

**Hong Kong Green Label Scheme**  
**Product Environmental Criteria for**  
**Thermal Building Insulation (GL-008-012)**



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## **BACKGROUND**

The Hong Kong Green Label Scheme (HKGLS) is an independent and voluntary scheme, which aims to identify products that are, based on life cycle analysis consideration, more environmentally preferable than other similar products with the same function. The Scheme is organized by the Green Council (GC) with contributions from the HKGLS Advisory Committee and a number of supporting organizations.

The prime objectives of HKGLS are:

- For Consumers: assist in making purchases of products that are less harmful to the environment;
- For Industry: stimulate development and production of environmentally preferable alternatives.

This specification sets out the requirements that “Thermal Building Insulation” will be required to meet in order to be licensed to use the HKGLS label. The requirements cover product environmental criteria and product performance characteristics.

## **POTENTIAL ENVIRONMENTAL IMPACTS**

The extraction, manufacturing, use and disposal of thermal insulators can be potentially harmful due to their hazardous substances (e.g. formaldehyde, asbestos, bleach, etc.). There are a number of areas where insulation manufacturers and suppliers can reduce environmental impact during extraction, manufacturing, use and disposal of these products. Substituting recycled material for virgin materials will reduce the amount of materials entering the waste stream and reduce total resource consumption.

Thermal insulators for buildings increase the energy efficiency and may contribute to less electricity consumption. The benefits of having well insulated buildings include improved indoor comfort levels, a reduction in respiratory problems, warmer internal surfaces, a reduction in the reliance on fossil fuels for heating or cooling; which contribute to global warming, and improved durability of internal finishes and a reduced risk of mildew growth.

## **LABEL OBJECTIVE**

The aim of the product environmental criteria developed for “Thermal Building Insulation” is to:

- Promote the use of recycled raw materials
- Prohibit the use of hazardous substances
- Ensure building insulation are effective and environmentally preferable
- Enhance energy efficiency in the cooling and heating of buildings

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**PRODUCT DEFINITION**

This document and all product environmental criteria therein apply to all “Thermal Building Insulation” and may include:

- Board-type thermal insulation;
- Loose-fill and spray-on thermal insulation;
- Windows and window coverings; and
- Other building materials that have insulating properties

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**PRODUCT ENVIRONMENTAL CRITERIA**

The product performance and environmental criteria for the product category of “Thermal Building Insulation” (GL-008-012) under the Hong Kong Green Label Scheme (HKGLS) are set out in this criteria document in the ensuing table.

| Product Environmental Criteria   | Verification Methods*  |      |            |       |                                  |       |                      |       |  |
|--|--|------|------------|-------|----------------------------------|-------|----------------------|-------|--|
| <p><b>PRODUCT PERFORMANCE CRITERIA</b></p> <p>1. A detailed breakdown of ALL materials composing the product shall be provided</p> <p>A. The product shall be made of recycled content where applicable:</p> <p style="text-align: right;">minimum percentage by weight</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;">Stone Wool</td> <td style="text-align: right;">(5%)</td> </tr> <tr> <td>Glass Wool</td> <td style="text-align: right;">(50%)</td> </tr> <tr> <td>Extruded Polystyrene / Styrofoam</td> <td style="text-align: right;">(30%)</td> </tr> <tr> <td>Rock / Cement / Slag</td> <td style="text-align: right;">(20%)</td> </tr> </table> <p>B. Other raw non-recycled materials are subject to approval:</p> <p>For products made out of 100% raw materials, a minimum 5 year guarantee must accompany product.</p> | Stone Wool   | (5%) | Glass Wool | (50%) | Extruded Polystyrene / Styrofoam | (30%) | Rock / Cement / Slag | (20%) | <p>✓ Review of supporting information; AND</p> <p>✓ Interview with relevant personnel (for product with recycled content only)</p> |
| Stone Wool   | (5%)   |      |            |       |                                  |       |                      |       |  |
| Glass Wool   | (50%)  |      |            |       |                                  |       |                      |       |  |
| Extruded Polystyrene / Styrofoam   | (30%)  |      |            |       |                                  |       |                      |       |  |
| Rock / Cement / Slag   | (20%)  |      |            |       |                                  |       |                      |       |  |
| <p>2. The product must be able to meet the minimum thermal conductivity (K-value) and or resistance (R-value) <sup>1</sup>:</p> <p>K-value <math>\leq 0.1 \text{ W/m}\cdot\text{K}</math></p> <p>R-value <math>\leq 2.5 \text{ m}^2\cdot\text{K}/(\text{W}\cdot\text{in})</math></p>   | <p>✓ Review of laboratory test report<sup>1</sup>;</p> <p>✓ Review of supporting information</p> |      |            |       |                                  |       |                      |       |  |
| <p>3. Emissions to Indoor Air</p> <ul style="list-style-type: none"> <li>• Volatile Organic Compounds (VOCs) shall not exceed <math>500\mu\text{g}/\text{m}^2/\text{hr}</math></li> <li>• Formaldehyde shall not exceed <math>0.2 \text{ mg}/\text{m}^2/\text{hr}</math></li> </ul>  | <p>✓ Review of laboratory test report(s) <sup>2</sup>.</p>                                       |      |            |       |                                  |       |                      |       |  |

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|--|---|
| <p>4. Product shall not be formulated or manufactured with the following hazardous substances:</p> <ul style="list-style-type: none"> <li>• CFC (chlorofluorocarbons)</li> <li>• Asbestos</li> </ul>   | <ul style="list-style-type: none"> <li>✓ Review of laboratory test report(s) <sup>2</sup>;</li> <li>✓ Review of supporting information (e.g. MSDS or other relevant documentation)</li> </ul>             |
| <p>5. The levels of the following hazardous substances as impurities shall not exceed the following:</p> <ul style="list-style-type: none"> <li>• Cadmium: 10 ppm</li> <li>• Lead: 300 ppm</li> <li>• Chromium VI: 10 ppm</li> <li>• Arsenic: 50 ppm</li> <li>• Mercury: 10 ppm</li> <li>• Selenium: 20 ppm</li> <li>• PBDE (polybrominated diphenyl ether): 100ppm</li> <li>• PBB (polybrominated byphenyls): 100ppm</li> </ul> | <ul style="list-style-type: none"> <li>✓ Review of laboratory test report(s) <sup>2</sup>;</li> <li>✓ Review of supporting information (e.g. MSDS or other relevant documentation)</li> </ul>             |
| <p>6. E-glass and “475” glass fibres shall not be used for reinforcement.</p>  | <ul style="list-style-type: none"> <li>✓ Review of supporting information</li> <li>✓ The type and percentage of fiberglass materials used shall be provided by the applicant in a declaration.</li> </ul> |
| <p>7. The product should be inflammable to minimize the risk of fire hazard.</p> <ul style="list-style-type: none"> <li>• Must meet Class A Fire Resistance (China Classification)</li> <li>• Or any other international fire standard of the highest grade</li> <li>• Applicable to relevant internal building insulation</li> </ul>  | <ul style="list-style-type: none"> <li>✓ Review of laboratory test report(s) <sup>2</sup>.</li> </ul>   |

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| construction material only   |   |
| 8. Production processes shall conform to relevant national or local environmental regulations on preventing air and waste pollution                          | ✓ Review of supporting information; AND<br>✓ Interview with relevant personnel.<br>(i.e.: ISO 14001; ISO 9001)                        |
| 9. Consumer information<br>The manufacturer/supplier of the product must provide detailed instructions on its proper installation, maintenance and disposal. | ✓ Review of supporting information.<br>(i.e. MSDS)  |
| 10. General packaging requirements<br>(Refer to criteria for packaging materials: GL-Packaging).   | ✓ Review of supporting information.<br><br><i>A declaration of conformity of the product with the requirements shall be submitted</i> |

\*Analytical testing should be accredited and performed by laboratories that meet the requirement laid out in the IEC/ISO 17025 or EN45001 standards or any equivalent systems e.g. HOKLAS, CNAS. Under special situation and with the approval from GC, tests can be performed by in-house method by the accredited laboratory or manufacturer.

Notes

1. *Thermal conductivity* – a material’s ability to conduct heat; the lower the K-value, the more efficient the insulator is. K-value in units of W/m·K

Test Method:

GB/T 20473-2006; Dry mix thermal insulating composition for buildings

BS EN 12667: Thermal Performance of Building materials and products

*Thermal resistance* – a material’s ability to resist heat; R-value in units of K·m<sup>2</sup> /W

Test Method:

ASTM C1363-11: Standard Test Method for Thermal Performance of Building Materials

2. Test Methods

- *Fire Hazard Tests*

- GB 8624-2006: Classification for burning behavior of building materials and products

- GB/T 5464-1999: Non-flammable test for construction materials

- GB/T 14402-2007: Reaction to fire tests for building materials and products

- ASTM E119-12: Standard Test Methods for Fire Tests of Building Construction and Materials

- *VOC*: ASTM D2369-04 / USEPA Method 24

- *Formaldehyde*: ASTM D5116 / ASTM 5197

- *CFC* (chlorofluorocarbons): ASTM-D-5020-89

- *Asbestos*: HK EPD In-house Method G-T-023

- Air Pollution Control Ordinance Section 2 (Gazette No. 23/1997) or equivalent

- *Lead and Cadmium*: USEPA 3051A/7000B

- *Chromium VI*: USEPA 3060A/7196A

- *Arsenic*: USEPA 3051A/7061A

- *Mercury*: USEPA 3051A/7471B

- *Selenium*: USEPA 3051A/7741A

- *PBDE* (polybrominated diphenyl ether) flame retardants; AND

- *PBB* (polybrominated biphenyls) flame retardants: B5 EN 62321:2009

US EPA 8280B / 8290A

**[All other equivalent and standardized methods are acceptable]**