

Environmental Choice^M Program

CERTIFICATION CRITERIA DOCUMENT

CCD-151



Product: Framing Materials and Assemblies

Introduction:

Environment Canada's Environmental Choice^M Program is pleased to publish the following certification criteria document on *Framing Materials and Assemblies*.

The Environmental Choice^M Program is designed to support a continuing effort to improve and/or maintain environmental quality by reducing energy and materials consumption, and minimizing the impacts of pollution generated by the production, use and disposal of goods and services available to Canadians.

The building construction industry consumes significant resources. Its worldwide annual consumption of raw materials has been estimated at over 3 billion tonnes, representing about 40% of the total use of such resources. The extraction, transportation and conversion of these construction materials into final building products result in a variety of environmental impacts. Additionally, at least 20% of North America's waste stream waste is generated directly by the construction/renovation industry. Ecolabeling programs around the world are therefore placing an increased priority on the certification and recognition of lower-impact, sustainable construction products.

Framing Materials and assemblies can be manufactured from different base materials including, *inter alia*, wood, steel, concrete and polymers. Many life-cycle analyses have been conducted in an attempt to identify the most preferable of these options. To date, the net result of these comparative studies has been inconclusive. Therefore, the Environmental Choice^M Program's strategic approach is to identify construction leadership in a more holistic sense, by recognizing the best available option(s) *within* each material group. In the case of wood and steel, "leadership" appears to be derived primarily from the source of the material itself (i.e., sustainable forestry for wood, recycled content for steel and appropriate mill practices for both). In the case of concrete, "leadership" appears to be better represented by the use of an appropriate assembly (e.g., insulating concrete forms) that optimizes the benefits of using this material. These differing approaches are reflected in the criteria for each material group category.

Notice

Throughout this document, any reference to a standard or guideline means to its latest edition.

The Environmental Choice^M Program reserves the right to accept equivalent test data for the test methods specified in this document.

Notice of Intent

Future revisions of this criteria document will consider additional criteria to address the concepts of designing for disassembly, deconstruction and reuse.

Interpretation

1. In this set of requirements, please note the following definitions:

"ASTM" means American Society for Testing and Materials;

"CCD-016" means the EcoLogo^M Certification Criteria Document *CCD-016: Thermal Insulation*;

"CCD-150" means the EcoLogo^M Certification Criteria Document *CCD-150: Steel for Use in Construction Products*;

"certified sustainable forest management standard" means a forestry operation that has been certified by a third party organization (i.e. CSA, FSC, PEFC or SFI) applying a sustainable forest management standard that contributes to the forest's long-term ecological and economic sustainability;

"CFC" means chlorofluorocarbon;

"CGSB" means Canadian General Standards Board;

"CITES" means the Convention on International Trade in Endangered Species of Wild Fauna and Flora;

"CSA" means the Canadian Standards Association. In reference to Section 5.1a), the CSA certifies forestry operations against the standard *CAN/CSA Z809-02 Sustainable Forest Management: Requirements and Standards*;

"construction waste" means those materials that are not salvageable, recyclable, or not optimally used in a new construction or renovation project;

"EPA" means the United States Environmental Protection Agency;

"ferrous waste" means the residues arising from a mill's processing of metallic products that might otherwise be sent to landfill and/or incinerated

"FSC" means the Forest Stewardship Council. In reference to Section 5.1a), the FSC certifies forestry operations against its Forest Management Certification program;

"framing materials and assemblies" mean the structural members that make up a building's structural load-bearing skeleton or framework, including, *inter alia*, studs, joists, beams, headers and rafters, or iron load bearing framework;

"global warming potential", or "GWP", means the time-integrated change in radiative forcing due to the instantaneous release of 1 kilogram of a gas expressed relative to the radiative forcing from the release of 1 kilogram of CO₂;

"insulating concrete form" or "ICF" means a building foundation and/or framing system that consists of parallel sheets of expanded (XPS) or extruded (EPS) polystyrene foam that are assembled and connected with ties to form a hollow structure, into which concrete is poured (and generally reinforced with rebar) to form a composite supporting wall structure;

"ozone depleting potential", or "ODP", means the ratio of calculated ozone column change for each mass unit of a gas emitted into the atmosphere relative to the calculated depletion for a mass unit of the reference gas CFC-11;

“**PEFC**” means Programme for the Endorsement of Forest Certification schemes. In reference to Section 5.1 a), PEFC provides a framework for the development and mutual recognition of national or sub-national forest certification schemes;

“**R-value**” means thermal resistance, which is the measure of an insulating material’s resistance to heat flow or its ability to slow the transfer of heat through it. Numerically, it is expressed in units of °F-ft²-h/Btu;

“**RSI-value**” means the metric equivalent to R-value. It is expressed in °C-m²/W, which is equivalent to (°F-ft²-h/Btu)/0.176228;

“**SFI**” means the Sustainable Forestry Initiative. In reference to Section 5.1a), the SFI certifies forest management operations against its standard;

“**slushing oil**” means a treatment applied to galvanized steel coil to prevent surface oxidation (“white rust”) over extended storage periods;

“**stud**” means a vertical framing member, to which horizontal pieces (joists) are connected in order to construct walls and partitions;

“**surface coating**” means a paint, stain, varnish or sealer applied to a framing material or assembly either for aesthetic, functional or protective purposes (e.g. general preservation, water-resistance, pest-resistance, weather-resistance or flame-resistance);

“**volatile organic compound**” or “**VOC**” means any organic compound that participates in atmospheric photochemical reactions. It excludes those organic compounds that the ECP designates as having negligible photochemical reactivity; and

“**wood-waste**” means the solid residues arising from a mill’s processing of forestry products that might otherwise be sent to landfill and/or incinerated, including, *inter alia*, bark, sawdust, solid trim, shavings and veneer clippings.

Category Definition

2. This category includes all ***framing materials and assemblies*** as further defined in the subcategories in this section:
 - (a) wooden framing materials;
 - (b) steel framing materials; and
 - (c) insulating concrete forms (ICF).

Note: Other subcategories may be added at a later date. The ECP reserves the right to determine which subcategory will be assigned to a particular applicant.

General Requirements

3. To be authorized to carry the EcoLogo^M, the ***framing materials and assemblies*** must:
 - (a) meet or exceed all applicable governmental and industrial safety and performance standards; and

- (b) be manufactured in such a manner that all steps of the process, including the disposal of waste products arising therefrom, will meet the requirements of all applicable governmental acts, by laws and regulations including, for facilities located in Canada, the *Fisheries Act* and the *Canadian Environmental Protection Act (CEPA)*.

Product Specific Requirements

- 4. To be authorized to carry the EcoLogo^M, the ***framing materials and assemblies*** must:
 - (a) meet the performance standards of the current National Building Code of Canada;
 - (b) not be manufactured with:
 - (i) surface coatings containing VOCs in excess of 50 mg/L as determined by ASTM D3960 *Standard Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings* or EPA Method 24 *Determination of Volatile Matter Content, Water Content, Density, Volume Solids and Weight Solids of Surface Coatings*;
 - (ii) heavy metals including mercury, lead, cadmium, arsenic or hexavalent chromium;
 - (iii) halogenated organic compounds; and
 - (iv) any chemicals that are included in the International Agency for Research on Cancer (IARC) lists for proven (Group 1), or probable (Group 2A) carcinogens.
- 5. To be authorized to carry the EcoLogo^M, the ***framing materials and assemblies*** must also meet criteria specific to their subcategory.
- 5.1 Wooden framing materials must:
 - (a) be manufactured exclusively from wood that has been sourced from operations that:
 - (i) are certified to a sustainable forest management standard,
 - (ii) ensure the rate of harvest does not exceed a sustainable yield,
 - (iii) do not use species that are listed in the CITES Appendices, and
 - (iv) use all wood wastes for secondary products (e.g. not be sent to landfill or incinerated without energy recovery); and
 - (b) not be manufactured from lumber that has been treated with chemical pest-control products, fungicides or preservative agents formulated with arsenic-based compounds.
- 5.2 Steel framing materials must:
 - (a) meet one of the following performance standards:

- (i) CAN/CGSB 7.1-98: *Lightweight Steel Wall Framing Components*, or
- (ii) CSA S136-01: *North American Specification for the Design of Cold Formed Steel Structural Members*;
- (b) be manufactured exclusively from steel that:
 - (i) has either been certified under CCD-150 or meets the applicable criteria provided in Appendix 1; and
 - (ii) has not been treated with slushing oil;
- (c) where a surface coolant is used in the production of the steel framing material, use only vegetable-based coolants; and
- (d) be manufactured by operations that divert all ferrous wastes from the waste stream.

5.3 Insulating concrete forms must:

- (a) be manufactured using insulation that has either been certified under CCD-016 or meets the applicable criteria provided in Appendix 2;
- (b) be manufactured exclusively from polystyrene foam that meets the performance standards of CGSB 57-GP-27M: *Thermal Insulation, Polystyrene, Loose Fill*;
- (b) as minimum, have a R-value of 4.0 per inch, or RSI of 0.70 per mm;
- (d) be manufactured with blowing agents that have zero ozone depleting potential; and
- (e) be manufactured with either:
 - (i) blowing agents that have a global warming potential of less than 15, or
 - (ii) greater than 10% recycled material by weight of finished product when calculated using a 12-month rolling basis.

Note: ODP and GWP values for common blowing agents are listed in Appendix 3.


Verification

- 6. To verify a claim that a product meets the criteria listed in this document, the ECP will require access, as is its normal practice, to relevant purchasing records, quality control and production records and the right of access to production facilities on an announced basis.
- 7. Compliance with requirement 3(b) shall be attested to by a signed statement of the Chief Executive Officer or the equivalent officer of the licensee. The ECP shall be advised in writing immediately by the licensee of any noncompliance which may occur during the term of the license. On the occurrence of any noncompliance, the license may be suspended or terminated as stipulated in the license agreement.

Conditions for EcoLogo^M Use

8. The EcoLogo^M may appear on the product itself, wholesale or retail packaging, sign boards, point-of-purchase displays, delivery vehicles, and any accompanying advertising or corporate literature provided the service meets the requirements in this document, provided that the product meets the requirements in this document.
9. All licensees and authorized users must comply with the ECP's *Guide to Proper Use of the EcoLogo^M* regarding the format and usage of the EcoLogo^M.
10. Any accompanying advertising must conform with the relevant requirements stipulated in this guideline, the license agreement and the ECP's *Guide to Proper Use of the EcoLogo^M*.
11. A criteria statement must appear with the EcoLogo^M whenever the EcoLogo^M is used in association with the **framing materials and assemblies**. The intent of this statement is to clarify why the product was certified and to indicate any constraints on the certification. This is to ensure no ambiguity over, or misrepresentation of, the reason(s) for certification.

The criteria statement must be specific to the product's sub-category. For sub-category 2(a) the criteria statement is "*Wooden Framing Material*"; for sub-category 2(b) the criteria statement is "*Steel Framing Material*"; and for sub-category 2(c) the criteria statement is "*Insulating Concrete Form*". The licensee may propose other wording for the criteria statement, but any such proposed wording must be approved by the Environmental Choice^M Program.

	<p>For more information about the EcoLogoTM Program, please direct your inquiry to: The EcoLogoTM Program 171 Nepean Street, Suite 400 Ottawa, ON, K2P 0B4 Phone: 1.800.478.0399 www.ecologo.org</p>	
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Appendix 1: ECP Product-Specific Criteria from CCD-150 (Steel for Use in Construction Products)

1. The steel for use in construction products must:

- (a) be manufactured exclusively from steel feedstocks that:
 - (i) contain a minimum total recycled content of 50% based on a rolling 12-month average;
 - (ii) contain a minimum total post-consumer content of 15% based on a rolling 12-month average; and
 - (iii) are generated by operations with implemented procedures that exclude feedstocks with greater than a total combined 0.025% of hazardous heavy metals and any radioactive materials.

Note: Recycled content must be expressed as a percentage of furnace charge, not final production. If the hot-band precursor to the steel is from more than one type of furnace (i.e. EAF and BOF), the total recycled content must be determined using the proportionate recycled contents from each furnace type.

- (c) be wholly produced from slabs manufactured on-site and not from slabs imported from other facilities;
- (c) in its hot band state, possess a total “gate-to-gate” embodied energy that is lesser than or equal to 7.5 MJ/kg, based on a rolling 12-month average;
- (d) in its final, finished steel roll state, possess a total “gate-to-gate” embodied energy that is lesser or equal to 11.5 MJ/kg, based on a rolling 12-month average;

Note: If the hot-band precursor to the steel is produced from more than one type of furnace (i.e. EAF and BOF), the total embodied energy must be determined using the proportionate embodied energy from each furnace type.

2. The manufacturer of steel for use in construction products must:

- (a) have implemented a sound environmental management system and adhere to sound environmental management practices at the steel production facility;
- (b) where the steel producer and feedstock source share common ownership, use only feedstocks that have been sourced from operations that have implemented a sound environmental management system and are adhering to sound environmental management practices;
- (c) where the steel producer and feedstock source do *not* share common ownership, make a concerted effort to source from operations that have implemented a sound environmental management system and are adhering to sound environmental management practices;
- (d) ensure that all hazardous by-products are segregated and adequate arrangements made for their recycling, reuse or proper disposal; and
- (e) ensure that at least 50% of the total of all NPRI-designated releases at the steel production facility are being diverted from landfill for recycling or reuse in other products.

Appendix 2: ECP Product-Specific Criteria from CCD-016 (Thermal Insulation Materials)

1. The thermal insulation material must:
 - (a) not require being labelled as toxic, corrosive or flammable under the Consumer Chemical and Container Regulations (SOR/ SOR/2001-269) of the Hazardous Products Act;
 - (b) be accompanied by detailed instructions for proper handling and installation so as to minimize health concerns;
 - (c) as demonstrated by due diligence of the manufacturer, be packaged in a material for which efforts have been made to ensure post-consumer recycled content.
 - (d) not be formulated or manufactured with polybrominated diphenyl ether flame retardants;
 - (e) if batt or blanket type insulation made of low density fiberglass or mineral wool, then not be formulated or manufactured with formaldehyde containing binders;
 - (f) if formulated or manufactured with blowing agents then use agents with zero ODP;
 - (g) if expanded polystyrene, polyisocyanurate or open-cell polyurethane type insulation then use blowing agents with a GWP of less than 15;
 - (h) not be formulated or manufactured with lead catalysts when spraying/forming plastic foam;
 - (i) if manufactured from expandable polystyrene resin, blowing agent content must be less than 6% by weight;
 - (j) meet the following minimum recycled content requirements, calculated on a 12-month rolling basis and measured as weight of final product: and

	Board type Insulation	Loose-fill / Spray Applied	Batt or Blanket type insulation
Cellulose	-----	80%	-----
Fiberglass	45 %	45%	45%
Mineral Wool	35 %	50%	35%
Expanded Polystyrene	no minimum content ¹	---	---
Extruded polystyrene	20 %	---	----
Polyisocyanurate (plastic component only e.g., not including facing)	15%	---	---
Closed –cell spray polyurethane foam	---	5%	-----
Aluminum reflective insulation (plastic layer content)	-----	----	15%

¹ Manufacturers must implement a corporate program for recovery of post-consumer and/or pre-consumer waste that can be re-introduced into the manufacturing process.

(k) comply with the following performance standards (as applicable to material type):

ASTM C547	<i>Specification for Mineral Fiber Pipe Insulation</i>
ASTM C553	<i>Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications</i>
ASTM C612	<i>Specification for Mineral Fiber Block and Board Thermal Insulation</i>
ASTM C655	<i>Specification Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing</i>
ASTM C739	<i>Standard Specification for Cellulosic Fiber (wood-base) Loose-Fill Thermal Insulation</i>
ASTM C1149	<i>Standard Specification for Self-Supported Spray Applied Cellulosic Thermal/Acoustical Insulation</i>
ASTM C1224	<i>Standard Specification for Reflective Insulation for Building Applications</i>
ASTM C1289	<i>Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.</i>
ASTM C1497	<i>Specification for Cellulosic Fiber Stabilized Thermal Insulation</i>
CAN/CGSB 92.2	<i>Trowel or Spray Applied Acoustical Material;</i>
CAN/ULC-S701	<i>Thermal Insulation, Polystyrene, Boards and Pipe Covering;</i>
CAN/ULC-S702	<i>Thermal Insulation, Mineral Fibre for Buildings (proof of compliance to the optional corrosion test is also required)</i>
CAN/ULC S703	<i>Standard for Cellulose Fibre Insulation (CFI) for Buildings</i>
CAN/ULC S705.1	<i>Thermal Insulation-Spray Applied Rigid Polyurethane Foam, Medium Density, Material Specifications</i>

Gradually being replaced but still in use:

CAN/CGSB-51.9	<i>Mineral Fibre Thermal Insulation for Piping and Round Ducting;</i>
CAN/CGSB-51.10	<i>Mineral Fibre Board Thermal Insulation;</i>
CAN/CGSB-51.11	<i>Mineral Fibre Thermal Insulation Blanket;</i>
CAN/CGSB-51.26	<i>Thermal Insulation, Urethane and Isocyanurate, Boards, Faced;</i>
CAN/CGSB-51.31	<i>Thermal Insulation, Mineral Fibre Board for Above Roof Decks;</i>
CGSB-51-GP-21M	<i>Thermal Insulation, Urethane and Isocyanurate, Unfaced;</i>
CGSB 51-GP-27M	<i>Thermal Insulation, Polystyrene, Loose Fill</i>

Appendix 3: Ozone Depleting Potential and Global Warming Potential of Selected Blowing Agents

Selected Blowing Agents	ODP ¹	GWP ²
CO ₂	- ³	1
Pentane	- ³	11 ⁴
HFC 134a	- ³	1320
HFC 245fa	- ³	1020
HFC 365mfc	- ³	782
HCFC 22	0.05	1780
HCFC 141b	0.12	713
HCFC 142b	0.07	2270

¹ Sources: The Scientific Assessment of Ozone Depletion, 2002. World Meteorological Association's Global Ozone Research and Monitoring Project and IPCC Third Assessment Report: Climate Change 2001 Intergovernmental Panel on Climate Change as reproduced by the U.S. Environmental Protection Agency at <http://www.epa.gov/ozone>

² Sources: The Scientific Assessment of Ozone Depletion, 2002. World Meteorological Association's Global Ozone Research and Monitoring Project and IPCC Third Assessment Report: Climate Change 2001 Intergovernmental Panel on Climate Change as reproduced by the U.S. Environmental Protection Agency <http://www.epa.gov/ozone>

³ Assumed to be zero

⁴ Chemistry and Technology of Polyurethanes. Third Edition. 2002. Walter Dias Vilar,

Note: Plastic thermal insulation products that are manufactured using blowing agents that are *not* listed above can be certified subject to the availability of ODP and GWP data from accredited sources.