divided into two groups: check (negative check) of environmental load applied by the environmental claim product and environmental claim. The former is set as an essential requirement in evaluating all environmental claim products, and in the latter, items are set widely so that personnel engaging in development, manufacture, sales, and use can make environmental claims in many fields.

Regarding the evaluation standard and grade, the standard for conformance and nonconformance was not merely established, but in the case of conformance, the product was graded according to the degree of conformance so that the level of environmental claim can be recognized and the target in the case where a higher grade is aimed can be seen clearly.

Regarding the verification for judging the validity of environmental claim, third-party verification was set forth as a premise so that the environmental claim was acceptable internationally. On the other hand, the width of verification corresponding to the third-party verification was expanded.

There are somewhat ambiguous expressions in a part of the evaluation standard etc. The intention of this is to avoid narrowing of the window of environmental claim by a uniform expression. This problem is to be overcome by positive consultation of the section in charge in the phase of implementation.

As described above, this system intends to upgrade many environmental claims and environmental claim products, and is regarded as a tool for environmental claim of a higher grade.

By the widespread use of this evaluation system, the technical competition relating to the environmental claim products is caused and hence the cost is reduced. Therefore, the purchase of environmental claim products is positively promoted not only by the states etc. but also by private business. Thereby, we wish to contribute to the building of an economic society of sustainable development.

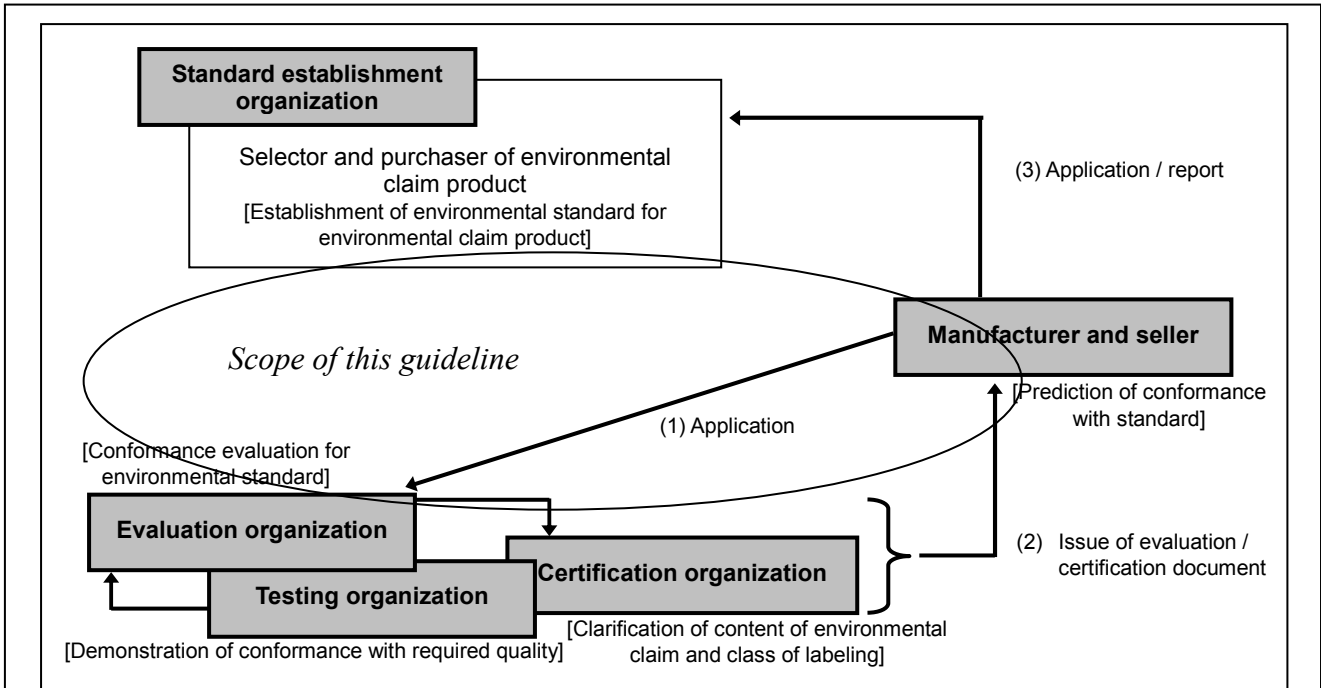
1. Objectives

- (1) An objective of this guideline is to support the establishment of a “standard” concerning the specification and procurement of environmental claim product performed by a material purchaser of the states, self-governing community, etc. and the judgment of conformance with standard on the environmental aspect of environmental claim product.
- (2) An objective of this guideline is to standardize the evaluation method in the case where a third-party organization evaluates and certifies the standard conformance with the “standard for judgment” specified by the states, self-governing community, etc.
- (3) An objective of this guideline is to evaluate the environmental claim for the environmental claim product objectively, engineeringly, and quantitatively.
- (4) An objective of this guideline is to improve the quality of environmental claim product and reduce the cost thereof by technical competition through the development, manufacture, and distribution of environmental claim product.
- (5) An objective of this guideline is to contribute to the building of an economic society of sustainable development, in which the purchase of environmental claim product is generally disseminated, and the formation of a recycling-based society is promoted, by making evaluation of environmental claim product by the manufacturer itself by using a proper evaluation method and by making evaluation in which fairness, strictness, and transparency are secured by a reliable third party.

2. Scope

- (1) This guideline is applied when the conformance of environmental claim for the environmental claim product is evaluated objectively, engineeringly, and quantitatively.
- (2) This guideline is applied when the selector, purchaser, etc. of environmental claim product rationally sets an environment standard for the environmental claim product.
- (3) This guideline is applied when a person who performs evaluation and certification of environmental claim product evaluates the conformance of environmental standard of the environmental claim product.
- (4) This guideline is applied when a person engaging in the development, manufacture, and distribution of environmental claim product predicts beforehand the degree of conformance of the environmental claim product declared by himself.
- (5) This guideline is applied mainly to construction materials of the environmental claim product.

Figure 2.1 is an image view of scope.



This image view of scope shows the fundamentals of development and the possibility thereof. Therefore, according to the characteristics of certification organization, the same organization can perform both certification and label indication, and also can perform both certification and testing.

In this guideline, organizations of “standard establishment”, “approval/certification”, and “testing/evaluation” that are recognized as components of certification/approval system in the consultation concerning international trade of WTO etc. are combined to make an image, and a combination of organizations having these functions and the way of certification are not specified.

Fig. 2.1 Image view of scope

Also, the basic form of evaluation/certification based on the image view of scope shown above is given below.

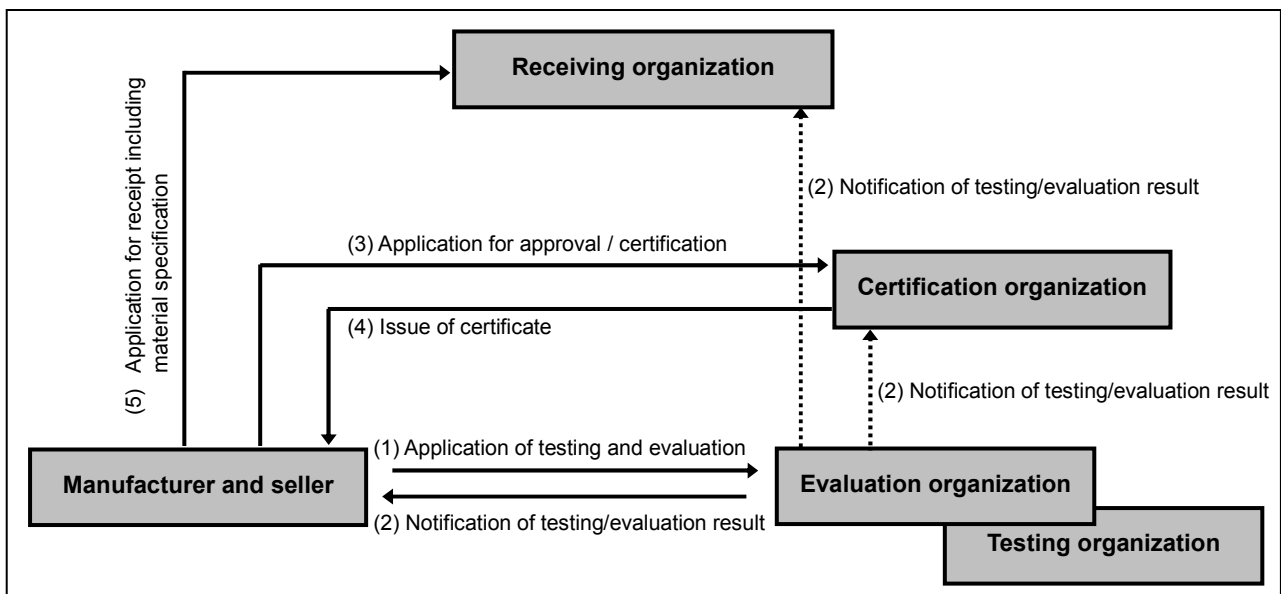


Fig. 2.2 Basic form of evaluation/certification

3. Normative references

ISO 14020:1998	Environmental labelling and declaration – General principle –
ISO 14021:1999	Environment labelling and declaration – Environmental claim by self declaration (Type II environment label indication)
ISO 14024:1999	Environment labelling and declaration – Type I environmental label indication – General principle and procedure
ISO/TR 14025	Environment labelling and declaration – Type III environmental declaration
ISO 14040:1997	Environmental management – Life cycle assessment – Principle and framework
ISO 14041:1998	Environmental management – Objective and setting of investigation scope and inventory analysis
JIS draft	Guideline concerning introduction of environmental aspect to building material standard
JIS draft	Common guideline concerning evaluation of environmental aspect of recycled construction material

4. Meaning of terms in this guideline

Environmental claim product	General term of raw material, material, part, member, equipment, and the like in which it is verified that they can contribute to reduction in environmental load, environmental preservation and improvement, etc. by the use of the goods in one or more of global environment, local environment, and residence surrounding environment of building, etc.
Environmental claim	Claim in which the conformance and validity of environmental claim product is proved, of claims concerning reduction in environmental load, environmental preservation, environmental improvement, etc. claimed by developer and manufacturer of the environmental claim product on his own responsibility.
Environmental impact	Impact exerted on global environment, local environment, residence surrounding environment of building, etc. through life cycle of the environmental claim product
Negative check	Prior evaluation of negative environmental impact exerted by the environmental claim product through its life cycle
Certification body	Organization which certifies the conformance and validity of environmental claim and required quality
Third-party organization	Public organization which can perform verification and evaluation fairly and strictly, independent of manufacturer/seller and purchaser
Global environment	Earth-scale environment including global warming, ecosystem destruction, ozone layer depletion, and acid rain
Local environment	Region-scale environment relating to typical seven kinds of pollution (water pollution, soil pollution, air pollution, vibration, dust, land subsidence, offensive odor), municipal weather (heat island phenomenon etc.), street sight, etc.
Residence surrounding environment	Work environment at the manufacture stage of materials etc. and residence space and its surrounding environment at the stage of use
Construction material	General term of material, equipment, facility, etc. used for construction work etc.
Recycled construction material	General term of material manufactured by reuse and recycling, of the construction materials

Reuse	<ol style="list-style-type: none"> 1. Use of circulating resource as it is as a product (including the use after repair) 2. Use of all or part of circulating resource as a part or a part of other products
Recycling	Use of all or a part of circulating resource as a raw material
Heat recovery	Use of all or part of circulating resource that can be used for combustion or has a possibility of being used for combustion to obtain heat
Class of conformance	Grade showing the degree of conformance and validity of environmental claim by evaluation result obtained by evaluation system of this guideline
Conventional product	<p>Product for comparison, which is used as a standard capable of objectively presenting effects concretely showing superiority when the superiority of the environmental claim product is evaluated by comparison.</p> <p>Concretely, JIS product used in the same or similar application as or to that of the environmental claim product or product that is widely distributed and used socially and is easily identified. Alternatively, product in which environmental claim can be proved rationally and objectively by being used as product for comparison, and the claim of its superiority is approved by standard establishment organization and evaluation/certification organization.</p>
Conventional type	<p>Manufacturing method etc. for comparison, which is used as a standard capable of objectively presenting effects concretely showing superiority when the superiority of the environmental claim product is evaluated by comparison.</p> <p>Concretely, manufacturing method for JIS product used in the same or similar application as or to that of the environmental claim product or manufacturing method for product that is widely distributed and used socially and is easily identified. Alternatively, manufacturing method etc. of product in which environmental claim can be proved rationally and objectively by being used as manufacturing method for comparison, and the claim of its superiority is approved by standard establishment organization and evaluation/certification organization.</p>

5. Evaluated environmental claim

5.1 Life cycle of environmental claim product and environmental claim

- (1) The environmental claim in life cycle is based on the concept of image shown in Fig. 5.1.
- (2) For the environmental claim, the positioning thereof in the life cycle of the environmental claim product is clarified.

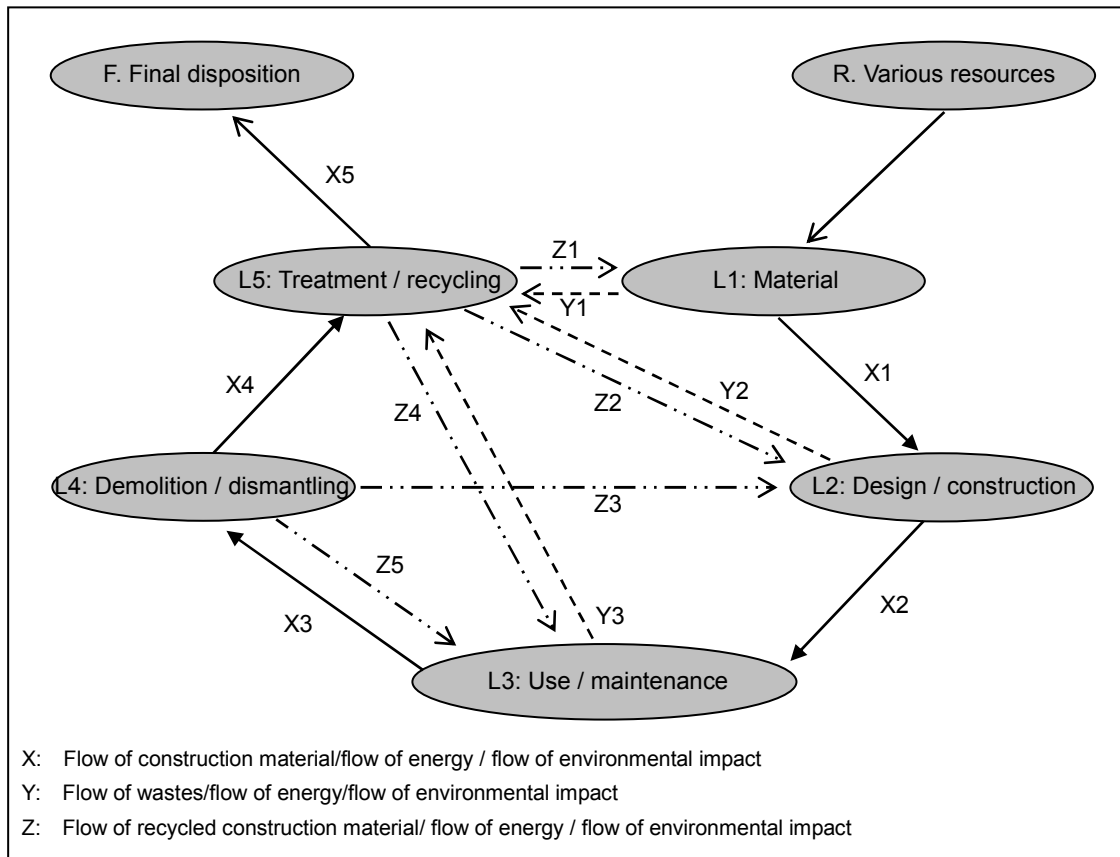


Fig. 5.1 Image of life cycle of environmental claim product

5.2 Classification of evaluated environmental claim

5.2.1 Environmental claim for safety, environmental load, etc.

Negative check is an essential requirement of all environmental claim products.

5.2.2 L1: Environmental claim at manufacturing stage of material

The environmental claim at the manufacturing stage of material is any one of the following three claims.

- A: Environmental claim concerning saving of resources and effective use of resources at the time of manufacture
- B: Environmental claim concerning saving of energy and effective use of energy at the time of manufacture
- C: Environmental claim concerning environmental preservation at the time of manufacture

5.2.3 Environmental claim concerning the whole of life cycle

The environmental claim concerning the whole of life cycle is any one or a combination of the following four classifications except for L1.

- L2: Environmental claim concerning design/construction stage
- L3: Environmental claim concerning use/maintenance stage
- L4: Environmental claim concerning demolition/dismantling stage
- L5: Environmental claim concerning treatment/recycling stage

5.3 N: Negative check for environmental claim

- (1) Negative check evaluates the global environment (N1), local environment (N2), and residence surrounding environment (N3) shown in Fig. 5.2.
- (2) For “N1: Negative check for global environment”, prevention of ozone layer depletion (N11), prevention of global warming (N12), and prevention of acid rain (N13) are evaluated.
- (3) For “N2: Negative check for local environment”, prevention of pollution (N21) and proper disposition of wastes (N22) are evaluated.
- (4) For “N3: Negative check for residence surrounding environment”, prevention of diffusion of air quality pollutant at the time of use (N31) and prevention of elution of heavy metals etc. (N32) are evaluated.

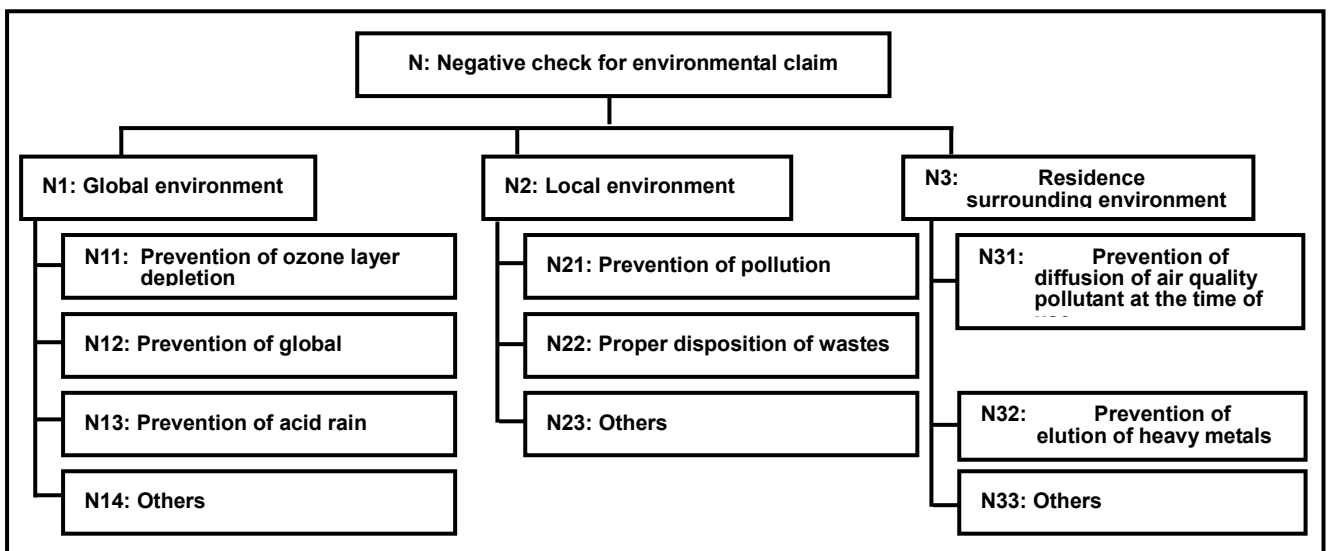


Fig. 5.2 Classification of negative check for environmental claim

5.4 A. Classification of environmental claim concerning saving of resources and effective use of resources at the time of manufacture

- (1) The environmental claim is any one or a combination of environmental claims concerning recycled resources (A1), by-product resources (A2), and natural resources (A3) shown in Fig. 5.3.
- (2) “A1: Environmental claim concerning recycled resources” includes reuse (A11) and recycle use (A12).
- (3) “A2: Environmental claim concerning by-product resources” includes resources originating from industrial by-product (A21) and resources originating from treatment (A22).
- (4) “A3: Environmental claim concerning natural resources” includes unused/alternate natural resources (A31), exhaustible resources (A32), and water resources (A33).

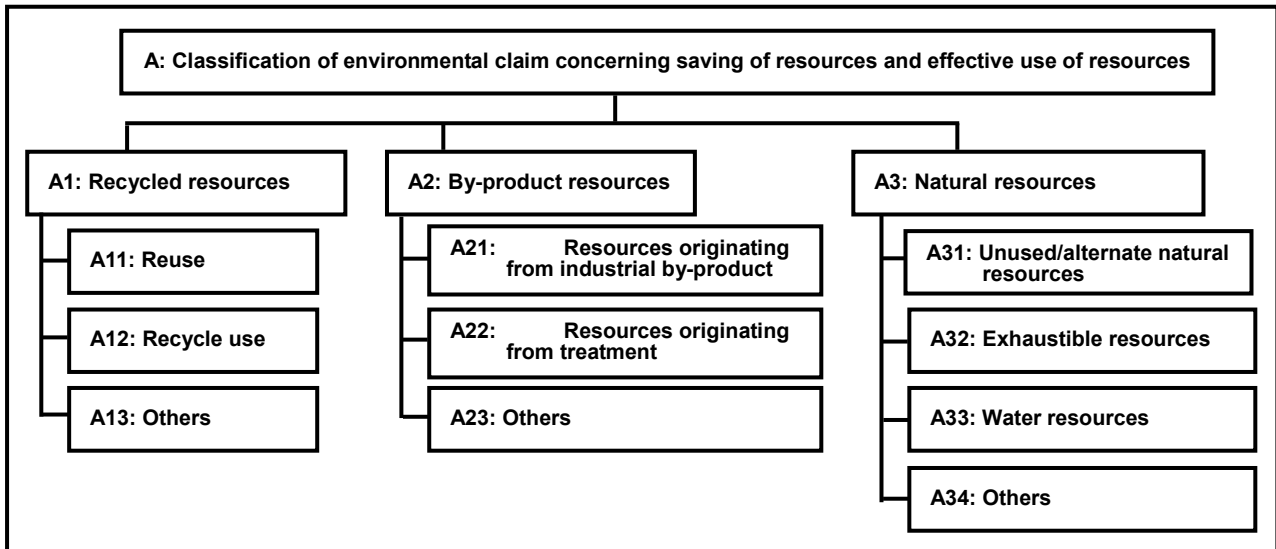


Fig. 5.3 Classification of environmental claim concerning saving of resources and effective use of resources

5.5 B. Classification of environmental claim concerning saving of energy and effective use of energy at the time of manufacture

- (1) The environmental claim is any one or a combination of environmental claims concerning saving of energy (B1) and effective use of energy other than fossil fuel (B2) shown in Fig. 5.4.
- (2) “B1: Environmental claim concerning saving of energy” includes reduction in usage (B11) and improvement in efficiency (B12).
- (3) “B2: Effective use of energy other than fossil fuel” includes effective use of natural energy, biomass energy, etc. (B21), effective use of recovered heat energy (B22), and effective use of energy originating from wastes (B23).

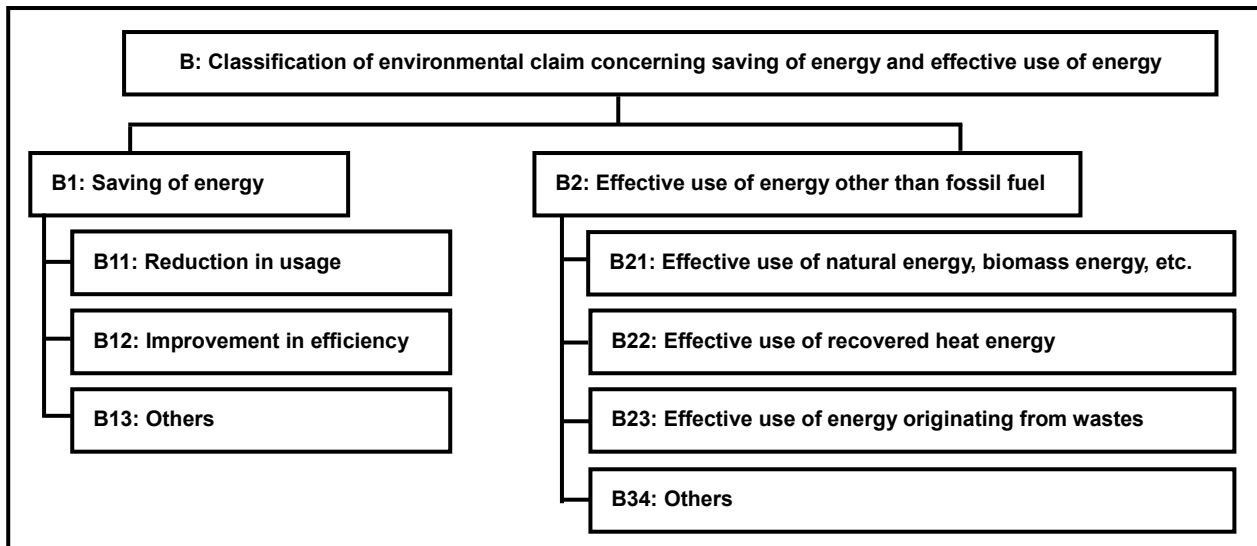


Fig. 5.4 Classification of environmental claim concerning saving of energy and effective use of energy

5.6 C: Classification of environmental claim concerning environmental preservation at the time of manufacture

- (1) The environmental claim is any one or a combination of environmental claims concerning preservation of global environment (C1), preservation of local environment (C2), and preservation of work environment (C3).
- (2) “C1: Environmental claim concerning preservation of global environment” includes global climate preservation (C11) and ecosystem preservation (C12).
- (3) “C2: Environmental claim concerning preservation of local environment” includes inhibition of waste generation (C21).
- (4) “C3: Environmental claim concerning preservation of work environment” includes air quality preservation (C31).

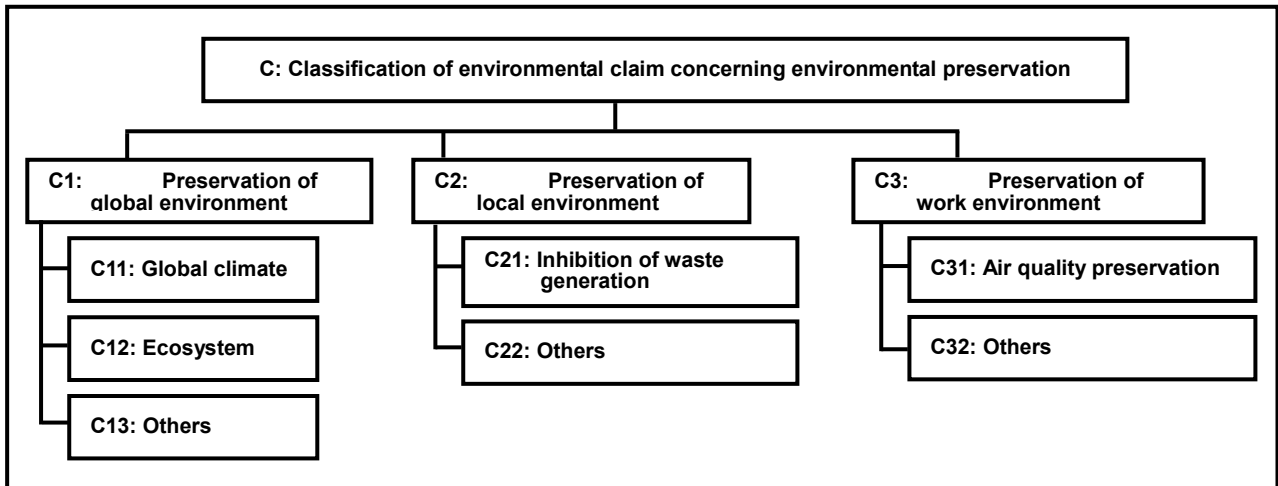


Fig. 5.5 Classification of environmental claim concerning environmental preservation

5.7 L: Classification of environmental claim concerning the whole of life cycle

- (1) The environmental claim is classified into design/construction stage (L2), use/maintenance stage (L3), demolition/dismantling stage (L4), and treatment/recycling stage (L5).
- (2) “L2: Environmental claim concerning design/construction stage” includes inhibition of waste generation (L21), reduction in environmental load (L22), and improvement in transportation efficiency (L23).
- (3) “L3: Environmental claim concerning use/maintenance stage” includes durability (L31), energy saving ability (L32), water saving ability (L33), ability to contribute to environment (L34).
- (4) “L4: Environmental claim concerning demolition/dismantling stage” includes easiness of separate dismantling (L41) and easiness of reuse (L42).
- (5) “L5: Environmental claim concerning treatment/recycling stage” includes easiness of recycle use (L51), easiness of heat recovery (L52) and easiness of natural recurrence (L53).

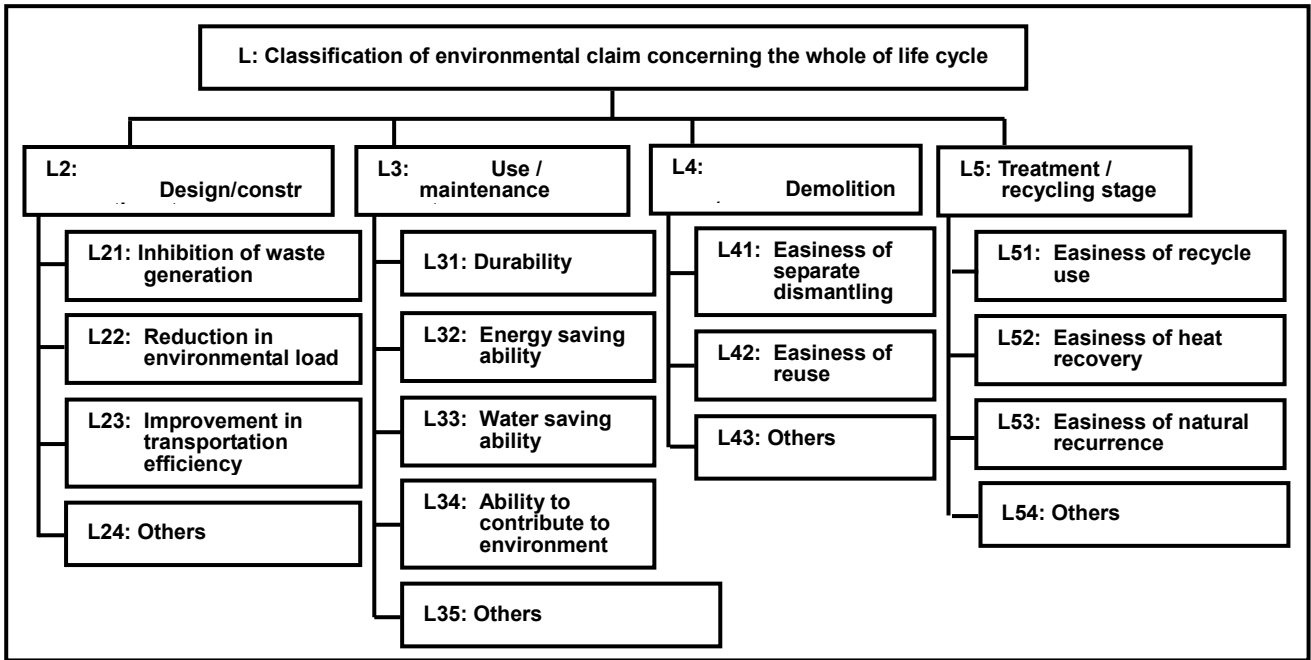


Fig. 5.6 Classification of environmental claim concerning the whole of life cycle

5.8 Other environmental claims

For environmental claims other than the above, claimed items can be set as “Others”.

6. Concrete evaluation item and meaning thereof

6.1 N: Negative check for environmental claim

6.1.1 N1: Negative check for global environment

1) N11: Prevention of ozone layer depletion

Use of substance (CFC, halon, etc.) causing depletion of ozone layer and emission thereof to the atmosphere fall under this item.

2) N12: Prevention of global warming

Emission of greenhouse effect gas (carbon dioxide, methane, dinitrogen monoxide, hydrofluorocarbon, etc.) causing global warming to the atmosphere falls under this item.

3) N13: Prevention of acid rain

Emission of NO_x, SO_x, etc. causing acid rain to the atmosphere falls under this item.

6.1.2 N2: Negative check for local environment

1) N21: Prevention of pollution

Eutrophic substance to water quality, water quality pollutant, etc., and heavy metals, noise, dust, vibration, offensive odor, etc. specified in the environment standard fall under this item.

2) N22: proper disposition of wastes

Proper disposition of wastes generated in plants etc. falls under this item.

6.1.3 N3: Negative check for residence surrounding environment

1) N31: Prevention of diffusion of air quality pollutant at the time of use

Formaldehyde inducing "sick house syndrome" and substances diffusing VOC into a living room fall under this item.

2) N32: Prevention of elution of heavy metals

Heavy metals which contain a substance (lead, arsenic, cadmium, etc.) specified in Notification No. 46 of the Environment Agency in 1991 and requires specific treatment for disposition by PRTR at the time of manufacture, and by manifest at the time of disposition, etc. fall under this item.

6.2 A: Evaluation item concerning saving of resources and effective use of resources at the time of manufacture

6.2.1 A1: Recycled resources

1) A11: Reuse

This has the same meaning as that of reuse specified in the Basic Law of Establishing a Recycling-based Society. This is a mode of use in which after a used product, part, etc. are subjected to some repair, fabrication, etc., they are used in the original application again or another application. Removed sash, furnishings, etc. that are reused fall under this item.

2) A12: Recycle use

This has the same meaning as that of recycle use specified in the Basic Law of Establishing a Recycling-based Society. In this guideline, scrap metal distributed as valuables, and concrete lump and lumber generated in construction, etc., which requires disposition cost, are distinguished definitely from each other. As the former, electric furnace steel using iron scrap as a raw material falls under this item. As the latter, recycled aggregate, recycled concrete, various wood boards, etc. fall under this item.

6.2.2 A2: By-product resources

1) A21: Resources originating from industrial by-product

Various slugs generating from steel making industry, metal refining industry, etc. and fly ash etc. generating from coal fired power plants fall under this item.

2) A22: Resources originating from treatment

Burned ash generating from incinerating plants, slug etc. obtained by melting the burned ash, sludge generating from sewage-treatment plants, and slug etc. obtained by melting the sludge fall under this item.

6.2.3 A3: Natural resources

1) A31: Unused/alternate natural resources

Natural resources that are not used generally at present, have no position as versatile resources, and have no fear of being exhausted fall under this item.

2) A32: Exhaustible resources

Exhaustible resources defined in this guideline are resources about which it is pointed out that they have a fear of being exhausted after about 100 years in the case where the present consumption trend still continues in the future.

3) A33: Water resources

Environmental claim concerning saving of underground water and industrial water, water saving, circulation use of water, etc. fall under this item.

6.3 B: Evaluation item concerning saving of energy and effective use of energy at the time of manufacture

6.3.1 B1: Saving of energy

1) B11: Reduction in usage of energy

Reduction in usage of energy such as fossil fuel and electric power falls under this item.

2) B12: Improvement in energy efficiency

The case in which the usage of fossil fuel, electric power, etc. is approximately constant and the efficiency is improved falls under this item.

6.3.2 B2: Effective use of energy other than fossil fuel

1) B21: Effective use of natural energy, biomass energy, etc.

The case in which wind force, solar heat and light, geotherm, tide, biomass, etc. are effectively used as energy falls under this item.

2) B22: Effective use of recovered heat energy

The case in which waste heat etc. are effectively used falls under this item.

3) B23: Effective use of energy originating from wastes

Heat recovery indicated in the Basic Law of Establishing a Recycling-based Society falls under this item. Concretely, wood chip, RDF, RPF, etc. can be cited.

6.4 C: Evaluation item concerning environmental preservation at the time of manufacture

6.4.1 C1: Preservation of global environment

1) C11: Global climate preservation

Discharge of global warming substance, mainly carbon dioxide, falls under this item.

2) C12: Ecosystem preservation

Reduction in usage of tropical rainforest lumber mainly falls under this item.

6.4.2 C2: Preservation of local environment

1) C21: Inhibition of waste generation

Reduction in wastes generated when the environmental claim product is manufactured and are subjected to final disposition without being recycled in the manufacturing plant falls under this item.

6.4.3 C3: Preservation of work environment

1) C31: Air quality preservation at work place

Reduction in amount of material that has been generally used conventionally in the manufacturing process of the environmental claim product and has a fear of polluting air quality at work place falls under this

item.

6.5 L: Evaluation item concerning the whole of life cycle

6.5.1 L2: Design/construction stage

1) L21: Inhibition of waste generation

Reduction in the number of fabrication processes at construction site falls under this item.

2) L22: Reduction in environmental load

Reduction in neighborhood pollution such as noise, vibration, and exhaust gas generated by construction work falls under this item.

3) L23: Improvement in transportation efficiency

Improvement in efficiency of transportation of the environmental claim product from manufacturing place to construction site falls under this item.

6.5.2 L3: Use/maintenance stage

1) L31: Durability

Physical and chemical durability and easiness of change of application of building (easiness of maintenance, easiness of installation/removal, easiness of replacement, etc.) fall under this item.

2) L32: Energy saving ability

Reduction in usage of heat, electric power, etc. consumed in practical use of building, improvement in energy efficiency, etc. fall under this item. Concretely, material having high heat insulating property, equipment having high efficiency, etc. can be cited.

3) L33: Water saving ability

Reduction in usage of water, effective use of rain water, circulation use of used water, etc. fall under this item.

4) L34: Ability to contribute to environment

Items concerning water permeability, water holding property, air purification, tree planting, sound-insulating property, fouling resistance fall under this item.

6.5.3 L4: Demolition/dismantling stage

1) L41: Easiness of separate dismantling

Construction method, and bonding/assembling method, etc. in which separation can be made easily when the environmental claim product is dismantled in the case where composite construction materials (construction material formed of several kinds of materials such as a composite panel) or the environmental claim product and another material are joined or bonded fall under this item.

2) L42: Easiness of reuse

Easiness of reuse defined in the Basic Law of Establishing a Recycling-based Society falls under this item.

6.5.4 L5: Treatment/recycling stage

1) L51: Easiness of recycle use

Easiness of recycle use defined in the Basic Law of Establishing a Recycling-based Society falls under this item.

2) L52: Easiness of heat recovery

Easiness of heat recovery defined in the Basic Law of Establishing a Recycling-based Society falls under this item.

3) L53: Easiness of natural recurrence

Natural recurrence by biodegradation, photolysis, etc. falls under this item.

7. Evaluation method

7.1 Basic policy of evaluation

- (1) Evaluation is made regarding the following items.
 - (a) Conformance with consideration of environmental load caused by the environmental standard
 - (b) Conformance concerning environmental claim or judgment standard
 - (c) Validity of presence of verification and degree of verification for the above items (a) and (b)
- (2) Evaluation is made for each environmental claim indicated in items 5.4, 5.5, 5.6 and 5.7. Also, overall evaluation is made as necessary.
- (3) Evaluation is made based on the evaluation standard set for each evaluation item.
- (4) The evaluation standard is stipulated numerically to the utmost. Grading is performed to several stages, and score is given according to each grade.
- (5) Evaluation result is given numerically by an objective, engineering, and quantitative system.

7.2 Evaluation standard

7.2.1 N: Evaluation item and evaluation standard concerning negative check

Table 7.1 gives the evaluation item and evaluation standard concerning negative check and conformance/nonconformance.

Table 7.1 Evaluation item and evaluation standard concerning negative check for environmental claim

Classification	Evaluation item (⇒ relating law)	Grade	Evaluation standard	Score
N1. Global environment	N11. Prevention of ozone layer depletion (⇒ Ozone Layer Protection Law)	0	Not applicable	Conformance
		i	Alternate CFC used	Conformance
		ii	Ozone layer depleting substance used	Nonconformance
	N12. Prevention of global warming (⇒ Law concerning the Promotion of the Measures to Cope with Global Warming)	0	Not applicable	Conformance
		i	Countermeasures for inhibiting emission of greenhouse effect gas taken	Conformance
		ii	Countermeasures for inhibiting emission of greenhouse effect gas not taken	Nonconformance
	N13. Prevention of acid rain (⇒ Discharge standard for acid rain causing substance (NO _x , SO _x , etc.) specified in the Air Pollution Control Law)	0	Not applicable	Conformance
		i	Not higher than legal standard value	Conformance
		ii	Exceeding legal standard value	Nonconformance
	N14. Others			

N2. Local environment	N21. Pollution prevention	N211. Noise prevention (⇒ Noise Regulation Law)	0	Not applicable	Conformance
			i	Not higher than legal standard value	Conformance
			ii	Exceeding legal standard value	Nonconformance
		N212. Vibration prevention (⇒ Vibration Regulation Law)	0	Not applicable	Conformance
			i	Not higher than legal standard value	Conformance
			ii	Exceeding legal standard value	Nonconformance
		N213. Offensive odor prevention (⇒ Offensive Odor Control Law)	0	Not applicable	Conformance
			i	Not higher than legal standard value	Conformance
			ii	Exceeding legal standard value	Nonconformance
		N214. Prevention of air pollution, dust, etc. (⇒ Air Pollution Control Law, Law on Industrial Safety and Hygiene)	0	Not applicable	Conformance
			i	Not higher than legal standard value	Conformance
			ii	Exceeding legal standard value	Nonconformance
		N215. Control of air quality pollutant at the time of manufacture (⇒ Law on Industrial Safety and Hygiene, PRTR Law)	0	Not applicable	Conformance
			i	Controlled based on law	Conformance
			ii	Not controlled based on law	Nonconformance
		N216. Prevention of water pollution (⇒ Water Pollution Control Law)	0	Not applicable	Conformance
			i	Not higher than legal standard value	Conformance
			ii	Exceeding legal standard value	Nonconformance
		N218. Control of heavy metals etc. at the time of manufacture (⇒ PRTR Law)	0	Not applicable	Conformance
			i	Controlled based on law	Conformance
			ii	Not controlled based on law	Nonconformance
N22. Proper disposition of wastes (⇒ Wastes Disposition Law)	0	Not applicable (limited to zero-emission plant)	Conformance		
	i	Disposed of based on law	Conformance		
	ii	Not disposed of based on law	Nonconformance		
N23. Others					
N3. Residence surrounding environment	N31. Prevention of diffusion of air quality pollutant at the time of use	0	Not applicable	Conformance	
		i	No fear of diffusion of air quality pollutant	Conformance	
		ii	Fear of diffusion of air quality pollutant	Reservation of judgment	
	N32. Prevention of elution of heavy metals etc.	0	Not applicable	Conformance	
		i	No fear of elution of heavy metals etc.	Conformance	
		ii	Fear of elution of heavy metals etc.	Reservation of judgment	
M33. Others					

- Note 1: In “N11. Prevention of ozone layer depletion”, an ozone layer depleting substance contained in environmental claim product is evaluated. Herein, the ozone layer depleting substance means regulated substances (CFC, halon, carbon tetrachloride, 1,1,1-trichloroethane, HCFC, HBFC, methyl bromide) specified in Montreal Protocol.
- Note 2: In “N12. Prevention of global warming”, countermeasures for inhibiting discharge of greenhouse effect gas at the manufacture stage is evaluated. Herein, the greenhouse effect gas means substances (carbon dioxide, methane, dinitrogen monoxide, hydrofluorocarbon, perfluorocarbon, sulfur hexafluoride) specified in Kyoto Protocol.
- Note 3: In “Prevention of diffusion of air quality pollutant at the time of use”, diffusion of specific chemical substances (formaldehyde, toluene, xylene, ethylbenzene, styrene) specified in the law concerning promotion etc. of quality security of residence is evaluated. Measurement is made by the chamber method, and judgment of diffusion rate is made by conversion using the public comment published by the Ministry of Land, Infrastructure and Transport along with the revision of the Building Standards Law. The judgment standard is based on the indoor environment pollutant standards specified by the Ministry of Health, Labor and Welfare.
- Note 4: Regarding “N32. Prevention of elution of heavy metals”, a product having a fear of elution is subjected to the test based on Notification No. 46 of the Environment Agency in 1991 (environmental standards relating to contamination of soil). If the test result value is not higher than the standard value, it is judged to be “conformance”, and the test result value exceeds the standard value, it is judged to be “nonconformance”. Also, the product such as a pipe and a coupling used for daily drinking shall satisfy Ordinance No. 15 of the Ministry of Health and Welfare “Ordinance specifying Technical Standards of Waterworks Facility”.
- Note 5: “Others” is a negative check evaluation item to be set in the future. Therefore, this item is not included in the object of evaluation at present.

7.2.2 Evaluation item, evaluation standard, and score concerning environmental claim

- (1) A: Table 7.2 gives the evaluation standard and score concerning saving of resources and effective use of resources at the time of manufacture.

Table 7.2 Evaluation item and evaluation standard concerning saving of resources and effective use of resources at the time of manufacture

Classification	Evaluation item	Grade	Evaluation standard	Score	
A1. Recycled resources	A11. Mode of reuse	0	Not claimed	0	
		i	Reservation of judgment or nonconformance	0	
		ii	Reused by combining good-quality portions only	1	
		iii	Reused after partial replacement, adjustment, etc.	2	
		iv	Reused after some rework, etc.	3	
	A12. Recycle use	A121. Use of metal scrap etc.	0	Not claimed	0
			i	Reservation of judgment or nonconformance	0
			ii	Recycled resources of not less than 30% and less than 50% used	1
			iii	Recycled resources of not less than 50% and less than 70% used	2
			iv	Recycled resources of not less than 70% used	3
		A122. Use of other wastes	0	Not claimed	0
			i	Reservation of judgment or nonconformance	0
			ii	Recycled resources of not less than 10% and less than 35% used	1
			iii	Recycled resources of not less than 35% and less than 50% used	2
			iv	Recycled resources of not less than 50% used	3
	A13. Others	0	Not claimed	0	
		i	Reservation of judgment or nonconformance	0	
		ii	Conformance	1-3	
	A2. By-product resources	A21. Use of resources originating from industrial by-product	0	Not claimed	0
			i	Reservation of judgment or nonconformance	0
ii			By-product of industrial production of not less than 20% and less than 40% used	1	
iii			By-product of industrial production of not less than 40% and less than 60% used	2	
iv			By-product of industrial production of not less than 60% used	3	
A22. Use of resources originating from treatment		0	Not claimed	0	
		i	Reservation of judgment or nonconformance	0	
		ii	By-product of treatment process of not less than 10% and less than 30% used	1	
		iii	By-product of treatment process of not less than 30% and less than 50% used	2	
		iv	By-product of treatment process of not less than 50% used	3	
A23. Others		0	Not claimed	0	
		i	Reservation of judgment or nonconformance	0	
		ii	Conformance	1-3	

A3. Natural resources	A31. Use of unused/alternate natural resources	0	Not claimed	0
		i	Reservation of judgment or nonconformance	0
		ii	Unused/alternate natural resources of not less than 10% and less than 30% used	1
		iii	Unused/alternate natural resources of not less than 30% and less than 50% used	2
		iv	Unused/alternate natural resources of not less than 50% used	3
	A32. Reduction in use of exhaustible resources	0	Not claimed	0
		i	Reservation of judgment or nonconformance	0
		ii	Usage rate reduced by not less than 20% and less than 30% as compared with conventional type	1
		iii	Usage rate reduced by not less than 30% and less than 40% as compared with conventional type	2
		iv	Usage rate reduced by not less than 40% as compared with conventional type	3
	A33. Reduction in use of water resources	0	Not claimed	0
		i	Reservation of judgment or nonconformance	0
		ii	Usage rate reduced by not less than 20% and less than 30% as compared with conventional type	1
		iii	Usage rate reduced by not less than 30% and less than 40% as compared with conventional type	2
		iv	Usage rate reduced by not less than 40% as compared with conventional type	3
	A34. Others	0	Not claimed	0
		i	Reservation of judgment or nonconformance	0
ii		Conformance	1-3	

Note 1: The usage rate is calculated by mass in principle. However, it may be calculated by volume depending on the property of environmental claim product.

Note 2: In principle, the rate is calculated by a rate to the final application of the environmental claim product. For example, when recycled aggregate is used as a roadbed material, the rate is calculated by a rate to all aggregates used as roadbed material, and when it is used as an aggregate for concrete, the rate is calculated by a rate to all aggregates used as aggregate for concrete.

Note: 3: In comparison with the conventional type, calculation is performed by total quantity ratio or unit requirement.

(2) B: Table 7.3 gives the evaluation standard and score concerning saving of energy and effective use of energy at the time of manufacture.

Table 7.3 Evaluation item and evaluation standard concerning saving of energy and effective use of energy at the time of manufacture

Classification	Evaluation item	Grade	Evaluation standard	Score	
B1. Saving of energy	B11. Reduction in usage of energy	0	Not claimed	0	
		i	Reservation of judgment or nonconformance	0	
		ii	Usage reduced by not less than 5% and less than 10% as compared with conventional type	1	
		iii	Usage reduced by not less than 10% and less than 15% as compared with conventional type	2	
		iv	Usage reduced by not less than 15% as compared with conventional type	3	
	B12. Improvement in energy efficiency	0	Not claimed	0	
		i	Reservation of judgment or nonconformance	0	
		ii	Improved by not less than 5% and less than 10% as compared with conventional type	1	
		iii	Improved by not less than 10% and less than 15% as compared with conventional type	2	
		iv	Improved by not less than 15% as compared with conventional type	3	
	B13. Others	0	Not claimed	0	
		i	Reservation of judgment or nonconformance	0	
		ii	Conformance	1-3	
	B2. Effective use of energy other than fossil fuel	B21. Effective use of natural energy, biomass energy, etc.	0	Not claimed	0
			i	Reservation of judgment or nonconformance	0
ii			Not less than 5% and less than 10% with respect to total energy used	1	
iii			Not less than 10% and less than 15% with respect to total energy used	2	
iv			Not less than 15% with respect to total energy used	3	
B22. Effective use of recovered heat energy		0	Not claimed	0	
		i	Reservation of judgment or nonconformance	0	
		ii	Not less than 10% and less than 20% with respect to total energy used	1	
		iii	Not less than 20% and less than 30% with respect to total energy used	2	
		iv	Not less than 30% with respect to total energy used	3	
B23. Effective use of energy originating from wastes		0	Not claimed	0	
		i	Reservation of judgment or nonconformance	0	
		ii	Not less than 10% and less than 20% with respect to total energy used	1	
		iii	Not less than 20% and less than 30% with respect to total energy used	2	
		iv	Not less than 30% with respect to total energy used	3	
B24. Others		0	Not claimed	0	
		i	Reservation of judgment or nonconformance	0	
		ii	Conformance	1-3	

Note 1: In principle, energy is compared by joule conversion. However, when energy is compared by another method, suitable data is submitted.

Note 2: In comparison with the conventional type, calculation is performed by total quantity ratio or unit requirement.

(3) C: Table 7.4 gives the evaluation standard and score concerning environmental preservation at the time of manufacture.

Table 7.4 Evaluation item and evaluation standard concerning environmental preservation at the time of manufacture

Classification	Evaluation item	Grade	Evaluation standard	Score
C1. Preservation of global environment	C11. Global climate preservation (reduction in discharge of global warming substances)	0	Not claimed	0
		i	Reservation of judgment or nonconformance	0
		ii	Discharge reduced by not less than 5% and less than 10% as compared with conventional type	1
		iii	Discharge reduced by not less than 10% and less than 15% as compared with conventional type	2
		iv	Discharge reduced by not less than 15% as compared with conventional type	3
	C12. Ecosystem preservation (reduction in usage of tropical rainforest lumber)	0	Not claimed	0
		i	Reservation of judgment or nonconformance	0
		ii	Usage of tropical rainforest lumber reduced by not less than 30% and less than 50%	1
		iii	Usage of tropical rainforest lumber reduced by not less than 50% and less than 70%	2
		iv	Usage of tropical rainforest lumber reduced by not less than 70%	3
	C13. Others	0	Not claimed	0
		i	Reservation of judgment or nonconformance	0
		ii	Conformance	1-3
	C2. Preservation of local environment	C21. Inhibition of waste generation	0	Not claimed
i			Reservation of judgment or nonconformance	0
ii			Quantity of wastes subjected to final disposition is not less than 2% and less than 3%.	1
iii			Quantity of wastes subjected to final disposition is not less than 1% and less than 2%.	2
iv			Quantity of wastes subjected to final disposition is less than 1%.	3
C22. Others		0	Not claimed	0
		i	Reservation of judgment or nonconformance	0
		ii	Conformance	1-3
C3. Preservation of work environment	C31. Reduction in air pollutant at work place	0	Not claimed	0
		i	Reservation of judgment or nonconformance	0
		ii	Usage of air pollutant reduced by not less than 30% and less than 50%	1
		iii	Usage of air pollutant reduced by not less than 50% and less than 70%	2
		iv	Usage of air pollutant reduced by not less than 70%	3
	C32. Others	0	Not claimed	0
		i	Reservation of judgment or nonconformance	0
		ii	Conformance	1-3

Note 1: Claim of reduction in tropical rainforest lumber is limited to the case where the conventional product uses tropical rainforest lumber as a versatile raw material.

Note 2: In comparison with the conventional type and conventional product, calculation is performed by total quantity ratio or unit requirement.

Note 3: The quantity of wastes subjected to final disposition defined in “C21. Inhibition of waste generation” means the quantity of wastes carried to the final disposal site, excluding wastes subjected to recycle use and heat recovery, of the wastes generating from the plant.

(4) L: Table 7.5 gives the evaluation standard and score concerning the whole of life cycle.

Table 7.5 Evaluation item and evaluation standard concerning the whole of life cycle

Classification	Evaluation item	Grade	Evaluation standard	Score
L2. Design/construction stage	L21. Inhibition of waste generation (reduction in the number of fabrication processes at construction site)	0	Not claimed	0
		i	Reservation of judgment or nonconformance	0
		ii	Reduced by not less than 30% and less than 45% as compared with conventional type	1
		iii	Reduced by not less than 45% and less than 60% as compared with conventional type	2
		iv	Reduced by not less than 60% as compared with conventional type	3
	L22. Reduction in environmental load (reduction in vibration and noise)	0	Not claimed	0
		i	Reservation of judgment or nonconformance	0
		ii	Reduced by not less than 10% and less than 30% as compared with conventional type	1
		iii	Reduced by not less than 30% and less than 50% as compared with conventional type	2
		iv	Reduced by not less than 50% as compared with conventional type	3
	L23. Improvement in transportation efficiency	0	Not claimed	0
		i	Reservation of judgment or nonconformance	0
		ii	Transportation efficiency improved by not less than 20% and less than 40% as compared with conventional type	1
		iii	Transportation efficiency improved by not less than 40% and less than 60% as compared with conventional type	2
		iv	Transportation efficiency improved by not less than 60% as compared with conventional type	3
	L24. Others	0	Not claimed	0
		i	Reservation of judgment or nonconformance	0
		ii	Conformance	1-3

L3. Use/maintenance stage	L31. Durability	L311. Durability [limited to recycled material]	0	Not claimed	0
			i	Reservation of judgment or nonconformance	0
			ii	Assumed useful life is equivalent to that of conventional product.	2
		L312. Durability [general material]	0	Not claimed	0
			i	Reservation of judgment or nonconformance	0
			ii	Assumed useful life is about 1.5 times that of conventional product.	1
			iii	Assumed useful life is 2 or more times that of conventional product.	2
		L313. Easiness of maintenance	0	Not claimed	0
			i	Reservation of judgment or nonconformance	0
			ii	Relatively easy	1
			iii	Easy	2
		L314. Easiness of installation/removal	0	Not claimed	0
			i	Reservation of judgment or nonconformance	0
			ii	Relatively easy	1
			iii	Easy	2
		L315. Easiness of replacement	0	Not claimed	0
			i	Reservation of judgment or nonconformance	0
			ii	Relatively easy	1
	iii		Easy	2	
	L316. Others	0	Not claimed	0	
		i	Reservation of judgment or nonconformance	0	
		ii	Conformance	1-3	
	L32. Energy saving ability	L321. Saving of consumed energy	0	Not claimed	0
			i	Reservation of judgment or nonconformance	0
			ii	Usage reduced by not less than 5% and less than 10% as compared with conventional type	1
			iii	Usage reduced by not less than 10% and less than 15% as compared with conventional type	2
			iv	Usage reduced by not less than 15% as compared with conventional type	3
		L322. Improvement in energy efficiency	0	Not claimed	0
			i	Reservation of judgment or nonconformance	0
			ii	Efficiency improved by not less than 5% and less than 10% as compared with conventional type	1
iii			Efficiency improved by not less than 10% and less than 15% as compared with conventional type	2	
iv			Efficiency improved by not less than 15% as compared with conventional type	3	
L323. Others		0	Not claimed	0	
		i	Reservation of judgment or nonconformance	0	
	ii	Conformance	1-3		

	L33. Water saving ability	L331. Saving of water, improvement in water efficiency, effective use of rain water etc.	0	Not claimed	0
			i	Reservation of judgment or nonconformance	0
			ii	Usage reduced by not less than 10% and less than 20% as compared with conventional type	1
			iii	Usage reduced by not less than 20% and less than 30% as compared with conventional type	2
		iv	Usage reduced by not less than 30% as compared with conventional type	3	
		L332. Others	0	Not claimed	0
			i	Reservation of judgment or nonconformance	0
			ii	Conformance	1-3
	L34. Ability to contribute to environment	L341. Water permeability, water holding property, air purification, tree planting, sound-insulating property, fouling resistance	0	Not claimed	0
			i	Reservation of judgment or nonconformance	0
			ii	One item applicable	1
			iii	Two items applicable	2
		iv	Three or more items applicable	3	
		L342. Others	0	Not claimed	0
			i	Reservation of judgment or nonconformance	0
ii			Conformance	1-3	
L4. Demolition/dismantling stage	L41. Easiness of separate dismantling	0	Not claimed	0	
		i	Reservation of judgment or nonconformance	0	
		ii	Relatively easy	1	
		iii	Easy	2	
	L42. Easiness of reuse	0	Not claimed	0	
		i	Reservation of judgment or nonconformance	0	
		ii	Relatively easy	1	
		iii	Easy	2	
	L43. Others	0	Not claimed	0	
		i	Reservation of judgment or nonconformance	0	
		ii	Conformance	1-3	
L5. Treatment/recycling stage	L51. Easiness of recycle use	0	Not claimed	0	
		i	Reservation of judgment or nonconformance	0	
		ii	Relatively easy	1	
		iii	Easy	2	
	L52. Easiness of heat recovery	0	Not claimed	0	
		i	Reservation of judgment or nonconformance	0	
		ii	Relatively easy	1	
		iii	Easy	2	
	L53. Easiness of natural recurrence	0	Not claimed	0	
		i	Reservation of judgment or nonconformance	0	
		ii	Relatively easy	1	
		iii	Easy	2	
	L54. Others	0	Not claimed	0	
		i	Reservation of judgment or nonconformance	0	
		ii	Conformance	1-3	

Note: In comparison with the conventional type and conventional product, calculation is performed by total

quantity ratio or unit requirement.

7.2.3 Evaluation standard and score concerning validity of presence of verification and degree of verification

Table 7.6 gives the evaluation standard and score concerning validity of the degree of verification.

Table 7.6 Evaluation standard and score concerning validity of degree of verification

Classification	No verification	Grade I	Grade II	Grade II	
		Evaluation standard			
		Proves to oneself	Verification by organization corresponding to third-party organization	Verification by third-party organization	
Score	0	1	1.5	2	

Note1: "Proves to oneself" is following items.

- 1) It is possible to prove according to objective data.
- 2) The insistence matter is declared to the materials buyer with the products catalog etc.

Note2: "Verification by organization corresponding to third-party organization" is any one of the following items.

- 1) Item and performance self-assured in the quality control by JIS mark display authorization factory or in the review by systems of ISO 9000s and 14000s
- 2) Item and performance self-declared based on environmental accounts and environmental report
- 3) Self-declared item that has been proved based on laws and standards in Japan and abroad and has gotten verification of public organization, material purchaser, etc. in any form.

7.3 Determination of score

7.3.1 Determination of score for each evaluation item

The score for each evaluation item is determined by Equation (1).

$$t_i = G_{pi} \times D_i \quad \dots (1)$$

where,

- t_i : score of evaluation item concerning each environmental claim
- G_{pi} : score of grade in each evaluation item
- D_i : score of grade of degree of verification
- i : classification A, B, C, L of environmental claim

7.3.2 Determination of score for each classification of each environmental claim

The score for each environmental claim is determined by Equation (2).

$$T_i = \sum t_i \quad \dots (2)$$

where,

- T_i : score of each environmental claim
- t_i : score of evaluation item concerning each environmental claim
- i : classification A, B, C, L of environmental claim

8. Judgment and indication of judgment result

8.1 Judgment

- (1) Judgment is made for each classification of each environmental claim.
- (2) For A, B and C, judgment is made by combining each score in these classifications and score in L, and for L, judgment is made by score in L only.
- (3) Judgment result is expressed by Table 8.1 by the classification of score.

Table 8.1 Judgment of conformance of environmental claim and class of conformance

Environmental claim item	Score of each environmental claim				Class of conformance
	A	B	C	L	
A	6 or more	-	-	4 or more	1st class
	6 or more	-	-	-	2nd class
	3 or more, and less than 6	-	-	3 or more	
	3 or more, and less than 6	-	-	-	3rd class
	Less than 3	-	-	-	Nonconformance
B	-	6 or more	-	4 or more	1st class
	-	6 or more	-	-	2nd class
	-	3 or more, and less than 6	-	3 or more	
	-	3 or more, and less than 6	-	-	3rd class
	-	Less than 3	-	-	Nonconformance
C	-	-	6 or more	4 or more	1st class
	-	-	6 or more	-	2nd class
	-	-	3 or more, and less than 6	3 or more	
	-	-	3 or more, and less than 6	-	3rd class
	-	-	Less than 3	-	Nonconformance
L	-	-	-	10 or more	1st class
	-	-	-	6 or more, and less than 10	2nd class
	-	-	-	3 or more, and less than 6	3rd class
	-	-	-	Less than 3	Nonconformance

8.2 Indication of judgment result

- (1) Judgment result is indicated for each classification of environmental claim.
- (2) Judgment result is indicated by class of conformance, and additionally score is indicated by numerical value, radar chart, etc. However, in principle, a product judged to be 3rd class is not indicated as class of conformance.

Committee list of names

No.	classification	name	section/official position
1	chairperson	Masafumi Kikuchi	Professor, department of architecture, faculty of science & technology, Meiji University
2	secretary	Akio Koyama	lecturer, department of architecture, faculty of science & technology, Meiji University
3	commissioner	Hiroshi Saitoh	commissioner, Kanto chapter, Architectural Institute of Japan
4	commissioner	Takanori Oishi	manager, industrial base minerals section, ceramics&building materials department, chemicals, forest products & general merchandise company, ITOCHU Corporation
5	commissioner	Satoshi Arikawa	senior researcher, national institute for land and infrastructure management ministry of land infrastructure and transport
6	substitute committee	Takuji Matsumoto	industrial base minerals section, ceramics&building materials department, chemicals, forest products & general merchandise company, ITOCHU Corporation
7	commissioner	Hiroshi Nouchi	chief consultant, regional environmental section, JMAResearch Institute, Inc.
8	commissioner	Hiroshi Nishihara	staff researcher, social environment systems department, Mitsubishi research institute, Inc.
9	internal commissioner	Ichiroh Nakaya	associate director, headquarters to performance evaluation, Japan testing center for construction materials
10	internal commissioner	Kenzo Kishi	manager, general testing division, Central laboratory, Japan testing center for construction materials
11	internal commissioner	Tetsuo Sato	manager, research and development section, Japan testing center for construction materials
12	internal person concerned	Hisao Mizutani	secretary general, managing director, Japan testing center for construction materials
13	internal person concerned	Kiyoyuki Shimazaki	deputy manager, conformity assessment section, Japan testing center for construction materials
14	internal person concerned	Tomohiro Saeki	Technical Staff, headquarters to performance evaluation Japan testing center for construction materials
15	secretariat	Yasushi Amano	deputy manager, research and development section, Japan testing center for construction materials
16	secretariat	Yusuke Kikuchi	research and development section, Japan testing center for construction materials