
Guidelines for SINTEF Technical Approval for Vapour barriers

1. General information about SINTEF Technical Approval

General information about SINTEF Technical Approval procedures is available at <http://www.sintefcertification.no/en-us/PortalPage.aspx?pageid=180>

2. Properties to be included in the approval and how the properties are determined

SINTEF Technical Approval for vapour barriers shall normally include a documentation of product properties shown in Table 1 and 2.

Requirements concerning material and product descriptions related to environment properties are available at; <http://www.sintefcertification.no/en-us/PortalPage.aspx?pageid=180>

For vapour barriers it is required with documentation of emission, this means that an emission test must be performed.

3. Description of the manufacturer's factory production control

As a basis for the approval SINTEF must receive a copy of the description of the manufacturer's control plan for the product. This may be the relevant part of the manufacturer's quality control system for the product, or other documentation describing the manufacturer's factory production control. The person responsible for the factory production control shall be identified.

The control plan shall as a minimum describe the controls performed for:

- Incoming materials
- The production process
- Finished product
- Marking and storage (including the control frequency, how the controls are performed and by whom.

The factory production control description shall also include what measures are taken when faults are observed in the production or in the product.

4. Supervisory production control

Supervisory production control normally comprises an annual inspection at the plant performed by an independent body. General description of how the supervisory product and production control are performed is available at; <http://www.sintefcertification.no/en-us/PortalPage.aspx?pageid=180>

However, for vapour barriers, SINTEF accept a certified quality system, according to ISO 9001, as an adequate supervisory production control. A copy of valid ISO certificate shall always be filed at SINTEF. In addition, SINTEF have to receive a confirmation each year which states still validity for the certificate.

Supervisory production control includes, in addition to the above mentioned conditions, an annual random testing of the products has to be carried out. Table 4 and 8 show an overview of annual audit testing of windbarriers and roofing underlays together with plasterboards.

5. Application for SINTEF Technical Approval and project management

Information regarding application and project management for SINTEF Technical Approval is available at; <http://www.sintefcertification.no/en-us/PortalPage.aspx?pageid=180>

6. More information

Further information about SINTEF Technical Approval can be found on www.sintefcertification.no.

7. Special technical conditions

7.1 Use of tape

Any tape belonging to the vapour barrier shall be documented in accordance with SINTEF's guidelines for tapes used in buildings.

7.2 Thickness of vapor barriers

Regarding thicknesses of vapor barriers, the following guidelines are valid:

SINTEF recommends minimum thicknesses for vapor barrier of polyethylene. Minimum thickness is set to ensure that the vapor barrier has a certain robustness against damage in connection with installation and during work on construction site until a protective cladding is installed. These recommendations are based on years of experience.

We recommend a **minimum thickness of 0,20 mm** for vapour barriers used in compact flat roofs and also for use in floors on the ground. For use in walls and ceilings in traditional wooden structures, we recommend a **minimum thickness of 0,15 mm**.

SINTEF Technical Approval can also be issued for building systems of wood in the form of elements and modules produced in a factory. For prefabricated elements and modules, SINTEF can, under certain circumstances, approve thicknesses down to 0,11 mm presupposed that the vapor barrier is covered and protected at the factory until installation on site. The requirement for protection of the vapor barrier also includes possible protruding "flaps" in connection with overlap joints. Production and detail design are evaluated in each case before a vapor barrier with a thickness down to 0.11 mm may be included in a Technical Approval for a building system. Fields of applications for vapour barriers, with the conditions described above, is so limited that SINTEF do not want thicknesses below 0.15 mm to be included in a separate Approval for a vapour barrier. This decision is made to avoid both misunderstandings, and use of vapor barriers with thicknesses less than SINTEF recommendations.

7.3 Evaluation of durability

The durability is evaluated based on testing of fresh and artificially aged material in laboratory. Changes in properties before and after ageing are evaluated.

- The properties must not change more than 20 % in relation to the tested fresh product.
- If the change is between 20 % and 30 % of the properties for fresh material, the properties must be within 15 % of the recommended value for the fresh product.
- If the change is larger than 30 %, the properties must be better than, or as good as, the recommended value for fresh product. The durability properties have to be evaluated in each case.
 - For roll products can for example low values for elongation be balanced/compensated with high values for tensile strength and analogous can low values for tensile strength be compensated with high values for elongation.
 - Use of tape together with vapour barriers are covered by own guidelines for tapes.
- Changes larger than 50 % will basically not be accepted.

Proposed text for approval documents:

XX vapour barrier is assessed to have satisfactory durability when used as described in clause 6. The durability is evaluated based on laboratory tests after artificial ageing consisting of alkaline ageing and ageing with and UV radiation followed by heat ageing.

7.4 Products properties

Table 1 and 2 below show an overview over material properties for vapour barriers for fresh and aged material.

Table 1: Fresh material for 0,15 mm thickness

Property	Method	Unit	Recommended minimum values	Guidelines for approval
Weight- and weight margin,/Thickness and thickness margin	EN 1848-2:2001 EN 1849-2:2009	kg/m ² / mm	Mean value	Declared value shall be met Declared value shall be met
Water tightness	EN 1928:2000	-	Tight at 2 kPa	Passed
Water vapour resistance ¹⁾	EN ISO 12572:2016 EN 1931:2000	s _d – value (m) m ² sPa/kg	Minimum Minimum	> 10 > 50 · 10 ⁻⁹
Foldability at low temperature	EN 495-5:2013	°C	Maximum	Declared value shall be met (recommended ≤ -20)
Dimensional stability	EN 1107-2:2001	%	Maximum	Declared value shall be met (recommended ≤ ± 1)
Resistance to tearing (nail shank) ¹⁾	EN 12310-1:1999	N	Minimum	Declared value shall be met (recommended ≥ 60)
Tensile strength ^{1) 2)}	EN 12311-2:2013	N/mm ²	Minimum	Declared value shall be met (recommended ≥ 15)
Elongation ^{1) 2)}	EN 12311-2:2013	%	Minimum	Declared value shall be met (recommended ≥ 200)
Resistance to impact (23 ± 2)°C	EN 12691:2006 Method A	mm	Minimum drop height	100 (minimum 4 out of five specimens have to be tight after dropping)
Resistance to static loading	EN 12730:2015 Metode A EPS quality CS(10)150	N	3 out of 3 specimens have to be tight at relevant load	Minimum 5 kg
Environmental properties	EN-ISO 16000	-	Low emitting	To be evaluated

¹⁾ Accredited methods

²⁾ Metode B has to be used usually (for products which are not reinforced)

Table 2: Aged material

Test method	Properties to be tested after ageing
Alkaline ageing (NT Poly 161) ¹⁾	Water vapour resistance and tensile strength/elongation
UV ²⁾ together with 12 weeks heat ageing at 70°C EN 1297 / EN 1296)	Water vapour resistance and tensile strength/elongation

¹⁾ Water vapour resistance is determined on only one test specimen after alkaline ageing

²⁾ 60 hours according to EN 1297 (UV/heat **without** water spraying)

7.5 Annual control testing

Table 3 below shows an overview of annual control testing for vapour barriers.

Table 3: Annual control testing of vapour barrier

Property	Method	Control limit	Frequency
Visual control, thickness and weight	EN 1848-2:2001 EN 1849-2:2009		Annual
Water thightness	EN 1928:2000		
Foldability at low temperature	EN 495-5:2013		2 of the properties are tested each year
Dimensional stability	EN 1107-2:2001		
Resistance to tearing	EN 12310-1:1999		
Resistance to impact	EN 12691:2006 Method A		
Resistance to static loading	EN 12730:2015 Metode A EPS kvalitet CS(10)150		
Tensile strength	EN 12311-2:2000 Method B		Each year
Elongation	EN 12311-2:2000 Method B		Each year
Alkaline ageing or climate ageing (UV + heat ageing)	NT POLY 161 EN 1297:2004 /EN 1296:2000		One of the tests is carried out each 5 th year
Change in tensile strength and elongation from fresh to aged material	EN 12311-2:2013		Each 5 th in connection with ageing
Water vapour resistance Fresh and aged material	EN ISO 12572:2016		Each 5 th in connection with ageing
Foldability at low temperature Aged material	EN 495-5:2013		Tested if UV + heat ageing are choosed