PP20 – Primo Vinduer A/S

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

DANISH TECHNOLOGICAL INSTITUTE

CPR 1235

DANISH
TECHNOLOGICAL
INSTITUTE
CPR 1235

DOORS AND WINDOWS - TEST OF PERFORMANCE CHARACTERISTICS

Report no.: 128774-1

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

Performed by:
Teknologisk Institut
Kongsvang Allé 29
8000 Aarhus C

Pages: 17 (incl. frontpage & appendices)
Appendices: 3 (6 pages total)

2022-10-28
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 PVCu profiles and using 2 gaskets, 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 2022-10-25. The test material was labelled "128774-1".

Test period: The testing was carried out on 2022-10-26.

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: 2022-10-28, Danish Technological Institute, Building & Construction, Aarhus

Morten Jul Laegaard
Business Manager, Engineer

Telephone: +45 7220 1132
E-mail: mjld@teknologisk.dk

Mads Ottosen Fricke (co-reader)
Head of section, Engineer

Telephone: +45 7220 1851
E-mail: mfri@teknologisk.dk

Description of test specimen

The test specimen consists of a top guided window, made of PVCu from the system PP20 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	25	55	1007

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

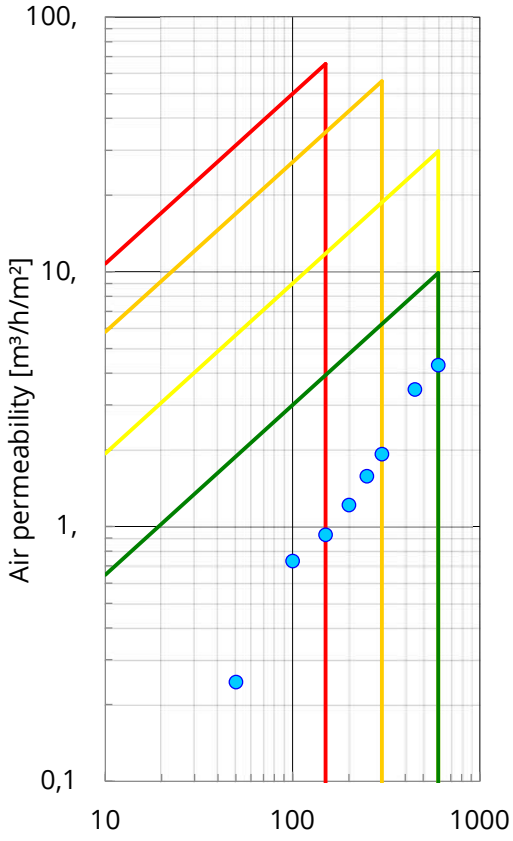
Product name	Primo PP20
Width x height	1500x1500 mm
Gaskets	2 gaskets, see drawings
Hardware	Hoppe, 4 + 2 locking points and 3 restrictors in top, see photo below and appendix
IGU	3 layered IGU, see drawings

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

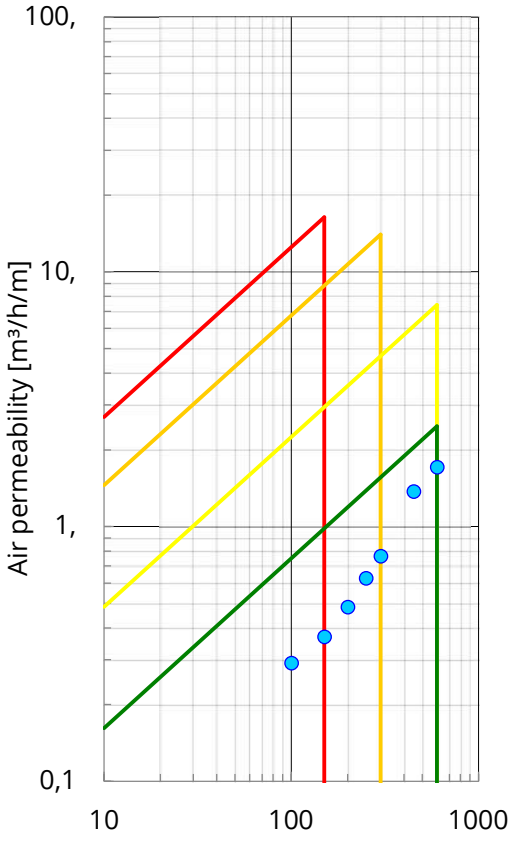
DANISH
TECHNOLOGICAL
INSTITUTE
CPR 1235

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	0,55	0,25	0,10	4	4
100	1,65	0,73	0,29	4	4
150	2,09	0,93	0,37	4	4
200	2,74	1,22	0,48	4	4
250	3,55	1,58	0,63	4	4
300	4,34	1,93	0,77	4	4
450	7,78	3,46	1,37	4	4
600	9,69	4,31	1,71	4	4



Air permeability related to area.



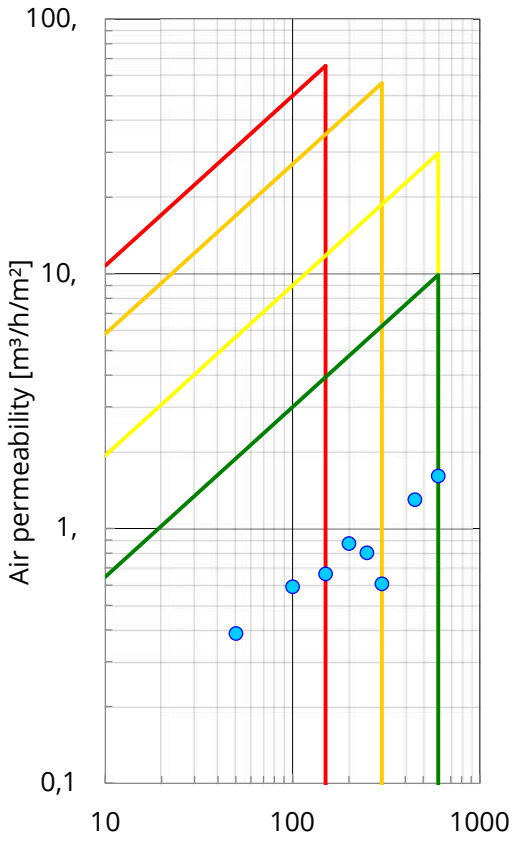
Air permeability related to length of joint.

The graphs show the classification in relation to the area and the length of joint.
Classes 1-4 are indicated by red, orange, yellow and green fields respectively.

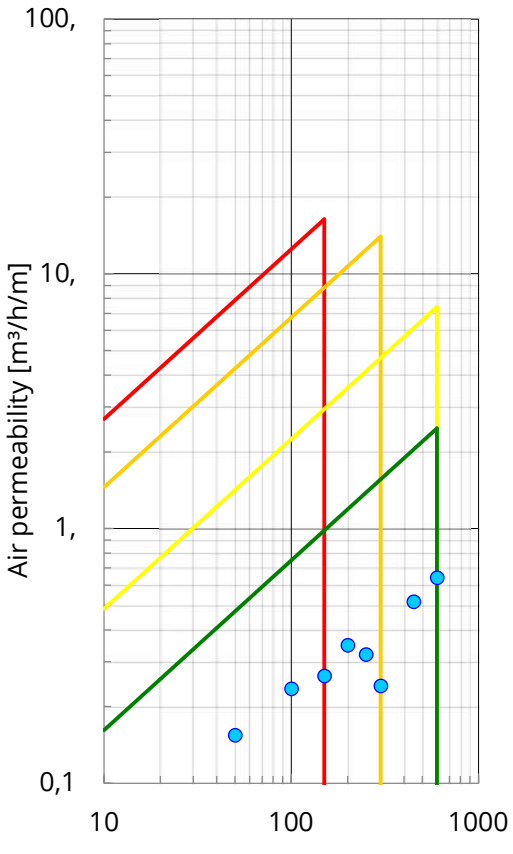
DANISH
TECHNOLOGICAL
INSTITUTE
CPR 1235

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	0,87	0,39	0,15	4	4
100	1,33	0,59	0,24	4	4
150	1,50	0,67	0,26	4	4
200	1,97	0,88	0,35	4	4
250	1,81	0,81	0,32	4	4
300	1,37	0,61	0,24	4	4
450	2,92	1,30	0,52	4	4
600	3,63	1,61	0,64	4	4



Air permeability related to area.



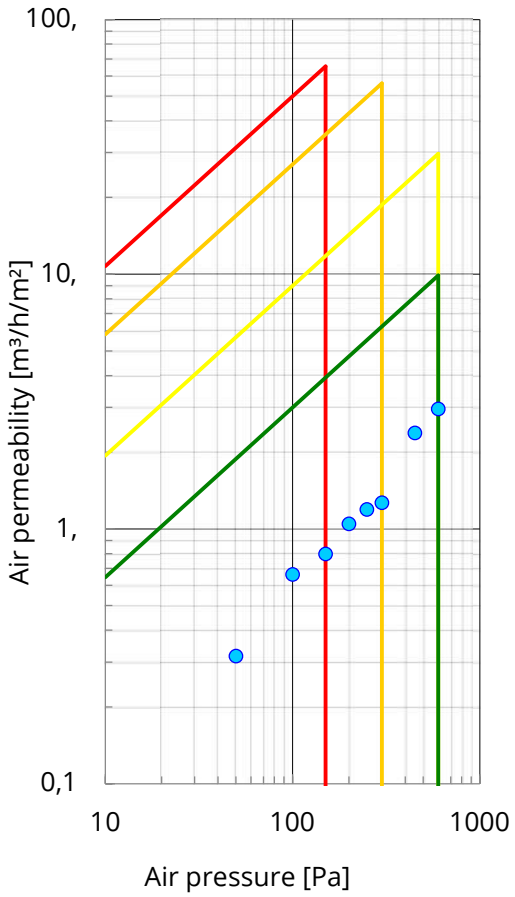
Air permeability related to length of joint.

The graphs show the classification in relation to the area and the length of joint.
Classes 1-4 are indicated by red, orange, yellow and green fields respectively.

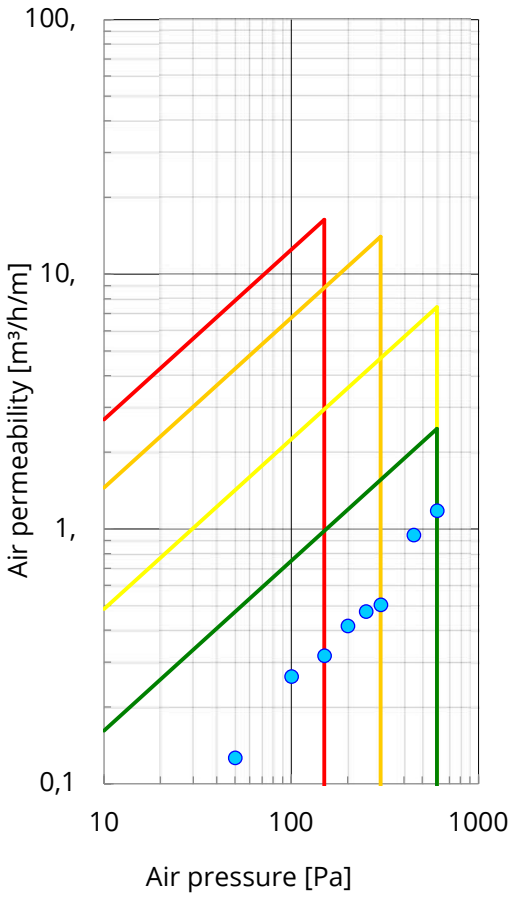
DANISH
TECHNOLOGICAL
INSTITUTE
CPR 1235

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	0,71	0,32	0,13	4	4
100	1,49	0,66	0,26	4	4
150	1,80	0,80	0,32	4	4
200	2,36	1,05	0,42	4	4
250	2,68	1,19	0,47	4	4
300	2,85	1,27	0,50	4	4
450	5,35	2,38	0,95	4	4
600	6,66	2,96	1,18	4	4



Air permeability related to area.



Air permeability related to length of joint.

The graphs show the classification in relation to the area and the length of joint.
Classes 1-4 are indicated by red, orange, yellow and green fields respectively.

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	1,9	3,9	1/741	1/351	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 and no damage or operating defects were observed.

Appendix 1: Photos

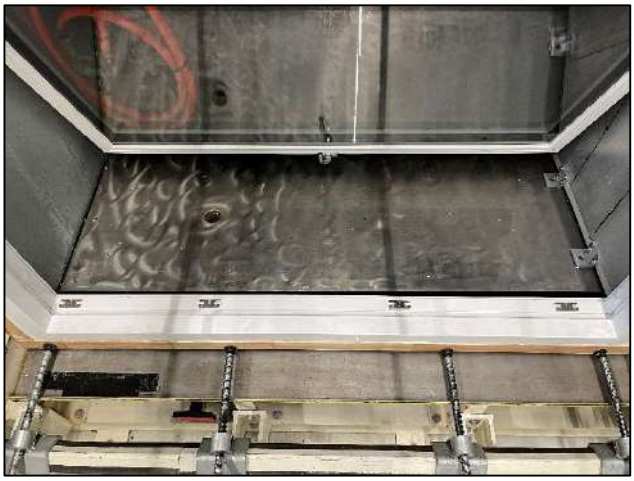
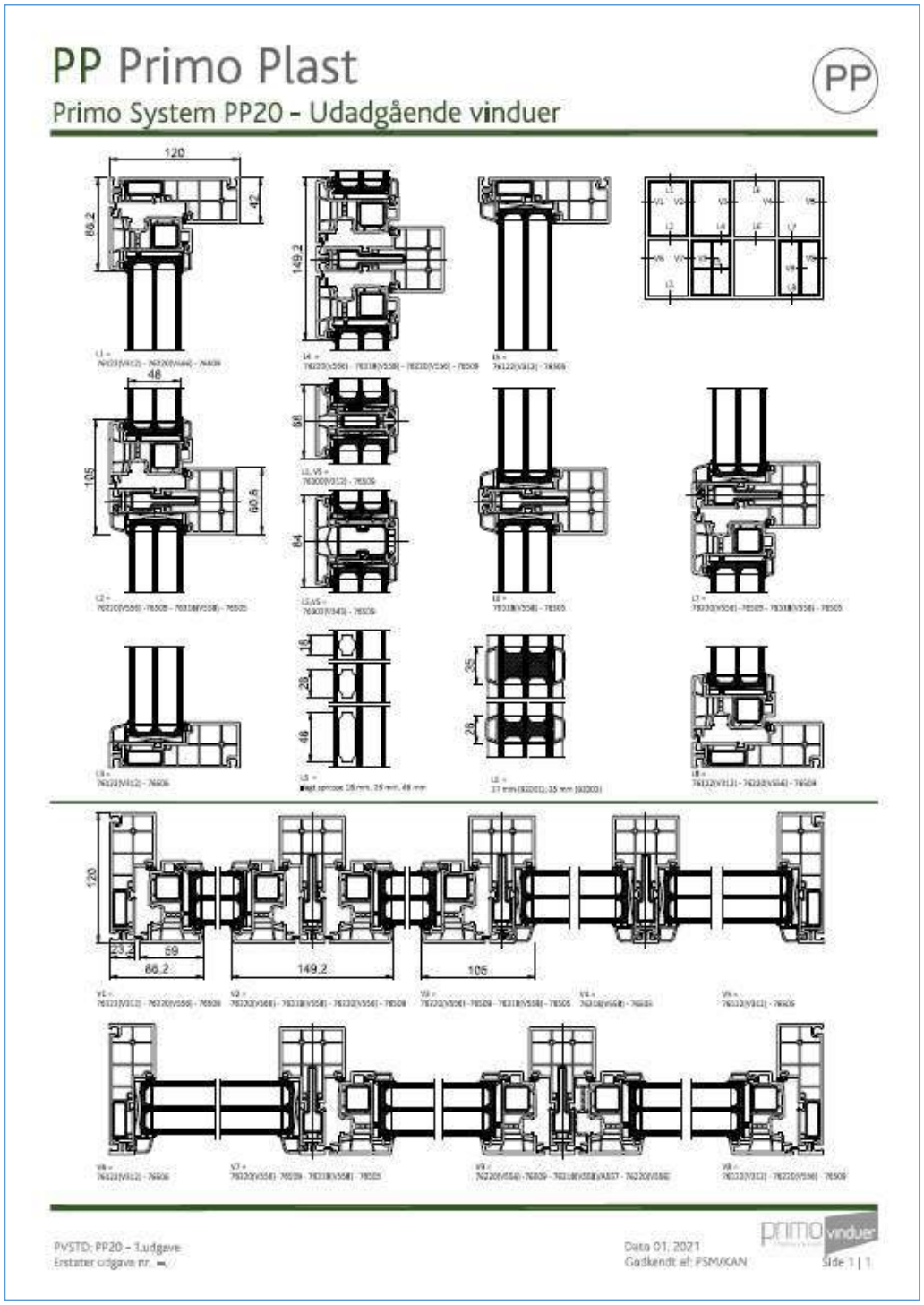


Photo 4. Hardware, bottom (DTI, 2022)

Photo 5. Hardware, side (DTI, 2022)

Appendix 2: Drawings



PP

PP Primo Plast

Primo System PP20 – Udadgående vinduer

Klassisk skandinavisk vinduessystem med slanke profiler og udadgående rammer. Systemet giver mulighed for at vælge mellem sidehængte rammer, sidestyret rammer eller topstyrede rammer.

Dimensioner min./max. mål

Elementer uden midter tætningsliste, standard

Udvendig karmmål min. bredde	350 mm
Udvendig karmmål min højde	350 mm
Udvendig karmmål max bredde ved sidehængt og sidestyr	750 mm
Udvendig karmmål max højde ved sidehængt og sidestyr	1600 mm
Udvendig karmmål max bredde ved topstyr	1600 mm
Udvendig karmmål max højde ved topstyr	1600 mm

Elementer med midter tætningsliste, tilvalg

Udvendig karmmål min bredde	500 mm
Udvendig karmmål min højde	500 mm
Udvendig karmmål max bredde ved sidehængt og sidestyr	750 mm
Udvendig karmmål max højde ved sidehængt og sidestyr	1600 mm
Udvendig karmmål max bredde ved topstyr	1600 mm
Udvendig karmmål max højde ved topstyr	1600 mm

Kombinationselementer

Max bredde x højde	3600 x 2600 mm

Dog må kun 1 side overstige 2400 mm

Profilvalg

Profil	Plast profil	Stål profil
120 mm karm	76122	V312
Vinduesramme	76220	V556
Karmpost 61 mm	76318	V558
Rammesprosse 68 mm	76300	V312
Rammesprosse 84 mm (tilvalg)	76302	V343 V319*
Glasliste til 48 mm *Kun til 76122 karm + 76318 post*	76505	
Glasliste til 48 mm *Kun til 76220 ramme +* 76300/76302 rammesprosse	76509	
Glasliste til 28 mm *Kun til 76122 karm + 76318 post*	2453	
Glasliste til 28 mm *Kun til 76220 ramme +* 76300/76302 rammesprosse	76526	
Glasliste til 28 mm *Kun til 76220 ramme +* 76300/76302 rammesprosse	76513	
Adapter anvendes ved løs lodpost (aluprofil)		A557
Stulp kappe	M715	

(* = Tilvalg)

primo vinduer

PVSTD: PP20 – 1. udgave
Erstatter udgave nr. -

Dato: 04.2021
Godkendt af: PSM/KAN

Side 1 | 4

PP

PP Primo Plast

Primo System PP20 – Udadgående vinduer

System artikler

Artikel	Artikel nr.	Anvendes til
Glasklods	M706	76220
Glasklods	M137	76300+76302
Glasklods	4 mm	76122+76318
Pakning for anker til rammesprosse 76300/76220	J254	76300
Fyldkerne for anker til rammesprosse 76300/76220	M750	76300
Pakning for anker til rammesprosse 76203/76220	J253	76302
Fyldkerne for anker til rammesprosse 76302/76220	M790	76302
X + T Postanker til karm	J217 + skruer S055 og S057	76122

Tætningslister og glasbånd

Profil	Profil nr.	Anvendes til
Reparations tætningsliste til karm/post.	G307.T (TPE)	76122/76318
Reparations glasbånd til ramme/ rammesprosse	G049.T (TPE)	76220/76300/ 76302
Reparations vindskærm til ramme	G281	76220
Tilvalg		
Midter tætningsliste (TPE) til karm/post. Kun muligt ved ramme brede/højde på min. 446 mm	G284	76122

Påklæbede energisprosser eller ilagte

Vælg mellem ilagte og påklæbede energisprosser med eller uden thermixindlæg.

Energisprosser

Sprossebredde	Profil nr.	Beskrivelse
26 mm PVC	92000-T 92001-T	Lodret Vandret
35 mm PVC	92002-T 92003-T	Lodret Vandret

Som tilvalg fås energisprosserne med 21 eller 25 mm thermixindlæg.

Ilagte sprosser

Sprossebredde	Beskrivelse
18 mm	Lodret og vandret
26 mm	Lodret og vandret
45 mm	Lodret og vandret

Glas

Som standard leveres energiglas med varm kant Technoform TGI, farve sort.

Følgende glastykkelser kan avnedes:

28 mm – valg af glasliste se under profilvalg.

48 mm – valg af glasliste se under profilvalg.

Elementerne kan levers med flere typer af funktionsglas f.eks. sikkerhedsglas, solafskærmende, ornamentglas, folie samt fyldninger eller som kombination.

Overfladebehandling

Elementer leveres som standard i hvid PVC, svarende til RAL 9016 ind- og udvendig.

Bearbejdning

Elementer leveres med 6 mm forboring.

Elementer leveres som standard med skjult dræn i karme

Ved vandrette poste er dræn synligt.

primo vinduer

PP

PP Primo Plast

Primo System PP20 – Udadgående vinduer

Åbningstyper

Leveres som sidehængt, sidestyret og topstyret, eller med fastskruet ramme.

Tætningslister

Tætningslister leveres som standard i farven lys grå. Kan mod tillæg leveres i farven sort.

Beslag/åbnings muligheder

Sidehængt ramme

Standard:

Med el-forzinket anverfere og stormkrog.

Tilvalg:

Rullepaskvil med pilzttap og natventilation. Greb type Hoppe mini Tokyo i "rustfri stållook", farve F9 og med grebsbetjent bremse.

Sidestyret ramme

Standard:

Med el-forzinket anverfere.

Tilvalg:

Rullepaskvil med pilzttap og natventilation. Greb type Hoppe mini Tokyo i "rustfri stållook", farve F9.

Topstyret ramme

Standard:

Rullepaskvil med pilzttap og natventilation. Greb type Hoppe mini Tokyo i "rustfri stållook", farve F9.

Greb

Der kan tilvælges følgende grebsmuligheder:

- Greb med nøgle
- Greb med spærre

Tilbehør

Beskrivelse	Varer nr.
Gerigt 50 mm bred	2114
Gerigt 70 mm bred	2837
Hjørne clips gerigt	9040

Notliste	76801
U- Profil	93020
H-koblingsprofil	93022
PN sikringsbeslag med dirkefri låsetap	???
Fjedrebelastet spærre som børnesikring til montering i karmfals	62050 højre 62051 venstre 62053 karmdel

Sammenkoblinger af karme

Der findes flere muligheder for at koble elementerne:

Se tegning PPK1 og PPK2

Friskluftventiler

Der kan monteres følgende friskluftventil:
Klikventil 2K2510

Trykklikventil type: med alu rist udvendig i farven hvid.

Måler 341 x 19 mm

Mindste udvendig karmmål: 390 mm

Ventil placeres i centreret i overkarm. Hvis der er lodpost i elementet placeres ventil centreret i det ene karmfelt.

Energidata for produktsystem

De anførte værdier gælder for referencemålet 1230 x 1480 mm.

Elementer uden midter tætningsliste, standard

E_{ref} + 9,4

U_w 0,76 W/m²K

U_g 0,503 W/m²K

G_g 0,53

LT_g 0,70

3-lags glas 4-18-S4-18-S4

primo vinduer

PVSTD: PP20 – 1. udgave
Erstatter udgave nr. -

Dato: 04.2021
Godkendt af: PSM/KAN

PP Primo Plast

Primo System PP20 – Udadgående vinduer

Elementer med midter tætningsliste, tilvalg

E_{wf} + 11,9

U_w 0,73 W/m²K

U_g 0,503 W/m²K

G_g 0,53

LT_g 0,70

3-lags glas 4-18-S4-18-S4

DANISH
TECHNOLOGICAL
INSTITUTE
CPR 1235

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