SINTEF Environmental certificate- health and environmental requirements

1 What is SINTEF Environmental Certificate?

SINTEF Environmental Certificate is a confirmation by SINTEF Certification stating that a construction product conforms to the relevant health and environmental requirements in the Norwegian market. SINTEF Environmental Certificate is a non-mandatory documentation scheme.

The health and environmental assessment in SINTEF Environmental certificate are based on TEK 17 – Regulations on technical requirements for building works (Norwegian: Forskrift om tekniske krav til byggverk). The requirements in TEK17 include:

- that products are chosen with no or low content of chemicals hazardous to health or environment (§ 9-2)
- that the amount of waste is reduced and that materials are chosen that can be reused or recycled (§ 9-5)
- that materials give little or no pollution of the indoor air (§ 13-1)
- that products in contact with potable water do not give of substances that reduce the water quality (§ 15-5)

The Product Control Act (Norwegian: Produktkontrolloven), § 3a, requires businesses to consider the substitution of hazardous substances with less harmful substances.

Recycled materials also need to have documented absence of chemicals hazardous to the health- and environment, see chapter 5.3.

Figure 1 shows the main points of the health and environmental assessment process. The extent of the certification depends on the application of the product in the building. The health and environmental assessments of SINTEF Environmental Certificate includes both the construction stage, the in use stage and the end of life stage.

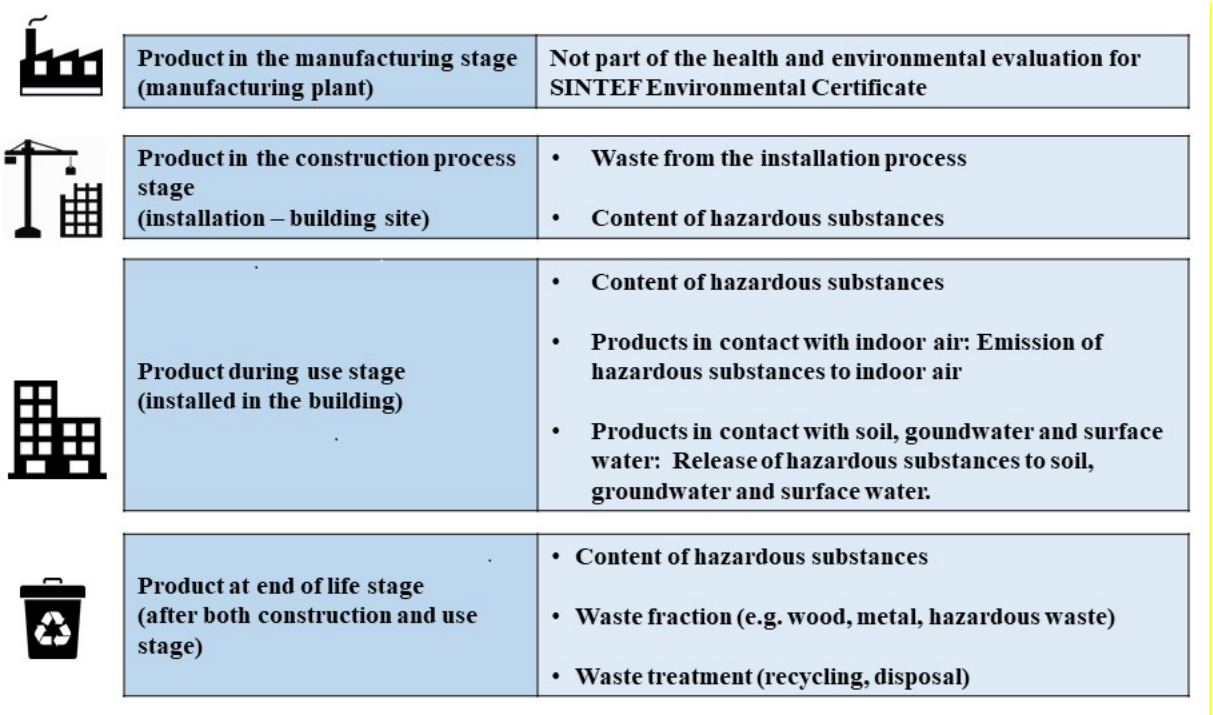

Figure 1. Evaluation of products for SINTEF Environmental Certificate. The extent of the assessments depends on the application of the product in the building.

2 What products are relevant for SINTEF Environmental Certificate?

SINTEF Environmental Certificate is offered for single products. Example of products that may be offered SINTEF Environmental Certificate:

- Glue
- Sealants
- Products used for paint and surface coatings
- Building boards made of gypsum and other materials
- Floor coverings
- Rendering and leveling compounds

Products mentioned above are often covered by harmonized European standards (hEN) requiring assessment and verification of constancy of performance in system 3 or 4 according to the Construction Product Directive (CPR), or similar assessment requirements according the Norwegian regulations on marketing construction products (DOK).

For products requiring assessment and verification of constancy of performance in system 2+, 1 and 1+ according to CPR a CPR certification is mandatory. SINTEF Environmental Certificate is not offered for such products.

SINTEF Environmental Certificate is neither offered for complex products such as prefabricated building elements and modules. For such products does SINTEF offer SINTEF Technical Approval, where the same environmental assessments and documentation are included.

3 About the certificate and product- and factory production control

SINTEF Environmental Certificate is generally valid for a five-year period. A contract for maintaining a valid certificate is made between SINTEF and the holder of the certificate. The contract includes one follow-up during the five-year period. However, the certificate must be updated and revised if changes of the product or in the production are made in the period of validity. Valid certificates are published on the SINTEF Certification web site, www.sintefcertification.no.

Costs for issuing and maintaining SINTEF Environmental Certificate are available from SINTEF on request.

4 Documentation and limit values

4.1 Documentation

The applicant must submit the following product documentation for a SINTEF Environmental Certificate:

- Product name, manufacturer and production site for products to be included in the SINTEF Environmental Certificate
- A short description of the product application in a building
- For requirements of content of substances dangerous to health or the environment: See chapter 4.2
- The form "*Obtainment of health and environmental data – Manufacturer's declaration*" shall be filled out. The form is filled out by the applicant if they are manufacturing the product, or by the subcontractor if such is used
- Technical data sheets or other product description
- Safety data sheets (applies only to products that are required to have safety data sheets)

- Declaration of performance for the product (DOP)
- For products in contact with indoor air: See chapter 4.3
- For products in contact with soil, groundwater or surface water: See chapter 4.4
- Products containing recycled material: see chapter 5.3
- Documentation that the manufacturer has an adequate quality system, for example a quality assurance management system certified according to ISO 9001, or other documentation showing that relevant requirements regarding quality are fulfilled.

4.2 Contents of substances that are dangerous to health or the environment-limits

Allowable content of hazardous substances:

- Manufacturing stage: No requirements
- Construction stage:
  - chemical mixtures that dries or hardens during the construction stage: see table 1
  - articles: see table 2
- Use stage and end of life stage:
  - chemical mixtures that are dry or hardened: see table 2
  - articles: see table 2

The manufacturing stage, construction stage, use stage and end of life stage are described in figure 1.

Table 1. Concentration limits for the construction stage (product installation). The limits apply only to chemical mixtures that dry or harden during the construction stage. Examples of chemical mixtures: adhesives, sealants, paints, mortars and screeds.

Classification	**Concentration limit (m/m) – before the product dries or hardens – during installation**	**Comments**
Carc. 1A H350 Carc. 1B H350	0.1 %	
Carc. 2 H351	1 %	
Repr. 1A H360 Repr. 1B H360	0.3 %	
Repr. 2 H361	3 %	
Muta. 1A H340 Muta. 1B H340	0.1 %	
Muta. 2 H341	1 %	
Brominated flame retardants	0.1 %	The group does not include PolyFR (CAS 1195978-93-8)
Substances on the Norwegian Priority List	0.1 %	
Substances on the Candidate List	0.1 %	
REACH Annex XVII - Restriction list	Limitation are set for each compound and area of usage	
PBT, vPvB	0.1 %	

Table 2. Concentration limits – construction stage (articles and dried or hardened chemical mixtures), use stage and end of life stage.

Classification	Concentration limits (m/m)	Comments
Skin Corr. 1A H314 Skin Irrit. 2 H315 Eye Dam. 1 H318 Eye Irrit. 2 H319	Sum H314: 1 % Sum H318: 10 % Sum H315 og H319: 20 %	Substances ≥ 1 % are included in the calculation
STOT SE 1 H370	1 %	
STOT SE 2 H371	10 %	
STOT SE 3 H335	20 %	
STOT RE 1 H372	1 %	
STOT RE 2 H373	10 %	
Asp. Tox. 1 H304	10 %	
Acute Tox. 1	Sum H300: 0.1 % Sum H310: 0.25 % Sum H330: 0.1 %	Substances ≥ 0.1 % are included in the calculation
Acute Tox. 2	Sum H300: 0.25 % Sum H310: 2.5 % Sum H330: 0.5 %	Substances ≥ 0.1 % are included in the calculation
Acute Tox. 3	Sum H301: 5 % Sum H311: 15 % Sum H331: 3.5 %	Substances ≥ 0.1 % are included in the calculation
Acute Tox. 4	Sum H302: 25 % Sum H312: 55 % Sum H332: 22.5 %	Substances ≥ 1 % are included in the calculation
Carc. 1A H350 Carc. 1B H350	0.1 %	
Carc. 2 H351	1 %	
Repr. 1A H360 Repr. 1B H360	0.3 %	
Repr. 2 H361	3 %	
Muta. 1A H340 Muta. 1B H340	0.1 %	
Muta. 2 H341	1 %	
Resp. Sens. 1 H334 Skin. Sens. H317	10 %	
Ozon H420	0.1 %	
Aquatic Acute H400	Sum Aquatic Acute H400: 25 %	Substances ≥ 0.1 % are included in the calculation
Aquatic Chronic 1 H410 Aquatic Chronic 2 H411 Aquatic Chronic 3 H412 Aquatic Chronic 4 H413	100*Sum H410 + 10*Sum H411 + Sum H412: 25 % Sum H410 + Sum H411 + Sum H412 + Sum H413: 25 %	H410: Substances ≥ 0.1 % are included in the calculation H411, H412 og H413: Substances ≥ 1 % are included in the calculation
Brominated flame retardants	0.1 %	The group does not include PolyFR (CAS 1195978-93-8)
Substances on the Norwegian Priority List	0.1 %	
Substances on the Candidate List	0.1 %	
REACH Annex XVII - Restriction list	Limitation are set for each compound and area of usage	
PBT, vPvB	0.1 %	

Classification	Concentration limits (m/m)	Comments
Nano particles	No limit, but we ask that content of nano particles is declared	

5 Requirements for products that impacts the indoor environment

Products that impacts the indoor environment: products that are used inside of the vapour barrier or are part of the vapour barrier/vapour barrier system.

5.1.1 Glued wood based products without surface treatment

Testing and documentation of emissions shall be carried out as following:

- Tests of formaldehyde according to EN 717-1, EN 12460-3 (replacing EN 717-2) or EN 12460-5 (replacing EN 120) are accepted for glued wood products without surface treatment, e.g. OSB, particle boards, glue laminated and plywood. The testing shall be carried out by an independent test laboratory that has been accredited for the test method. The products must meet formaldehyde emission class E1.
- Emission of volatile organic compounds (VOC) shall be conducted according to EN ISO 16000-9 in combination with ISO 16000-6. Testing at 28 days. Test specimen preparation, calculation of TVOC and the report shall be according to EN 16516. The testing shall be carried out by an independent test laboratory that has been accredited for the test method.

Emission of formaldehyde can also be tested according to EN ISO 16000-9 in combination with 16000-3. Testing at 28 days.

The test results must meet the requirements given in table 3.

5.1.2 All products except glued wood products

Testing and documentation of emissions shall be carried out as following:

- Emissions of volatile organic compounds (VOC) as specified in EN ISO 16000-9 combined with ISO 16000-6. Testing at 28 days.
- Emissions of formaldehyde to indoor air as specified in EN ISO 16000-9 combined with ISO 16000-3. Testing at 28 days.

Test specimen preparation, calculation of TVOC and the report shall be according to EN 16516. The testing shall be carried out by an independent test laboratory that has been accredited for the test method. The test results must meet the requirements given in table 3.

Products that are certified according to the following classification schemes meet the emission criteria for SINTEF Technical Approvals:

- M1 Emission Class for Building Materials
- GEV EC1 Plus
- GEV Emicode EC1 (except products with very small areas)

Table 3. Requirements.

Parameter – 28 days	**Limits – very small areas[1)] [µg/(m² h)]**	**Limits – floor/ceiling, wall and small areas[2)] [µg/(m² h)]**
TVOC	4260 µg/(m² h)	200 µg/(m² h)
Formaldehyde	700 µg/(m² h)	50 µg/(m² h)
Sum carcinogenic	70 µg/(m² h)	5 µg/(m² h)

1. Very small areas are defined in PD CEN/TS16516:2013 as sealants and similar products used in small amounts, i.e. loading factor 0,007 m^2/m^3.
2. Floor/ceiling, wall and small areas (windows and doors) are defined in CEN/TS16516. These products are used in larger amounts than sealants. Windows and doors are small areas.

Indoor paints and varnishes applied on site shall fullfill corresponding maximum VOC content according to directive 2004/42/CE, Annex II/A.

5.2 Requirements for products that come in contact with soil and water

Products that come into contact with soil and water: products that come into contact with groundwater, surface water or soil - mainly outdoor surface products.

5.2.1 Testing of monolithic products

Monolithic construction products are tested according to CEN/TS 16637-1 and CEN/TS 16637-2. The following parameters are used:

- All leaching steps (64 days)
- Each eluate and the reference is tested for the following:
  - Concentration of As, Cr, Cu, Ni, Zn, Pb, Cd and Hg
  - pH
  - Conductivity
- The final eluate is analysed with respect to organic compounds according to EN 15768. Individual substances must be reported, as well as concentration estimates (toluene equivalents)

The testing shall be carried out by an independent test laboratory that has been accredited for the test method. The test results must meet the requirements given in table 4.

Table 4. Concentration limits, leaching test according to CEN/TS 16637-2.

Parameter	**Maxium allowable cumulated emission after 64 days, R_{64} days (=R_8) [mg/m^2]**
Arsenic, As	260
Cadmium, Cd	3,8
Chromium, Cr	120
Copper, Cu	98
Mercury, Hg	1,4
Nickel, Ni	81
Lead, Pb	400
Zinc, Zn	800

5.2.2 Testing of granulary material

Granular material is tested according to CEN/TS 16637-3.

5.3 Recycled materials and other additional documentation requirements

SINTEF also requires low content of hazardous chemicals in recycled materials. Requirements is further described in "SINTEF Technical approval- Health- and environmental Requirements", chapter 2.6

After assessment, additional documentation requirements can be made for individual product groups.

6 References

Candidate list. https://echa.europa.eu/

CEN/TS 16637-1:2014 *Construction products – Assessment of release of dangerous substances – Part 1: Guidance for the determination of leaching tests and additional steps*

CEN/TS 16637-2:2014 *Construction products – Assessment of release of dangerous substances – Part 2: Horizontal dynamic surface leaching test*

CEN/TS 16637-3:2016 *Construction products – Assessment of release of dangerous substances – Part 3: Horizontal up-flow percolation test*

EN 120:1998. *Wood based panels - Determination of formaldehyde content - Extraction method called the perforator method*

EN 717-1:2004. *Wood-based panels - Determination of formaldehyde release - Part 1: Formaldehyde emission by the chamber method*

EN 717-2:1994. *Wood-based panels - Determination of formaldehyde release - Part 2: Formaldehyde release by the gas analysis method*

EN 16516:2017. *Construction products. Assessment of release of dangerous substances.Determination of emissions into indoor air*

EN ISO 12460-3:2015. *Wood-based panels - Determination of formaldehyde release - Part 3: Gas analysis method*

EN ISO 12460-5:2015. *Wood-based panels - Determination of formaldehyde release - Part 5: Extraction method (called the perforator method)*

EN ISO 16000-9:2006. *Indoor air - Part 9: Determination of the emission of volatile organic compounds from building products and furnishing - Emission test chamber method*

ISO 16000-3:2011. *Indoor air – Part 3: Determination of formaldehyde and other carbonyl compounds in indoor air and test chamber air – Active sampling method*

ISO 16000-6:2011. *Indoor air - Part 6: Determination of volatile organic compounds in indoor and test chamber air by active sampling on Tenax TA sorbent, thermal desorption and gas chromatography using MS or MS-FID*

Norwegian Priority List. http://www.miljostatus.no/prioritetslisten

Product Control Act. Produktkontrolloven. Lov om kontroll med produkter og forbrukertjenester. www.lovdata.no

TEK17. Regulations on technical requirements for bulding works. Forskrift om tekniske krav til byggverk (Byggteknisk forskrift). Norwegian: www.lovdata.no