

SPECIAL CONDITION: Form-Specific Hazards

Version: SCFormSpecific/2019-12-19

BACKGROUND

Definitions

Form-specific hazard: A form-specific hazard refers to a hazard in which the mechanism of the toxicity is directly caused by the physical form of the substance rather than its chemical composition. (For more detailed explanation, see “Criteria for Substances Selected” below.)

The need for a form-specific hazard Special Condition

Regular hazard reporting in the HPD Open Standard is specified by the [Harmonized Method for Hazard Screening](#). This method has been established to ensure accurate, reliable and consistent reporting of human and environmental health hazards in building products. Hazards are reported for each substance included in an HPD based on the substance’s CAS Registry Number (CAS RN).

However, the CAS RN considers only the chemical composition of the substance and does not differentiate the various forms of a substance, nor does it consider the material context of substances. The GreenScreen hazard assessment methodology referenced by the HPD Open Standard likewise relies on chemical composition regardless of physical form. Therefore, when relying solely on the CAS RN system and GreenScreen scores, the hazards associated with a specific form are typically generalized to include all forms of the substance without any information regarding hazard thresholds based on physical form.

This approach has limitations. Some hazards have thresholds that differ based on the particular physical form and size of the substance. For example, crystalline silica in dust form is carcinogenic due to physical effects following inhalation into the lungs. On the other hand, this same substance is not known to be carcinogenic in other forms, such as when it is an ingredient in a solid (such as glass) or a liquid (such as paint).

On an HPD prepared using the regular method, the GreenScreen score for crystalline silica, which indicates a high level of concern, will appear no matter what form the silica is in. Likewise, the hazard warnings related to crystalline silica dust will appear even when the silica is part of a solid or liquid material.

The purpose of this Special Condition policy is to provide an alternative for reporting hazards in this situation.

This policy allows a manufacturer the option to report a substance’s hazards as form-specific when the substance appears in the product only in a form not associated with the hazard warning. When this Special Condition is used, the HPD hazard information for these substances will be augmented. Additional information will appear which accounts for the expected use of the product by occupants of the building.

Only those substances that have been approved for inclusion in this Special Conditions policy are covered. All substances covered by the policy are noted below—see “Qualifying substances.”

How substances are selected for inclusion in this Special Condition

The HPDC Technical Committee has approved this policy, as well as the qualifying substances for which form-specific hazard reporting is acceptable. HPDC gave these substances special consideration because:

- These substances are prevalent in building products and materials in forms not associated with the hazard warnings they typically carry.
- Stakeholder consensus has been established that an alternative hazard reporting protocol for such substances is appropriate.
- The substances comply with the toxicological criteria that HPDC has established for a form-specific hazard, as described below (see “Criteria For Substances”).

Scope limitations

The following notes further clarify the scope of this Special Condition.

Particles of Respirable Size

This HPDC policy focuses on particles of respirable size, i.e., dust. Hazards that have been identified have thresholds associated with their specific physical form, i.e., particle size. If the particle sizes are not respirable or particles are embedded in a bulkier material that renders them non-respirable, little or no risk of adverse effects is expected during product use. (Exposure to respirable particles during manufacture, installation, maintenance, or demolition, due to activities such as sawing, sanding, grinding, or intensive cleaning, remains possible.)

It is important to distinguish that this policy is focused on particles of respirable size, and not all inhalation hazards. Referring to inhalation hazards specifies a route of exposure (inhalation) that may encompass other hazards, such as off-gassing of volatile organic compounds (VOCs) from other types of materials that are not covered here.

Additives

This Special Condition covers only the specific qualifying substances named in the policy. Any other substances or materials that are a part of the product must use the typical HPD content inventory and hazard screening process.

EXPLANATION OF POLICY AND APPLICABLE SUBSTANCES

Summary of the policy

When an ingredient with a form-specific hazard is present in the product in a form distinct from the form associated with the hazard, i.e., in a non-respirable particle size, or the form-specific hazardous particles are bound in a material preventing inhalation, an asterisk and a qualifying statement will appear on the HPD distinguishing that the hazard is form-specific.

Criteria for Substances Selected

When evaluating whether the form-specific hazard Special Condition is relevant to a particular substance, it is important to differentiate between hazards to biological systems posed by the physical form of a substance, i.e., form-specific hazards, and hazards related to the chemical formula and how that chemical interacts with biological systems.

The focus of this policy is on chemicals that have little to no known hazards related to chemistry. That is, they are biologically inert but have hazards related to their physical form. Due to the prevalence of such hazards in building products and materials, the focus of this policy is on form-specific hazards related to inhalation of a substance into the lungs and the body's inability to clear the substance from the lungs.

HPDC may consider other substances under this policy, either for similar reasons, i.e. hazards specific to dust inhalation, or for analogous reasons, i.e., hazards specific to a form that is not present in the product reported on the HPD. Contact HPDC at customersupport@hpdc.org to suggest a substance for consideration.

This policy applies to substances that exhibit little to no toxicity following oral and dermal exposure and only exhibit toxicity localized to the lungs following inhalation exposure. That is, no systemic toxicity is detected following exposure to the substance by any route other than inhalation. This must be demonstrated via a full, publicly available assessment completed using either the GreenScreen for Safer Chemicals methodology or the Cradle to Cradle Certified Material Health Assessment methodology. (See HPDC's [Emerging Best Practices for Hazard Screening](#) for more information on publicly available assessments and where to find them.)

The toxicity of chemicals with form-specific hazards is defined as adverse effects limited to the respiratory tract, characterized as the nasal and oral cavities, pharynx, larynx, trachea, bronchi, and lungs, following inhalation exposure. Hazards via oral or dermal routes of exposure must not be identified for a chemical under consideration for compliance with this policy, as they may not be limited by a chemical's physical form. The differential hazards by exposure route can be demonstrated visually with a GreenScreen for Safer Chemicals hazard table stratified by exposure route or a Cradle to Cradle Certified hazard profile where the only red hazards are identified for inhalation-related endpoints or sub-endpoints. (I.e., in Cradle to Cradle Certified, the substance as used in the product needs to qualify for a 'c' assessment or better.)

Form-specific hazards are limited to adverse effects to the respiratory tract tissues, including but not limited to histopathological changes to the cells lining the respiratory tract, i.e., respiratory epithelium, that may lead to pulmonary fibrosis and tumor formation, i.e. carcinogenesis. Evidence of systemic toxicity, including toxicity to other internal organs, reproductive tissues, or the developing organism, indicates that the chemical under evaluation does not meet the intent of this policy.

GreenScreen® List Translator™ results for chemicals with form-specific hazards are usually limited to carcinogenicity of the respiratory tract and/or mechanical irritation of the skin, eyes, and/or respiratory tract. Carcinogenic chemicals are typically identified via authoritative bodies such as the U.S. Environmental Protection Agency (U.S. EPA), the International Agency for Research on Cancer (IARC), the State of California's Office of Environmental Health Hazard Assessment, or the Centers for Disease Control (CDC) (occupational carcinogens only).

This policy allows for chemicals with form-specific hazards to be persistent, especially for inorganic chemicals resistant to biodegradation. They must not be bioaccumulative, as bioaccumulation typically involves chemicals concentrating in the fat or adipose tissues, and systemic bioavailability is required for a chemical to reach these tissues.

Qualifying substances

Only specific substances approved by HPDC and its Technical Committee qualify for application of this policy. (See “Criteria for Substances” above.)

The substances that qualify under the current edition of this policy are:

- Carbon black (CAS RN 1333-86-4)
- Titanium dioxide (CAS RN 13463-67-7) – most common CAS RN for Titanium dioxide
 - Anatase titanium dioxide (CAS RN 1317-70-0)
 - Rutile titanium dioxide (CAS RN 1317-80-2)
- Crystalline silica
 - Quartz (CAS RN 14808-60-7) – most common CAS RN for crystalline silica
 - Cristobalite (CAS RN 14464-46-1)
 - Tridymite (CAS RN 15468-32-3)
 - Tripoli (CAS RN 1317-95-9)

There are additional CAS RNs for each of these substances that have been used historically, but that are outdated and should not be used in an HPD.

Summary of implementation in an HPD

When this policy is in effect, it requires the following changes to an HPD.

Section 1: Summary

Summary of Content in Descending Order of Quantity – The GreenScreen Benchmark or List Translator score (BM-1 or LT-1) shown in “Content in Descending Order of Quantity” in Section 1 of the HPD will be augmented with an asterisk (*). The asterisk denotes the use of the form-specific hazard reporting for this substance, and is associated with a statement providing this context in the Inventory and Screening Notes.

Calculation of “Highest concern GreenScreen Benchmark or List Translator score” – This section of the HPD indicates the single highest concern GreenScreen Benchmark or List Translator Score among scores for all of the substances in a product [See 2.1.3.3]. When the form-specific-hazard option is used, the calculation of this data element will not include GreenScreen BM-1 and/or LT-1 scores associated with these substance(s). For example, if the highest-concern GreenScreen score on an HPD is an LT-1 score associated with titanium dioxide (CAS RN 13463-67-7), that score is not included in the “Highest concern” calculation. If the next-highest-concern score is LT-P1, that score will appear instead. Or, if another substance in the product has an LT-1 score, that score will appear.

Calculation of LEED v4 Pre-Check Indicator – In some LEED v4 options, a GreenScreen BM-1 or LT-1 score on a product’s HPD may prevent that product from contributing to LEED credit compliance. This policy excludes the BM-1 or LT-1 score for qualifying substances from negatively affecting LEED v4 compliance checks. For example, if a product includes titanium dioxide (CAS RN 13463-67-7), and the form-specific-hazard option is in use, that substance’s LT-1 score will not prevent the product from being found compliant with the requirements of the LEED v4 Material ingredients credit, Option 2, in the HPD Builder’s “LEED Pre-check Indicator” calculation.

Section 2: Content inventory

Content inventory – The GreenScreen score, and the hazard warnings shown in the content inventory in Section 2 of the HPD will be augmented with a double asterisk (**). The asterisk denotes use of the

form-specific hazard reporting for this substance, and is associated with a statement providing this context in the Substance Notes.

Harmonization

This Special Condition has been harmonized with the following programs.

- This form-specific hazards policy is harmonized with the policy used by Clean Production Action in the [GreenScreen Certified Standard for Building Products Version 1.0](#). Relative to GreenScreen Benchmark and List Translator scores, those scores are associated with the substance more generally while the HPD is specific to the product and the way the substance is specifically used in it. Thus, this policy considers form-specific hazards in a way that GreenScreen does not. However, Clean Production Action (the organization behind GreenScreen) has been a part of this policy development and has approved it.
- This policy also aligns with the [Cradle to Cradle Certified Material Health Assessment methodology](#) and specifically the [Cradle to Cradle Certified Exposure Assessment methodology](#). According to this methodology, “red” hazards translate to “yellow” risks for the use phase of a product if they are associated with substances that are “...bound to or encapsulated by the material matrix (e.g. titanium dioxide and carbon black as polymer fillers/pigments, other inorganic pigments within polymers, polymer crosslinkers, and colorants fused within a glass matrix, and metals within metal alloys when part of the alloy crystallites)” in the product.
- International Living Future Institute and Declare do not currently have a policy related to form-specific hazards; none of the substances currently included in this policy are on the LBC Red List.
- [BIFMA e3 2019](#) has no specific requirements that are affected by this policy.

The HPDC actively seeks additional programs as harmonization partners. As a determination of harmonization is made with such programs, this document will be amended to update this list of harmonized programs.

GUIDANCE/ INSTRUCTIONS:

Special Conditions instructions for specific data fields follow; ***if there are no specific instructions listed for a data field, the typical requirements of the HPD Open Standard should be followed.*** If the HPD Open Standard and Special Conditions instructions are followed, the HPD will not be barred from qualifying for the LEED v4 Material Disclosure and Optimization, Material Ingredients credit, Option 1.

*Data field auto-fills if using HPD Builder

HPD Data Field	Form-Specific Hazard Special Condition Implementation Requirements
SECTION 1: SUMMARY	
Content in Descending Order of Quantity*	<ul style="list-style-type: none"> • List Materials and Substances per typical HPD method. If the Form-Specific Hazard option has been selected, an asterisk (*) will be inserted next to the GreenScreen Benchmark or List Translator score. A specific statement will be inserted in the Inventory and Screening Notes (see below).

	Example: TITANIUM DIOXIDE LT-1*
Characterized Screened Identified*	<p>Proceed with normal selections for this section under typical HPD method, including as required by other Special Conditions policies that apply. The following additional option is to be included in the available responses when this Special Condition is in use:</p> <ul style="list-style-type: none"> • Select “Yes Ex/SC” for “Screened”
Inventory and Screening Notes*	<ul style="list-style-type: none"> • If the only content not characterized, identified and/ or screened is covered by the Special Condition, Inventory and Screening Notes should include the following notes: <ul style="list-style-type: none"> ○ “Special conditions applied: [Form-Specific Hazards].” ○ [LEED v4] “Yes ex/SC ” result is due only to materials and substances for which Special Conditions were applied. Thus “Yes ex/SC” does not disqualify the product for the LEED v4 Materials and Resources Disclosure and Optimization credit, Option 1. • The following note must also be included, and should be put inside a black box: <ul style="list-style-type: none"> ○ *Form-Specific Hazard: This substance’s GreenScreen Benchmark or List Translator score and the applicable hazards are related to particulate inhalation, which is expected to occur only during manufacture, installation, maintenance, or demolition, due to activities such as sawing, sanding, grinding, or intensive cleaning. For this reason, this score is intentionally omitted from the “Contents highest concern” line above. See HPDC’s Special Conditions policy for more information. ○ The following illustrates the appearance of this statement and box: <div data-bbox="457 1150 1062 1339" style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p>*Form-Specific Hazard: This substance’s GreenScreen Benchmark or List Translator score and the applicable hazards are related to particulate inhalation, which is expected to occur only during manufacture, installation, maintenance, or demolition, due to activities such as sawing, sanding, grinding, or intensive cleaning. For this reason, this score is intentionally omitted from the “Contents highest concern” line above. See HPDC’s Special Conditions policy for more information.</p> </div>
SECTION 2: CONTENT IN DESCENDING ORDER OF QUANTITY	
Materials – No change to requirements	
Substances – The following requirements apply to both Nested Materials and Basic Inventory formats	
Substance Name	Enter the substance name (per typical process).
ID (Identifier):	<p>Enter the CAS RN (per typical process).</p> <p>The following CAS RN designations are authorized by this policy:</p> <ul style="list-style-type: none"> • Carbon black (CAS RN 1333-86-4) • Titanium dioxide

	<ul style="list-style-type: none"> ○ Titanium dioxide (CAS RN 13463-67-7) – most common CAS RN for this substance ○ Anatase titanium dioxide (CAS RN 1317-70-0) ○ Rutile titanium dioxide (CAS RN 1317-80-2) ● Crystalline silica <ul style="list-style-type: none"> ○ Quartz (CAS RN 14808-60-7) – most common CAS RN for crystalline silica ○ Cristobalite (CAS RN 14464-46-1) ○ Tridymite (CAS RN 15468-32-3) ○ Tripoli (CAS RN 1317-95-9) <p>If a CAS RN from the list above is selected, the HPD Builder (or other implementation method) will automatically apply the following required implementation formatting and statements. Otherwise, continue without use of the Form-Specific Hazard implementation described below.</p>
<p>Form-Specific Hazards Questionnaire</p>	<p>If one of the CAS RNs listed above is entered, the manufacturer will be presented with the following dialogue and questions:</p> <ol style="list-style-type: none"> 1. Option to Use Form-Specific Hazard reporting <ol style="list-style-type: none"> a. <i>Dialogue:</i> “This CAS RN qualifies for HPDC’s Special Conditions policy for Form-Specific Hazards. For more information, please review the policy. In summary, this policy allows for hazard screening information to be shown in a modified format on the HPD, because the hazards associated with this substance are form-specific. If you elect to apply this Special Condition, a statement will appear on the HPD indicating that the applicable hazards are related to particulate inhalation, which is not expected to occur during normal use of this product.” b. <i>Question:</i> “Do you want to apply the Form-Specific Hazard policy?” [Yes/No] [If Yes, indicate “Special Condition selected” and go to Question 2. If No, indicate “Special Condition not selected” and exit Special Condition dialogue. Special Condition is not used for this substance.] 2. Liquid or non-powder solid <ol style="list-style-type: none"> a. <i>Dialogue:</i> “Substances sold as liquids or non-powder solids, for example, paints and pre-mixed joint compounds, qualify for this Special Condition provided that the substance does not volatilize, leach, emit, or abrade from the liquid or bulk material in the particle size and physical form of concern in normal use during the occupancy of the building.” b. <i>Question:</i> “Is the substance you entered present in the product as a part of a liquid or as a non-powder solid, as defined above?” [Yes/No] [If Yes, go to next question. If No, go to Question 4.] 3. Attestation <ol style="list-style-type: none"> a. <i>Dialogue:</i> “Use of this Special Condition requires attestation that the substance you have entered should not volatilize, leach, emit,

	<p>or abrade from the liquid or bulk material as a fine dust during the normal occupancy of the building.”</p> <p>b. <i>Question:</i> “Do you so attest?” [Yes/No] [If Yes, indicate “Special Condition requirement is met.” Proceed to #4. If No, indicate “Special Condition requirement is not met for this substance.” And exit Special Condition dialogue.</p> <p>4. Part of a Powder or Aerosol</p> <p>a. <i>Dialogue:</i> No dialogue for this question</p> <p>b. <i>Question:</i> “Is the substance you entered present in the product as a part of a powder or aerosol?” [Yes/No] [If Yes, go to next question. If No, Special Condition indicate “Special Condition is not used for this substance” and exit Special Condition dialogue.</p> <p>5. Particle Size Distribution</p> <p>a. <i>Dialogue:</i> “For substances that are sold as part of a powder or aerosol to qualify under this Special Condition, the particle size distribution (D0.01, D10, D50, D90) must be reported. [This measure refers to the diameter sizes for which 0.01%, 10%, 50%, and 90% of particles, respectively, have diameters less than.] Respirable particles have aerodynamic diameters <10 micrometers (µm). Therefore, the proportion of particles with diameters <10 micrometers in a given product must be restricted in order to limit the potential for respiration. The D0.01 must be less than 10 µm for products or materials sold in powdered form to qualify for this Special Condition, i.e., 0.01% of the particulates have diameters less than 10 microns. This requirement can be demonstrated in a sieving assessment report or certification of analysis or technical data sheet presenting the sieving distribution for the product.”</p> <p>b. <i>Question:</i> “Can you provide a link to such a report or certification that is publicly accessible online?” [Yes/No] [If Yes, ask “Enter link”, and allow entry of a valid URL. And enter the following in Substance Notes. “This substance is part of a powder or aerosol; however, its potential for respiration is limited, as demonstrated by the following report or certification: [link]”. If No, indicate “Special Condition is not used for this substance,” and exit the Special Condition dialogue]</p>
<p>Substance Notes</p>	<p>Enter the following statements in the Substance Notes:</p> <ul style="list-style-type: none"> • Always Required: “**Form-Specific Hazard: This substance’s GreenScreen Benchmark or List Translator score and the applicable hazards are related to particulate inhalation, which is expected to occur only during manufacture, installation, maintenance, or demolition, due to activities such as sawing, sanding, grinding, or intensive cleaning. See HPDC’s Special Conditions policy for more information. Manufacturer’s Safety Data Sheet (SDS), if applicable, may offer occupational health and safety information.” • Contingent: If a statement is indicated for the powder or aerosol information provided in the questionnaire above, that statement should be entered here, as

	noted in number 5b, above.
Hazards and Agency(ies) with Warnings*	Insert a double asterisk (**) following each of the hazard warnings listed for qualifying substances. This notation references the Substance Note indicated with (**) in Substance Notes (see above). Example: CANCER**
SECTION 3: CERTIFICATIONS AND COMPLIANCE	
No change to implementation requirements for this Special Condition	
SECTION 4: ACCESSORIES	
No change to implementation requirements for this Special Condition	
SECTION 5: GENERAL NOTES	
No change to implementation requirements for this Special Condition	
SECTION 6: REFERENCES	
No change to implementation requirements for this Special Condition	

VERSION CONTROL

This document replaces SCFormSpecific /2019-07-18. It includes the following updates:

- Revision of reference to Safety Data Sheet (SDS) to accommodate products such as articles where an SDS may not be applicable.