



**DANISH  
TECHNOLOGICAL  
INSTITUTE**

HansenGroup  
Bredgade 4  
6940 Lem St

Order no. 0301/698932  
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Appendices 1  
Initials MFRI/MJLD

Teknologiparken  
Kongsvang Allé 29  
DK-8000 Aarhus C  
72 20 20 00  
info@teknologisk.dk  
www.teknologisk.dk

## Test report



- Material:** Inward opening, turn/tilt door height window with a fixed side panel, further details can be found on page 2.
- Sampling:** The test specimen was forwarded by the client and received at the Danish Technological Institute 2016-11-10. The specimen was labelled 698932 by the laboratory.
- Method:** EN 14351-1+A1:2010 Windows and doors – Product standard, performance characteristics – Part 1: Windows and external pedestrian doorsets without resistance to fire and/or smoke leakage characteristics  
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
- Period:** The testing was carried out 2016-11-10.
- Result:** Classification of the test specimen according to EN 14351-1 4.2, 4.5 and 4.14 and the standards mentioned below:  
**Air permeability: Class 4** at  $\pm 600$  Pa  
EN 12207 – Windows and doors – Air permeability – Classification  
**Watertightness: Class 9A**  
EN 12208 – Windows and doors – Watertightness – Classification  
**Wind load: Class C4**  
EN 12210 – Windows and doors – Resistance to wind load – Classification
- The results of the test are given on page 3-8.
- Storage:** As the test is destructive and non-reproducible the samples have been removed immediately after ending the test.
- Terms:** The test has been performed according to the enclosed conditions, which are according to the guidelines laid down by DANAK (The Danish Accreditation). The testing is only valid for the tested specimen.  
The test report may only be extracted, if the laboratory has approved the extract.

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2016-11-18, Danish Technological Institute, Glass and Windows

  
Mads O. Fricke  
Consultant, Engineer

  
Morten J. Laegaard  
Team Manager

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

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

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## Description of test specimen

The test specimen consists of an inward opening, turn/tilt door height window with a fixed side panel made of aluminium, see drawings in Appendix 1.

Before delivery a subframe was prepared and mounted around the element by the client. The subframe 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.

Width [mm]	Height [mm]	Area [m <sup>2</sup> ]	Length of joint [m]	Temperature [°C]	Atmospheric pressure [hPa]
1800	2741	4,93	7,52	19,7	999,3

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

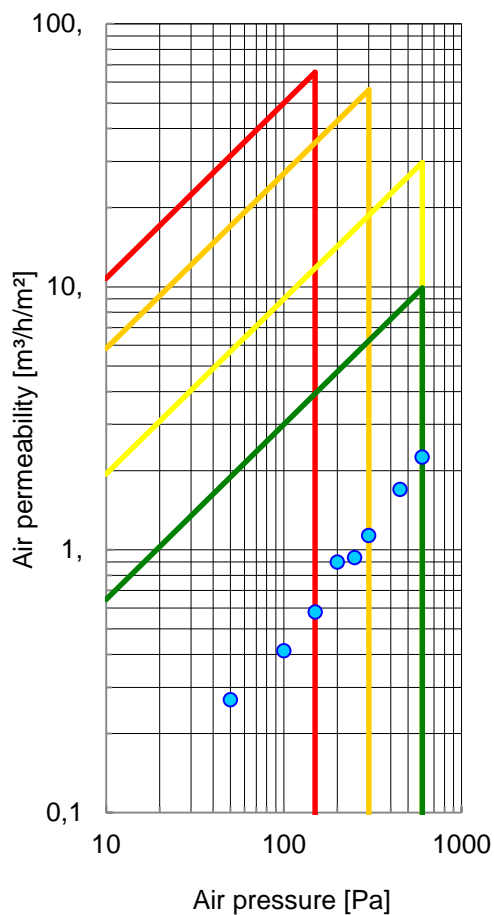
<b>Product name</b>	Millennium G40
<b>Width x height</b>	1800 X 2741 mm
<b>Gaskets</b>	See appendix 1
<b>Hardware</b>	See appendix 1
<b>IGU</b>	See appendix 1



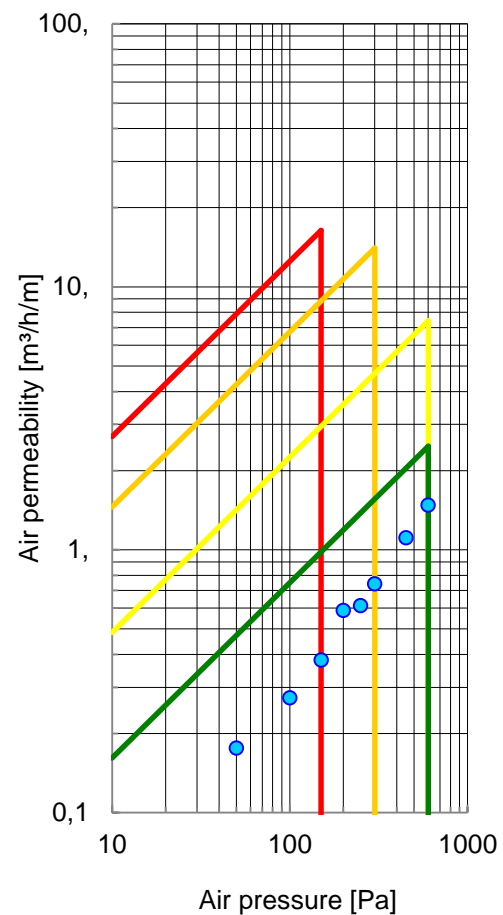
*Door height window during testing*

## Test results – Air permeability – Positive air pressure

Air pressure [Pa]	Air flow Total [m <sup>3</sup> /h]	Air flow Area [m <sup>3</sup> /h/m <sup>2</sup> ]	Air flow Length of joint [m <sup>3</sup> /h/m]	Class Area [-]	Class Length of joint [-]
50	1.33	0.27	0.18	4	4
100	2.04	0.41	0.27	4	4
150	2.87	0.58	0.38	4	4
200	4.44	0.90	0.59	4	4
250	4.61	0.94	0.61	4	4
300	5.59	1.13	0.74	4	4
450	8.38	1.70	1.11	4	4
600	11.13	2.26	1.48	4	4



Air permeability related to area.

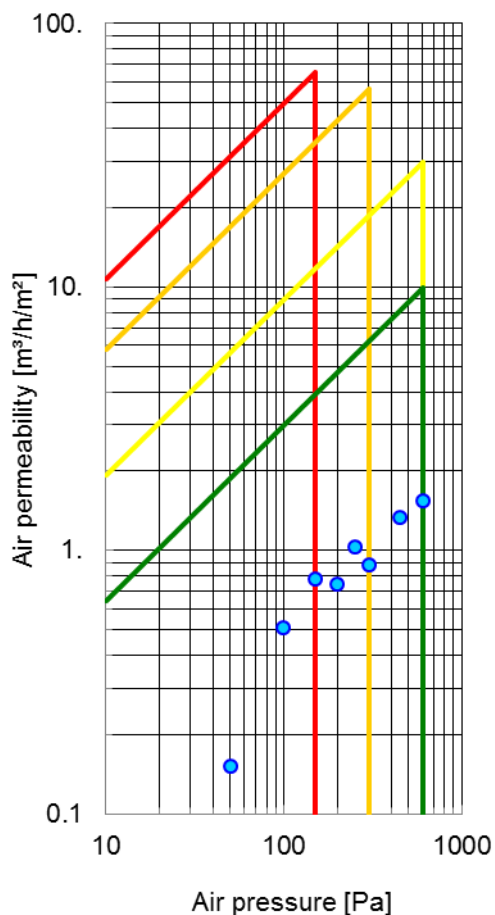


Air permeability related to length of joint.

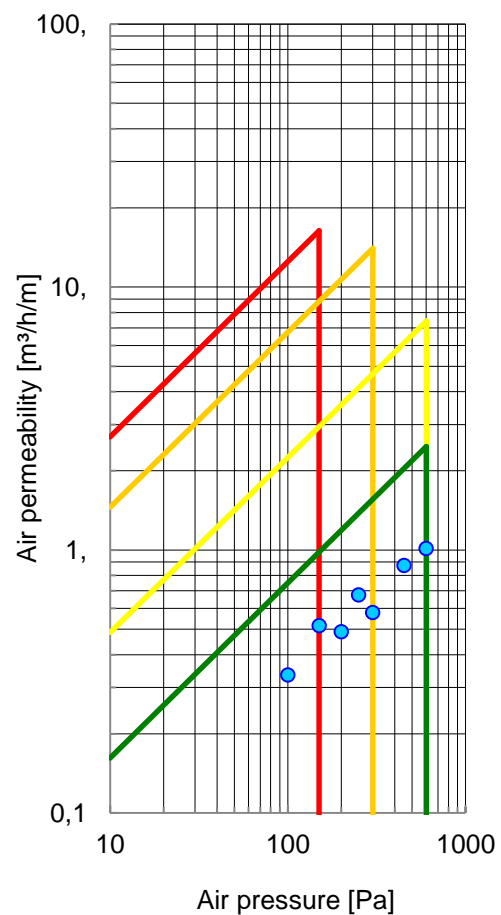
The graphs show the classification in relation to the area and the length of joint.  
Classes 1-4 are indicated by red, orange, yellow and green fields respectively.

## Test results – Air permeability – Negative air pressure

Air pressure [Pa]	Air flow Total [m <sup>3</sup> /h]	Air flow Area [m <sup>3</sup> /h/m <sup>2</sup> ]	Air flow Length of joint [m <sup>3</sup> /h/m]	Class Area [-]	Class Length of joint [-]
50	0.75	0.15	0.10	4	4
100	2.52	0.51	0.33	4	4
150	3.86	0.78	0.52	4	4
200	3.68	0.75	0.49	4	4
250	5.09	1.03	0.67	4	4
300	4.36	0.88	0.58	4	4
450	6.56	1.33	0.87	4	4
600	7.61	1.54	1.01	4	4



Air permeability related to area.

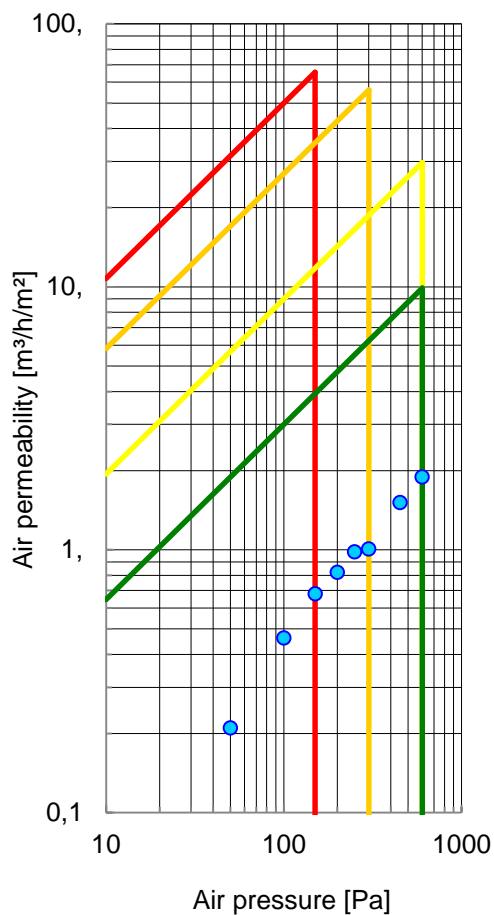


Air permeability related to length of joint.

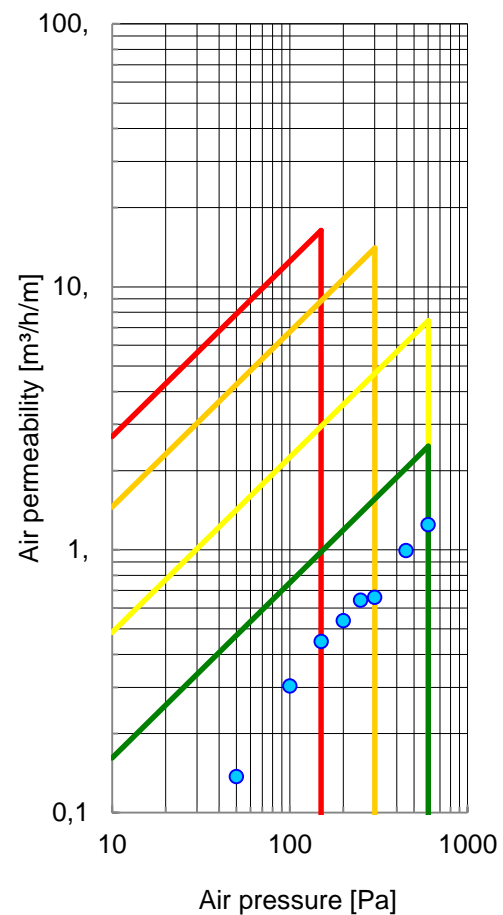
The graphs show the classification in relation to the area and the length of joint.  
Classes 1-4 are indicated by red, orange, yellow and green fields respectively.

## Test results – Average air permeability

Air pressure [Pa]	Air flow Total [m <sup>3</sup> /h]	Air flow Area [m <sup>3</sup> /h/m <sup>2</sup> ]	Air flow Length of joint [m <sup>3</sup> /h/m]	Class Area [-]	Class Length of joint [-]
50	1.04	0.21	0.14	4	4
100	2.28	0.46	0.30	4	4
150	3.36	0.68	0.45	4	4
200	4.06	0.82	0.54	4	4
250	4.85	0.98	0.64	4	4
300	4.98	1.01	0.66	4	4
450	7.47	1.51	0.99	4	4
600	9.37	1.90	1.25	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.

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## 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

## 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]	[-]	[-]	[-]
± 1600	0,9	0,8	1/689	1/775	C4



*The red circles indicate the displacement measuring points*

## Pulsating air pressure test

Air pressure - P2 [Pa]	Observations during testing [-]
± 800	The specimen remained closed and no damage or operating defects were observed.

## Air permeability test

Air pressure [Pa]	Classification					
	Positive pressure		Negative pressure		Average	
	Area [-]	Length of joint [-]	Area [-]	Length of joint [-]	Area [-]	Length of joint [-]
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 [Pa]	Observations during testing [-]
± 2400	The specimen remained closed and no damage or operating defects were observed.

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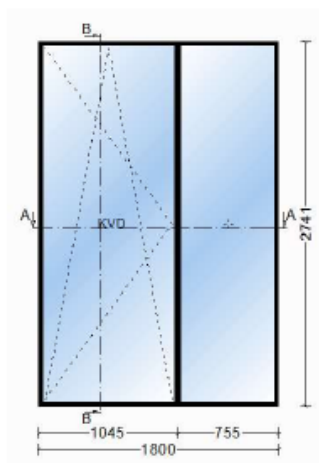
## Drawings

PEBA  
J698832-2-1

18-11-2016

### Data for element til LVV test

<b>System</b>	Millennium G40
<b>Åbnfunktion</b>	Dreje/kip + fast
<b>Bredde</b>	1800
<b>Højde</b>	2741
<b>Bredde opluk</b>	1045 (venstrehængt)
<b>Rude</b>	8 (hæ) - 20 - 6 - 20 - 8 (hæ)

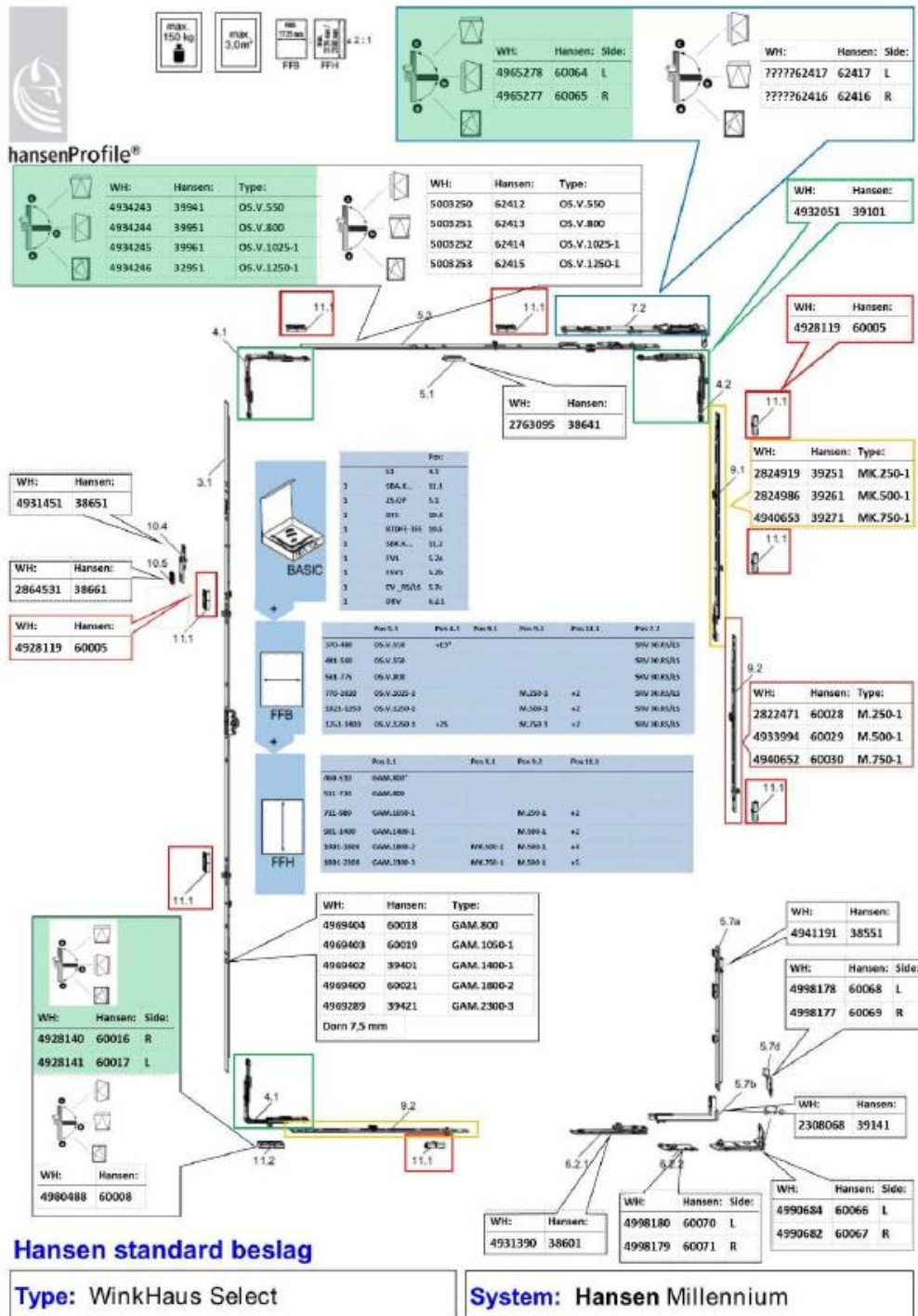


### Tætningslister

Nr.	Betegnelse
160171	LF. Anslagstætningsliste
160661	LF. Glasningsliste
161101	Kantprofil
161211	LF.Primo 8230-0002
162531	Anslagstætning
162571	Midtertætning
90961	Norton bånd
F48x72	Fuge

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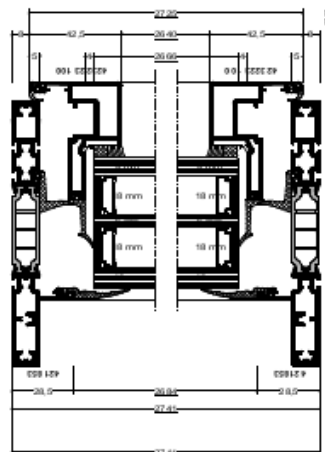
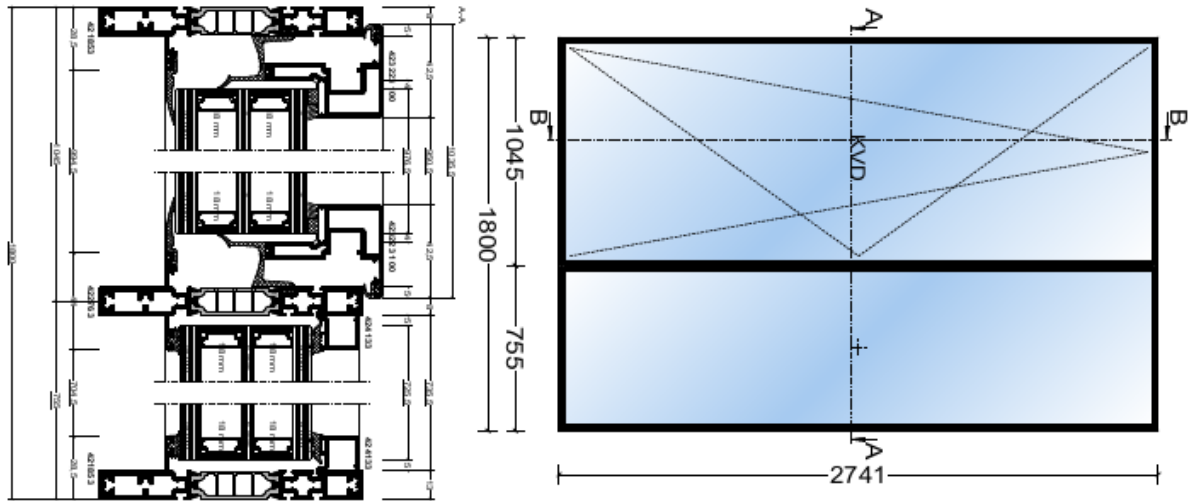
**Besl ning Winkhaus ActivPilot Select**




Dato: 18-11-2016 kl.9:54

Hardware

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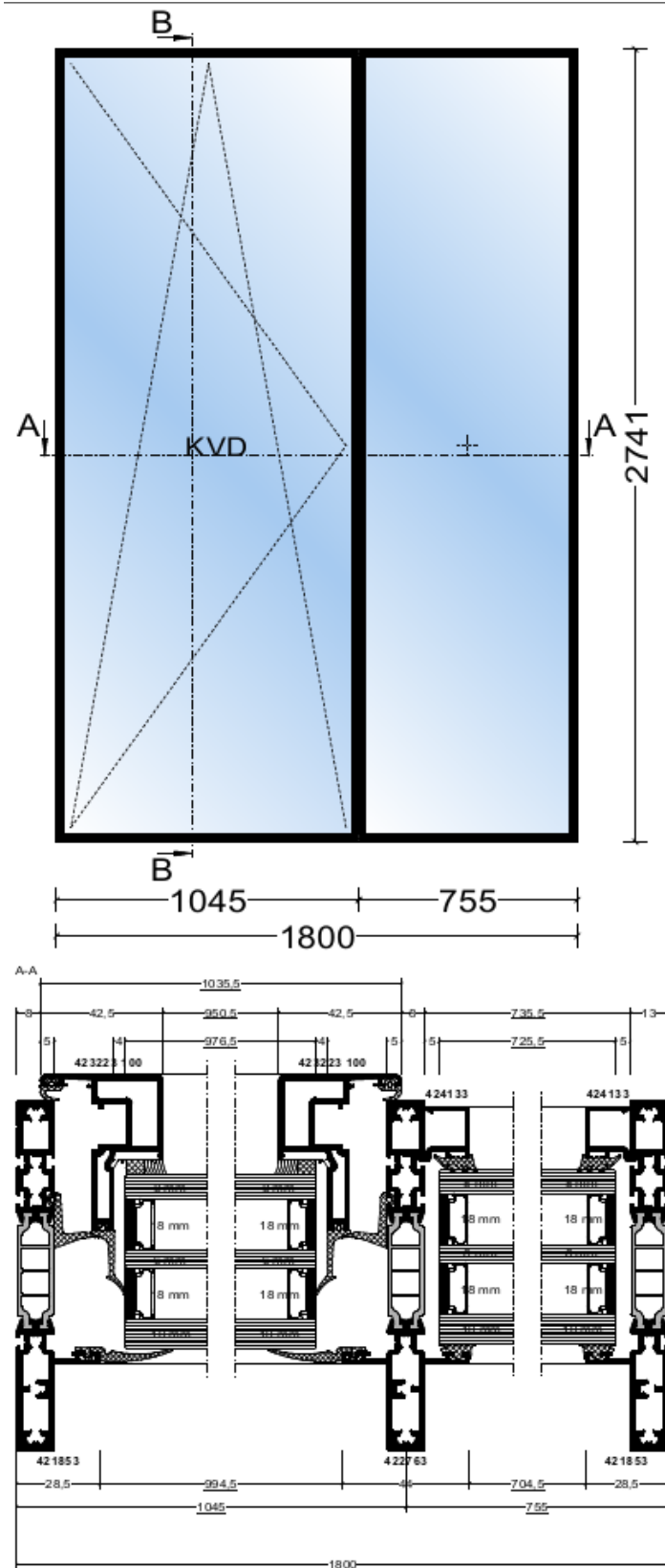


1 0161101  
2 1506561

		Projekt: <b>NHH - Mock-up Millennium                  Millennium G40</b>	
HSH Andersen a/s Bredgade 4, DK-6940 Lønn SØ. Tlf: +45 9675 1100 WWW.HSH-DK		Tegningnummer: <b>32800-1</b>	
Dato: 10-11-2018		Revision: <b>1</b>	
Mål: 1 : 2		Tegning: PEBA	
Ordre nr.:		Ordre nr.:	

Drawing A

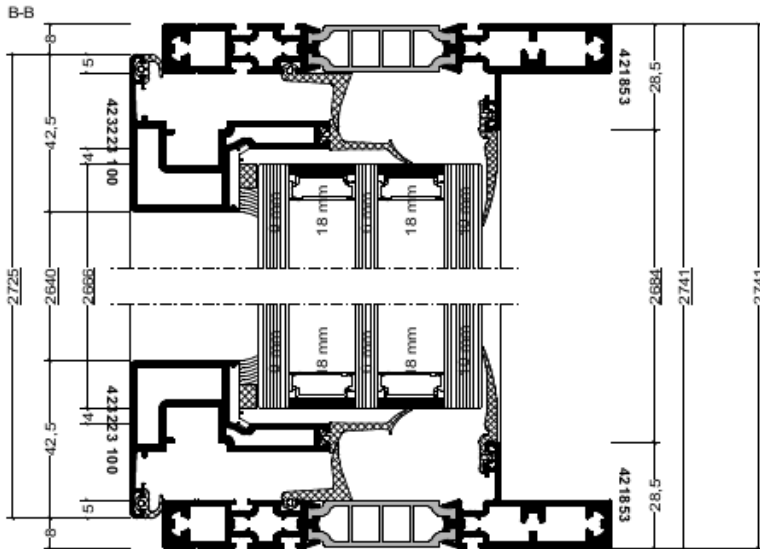
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Part 1/2 of drawing A

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Projekt:

## NHH - Mock-up Millennium Millennium G40

HSHansen a/s  
Bredgade 4, DK-6940 Lem St. TLF: +45 9675 1100 WWW.HSH.DK

Indhold:

Tegningsnummer:

Revision:

32800-1

1

Dato: 10-11-2016 Mål: 1 : 2

Tegn.: PEBA

Ordre nr.:

Part 2/2 of drawing A

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:**

The Danish Technological Institute guarantees that employees carrying out tests to be used together with harmonized standards under notification no. 1235 according to EU regulation 305/2011, article 43, satisfy all the requirements made for capability, integrity and impartiality. You find the CPR here:

[http://ec.europa.eu/growth/single-market/european-standards/harmonised-standards/construction-products/index\\_en.htm](http://ec.europa.eu/growth/single-market/european-standards/harmonised-standards/construction-products/index_en.htm)

September 2015