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Guidelines for SINTEF Technical Approval for

Tapes used in buildings

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 tapes used in buildings shall normally include a documentation of the following product properties:

- Material properties
- FTIR material characterization
- Health related and environmental properties
- Durability
- Performance test

The extend of necessary testing is depending on the type of approval (ref. item 2.1). The tests are described in detail in items 2.2-2.6. A summary of the tests is given in Table 1, item 2.7.

2.1 Type of approval

There are two different possibilities how to approve a tape used in buildings in a SINTEF Technical Approval:
1) Separate Tape approval
2) Tape as an accessory within a SINTEF Technical Approval for wind barrier, roof underlay or vapour barrier.

2.1.1 Separate Tape Approval

In a separate tape approval the properties of the tape are the main focus. In the SINTEF Technical Approval an evaluation of surfaces a tape is approved against is given, while no large scale testing is performed.

2.1.2 Tape as an accessory within a SINTEF Technical Approval for wind barrier and roof underlay

The main focus lies on the function of the tape together with the membranes/boards. The tape is tested against the standard surfaces (jmf. kap. 2.2) and adhesive properties are not described separately in the approval document. Large scale testing of air tightness and rain tightness is required (ref. Guidelines for SINTEF Technical Approval for wind barriers and roofing underlays).

2.1.3 Tape as an accessory within a SINTEF Technical Approval for vapour barrier

The main focus lies on the function of the tape together with the membranes. The tape is tested against the standard surfaces (jmf. kap. 2.2) and adhesive properties are not described separately in the approval document. Large scale testing of air tightness is required for vapour barriers of other

materials than PE-foil, for vapour barriers with other surface than PE-foil or if the product is reinforced (ref. Guidelines for SINTEF Technical Approval for vapour barriers).

2.2 Material properties

The material properties for newly produced product (fresh material) are tested according to the given methods in Table 1.

Wind barrier tapes:
Adhesion and water tightness of the tapes adhered to wind barrier membranes, galvanized steel (it can be either hot-dip or electro, provided the surface is smooth) and untreated spruce wood should be tested. These substrates will cover the following materials: coated wood, stainless steel, painted and anodized aluminium and PVC. The adhesion of the tape adhered to other substrates selected by the manufacturer (such as gypsum board, asphalt fibreboard) may also be tested. Water tightness test of joints is mandatory for tapes used on roof underlays.

Vapour barrier tapes:
Adhesion of the tapes adhered to PE-foil (or other types of vapour barriers) and untreated spruce wood should be tested. These substrates will cover, in addition, coated wood. The adhesion of the tape adhered to other substrates selected by the manufacturer (such as galvanized steel or gypsum board) may also be tested. If the tape is tested on galvanized steel this will cover in addition the materials stainless steel, painted and anodized aluminium and PVC.

Performance tests:
For tapes included into a SINTEF Technical Approval for wind barrier(s) and/or roof underlay(s) large scale tests for the joints regarding air tightness and rain tightness have to be performed in addition (ref. Guidelines for SINTEF Technical Approval for wind barriers and roofing underlays).

All products sent for testing shall be marked with the name of manufacturer, production date and production number directly visible on the product.

Suggestion for text in the SINTEF Technical Approval for tape[1)]:

	wind barrier	vapour barrier
Norwegian	Xxxx vindsperre tape har tilfredsstillende heft mot overflater av xxx-vindsperre, malt og umalt trevirke, galvanisert og rustfritt stål, malt og eloksert aluminium og PVC.	Xxx dampsperre tape har tilfredsstillende heft mot overflater av dampsperre av PE-folie og malt og umalt trevirke.
English	Xxx wind barrier tape has satisfactory adhesion to the surface of painted and untreated wood, galvanized and stainless steel painted and anodized aluminium and xxx wind barrier.	Xxx vapour barrier tape has satisfactory adhesion to the surface of untreated and painted wood and vapour barrier of PE-foil.

[1)] The text will be adjusted in case that adhesive properties in more than the required standard surfaces are tested.

2.3 FTIR material characterization

FTIR material characterization shall be tested for the tape product. The FTIR material characterization is carried out applying an attenuated total reflectance (ATR) accessory (single reflection) with a diamond crystal, in the wavelength range 4000 cm^{-1} (2.5 μm) to 400 cm^{-1} (25 μm), in an atmosphere with minimized CO_2 and H_2O content through purging. FTIR material characterization has to be performed on fresh tape.

2.4 Health related and environmental properties

Requirements concerning material and product properties related to impact on the environment is available at;
https://www.sintefcertification.no/file/index/1867

2.5 Durability

Durability assessment shall always be performed. It will normally be carried out as accelerated laboratory aging, where a limited number of properties are tested after aging. The accelerated aging procedure for tapes used for outdoor and indoor application has to follow the test methods and requirements given in Table 1. Maximum acceptable change will be evaluated in relation to the requirement for fresh products (tapes and joints).

Suggestion for text in the SINTEF Technical Approval:[1)]

	wind barrier	vapour barrier
Norwegian	Bestandigheten av heftegenskapene til xxxx Tape er vurdert som tilfredsstillende på grunnlag av prøving før og etter kunstig aldring i laboratorium. Kunstig aldring for vindsperre/undertaks tape(ne) er gjennomført med 14 døgn i klimasimulator iht. NT Build 495, og 12/24 uker i varmeskap ved 70 °C iht. NS-EN 1296.	Kunstig aldring for dampsperre tape(ne) er gjennomført med 48 timer UV/varmealdering iht. NS-EN 1297 (uten vannpåsprøyting), og 12 uker i varmeskap ved 70 °C iht. NS-EN 1296.
English	The durability of adhesive properties for xxx tape is based on testing before and after artificial ageing in the laboratory. Artificial ageing for the wind barrier /underlay tapes is performed with 2 weeks (14 days) exposure in climate simulator (NT Build 495) followed by 12/24 weeks (168 days) of aging in a heat chamber at 70 °C (NS-EN 1296).	Artificial ageing for the vapour barrier tape(s) is performed with 48 hours UV/heat ageing according to NS-EN 1297 (without water praying), followed by 12 weeks (84 days) of aging in a heat chamber at 70 °C (NS-EN 1296).

[1)] Applies to all types of approvals named in item 2.1.

2.6 Performance test

For tapes included into a SINTEF Technical Approval for wind barrier(s) and/or roof underlay(s) the performance for the joints regarding air tightness and rain tightness shall be tested, as given in Table 1.

2.7 Summary of tests

Table 1. Test methods and requirements for tapes used in buildings - M=mandatory to determine property/performance, O=optional to determine property/performance, NR=not relevant.

Characteristic	Test method	Requirements			Comments
		Separate tape approval for wind barrier tapes and roof underlay tapes	Tape included in approval for wind barrier and/or roof underlay	Approval for vapour barrier tapes (separate or included into membrane approval)	
Properties for fresh material, material characterization, health related and environmental properties					
Tensile strength and elongation	NS-EN 12311-2	M	M	M	Used as a reference for comparison with aged tape/joints.
Peel resistance of joints	NS-EN 12316-2	M	M	M	
Shear resistance of joints	NS-EN 12317-2	M	M	M	
Water tightness	NS-EN 13111	O- for wind barrier tapes M- for roof underlay tapes		NR	
Reaction to fire	EN ISO 11925-2 EN ISO 13823	O	O	O	Classification according to EN 13501-1
FTIR	ISO 10640	M	M	M	
Health and environmental assessment	Assessment based on questionnaire form	M	M	M	
Emission test	ISO 16000-10	NR	NR	M	
Properties for artificially aged material (durability)					
Ageing process	NT Build495 NS-EN 1296 NS-EN 1297	Resist 2 weeks (14 days) exposure in climate simulator (NT Build 495) followed by 24[1)] weeks (168 days) of aging in heat chamber at 70 °C (NS-EN 1296) without noticeable changes of properties.		Resist 48 hours UV/heat ageing (NS-EN 1297) (without water praying) followed by 12 weeks (84 days) of aging in heat chamber at 70 °C (NS-EN 1296) without noticeable changes of properties.	- 14 days of accelerated aging in climate carousel simulates the aging during construction period of wind barrier tapes and roof underlay tapes. Vapour barrier tapes should not be exposed to UV and water during the construction period. - 24[1)] weeks of heat aging simulates the aging during intended use.
The following property changes should be < 50 % in relation to the tested fresh product.					
Tensile strength and elongation	NS-EN 12311-2	M	M	M	The physical properties should be tested after 24[1)] weeks of heat aging.
Peel resistance of joints	NS-EN 12316-2	M	M	M	
Shear resistance of joints	NS-EN 12317-2	M	M	M	
Water tightness	NS-EN 13111	O- for wind barrier tapes M- for roof underlay tapes		NR	
Large scale tests for joints – performed on a test wall equipped with membrane and taped joints					
Air tightness	EN 12114	O	M	O/M[2)]	
Rain tightness	NS-EN 1027/ NT Build 421	O	M	NR	

1) It is possible to perform heat aging for 12 weeks (84 days) as a complete aging test if the test results after 12 weeks of heat aging fulfil the requirement for the percentage change of < 35 % in relation to the tested fresh product.

2) Mandatory for vapour barriers of other materials than PE-foil, for vapour barriers with other surface than PE-foil or if the product is reinforced.

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

The production shall be subject to a supervisory product and production control 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

This chapter applies to all types of approvals named item 2.1.

4.1 Annual inspection

The tape manufacturer shall have a production quality control system which is described in a quality manual. A SINTEF Technical Approval includes one annual inspection at the product manufacturer to make sure that the quality system is followed. The inspection shall be performed by SINTEF or another independent inspection body accepted by SINTEF. If appropriate, the inspection shall include sampling of the approved product for audit testing according to item 4.2.

4.2 Annual audit testing

Three years out of a control period of five years (including 5-year renewal), test specimens of the approved products are taken from stock in Norway for audit testing. Testing will be carried out according to Table 2 below where one or several properties will be tested each control year. Each fifth year, properties for both fresh and aged material will be tested in addition. Audit testing is performed by SINTEF or another independent test institute accepted by SINTEF.
Products shall be marked with the name of manufacturer, production date and production number directly visible on the product.

Table 2 Audit testing[1)]

Properties	Test methods	Requirements	Frequency	Control year
Tensile strength and elongation - Fresh	EN 12311-2	Defined based in the results for initial type testing.	Once every 5th year starting 20xx	1
Shear resistance test for joints - Fresh	EN 12317-2	Defined based in the results for initial type testing.	Once every 5th year starting 20xx	3
Peel resistance test for joints - Fresh - Aged (according to the aging procedure mentioned in Table 1) ***Shear resistance test for joints*** - Fresh - Aged (according to the aging procedure mentioned in Table 1)	EN 12316-2 EN 12317-2	Defined based in the results for initial type testing.	Once every 5th year starting 20xx	5 (sampling and ageing in year 4 due to the long ageing period)

1) This is an example of annual control testing. Adhesive properties are usually tested on the corresponding membrane.

5. Application for SINTEF Technical Approval and project management

Information regarding application and project management for SINTEF Technical Approval is available at;
https://www.sintefcertification.no/file/index/2980

6. More information

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