

### A.6.4.3 Non-halogenated substances

#### Background

The purpose of this mandate is to increase the knowledge of substances with regards to their human and environmental impacts and to drive a shift towards less hazardous alternatives.

The mandate uses the hazard assessment and decision logic framework called GreenScreen™ for Safer Chemicals (GS) developed by the non-profit organization Clean Production Action (CPA). The GS methodology can be used for identifying substances of high concern and safer alternatives.

The evaluation of a substance covers 18 human and environmental health hazard endpoints for the chemical and its environmental Transformation Products (TP). Each of the 18 hazards receives a classification of concern ranging from Very High to Very Low. Based on the classifications the substance is then assigned an overall benchmark score of 4, 3, 2, 1 or U. Benchmark 1 is the lowest score and according to CPA, aligns with the criteria for Substances of Very High Concern (SVHC) in the European Reach Regulation. A substance that is assigned U (Undefined) is due to data gaps there too much important data is missing in order to assign a benchmark. For detailed information on the GS methodology it is recommended to read the document: *GreenScreen For Safer Chemicals Hazard Assessment Procedure*.

The GS criteria are in line with international standards and regulations including the Globally Harmonized System of Classification and Labelling of Chemicals (GHS), OECD testing protocols and the European Reach Regulation. The U.S. EPA's Design for Environment (DfE) Alternatives Assessment is also an important influence on the GreenScreen™ for Safer Chemicals.

#### Definitions

*Plastic parts* are parts made mainly of plastics, e.g. the housing. Parts containing other materials in any significant amounts, e.g. cables with metal conductors, are not included in the definition.

*Printed wiring board laminate* is a printed board that provides point-to-point connections but not printed components in a predetermined configuration on a common base.

*Licensed Profilers* are organisations approved by CPA with the capacity to provide GS assessments.

*Accepted substances* are considered the most sustainable alternatives which are possible for the industry to use and also taking into consideration aspects such as; availability and functionality. Accepted substances are found on the TCO Development website under "*Accepted substances list*".

#### Applicability

All FPDs.

#### Clarification

B.6.4.3

**Mandate A.6.4.3:**

Non halogenated flame retardants used in plastic parts that weigh more than 25 grams shall have GreenScreen™ assessments performed by Licensed Profilers and assigned a benchmark score.

The following acceptance decisions apply to substances given Benchmarks 4, 3, 2, 1 or designated U (undefined):

4: Accepted – (Few concerns)

3: Accepted – (Slight concern)

2: Accepted – (Moderate concern)

1: Not accepted - (High concern)

U: Not accepted - (Undefined)

All substances of a flame retardant mixture shall be accounted for. Non-accepted components shall not exceed concentration levels of 0,1% by weight of the flame retardant.

Exempted are *printed wiring board laminates*, electronic components and all kinds of cable insulation.

The following information shall be submitted to an approved verifier:

A written guarantee that the above mandate is fulfilled. The guarantee shall be signed by the responsible person at the applicant company.

The following information shall be submitted with the application to TCO Development:

A copy of a verification report from a verifier approved by TCO Development.

We hereby guarantee that the above mandate is fulfilled.

.....  
Product brand name and model name

.....  
Signature

.....  
Name and title in block capitals

.....  
Date

.....  
Company

### B.6.4.3 Non-halogenated substances

Substances relevant for the IT industry can be used in TCO Certified products once they receive an accepted benchmark. TCO Development makes a list of accepted substances available on its website. The *Accepted Substances list* (see the example Table B.6.4.3.2) is dynamic, which allows new substances that have undergone a valid assessment to be added or for accepted substances to come under reassessment in light of new scientific findings.

Most substances have insufficient data to assess and classify all of the hazard endpoints in the assessment. Experimental tests results are preferred but when test data is not available data gaps may be filled with models, analogues, authoritative lists, screening lists and expert judgment. The GS identifies the maximum number of data gaps allowed to reach each benchmark, with more stringent requirements on higher benchmark scores. A substance with unknown hazard will receive a low benchmark score but may improve when more data is provided to fill data gaps. Environmental Transformation Products (TPs) are also considered and may determine the final benchmark score of the parent substance.

TCO Development sets the minimum accepted level for substances at benchmark 2 (see Table B.6.4.3.1 Benchmark key). For the purpose of progressive action toward more preferable substances, as more suitable alternatives with improved properties and a benchmark of at least 3 become readily available then these will be preferred over lower benchmark 2s. Therefore, TCO Development reserves the right to remove a substance where it is proven that there are a sufficient number of suitably safer alternatives of less concern. Any substance to be removed will be set a sunset date. The sunset date shall give adequate time for equipment manufacturers to switch to a flame retardant alternative.

When considered necessary, TCO Development also reserves the right to request a substance undergo further assessment in order to assess the completeness, quality and validity of a draft benchmark score, such as a GS Verification assessment.

Full GS Assessments of substances are made publicly available on databases such as IC2 (Interstate Chemicals Clearinghouse) or Techstreet (see list of links under: **For more information visit**). If no public assessment report is available, then TCO Development may place interested persons in contact with the owner of the report.

Table B.6.4.3.1

Benchmark key		
Benchmark 4	Few concerns, i.e. safer chemical	Preferable
Benchmark 3	Slight concern	Improvement possible
Benchmark 2	Moderate concern	Use but search for safer substitutes
Benchmark 1	High concern	Avoid
Unspecified (U)	Insufficient data to assign a benchmark	

Table B.6.4.3.2 Accepted Substance list *example*

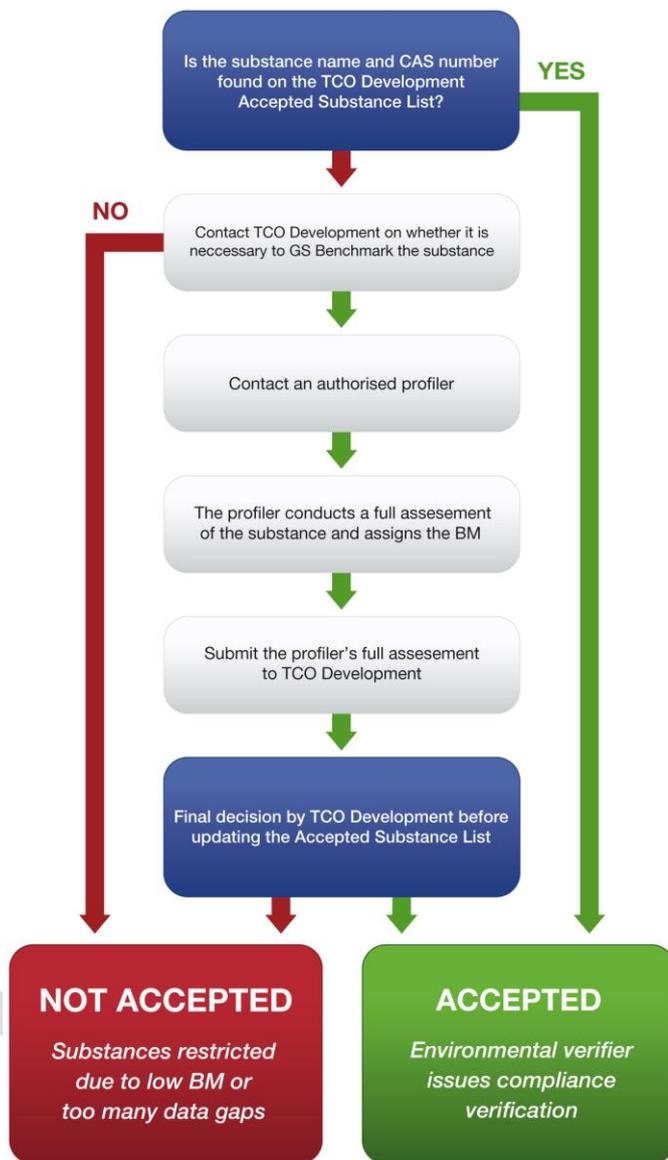
Substance name	CAS	Benchmark	Assessment date (expires 3 years)	Sunset date	Assessment available
Polyphosphonate	68664-06-2	3	Feb 9, 2014	-	IC2

Templates A.6.4.3 and A.6.4.5 in the TCO Certified criteria document co-exist to review information on the Flame retardants being used in TCO Certified products. Template A.6.4.3 is a signed declaration that the product's relevant Non-halogenated substances comply with the mandate. Template A.6.4.5 requires that all relevant Flame retardants are specified so the verifier may check the declaration of A.6.4.3. Therefore the applicant should be aware of the procedural guidelines before declaring compliance with mandate A.6.4.3.

#### B.6.4.3.1 Compliance procedures (See also Flow chart B.6.4.3.1)

- **If all declared substances are present on the Accepted Substances List** the procedure is as follows:
  1. Templates A.6.4.3 and A.6.4.5 shall be completed before being submitted to the approved environmental verifier. When the verifier considers all environmental documentation is compliant they will issue an Environmental verification to the applicant.  
**Note:** To save time, it is recommended that the applicant first check themselves or with the verifier that a substance is accepted and listed on the TCO Development website before submitting the templates for verification.
- **If any declared substance is not on the Accepted Substances List** then it will need to be added before approval can be given by the environmental verifier. For this the procedure is as follows:
  1. The verifier will inform you if the substance is not on the Accepted Substances List.
  2. Contact TCO Development directly to see if we have any additional information on the substance: Reasons for the substance's absence can be that no assessment has been conducted or it has a benchmark score U (undefined) due to many data gaps.
  3. If TCO Development requires the substance to be benchmarked, we recommend you contact your supplier and inform them the substance will need a GS assessment by a licenced profiler. The list of licenced profilers can be found on the CPA website at <http://www.greenscreenchemicals.org/professionals/profilers>
  4. A draft report per substance (not product) is assembled from the available information (literature search, structural similarity comparison, expert judgment) by the profiler.
  5. It is the profiler that sets the benchmark score per relevant substance, which is valid for 3 years. Substances are assessed at 3 year intervals since mandates are revised and more data and new knowledge on the substance may lead to other results.  
**Note:** All assessments **and** reassessments shall be conducted by licensed profilers.
  6. Full GS **assessments per substance** shall be submitted to TCO Development for final approval before the Accepted Substances List can be updated.

7. Once a substance is added to the list and the verifier identifies them, then they will issue the environmental verification to the applicant (see above point 1 under: **If all declared substances are present on the TCO Development list of Accepted Substances**)



Flow chart B.6.4.3.1. The Compliance procedure

**For more information visit the following websites:**

TCO Development: Criteria review - Non-Halogenated Substances: [www.tcodevelopment.com](http://www.tcodevelopment.com)

Clean Production Action: <http://www.greenscreenchemicals.org/>

GS Procedure guidelines: <http://www.greenscreenchemicals.org/method/method-documents>

Full GS assessments can be found at:

IC2: <http://www.newmoa.org/prevention/ic2/projects/resource/hazassesstool.cfm>

Techstreet: <http://www.techstreet.com/searches/3638231>