



# CONSTRUCTION INDUSTRY COUNCIL

## CIC GREEN PRODUCT CERTIFICATION

### ADHESIVE & SEALANT

#### *Assessment Standard*

(Version 1.0)

Obsolete - for reference only

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## ADHESIVE & SEALANT

### *Summary of Assessment Criteria*

#### CORE CRITERIA

Criteria	Requirements	Verification	Points		Index
			Basic	+Bonus	
Product Information	<ul style="list-style-type: none"> <li>○ Provide the following product information on the packaging of the product and/ or company website:               <ul style="list-style-type: none"> <li>▪ Product composition</li> <li>▪ Possible toxicity or health hazards imposed by the chemical components</li> <li>▪ Instructions for use</li> <li>▪ Amount of adhesive needed per unit area</li> <li>▪ Instructions for disposing the waste packaging as well as any remaining adhesives</li> <li>▪ Methods of cleaning the application equipment</li> </ul> </li> </ul>	Documentation related to the label and relevant information	<b>5</b>		4.1.3 (page 4)
Carcinogenic Substances	<ul style="list-style-type: none"> <li>○ Substances listed in IARC Group 1, 2A and 2B shall be &lt; 0.1% by weight of the product</li> </ul>	Laboratory test report(s), MSDS and production documentation	<b>10</b>		4.2.1 (page 4)
Heavy Metals	<ul style="list-style-type: none"> <li>○ The following heavy metals shall be less than 0.01% (by weight of product):               <ul style="list-style-type: none"> <li>▪ Lead</li> <li>▪ Cadmium</li> <li>▪ Mercury</li> <li>▪ Hexavalent chromium</li> </ul> </li> </ul>	Laboratory test report(s), MSDS and production documentation	<b>10</b>		4.2.2 (page 5)
Reproductive Toxins	<ul style="list-style-type: none"> <li>○ Reproductive toxins shall be less than 0.1% by weight of the product</li> </ul>	Laboratory test report(s), MSDS and production documentation	<b>10</b>		4.2.3 (page 5)
Toxic Compounds	Inhalation LD <sub>50</sub> values shall be: <ul style="list-style-type: none"> <li>▪ ≥ 2,000 ppm of vapour of gas</li> <li style="text-align: center;">OR</li> <li>▪ ≥ 20 mg/L of mist, dust or fumes</li> </ul>	Laboratory test report(s), MSDS and production documentation	<b>10</b>		4.2.4 (page 5)

Volatile Organic Compounds	o Lower than the limit of volatile organic compounds as shown in Tables 1 or 2 in section 4.3.1. by	Laboratory test report(s), MSDS and production documentation	5	+5 / +10	4.3.1 (page 6)						
	<table border="1"> <tr> <td>≥ 1 %</td> <td>5 [basic]</td> </tr> <tr> <td>≥ 5 %</td> <td>+5 (bonus)</td> </tr> <tr> <td>≥ 10 %</td> <td>+10 (bonus)</td> </tr> </table>					≥ 1 %	5 [basic]	≥ 5 %	+5 (bonus)	≥ 10 %	+10 (bonus)
	≥ 1 %					5 [basic]					
	≥ 5 %					+5 (bonus)					
≥ 10 %	+10 (bonus)										
		<b>Subtotal:</b>	<b>50</b>	<b>+10</b>							

## NON-CORE CRITERIA

Criteria	Requirements	Verification	Points	Index
			+Bonus	
Environmental Management System	o Valid certification of ISO14001 or the EU Eco-Management and Audit Scheme (EMAS)	ISO14001 or EMAS certificate issued by accredited certification body	+10	4.1.1 (page 3)
Packaging Requirements	The packaging materials shall: <ul style="list-style-type: none"> <li>o Not contain chlorinated or halogenated plastics;</li> <li>o Use environmental friendly packaging such as aluminium foil packaging; and</li> <li>o Be re-sealable after first use.</li> </ul>	Documentation on the packaging materials used	+10	4.1.2 (page 3)
Durability	o The performance of product shall be maintained for 5 years (interior) or 10 years (exterior)	Documentation or test report(s) on product warranty or guarantee performance	+5	4.1.4 (page 4)
Hazardous Substances	o The following substance shall be less than 0.1%, unless specified*: <ul style="list-style-type: none"> <li>▪ Phthalates</li> <li>▪ Alkylphenoethoxylates</li> <li>▪ Halogenated solvents</li> <li>▪ Bioaccumulative preservatives</li> <li>▪ Aromatic solvents</li> <li>▪ Formaldehyde* (&lt;0.001%)</li> </ul>	Laboratory test report(s), MSDS and production documentation	+10	4.2.5 (page 5)
Ozone Depletion Substances	o Ozone depletion substances shall be less than 0.1% by weight of the product	Laboratory test report(s), MSDS and production documentation	+5	4.3.2 (page 8)
<b>Subtotal:</b>			<b>+40</b>	

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# **1. INTRODUCTION**

## **1.1 PURPOSE**

The CIC Green Product Certification (*formerly known as HKGBC Green Product Accreditation and Standards [HK G-PASS]*) (herein after referred as the “Scheme”) is an environmental labelling scheme owned by the Construction Industry Council (CIC) and implemented by the Hong Kong Green Building Council (HKGBC) which aims to help consumers, building professionals and policy makers identify environmentally preferable building materials and products. This Assessment Standard (hereafter referred as the “Standard”) sets out the assessment criteria and their benchmarks for adhesives and sealants to govern the application and award of a label under the Scheme. The Standard also defines the verification methods to determine which labelling grade should be awarded to the product according to the assessment criteria.

This Standard neither modifies nor supersedes laws and regulations. Compliance with this Standard is not a substitute for, and does not assure, compliance with any applicable laws or regulations. Compliance with all applicable laws and regulations is a prerequisite for the manufacturing and marketing of the product.

## **1.2 BACKGROUND**

Adhesives and sealants are two commonly used materials in the construction industry worldwide. They come in many formulations and are used for bonding a wide variety of substrates in fabrication, maintenance and repair applications by industry, contractors and individual consumers. Adhesives and sealants are well known for their fumes and odours which may affect the installers and/or building occupants and they are one of the main contributors of toxic air emissions to the environment worldwide. They contain a large range of chemicals to ensure superior binding strengths for different applications in the construction sector. The adhesive industry has certain progress in reducing the level of toxic compounds while still maintain their bonding strength for the intended purposes. The purposes of the assessment criteria developed for adhesives and sealants are therefore to minimise the use and subsequent release of harmful substances to the human health and environment throughout the product’s life cycle.

# **2. SCOPE**

The Standard shall apply to all adhesive and sealants (see definitions in Section 3) applied on-site in the building interior and exterior.

*Note:*

Each application should specify the product code / serial number.

### 3. DEFINITIONS

*Adhesives:* Any substance which is used to bond one surface to another surface by attachment. Adhesives include adhesive bonding primer, adhesive primers, adhesive primers for plastics and other any other primers.

*Applicant:* Organisations which apply for the label of the CIC Green Product Certification of the Construction Industry Council

*CIC:* Construction Industry Council

*CNAS:* China National Accreditation Service for Conformity Assessment

*HKAS:* Hong Kong Accreditation Service

*HKGBC:* The Hong Kong Green Building Council Limited

*HOKLAS:* The Hong Kong Laboratory Accreditation Scheme

*IARC:* International Agency for Research on Cancer

*ISO:* International Organization for Standardization

*MSDS:* Material safety data sheet. To qualify as suitable, the MSDS and information therein must not be more than 5 years old.

*Ozone depleting substances:* The “scheduled substances” defined in Ozone Layer Protection Ordinance (Chapter 403).

*Reproductive toxins:* Chemical with reproductive toxicity includes impairment of male and female reproductive functions or capacity and the induction of non-inheritable harmful effects on the progeny (Refer to Commission Directive 2001/59/EC).

*Sealants:* Any materials with adhesive properties which are formulated primarily to fill, seal, or waterproof gaps and joints between two surfaces.

*Third-party:* An entity without any financial interest or stake in the sales of the product or service being evaluated or other conflict of interest

*VOC:* Volatile organic compounds. Any organic compound (compound which contains carbon) with either a boiling point below 250°C measured at 101.3 kPa or a vapour pressure of more than 0.1 mm Hg measured at 25°C

## 4. EVALUATION CRITERIA

A product to be assessed should meet all the minimum requirements of the “Core Criteria” in order to be awarded a “Green” (i.e. a “pass” grade) Label under the Scheme. Bonus points may be awarded if the product meets the “Non-core Criteria” and a “Bronze”, “Silver”, “Gold” or “Platinum” Label will be awarded according to the total points accumulated (see Section 5 for details). All submission and documentation shall be endorsed by the Chief Executive Officer or other authorised persons of the Applicant to demonstrate conformance to the assessment criteria. The chemical tests should be conducted by either a third party or the manufacturer who has received the ISO17025 certification or relevant national accreditation systems, e.g. HOKLAS, CNAS, etc.

### 4.1 GENERAL REQUIREMENTS

#### 4.1.1 *Environmental Management System*

##### 10 Points (Non-core Criterion)

Manufacturer of the products shall possess valid certificate of ISO14001 or the EU Eco-Management and Audit Scheme (EMAS). Targets shall be set to reduce the environmental impacts during the manufacturing process which include but not limited to the reduction of hazardous substance emissions, energy consumption, CO<sub>2</sub> emissions, secondary environmental load, waste management, water management, etc.

##### Verification

A valid ISO14001 or EMAS Certificate issued by local or overseas accredited certification bodies.

#### 4.1.2 *Packaging Requirements*

The packaging requirements are relevant to all primary packaging materials, i.e. those being used to envelop the product and hold it. The primary packaging materials are usually in direct contact with the contents and shall be in the minimal amount of distribution and/or use as they may eventually be disposed by the consumers.

##### 10 Points (Non-core Criterion)

The packaging materials shall:

- Not contain chlorinated or halogenated plastics;
- Use environmental friendly packaging such as aluminium foil packaging; and
- Be re-sealable after first use.

##### Verification

Documentation that describes the packaging and the materials used.

### **4.1.3 Product Information**

#### 5 Points (Core Criterion)

The following information shall be supplied with the product or made available to the public to help the users to use the adhesive / sealant in a sustainable manner:

- Chemical composition;
- Possible toxicity or health hazards imposed by the chemical components;
- Instructions for use;
- Recommendation on the amount of adhesive per unit area;
- Instructions for cleaning equipment and waste proposal methods for the packaging and any remaining adhesives; and
- Methods of cleaning application equipment.

#### Verification

Documentation related to the product labels, care instructions and other information provided with the product; material safety data sheets (MSDS); web pages and any other information shall be freely available to customers or the public.

### **4.1.4 Durability**

#### 5 Points (Non-core Criterion)

The performance of product shall be maintained for at least 5 years (for interior use) or 10 years (for exterior use) to minimise the resource consumption and maintenance time.

#### Verification

Documentation and test report(s) related to the product warranty or guarantee performance shall be submitted.

## **4.2 HUMAN TOXICITY**

### **4.2.1 Carcinogenic Substances**

#### 10 Points (Core Criterion)

Hazardous substances listed in the International Agency for Research on Cancer's (IARC) Groups 1, 2A and 2B Classifications (details can be found in website: <http://monographs.iarc.fr/ENG/Classification/>) shall be avoided during the production process or present in the final product. Any such carcinogens which are known to be present as contaminants shall be less than 0.1% by weight of the product.

#### Verification

Laboratory test report(s), MSDS and any relevant production documentation shall be provided.

#### **4.2.2 Heavy Metals**

##### 10 Points (Core Criterion)

The product shall be less than 0.01% by weight of the product with toxic heavy metals, including lead (Pb), cadmium (Cd), mercury (Hg), hexavalent chromium (Cr(VI)).

#### **4.2.3 Reproductive Toxins**

##### 10 Points (Core Criterion)

The adhesive / sealant products shall not be formulated with any reproductive toxins. Any reproductive toxin which is known to be present as a contaminant shall not be less than 0.1% by weight of the product.

#### **4.2.4 Toxic Compounds**

##### 10 Points (Core Criterion)

The product shall not be toxic. A product is regarded as non-toxic if the following lethal dosage (LD) criterion applies:

Inhalation LD<sub>50</sub>:  $\geq 2,000$  ppm of vapour of gas or  $\geq 20$  mg/L of mist, dust or fumes

#### **4.2.5 Hazardous Substances**

##### 10 Points (Non-core Criterion)

The following substances shall be less than 0.1% in the product (\*except formaldehyde which shall be less than 0.001%):

- Phthalates (including bis(2-ethylhexyl)phthalate (DEHP), dibutyl phthalate (DBP), diallyl phthalate (DAP) or n-butyl benzyl phthalate;
- Alkylphenolethoxylates;
- Halogenated solvents;
- Bioaccumulative preservatives;
- Aromatic solvents, including benzene, toluene and their derivatives; and
- Formaldehyde\*.

##### Verification for 4.2.1 to 4.2.5

Laboratory test report(s), MSDS and relevant production documentation. The tests shall be performed in accordance with relevant international standards.

## 4.3 ECOSYSTEM IMPACTS

### 4.3.1 Volatile Organic Compounds (VOCs)

#### 15 Points (Core Criterion)

Volatile organic compounds (VOC) could cause harm to the environment and are dangerous to human health. When released into the atmosphere, VOCs react with nitrogen oxide to form ozone, resulting in air pollution, particularly summer-time smog. VOCs may cause damage to human nervous system, blood, liver and kidneys when exposed over a long period of time. The products shall meet the limits of VOCs as stated in Tables 1 and 2 below respectively:

*Table 1: Limits of VOCs in adhesives*

<i>Adhesive and application</i>	<i>Maximum limits of VOC content (g/L less water)</i>
<i>I. Architectural applications</i>	
1. Carpet pad adhesives	50
2. Ceramic tile adhesives	65
3. Cove base adhesives	50
4. Dry wall and panel adhesives	50
5. Indoor carpet adhesives	50
6. Multi-purpose construction adhesives	70
7. Outdoor carpet adhesives	150
8. Rubber flooring adhesives	60
9. Single-ply roof membrane adhesives	250
10. Structural glazing adhesives	100
11. Subfloor adhesives	50
12. VCT and asphalt tile adhesives	50
13. Wood flooring adhesives	100
<i>II. Specialty applications</i>	
14. ABS welding adhesives	325
15. Adhesive primers for plastic	550
16. Contact adhesives	80
17. CPVC welding adhesives	490
18. Graphic arts adhesives	150
19. Paper, fabric and film coating adhesives	265
20. Plastic cement welding adhesives	250
21. PVC welding adhesives	510
22. Sheet-applied rubber lining operation adhesives	850
23. Special purpose contact adhesives	250
24. Structural wood member adhesives	140
25. Wood flat stock adhesives	250

<i>III. Adhesive substrate specific applications: For adhesives not listed in Category (I) and (II) above and applied to the following substrates, the following limits shall apply</i>	
26. Adhesives for fibreglass	80
27. Adhesives for metal	30
28. Adhesives for plastic foams	50
29. Adhesives for porous material	50
30. Adhesives for wood	30
<i>IV. Other adhesives: Any adhesives not falling within Category (I) to (III) above</i>	
31. Other adhesives	250

Source: Environmental Protection Department (2012)

Table 2: Limits of VOCs in sealants

<i>Sealant and application</i>	<i>Maximum limits of VOC content (g/L less water)</i>
1. Portable sealants or caulking compounds	4%
<i>Sealants that are not portable sealants or caulking compounds</i>	
2. Architectural sealants (except sealant primers)	250
3. Architectural (non-porous) sealant primers	250
4. Architectural (porous) sealant primers	775
5. Modified bituminous sealant primers	500
6. Non-membrane roof sealants (except sealant primers)	300
7. Roadway sealants (except sealant primers)	250
8. Single-ply roof membrane sealants (except sealant primers)	450
9. Other sealants	420
10. Other sealant primers	750

Source: Environmental Protection Department (2012)

Basic and bonus points will be awarded to the Applicant according to the table below:

Table 3: Limits of VOCs and associated points

<i>Criteria</i>	<i>Points</i>
Lower than the limit of volatile organic compounds as shown in Tables 1 or 2 by $\geq 1\%$	5 [basic]
Lower than the limit of volatile organic compounds as shown in Tables 1 or 2 by $\geq 5\%$	+5 (bonus)
Lower than the limit of volatile organic compounds as shown in Tables 1 or 2 by $\geq 10\%$	+10 (bonus)

### Verification

Laboratory test report(s), MSDS and relevant production documentation. The tests in laboratories shall be performed in accordance with relevant testing methods including but not limited to USEPA Test Methods; South Coast Air Quality Management

District Method 303 and Method 316A; California Air Resources Board Method 310; ASTM Methods; NIOSH Manual of Analytical Methods.

#### **4.3.2 *Ozone Depletion Substances***

##### 5 Points (Non-core Criterion)

Ozone depletion substance shall be less than 0.1% by weight of the product.

##### Verification

Laboratory test report(s), MSDS and relevant production documentation. The tests in laboratories shall be performed in accordance with relevant testing methods including but not limited to ISO 17895, ISO 11890 and ASTM 17895.

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## 5. SCORING AND GRADING

The points for meeting each criterion stated in Section 4 are summarised in Table 4.

Table 4: Points to be awarded under the assessment criteria of this Standard

<i>Evaluation Criteria</i>	<i>Points</i>	
	<i>Basic</i>	<i>+Bonus</i>
4.1.1 Environmental Management System		+5
4.1.2 Packaging Requirements		+10
4.1.3 Production Information [CORE]	<b>5</b>	
4.1.4 Durability		+5
4.2.1 Carcinogenic Substances [CORE]	<b>10</b>	
4.2.2 Heavy Metals [CORE]	<b>10</b>	
4.2.3 Reproductive Toxins [CORE]	<b>10</b>	
4.2.4 Toxic Compounds [CORE]	<b>10</b>	
4.2.5 Hazardous Substances		+10
4.3.1 Volatile Organic Compounds [CORE]	<b>5</b>	+5 / +10
4.3.2 Ozone Depletion Substances		+10
	<b>50</b>	<b>+50</b>
<b>Total:</b>	<b>100</b>	

The minimum requirement to be awarded a “Green” Label under this product category is to obtain 50 points by meeting all minimum requirements laid down in the “Core Criteria”.

Table 5: Benchmarks for grading adhesive & sealant

<i>Grade to be awarded</i>	<i>Points required</i>
Platinum	90 or above
Gold	80 - 89
Silver	70 - 79
Bronze	60 - 69
Green	50 - 59
No Label	Below 50