



CERTIFICATION

QB Certification System Technical Management Appendix: Flexible Underlays for Waterproofing for Walls



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Modification history



REVISION NO.	APPLICATION DATE	MODIFICATIONS
00	17/11/2017	Update to the document layout and reference
01	09/10/2018	Update to testing standards (NF EN 12317-2 – Shear testing on joints)
02	05/02/2021	Addition of 1000 h UV ageing tests



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1- Type testing and reference standards

The type testing can be carried out in the CSTB laboratory or in any other external laboratory which has been ISO 17025 accredited by a body belonging to the EA (European cooperation for Accreditation) or assessed periodically by an internal CSTB qualified auditor in accordance with the requirements set out in the ISO 17025 reference system.

Table 1: Flexible wall underlay characterisation test

Type testing	Unit/Class	Flexible wall underlays	Comments
SURFACE DENSITY	g/m ²	in § 5.2.1 in Standard NF EN 13859-2	The methodology is defined in Standard NF EN 1848-2: 2010 and EN ISO 536: 2012.
WATER PENETRATION RESISTANCE (in new condition and after artificial ageing)	W1	§ 5.2.3 in NF EN 13859-2	Artificial ageing is described below. The testing methodology is defined in Standard NF EN 1928: 2000. Method A shall be used with the modifications set out in Standard NF EN 13859-2.
WATER VAPOUR TRANSMISSION PROPERTY	m	§ 5.2.5 in NF EN 13859-2	This water vapour transmission property and its durability may, in case of questions from the certifying body, be presented to the members of the Assessment Committee.
TENSILE PROPERTY (in new condition and after artificial ageing) Tensile force at break Elongation	N/50 mm %	§ 5.2.7 in Standard NF EN 13859-2	Artificial ageing is described below. The testing methodology is defined in Standard NF EN 12311-2: 2013 amended by Appendix A to Standard NF EN 13859-2.
RESISTANCE TO TEARING	N	§ 5.2.8 in Standard NF EN 13859-2 and its Appendix B	The testing methodology is defined in Standard NF EN 12310-2: 2001 amended by Appendix B to Standard NF EN 13859-2.
DIMENSIONAL STABILITY	%	§ 5.2.9 in Standard NF EN 13859-2	The testing methodology is defined in Standard NF EN 1107-2: 2001.
FLEXIBILITY AT LOW TEMPERATURE (PLIABILITY)	°C	§ 5.2.10 in Standard NF EN 13859-2	The testing methodology is defined in Standard NF EN 1109: 2013.
ARTIFICIAL UV AGEING		§ 5.2.11 in Standard EN 13859-2 and its Appendix C	For use behind closed-joint cladding: combination of UV radiation and a temperature of 50°C for 336 and 1000 hours + 90 days of exposure at 70°C;
		Or Technical Document DT01	For use behind open-joint cladding ⁽¹⁾ : combination of UV radiation and a temperature of 50°C for 5000 hours + 90 days of exposure at 70°C.

⁽¹⁾: open-joint cladding: in accordance with paragraph 12.3.2. of Standard NF DTU 31.2



Table 2: Flexible wall underlay joint characterisation test

Type of tape	Type testing	Unit/Class	Flexible wall underlays	Comments
Built-up cladding as shown in Figure 1 below	SHEAR STRENGTH of longitudinal overlaps or at the end of bonded lengths (in new condition and after ageing)	N/50 mm	NF EN 12317-2 and NF EN 13859-2	Tape must undergo artificial UV ageing compatible with the associated membrane as well as thermal ageing set out in NF DTU 31.2 or 31.4.
	PEELING TEST of longitudinal overlaps or at the end of bonded lengths (in new condition)	N	NF DTU 31.2 Appendix D	.
Integrated tape as shown in Figure 2 below	SHEAR STRENGTH of longitudinal overlaps or at the end of bonded lengths (in new condition and thermal ageing)	N/50 mm	NF EN 12317-2 and NF EN 13859-2	Integrated adhesive tape undergoes thermal ageing tests only. Ageing is described above. Note: Integrated adhesive tape is not directly exposed to UV rays and therefore does not undergo UV ageing tests
	PEELING TEST of longitudinal overlaps or at the end of bonded lengths (in new condition)	N	NF DTU 31.2 Appendix D	

NOTE: For an application for integration of adhesives already covered under 'CSTB Components and Systems' certification, peeling and shear testing shall be conducted by the certifying body, CSTB, on the QB 38 certified membrane during annual follow-up.

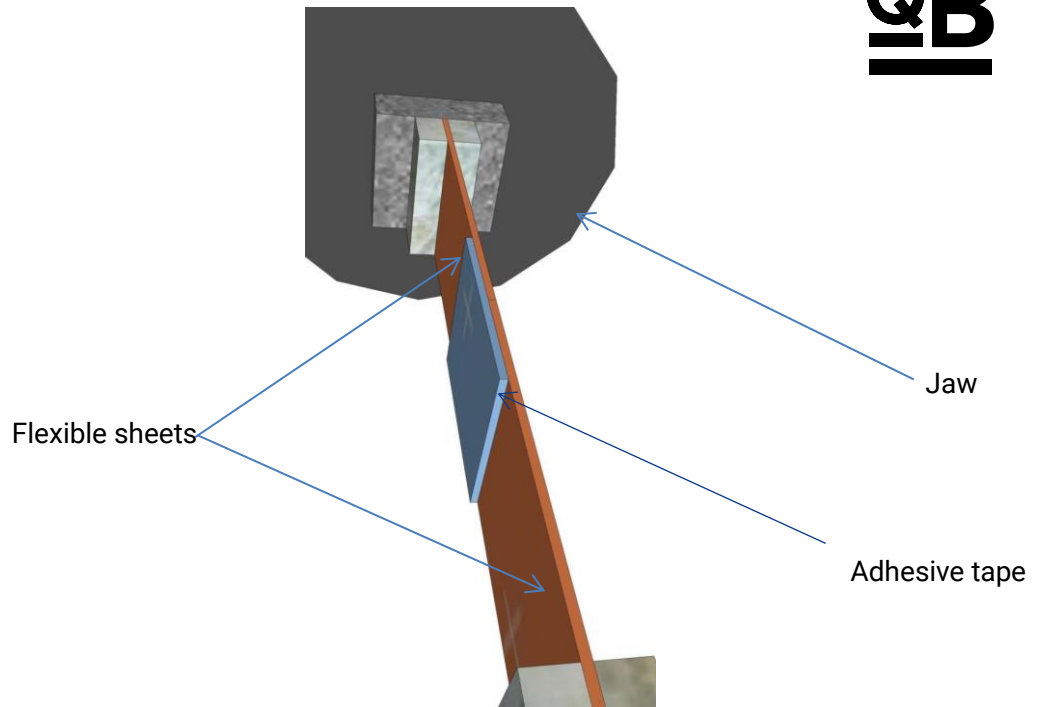


Figure 1 Shear test on a joint between two flexible sheets with associated or applied adhesive tape bond (visible)

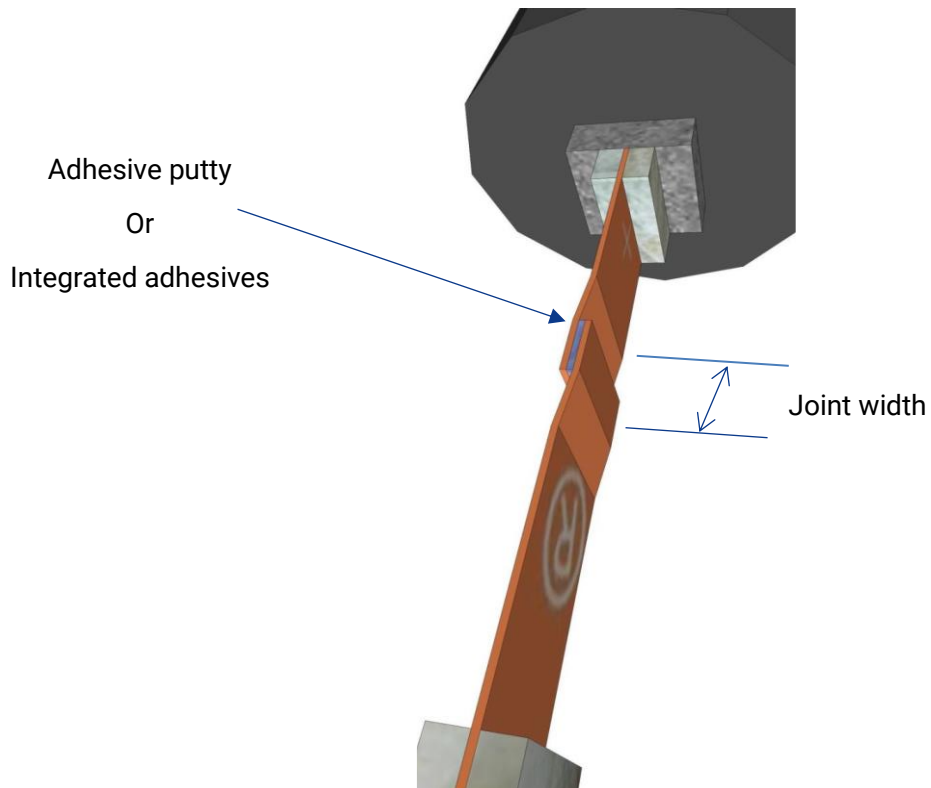


Figure 2 Shear test on a joint between two flexible sheets with adhesive putty bond or integrated adhesive (not visible)



2- Technical specifications for Flexible Wall Underlays

2.1. Tests and criteria

This section describes the technical specifications for Flexible Wall Underlays. The characteristics and performances are detailed in the table below:

Table 3: Definition of test standards and criteria for flexible wall underlays

Test	Standard	Note	Criteria
Ageing			
Ageing test (Appendix C – NF EN 13859-2)	NF EN 13859-2	-	336h UV/50°C + 90 days at 70°C ⁽¹⁾
		-	5000 h UV/50°C + 90 days at 70°C ⁽²⁾
Ageing test	DT01	-	1000 h UV/50°C + 90 days at 70°C ⁽³⁾
Watertightness property			
Water penetration resistance in new condition	NF EN 1928 method A NF EN 13859-2	VDF	W1
Water penetration resistance after artificial ageing	NF EN 1928 method A NF EN 13859-2	VDF	W1
Water vapour transmission properties			
sd value	NF EN ISO 12572 NF EN 13859-2	VDF	≤ 0.18 m
Mechanical properties			
Tensile strength in new condition (warp (L) and weft (T))	NF EN 12311-1 NF EN 13859-2	VDF	Declared value ⁽⁴⁾ With indication of centre-to-centre distance according to Standard NF DTU 31.2
Tensile strength after ageing (warp (L) and weft (T))	NF EN 12311-1 amended by EN 13859-2	VDF	Declared value ⁽⁴⁾ With indication of centre-to-centre distance according to Standard NF DTU 31.2
Elongation property: - New condition (MDV) - After ageing (MDV)	NF EN 12311-1 Modified by NF EN 13859-2	VDF	Declared value
Resistance to tearing on nail shank (in new condition)	NF EN 12310-1	VDF	Certified value ⁽⁴⁾ With indication of centre-to-centre distance according to Standard NF DTU 31.2
Dimensional stability	NF EN 1107-2	-	≤ 1.5%
Flexibility at low temperature	NF EN 1109	MLV	T ≤ -5 °C
Types of substrates			
Substrate	–	-	Continuous or discontinuous ⁽⁵⁾
⁽¹⁾ : closed-joint cladding + overlap maximum 15 days with closed-joint cladding: 0% opening ⁽²⁾ : open-joint cladding + overlap maximum 3 months (with open joints ≤ 10 mm, and the surface of open joints surrounding the cladding skin component must be ≤ 1.5% of the surface of the component as specified by the Information Note of GS2.2 no. 6 version 2 'Definitions, Requirements and Traditionalism Criteria Applicable to Built-Up Cladding' [CSTB Specification 3251_v2 of December 2017], with an increased joint width of 8 to 10 mm) or closed-joint cladding if installation will take place within a period of more than 15 days but less than 3 months. ⁽³⁾ : ⁽⁴⁾ : Declared value – minimum values set out in Table 5 ⁽⁵⁾ : under Standard NF DTU 31.2 (continuous substrate: a rigid facing, whether ensuring bracing or not, is fixed to the frame on the outer side, discontinuous substrate: framing component stud with no rigid facing on the outer side) MDV: Manufacturer's Declared Value / MLV: Manufacturer's Limit Value			



Table 4: Definition of test standards and criteria for joints between flexible wall underlays

Overlap properties		
Testing	Standard	Criteria
Associated or applied adhesive component		
Shear strength of longitudinal overlaps and at the end of lengths, in new condition	NF EN 12317-2	Certified value ⁽³⁾
Shear strength of longitudinal overlaps and at the end of lengths after UV ageing + 90 days at 70°C	NF EN 12317-2	Certified value ⁽³⁾
Shear strength after thermal ageing ⁽⁴⁾	NF DTU 31.2 – Appendix D	Certified value ⁽³⁾
Bonding test by peeling for overlaps in new condition (*)	NF DTU 31.2 – Appendix D	Certified value ⁽³⁾
Integrated adhesive component		
Shear strength of longitudinal overlaps and at the end of lengths, in new condition	NF EN 12317-2	Certified value ⁽³⁾
Shear strength after thermal ageing ⁽⁴⁾	NF DTU 31.2 – Appendix D	Certified value ⁽³⁾
Bonding test by peeling for overlaps in new condition (*)	NF DTU 31.2 – Appendix D	Certified value ⁽³⁾
⁽³⁾ : certified value – minimum values set out in the table below (Table 6) ⁽⁴⁾ : thermal ageing: 14 days at 23+/-2°C and 50+/-10% RH+ 4 days at 70+/-2°C + 1 day at 23+/-2°C and 50+/-10% (*): initial conditioning: 14 days at 23+/-2°C and 50+/-10% RH		

Note 1: The minimum tensile strength values before and after ageing, the resistance to tearing on nail shank and the shear strength of overlaps between lengths before and after ageing are set out in the table below, based on the substrate type considered.

Note 2: As part of an admission application for the right to use the QB 38 mark - Flexible Wall Membranes under Standard EN 13859-2, type testing carried out under Standard EN 13859-1 for the QB 25 application (Flexible Underlays) can be taken into account at the time of the application.

Note 3: Shear tests and peeling tests on joints may be carried out by the FCBA laboratory, since the latter has signed a recognition contract with CSTB. This contract clearly specifies the criteria for this recognition of an ISO 17025 accredited laboratory.

Table 5: Minimum permissible value for tensile tests and tearing on nail shank

Substrate type ⁽⁴⁾	Fixing line centre-to-centre distance	Before ageing Minimum tensile and/or shear strength of overlaps between lengths (L x T) EN 12311-2	After ageing Minimum tensile and/or shear strength of overlaps between lengths (L x T) EN 12311-2	Minimal resistance to tearing on nail shank Minimum value (L x T) EN 12310-2
Continuous	-	100 N/50 mm	≥ 70% of the initial value With a minimum of 70 N/50 mm	75 N
Discontinuous	c.t.c. ≤ 45 cm	100 N/50 mm	≥ 70% of the initial value With a minimum of 70 N/50 mm	75 N
Discontinuous	c.t.c. ≤ 65 cm	140 N/50 mm	≥ 70% of the initial value With a minimum of 100 N/50 mm	100 N

⁽⁴⁾: under standard NF DTU 31.2:
- continuous substrate: a rigid facing, whether ensuring bracing or not, is fixed to the frame on the outer side;
- discontinuous substrate: framing component stud with no rigid facing on the outer side.



Table 6: Minimum strength values for associated or integrated adhesive components

	Before ageing (L x T) EN 12311-2	After ageing (L x T) EN 12311-2
Minimum tensile strength of the sheet and/or Shear strength of overlaps		
integrated adhesive components	100 N/50 mm	Thermal ageing: ≥ 50% of the initial value With a minimum of 70 N/50 mm
associated adhesive components for open-joint cladding ⁽²⁾	100 N/50 mm	Thermal and UV ageing: ≥ 50% of the initial value With a minimum of 70 N/50 mm
associated adhesive components for closed-joint cladding ⁽¹⁾	40 N/50 mm	Thermal and UV ageing: ≥ 50% of the initial value With a minimum of 30 N/50 mm
Minimum peeling strength		
integrated adhesive components	15 N And 100% cohesive failure ⁽³⁾	No ageing
associated adhesive components	15 N And 100% cohesive failure ⁽³⁾	No ageing
<p>⁽¹⁾: closed-joint cladding + overlap maximum 15 days with closed-joint cladding: 0% opening</p> <p>⁽²⁾: open-joint cladding + overlap maximum 3 months (with open joints ≤ 10 mm, and the surface of open joints surrounding the cladding skin component must be ≤ 1.5% of the surface of the component according to § A.2.3 of Appendix A of Standard NF DTU 41.2 P1-1)</p> <p>⁽³⁾ type of cohesive failure: integral failure in the adhesive</p>		



2.2. Tests performed in the factory during audits

Table 7: Tests performed during the Admission Audit or Follow-Up Audit:

Type testing	Unit/Class	Flexible wall underlays	Comments
Surface density	g/m ²	in § 5.2.1 in Standard NF EN 13859-1.	-
Water penetration resistance (in new condition)	W1	§ 5.2.3 in NF EN 13859-1	-
Water vapour transmission property	Sd	§5.2.5 in NF EN 13859-2	-
Tensile property (in new condition) Tensile force Elongation at break	N/50 mm %	§ 5.2.6 in Standard NF EN 13859-1 and its Appendix A	The minimum unilateral confidence interval of the mean at 95% cannot be less than the declared value
Resistance to tearing on nail shank	N	§ 5.2.7 in Standard NF EN 13859-1 and its Appendix B.	The minimum unilateral confidence interval of the mean at 95% cannot be less than the declared value
Dimensional stability	N/50 mm	§ 5.2.8 in Standard NF EN 13859-1	-
Flexible wall underlay joint testing	N/50 mm	NF EN 12316-2 NF EN 12317-2	The minimum unilateral confidence interval of the mean at 95% cannot be less than the declared value
Flexibility at low temperature	°C	§ 5.2.10 in Standard NF EN 13859-1	-

Note: the results of testing for water penetration resistance, tensile strength and joint strength with associated adhesives are conducted by the manufacturer after UV ageing once every 2 years.

The tests that will be conducted during the follow-up audits and later under the responsibility of the mark laboratory using collected samples shall be performed on each series of five test specimens in both directions for tensile properties and tearing on nail shank.

The minimal unilateral confidence interval of the mean is expressed with a confidence level of at least 95% (5% fractile), calculated according to Standard ISO 2602, and is then compared to the certified value.



2.3. Tests carried out in the mark laboratory

Table 8: Tests conducted by the mark laboratory on certified products as part of annual sample collection:

Type testing	Unit/Class	Flexible wall underlays	Comments
Surface density	g/m ²	in § 5.2.1 in Standard NF EN 13859-1.	-
Water penetration resistance (in new condition)	W1	§ 5.2.3 in NF EN 13859-1	-
Water vapour transmission property	Sd	§5.2.5 in NF EN 13859-2	-
Tensile property (in new condition) Tensile force Elongation at break	N/50 mm %	§ 5.2.6 in Standard NF EN 13859-1 and its Appendix A	The minimum unilateral confidence interval of the mean at 95% cannot be less than the declared value
Resistance to tearing on nail shank	N	§ 5.2.7 in Standard NF EN 13859-1 and its Appendix B.	The minimum unilateral confidence interval of the mean at 95% cannot be less than the declared value
Dimensional stability	%	§ 5.2.8 in Standard NF EN 13859-1	-
Flexible wall underlay joint testing	N/50 mm	NF EN 12316-2 NF EN 12317-2	The minimum unilateral confidence interval of the mean at 95% cannot be less than the declared value
Flexibility at low temperature	°C	§ 5.2.10 in Standard NF EN 13859-1	-

Note: the results of testing for water penetration resistance, tensile strength and joint strength with associated adhesives are conducted with UV ageing once every 3 years in the mark laboratory.

The minimal unilateral confidence interval of the mean is expressed with a confidence level of at least 95% (5% fractile), calculated according to Standard ISO 2602, and is then compared to the certified value.