TH 011 – Primo Vinduer A/S

EN 1026:2016	Air permeability
EN 1027:2016	Watertightness
EN 12211:2016	Resistance to windload

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DOORS AND WINDOWS - TEST OF PERFORMANCE CHARACTERISTICS

Report no.: 167888

Performed for:
Primo Vinduer A/S
Gl. Møllevej 5B
DK-6660 Lintrup

Performed by:
Teknologisk Institut
Kongsvang Allé 29
8000 Aarhus C

Pages: 15 (incl. frontpage & appendices)
Appendices: 3 (7 pages total)

2022-11-25
Author: Morten Jul Laegaard

DANISH TECHNOLOGICAL INSTITUTE
CPR 1235

TEST Reg.no. 2

Test report

Client: Primo Vinduer A/S
Gl. Møllevej 5B
DK-6660 Lintrup

Material: Top guided window made of wood- and aluminium profiles, further details can be found on page 4.

Sampling: The test material was forwarded by the client and received at the Danish Technological Institute on 2022-11-21. The test material was labelled "167888".

Test period: The testing was carried out on 2022-11-23 and -24.

Method:

EN 14351-1:2006 +A2:2016:	Windows and doors – Product standard, performance characteristics – Part 1: Windows and external pedestrian doorsets.
EN 1026:2016:	Windows and doors – Air permeability – Test method
EN 1027:2016:	Windows and doors – Watertightness – Test method
EN 12211:2016	Windows and doors – Resistance to wind load – Test method

Result: Classification of the test specimen according to EN 14351-1 4.2, 4.5 and 4.14 and the standards mentioned below:

EN 1026:2016 Air permeability:	**Class 4** at ± 600 Pa EN 12207 - Windows and doors Air permeability - Classification
EN 1027:2016 Watertightness:	**Class E1800** (1800 Pa) EN 12208 -Windows and doors - Watertightness - Classification
EN 12211:2016 Wind load	**Class C5** EN 12210 – Windows and doors – Resistance to wind load - Classification

Storage: The sample will be destroyed after 2 months if nothing else has been agreed in writing.

Terms: Accredited testing was carried out in compliance with international requirements (EN/ISO/IEC 17025:2017) and in compliance with Danish Technological Institute's General Terms and Conditions regarding Commissioned Work accepted by Danish Technological Institute. The test results apply to the tested products only. This report may be quoted in extract only if the laboratory has granted its written consent.

Location: 2022-11-25, Danish Technological Institute, Building & Construction, Aarhus

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Description of test specimen

The test specimen consists of a top guided window, made of wood- and aluminium profiles from the system TH 011 manufactured by the client, see drawings in Appendix 2.

Before delivery a subframe was prepared and mounted around the element by the client. The sub-frame does not hinder the normal functioning of the element. The test conditions and the dimensions of the test specimen are measured by the laboratory and are given in the table below.

Closing condition, according to EN 12519 Windows and pedestrian doors - Terminology, during test: Locked

Width [mm]	Height [mm]	Area [m²]	Length of joint [m]	Temperature [°C]	Relative humidity [%]	Atmospheric pressure [hPa]
1500	1500	2,25	5,66	21	35	995

The client has provided the following information about the construction of the test specimen:

Product name	Primo TH 011-3
Width x height	1500x1500 mm
Gaskets	2 gaskets, see drawings
Hardware	Hoppe, 4 + 2 locking points without ventilation position and 3 restrictors in top, see photo below and appendix
IGU	3 layered IGU, see drawings

Photo 1: Restrictors in top frame and sash (DTI, 2022)

Test results – Air permeability – Positive air pressure

Air pressure [Pa]	Air flow Total [m³/h]	Air flow Area [m³/h/m²]	Air flow Length of joint [m³/h/m]	Class Area [-]	Class Length of joint [-]
50	< 0,1	-	-	4	4
100	< 0,1	-	-	4	4
150	< 0,1	-	-	4	4
200	< 0,1	-	-	4	4
250	< 0,1	-	-	4	4
300	< 0,1	-	-	4	4
450	< 0,1	-	-	4	4
600	< 0,1	-	-	4	4

Test results – Air permeability – Negative air pressure

Air pressure [Pa]	Air flow Total [m³/h]	Air flow Area [m³/h/m²]	Air flow Length of joint [m³/h/m]	Class Area [-]	Class Length of joint [-]
50	< 0,1	-	-	4	4
100	< 0,1	-	-	4	4
150	< 0,1	-	-	4	4
200	< 0,1	-	-	4	4
250	< 0,1	-	-	4	4
300	< 0,1	-	-	4	4
450	< 0,1	-	-	4	4
600	< 0,1	-	-	4	4

Test results – Average air permeability

Air pressure [Pa]	Air flow Total [m³/h]	Air flow Area [m³/h/m²]	Air flow Length of joint [m³/h/m]	Class Area [-]	Class Length of joint [-]
50	< 0,1	-	-	4	4
100	< 0,1	-	-	4	4
150	< 0,1	-	-	4	4
200	< 0,1	-	-	4	4
250	< 0,1	-	-	4	4
300	< 0,1	-	-	4	4
450	< 0,1	-	-	4	4
600	< 0,1	-	-	4	4

Test results – Watertightness

Air pressure [Pa]	Duration [min]	Observations [-]	Class [-]
0	15	No water penetration	1A
50	5	No water penetration	2A
100	5	No water penetration	3A
150	5	No water penetration	4A
200	5	No water penetration	5A
250	5	No water penetration	6A
300	5	No water penetration	7A
450	5	No water penetration	8A
600	5	No water penetration	9A
750	5	No water penetration	E750
900	5	No water penetration	E900
1050	5	No water penetration	E1050
1200	5	No water penetration	E1200
1350	5	No water penetration	E1350
1500	5	No water penetration	E1500
1650	5	No water penetration	E1650
1800	5	No water penetration	E1800

Photo 2: Test specimen during testing (DTI, 2022)

Test results – Wind load – Deflection test

Air pressure - P1	Displacement		Relative frontal deflection		Class
	Positive pressure	Negative pressure	Positive pressure	Negative pressure	
[Pa]	[mm]	[mm]	[-]	[-]	[-]
± 2000 Pa	2,1	2,3	1/659	1/587	C5

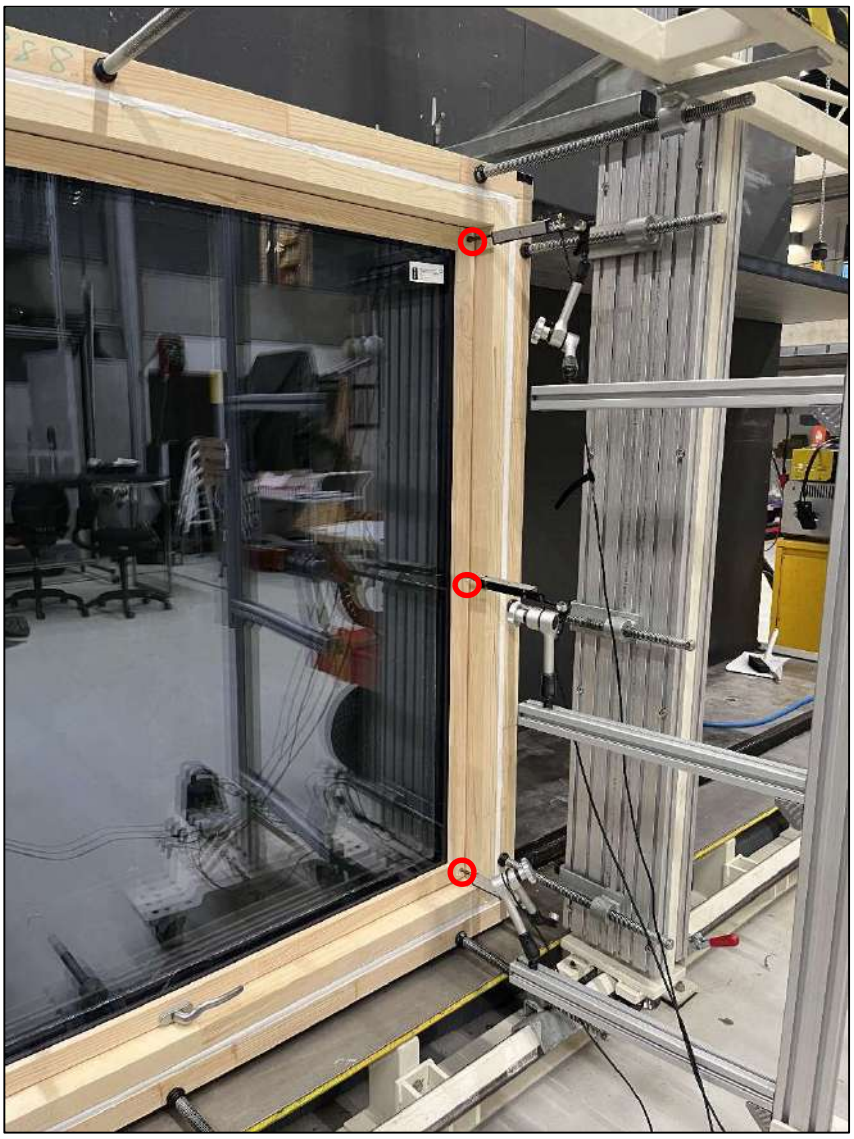


Photo 3: Test specimen during deflection test (DTI, 2022)
The red circles indicate the displacement measuring points

Pulsating air pressure test

Air pressure - P2	Observations during testing
[Pa]	[-]
± 1000 Pa	The specimen remained closed and no damage or operating defects were observed.

Air permeability test

Air pressure	Classification					
	Positive pressure		Negative pressure		Average	
	Area	Length of joint	Area	Length of joint	Area	Length of joint
[Pa]	[-]	[-]	[-]	[-]	[-]	[-]
50	4	4	4	4	4	4
100	4	4	4	4	4	4
150	4	4	4	4	4	4
200	4	4	4	4	4	4
250	4	4	4	4	4	4
300	4	4	4	4	4	4
450	4	4	4	4	4	4
600	4	4	4	4	4	4

Safety test

Air pressure - P3	Observations during testing
[Pa]	[-]
± 3000 Pa	The specimen remained closed, but the vertical locking points broke in both sides. Se photo below. .

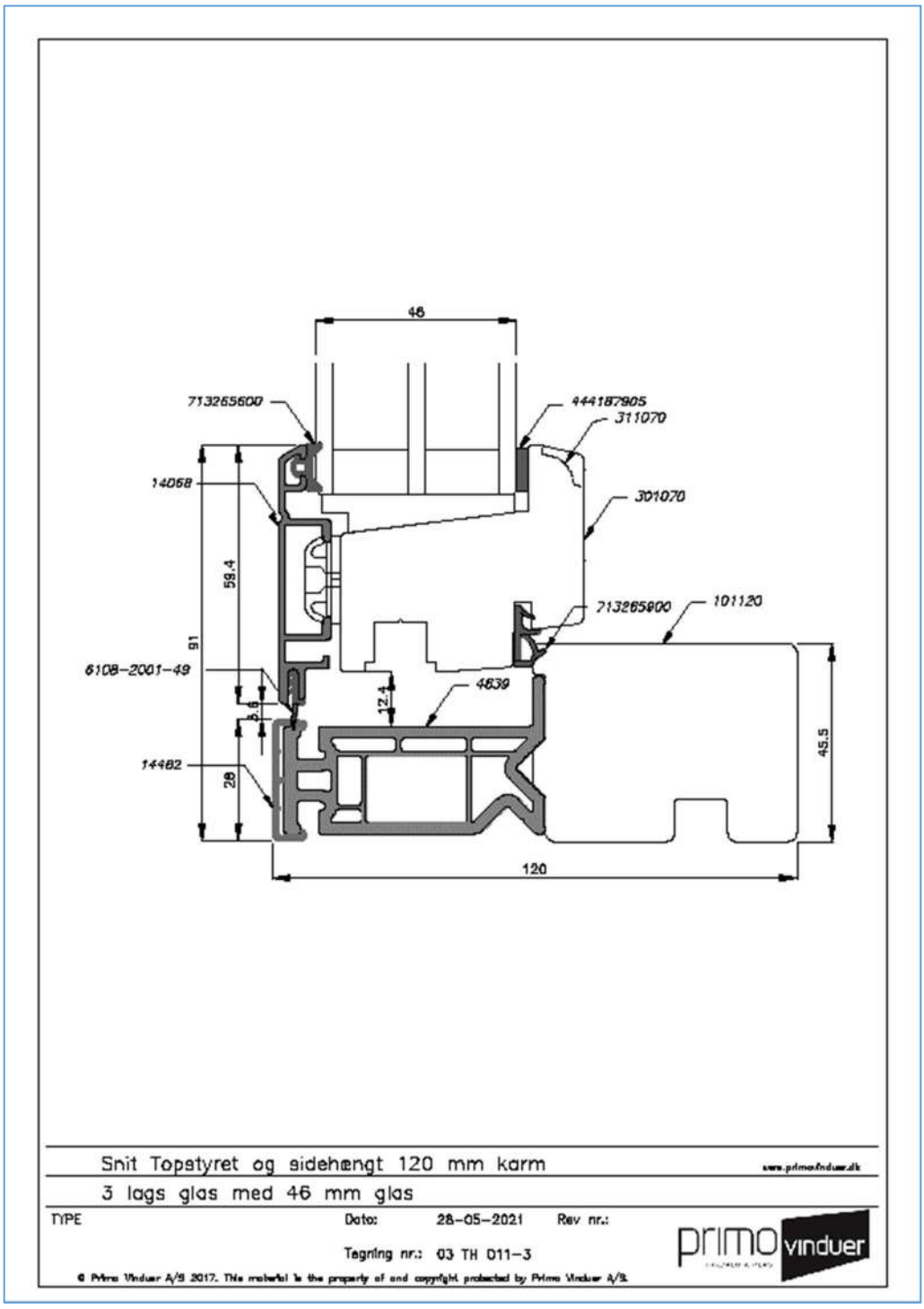
Photo 4. Hardware, both sides, broken during P3 (DTI, 2022)

Appendix 1: Photos

Photo 5. Hardware, bottom (DTI, 2022)

Photo 6. Hardware, side (DTI, 2022)

Appendix 2: Drawings



PRODUKTSTANDARD for

TOPSTYRET (101120, 301070,311070)

primo vinduer

Erstatter udgave nr.: PVSTD 037 5. udg.
Dato: 18/06-2021
Godkendt af: PSM/KAN

PVSTD 037
TRÆ/ALU

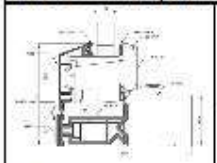
Profiler i serien:

4639 – Vedligeholdelsesfri energiisolator i karm (uden stål), svejset i hjørner
101120 – Karmprofil til 120 mm karm (standard)
101140 – Karmprofil for 140 mm karm
101160 – karmprofil for 160 mm karm
101170 – Karmprofil for 170 mm karm

511098 – Vandret karmpost med profil kehl 63 mm (til alle karmdybder)
502113 – Lodret karmpost med skrå kehl 63 mm (til alle karmdybder)
512113 – Lodret karmpost med profil kehl 63 mm (til alle karmdybder)

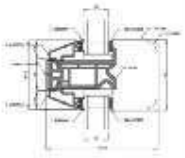
301070 – Rammeprofil med skrå kehl (standard)
311070 – Rammeprofil med profil kehl
601070 – Rammesprosse med skrå kehl (60 mm)
611070 – Rammesprosse med profil kehl (60 mm)
602070 – Rammesprosse med skrå kehl (100 mm)
612070 - Rammesprosse med profil kehl (100 mm)

701026 – 25 mm påklæbet sprosse med skrå kehl
711026 – 25 mm påklæbet sprosse med profil kehl

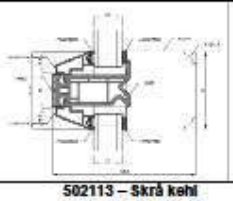


101120/301070 - Skrå kehl
101120/311070 - Profil kehl

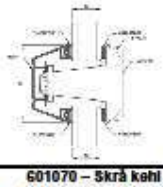
101120/301070 – Skrå kehl
101120/311070 – profil kehl



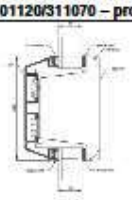
511098 – Profil kehl



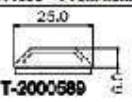
502113 – Skrå kehl
512113 – Profil kehl



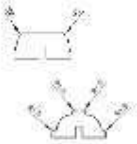
601070 – Skrå kehl
611070 – Profil kehl



602070 – Skrå kehl
612070 – Profil kehl



T-2000589 – 25 mm alu sprosse udvendig



701026 – Skrå kehl
711026 – Profil kehl

1-fags vindue - Karm Min: bredde x højde (udv. Karmmål)
382 x 335 mm

1-fags vindue - Karm Max: bredde x højde (udv. Karmmål)
1500 x 1608 mm (bemærk max rammevægt 70 kg)

Ramme Min: bredde x højde (udv. Rammemål)
318 X 272 mm

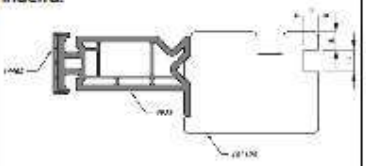
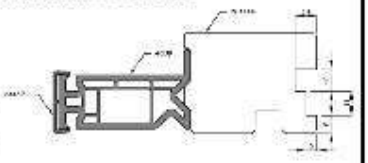
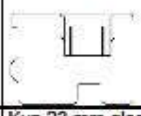
Ramme Max: bredde x højde (udv. Rammemål)
1437 x 1526 mm

1-fags vindue - Karm Min: bredde x højde (udv. Karmmål) med modsat friktion for redningsåbning
382 x 940 mm

Side **1** af **4**

1-fags vindue - Karm Max: bredde x højde (udv. karmmål) med modsat friktion for redningsåbning	
1500 x 1208 mm	
Karm Max: bredde x højde (udv. Karmmål ved postdeling)	
2000 mm x 2400 mm	
Glaslister	**Glaslister placeret udvendig**
Farve udvendig alu (standardfarver)	**Glat overflade i glans 30:** **Hvid (9010),** Antracit (7016), Lysgrå (7038), Sort (9005) **Fiji overflade I tilnærmet glans 20:** Fiji Antracit (7016), Fiji Sort (9005) **Sable overflade I tilnærmet glans 5:** Sort Futura Sablé (2100), Sort/grå Futura Sablé (2200), Blå Futura Sablé (2600), Grå Futura Sablé (2900)
Farve indvendig	**Hvid RAL 9010 - Andre farver ikke muligt.**
Overfladebehandling	**1 x Aqua Primer 297-42** **1 x Aquatop 2600-82**
Trækvalitet	**Fingerskåret fyrretræ (knastfrit) der overholder kravene til 2ØKO i henhold til DVV**
Karmposte (med isolator)	63mm skrå kehl lodret (4639/502113). Total dybde 115,5 mm 63mm profil kehl lodret (4639/512113). Total dybde 115,5 mm 63mm profil kehl vandret (4639/511098). Total dybde 105,5 mm Bemærk at karmposte har samme dybde uanset valg af karmdybde.
Aluskal på ramme	**14069** - til 23mm glas 14068 - til 44mm glas
Aluskal på karm og karmpost	**14462 – aluprofil på isolator**
Aluskal på rammepost	**14067 – 60 mm rammesprosse med** 23mm glas 14066 – 60 mm rammesprosse med 44mm glas **14459 – 100 mm rammesprosse med 23 mm glas** 14460 – 100 mm rammesprosse med 44 mm glas
Glasliste (fast karmfelt)	T-2000074 – glasliste ved 23 mm glas T-2000586 – glasliste ved 44 mm glas
Glasliste tætning	**713265600 – EPDM sort (Trelleborg)**
Rammetætning	**7133265900 – EPDM sort/EPDM Celluar grå (Trelleborg)** 6108-2001-49 – Vindskærm sort TPE (Primo)
Glasbånd (indvendig mod træ)	**444187905 – EPDM Celluar sort (Trelleborg)**
Glastykkelser	**Kun 23 eller** 44/46 mm glas er muligt.
Standardglas	**Energiklasse A (Fast karm):** 3 lags lavenergi Semco Euro Energy 4-16-4-16-4 - Ug-værdi 0,55 W/m2k eller tilsvarende produkt fra anden godkendt leverandør **Energiklasse A (Vinduesramme):** 3 lags lavenergi Semco Euro Energy 4-16-4-18-4 - Ug-værdi 0,52 W/m2k eller tilsvarende produkt fra anden godkendt leverandør

Side **2** af **4**

	Energiklasse B: 2 lags lavenergi Semco Star E 4-15-4 – Ug-værdi 1,1 W/m2k eller tilsvarende produkt fra anden godkendt leverandør	
Glas limes	**Glasset punkt limes**	
Rammesprosser	60 mm skrå kehl til 23 mm glas (601070/14067) 60 mm skrå kehl 46 mm glas (601070/14066) 60 mm profil kehl til 23 mm glas (611070/14067) 60 mm profil kehl 46 mm glas (611070/14066) 100 mm skrå kehl til 23 mm glas (602070/14459) 100 mm skrå kehl 46 mm glas (602070/14460) 100 mm profil kehl til 23mm glas (612070/14459) 100 mm profil kehl 46 mm glas (612070/14460)	
Ilagte sprosser	18, 26, 45 mm (kan ikke leveres med Fiji og Sablé overflade)	
Pålagte sprosser (indvendig/træ)	701026 skrå kehl (25 mm) 711026 profil kehl (25 mm)	
Alu sprosser (udvendig/alu)	T-2000589 (25 mm)	
Wienersprosse	21,4 mm Thermix	
Lysningsnot og bundpladenot	**Standard er uden lysningsnoter.** Som tilvalg kan vælges: 10 mm lysningsnot, dybde 7 mm. Placeres 18 mm inde fra udvendig karm. Kan fræses på alle 3 sider. Eller på enkle sider efter eget valg. Placering af lysningsnot er altid set indefra. 	**Standard er uden Bundpladenot.** Som tilvalg kan vælges: 10 mm bundpladenot, dybde 10 mm. Placeres 29 mm inde fra udvendig karm. Kan kun fræses i bund 
Ventiler	Tryk klik	Tryk klik ventil 30 cm2 nedfræst i karmtræ – se tegning. Placeres altid i venstre side (set indefra) midt i karmfeltet. Der kan ikke monteres ventil i fastkarm. 
	Aeromat 90	Kun 23 mm glas
	Glazair	Kun 23 mm glas
Forboring	**Ingen forboring** for montagehuller	
Dræn	**Skjult dræn** placeret i isolator glaslistespor Synlig dræn (i front på isolator) kan vælges. Dette skal vælges ved sammenkobling af elementer over hinanden	

Koblingsprofil (indvendig)	Der findes ingen til systemet
Koblingsprofil (udvendig)	Der findes ingen til systemet
Beslag	**IPA 62886-89 topstyr beslag** – 304Ø725C, 304Ø728 C, 304Ø731 C Fås også med: IPA 62886-89 topstsyr beslag med modsat friktion for redningsåbning – 304Ø734 C
Paskvil	**Siegenia paskvil, dorn 22. Standard slutblik.** 2 pilzruller i paskvil ved rammebredde 318 mm 1 pilzrulle i hver ende ved rammebredde indtil 928 mm 1 pilzrulle i paskvil og 1 rulle hver ende i rammebredde indtil 1118 mm 2 pilzruller i paskvil og 1 rulle i hver ende i rammebredde over 1618 mm
Greb	**Hoppe** – Mini Tokyo 7/48 mm højre. Farve F9

Fremhævet = standard

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The general conditions pertaining to assignments accepted by Danish Technological Institute shall apply in full to the technical testing or calibration at Danish Technological Institute and to the completion of test reports or calibration certificates within the relevant field.

Danish Accreditation (DANAK):

DANAK is the national accreditation body in Denmark in compliance with EU regulation No. 765/2008.

DANAK participates in the multilateral agreements for testing and calibration under European co-operation for Accreditation (EA) and under International Laboratory Accreditation Cooperation (ILAC) based on peer evaluation. Accredited test reports and calibration certificates issued by laboratories accredited by DANAK are recognized cross border by members of EA and ILAC equal to test reports and calibration certificates issued by these members' accredited laboratories.

The use of the accreditation mark on test reports and calibration certificates or reference to accreditation, documents that the service is provided as an accredited service under the company's DANAK accreditation according to EN ISO IEC 17025.

Construction Product Regulation:

In accordance with Regulation (EU) No. 305/2011 of the European Parliament and of the Council, the Construction Products Regulation (CPR), the test was conducted for the purpose of the assessment of the performance under AVCP System 3 as described in Regulation (EU) No. 568/2014 and in compliance with all applicable provisions of the CPR. The Danish Technological Institute is a notified body in accordance with CPR Article 48.

January 2021