



**DANISH  
TECHNOLOGICAL  
INSTITUTE**

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Order no. 0301/505220 R1  
Page 1 of 11  
Appendices 1  
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## Test report



EU Notified Body

Test specimen Outward opening double door, Millennium G40, further details can be found on page 2.

Sampling: The test specimen was forwarded by the client and received at the Danish Technological Institute on 2012-11-27. The test specimen was marked 505220 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 (2000): Windows and doors – Air permeability – Test method  
EN 1027 (2000): Windows and doors – Watertightness – Test method  
EN 12211 (2000): Windows and doors – Resistance to wind load – Test method

Period: The testing was carried out 2012-11-30 to 2013-01-17.

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

Air permeability: Class **4** at **±600 Pa**  
according to EN 12207 – Windows and doors – Air permeability – Classification

Watertightness: Class **E1200**  
according to EN 12208 – Windows and doors – Watertightness – Classification

Wind load: Class **C5**  
according to EN 12210 – Windows and doors – Resistance to wind load – Classification

The results of the test appear from page 3-8.

Terms: The test has been performed according to the enclosed conditions, which are according to the guidelines laid down by DANAK (The Danish Accreditation Scheme). 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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2013-02-13, Danish Technological Institute, Sustainable Building and Construction



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## Description of test specimen

The test specimen consists of an outward opening, side hung double leaf door with active leaf left made of aluminium, see drawings in appendix 1.

The handle was without gasket. That was solved with grease.

The test conditions and the dimensions of the test specimen are measured by the laboratory and appear from the table below.

Width	Height	Area	Length of joint	Temperature	Atmospheric pressure
[mm]	[mm]	[m <sup>2</sup> ]	[m]	[°C]	[hPa]
2010	2230	4,482	10,516	19,8	1017

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

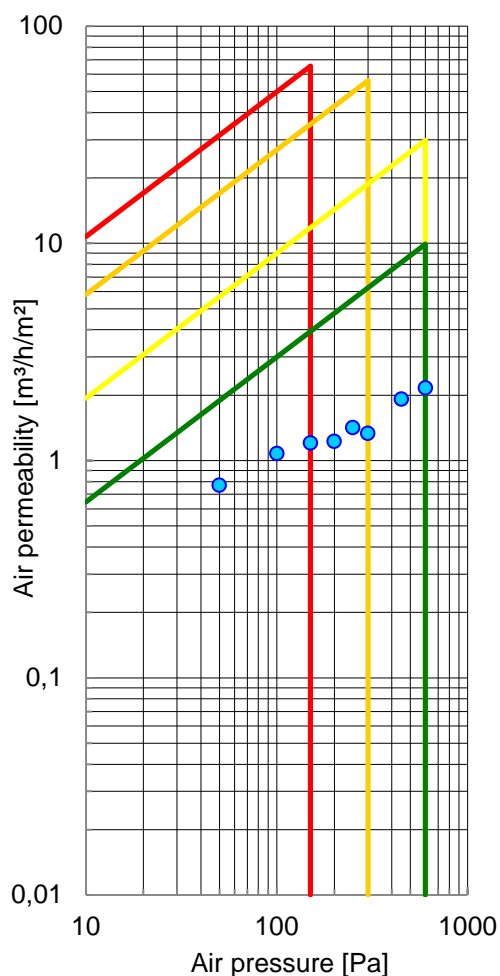
<b>Product name</b>	Millennium G40
<b>Gaskets</b>	See drawings in appendix 1
<b>IGU</b>	See drawings in appendix 1
<b>Hardware</b>	Roto Hardware Systems



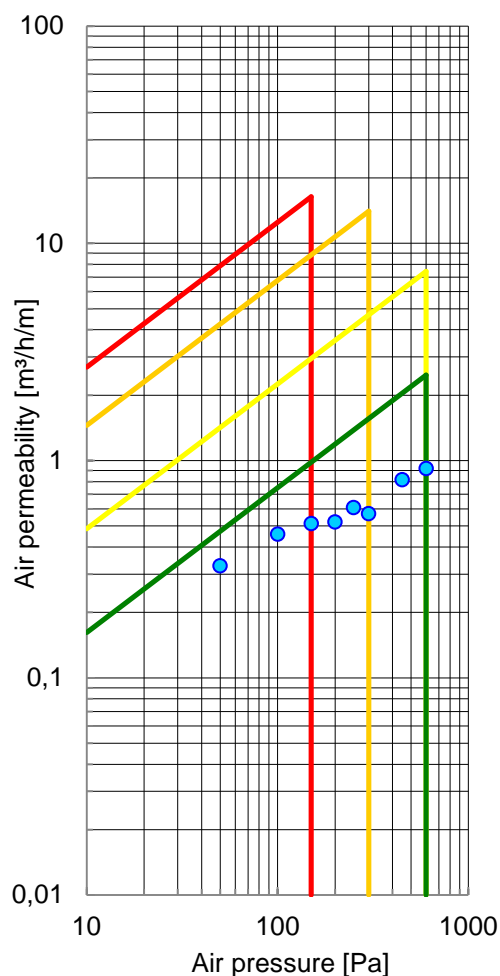
*Door before testing*

## Test results – Air permeability – Positive air pressure (in locked position)

Air pressure	Air flow	Air flow	Air flow	Class	Class
	Total	Area	Length of joint	Area	Length of joint
[Pa]	[m³/h]	[m³/h/m²]	[m³/h/m]	[-]	[-]
50	3,44	0,77	0,33	4	4
100	4,82	1,08	0,46	4	4
150	5,39	1,20	0,51	4	4
200	5,48	1,22	0,52	4	4
250	6,34	1,42	0,61	4	4
300	5,96	1,33	0,57	4	4
450	8,57	1,91	0,81	4	4
600	9,66	2,15	0,92	4	4



*Air permeability related to area.*

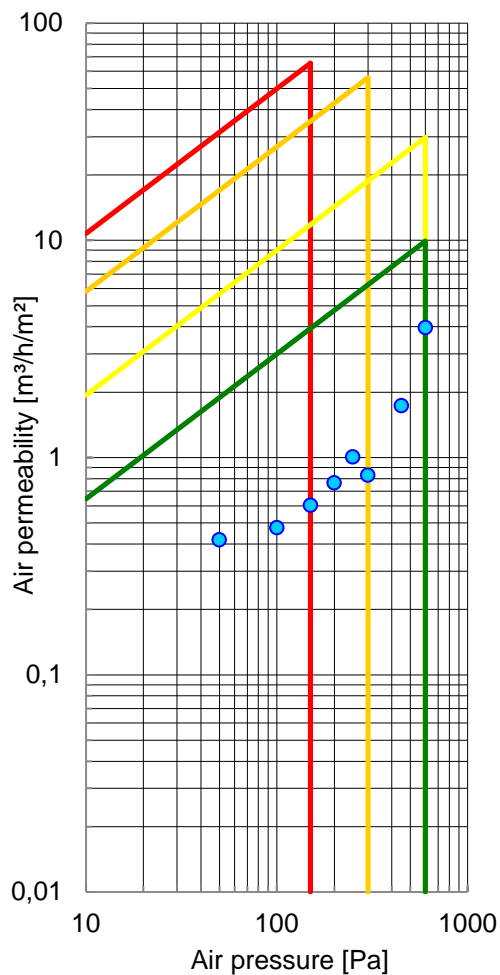


*Air permeability related to length of joint.*

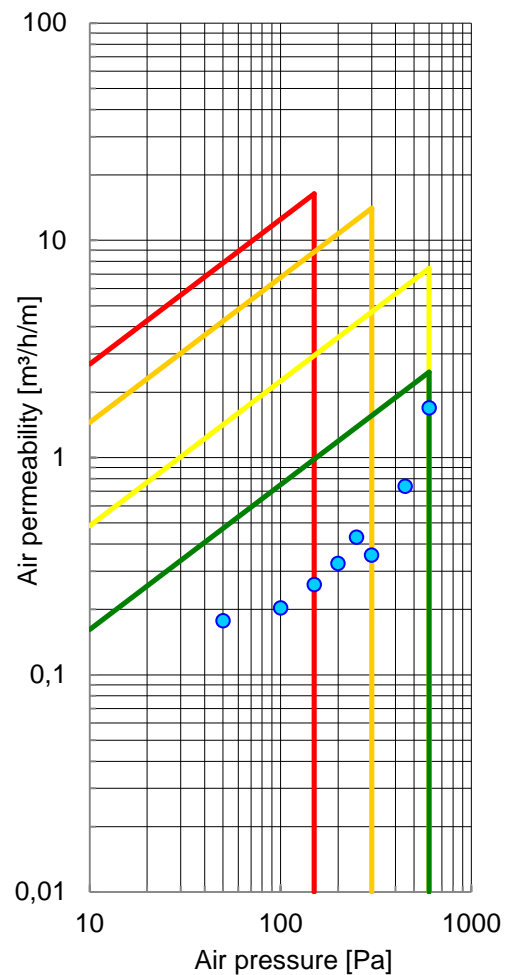
*The graphs show the classification in relation to the area and the length of joint.  
Classes 1-4 are indicated by red, orange, yellow and green fields respectively.*

## Test results – Air permeability – Negative air pressure (in locked position)

Air pressure	Air flow	Air flow	Air flow	Class	Class
	Total	Area	Length of joint	Area	Length of joint
[Pa]	[m³/h]	[m³/h/m²]	[m³/h/m]	[-]	[-]
50	1,87	0,42	0,18	4	4
100	2,13	0,48	0,20	4	4
150	2,71	0,60	0,26	4	4
200	3,42	0,76	0,32	4	4
250	4,50	1,00	0,43	4	4
300	3,73	0,83	0,35	4	4
450	7,76	1,73	0,74	4	4
600	17,76	3,97	1,69	4	4



*Air permeability related to area.*

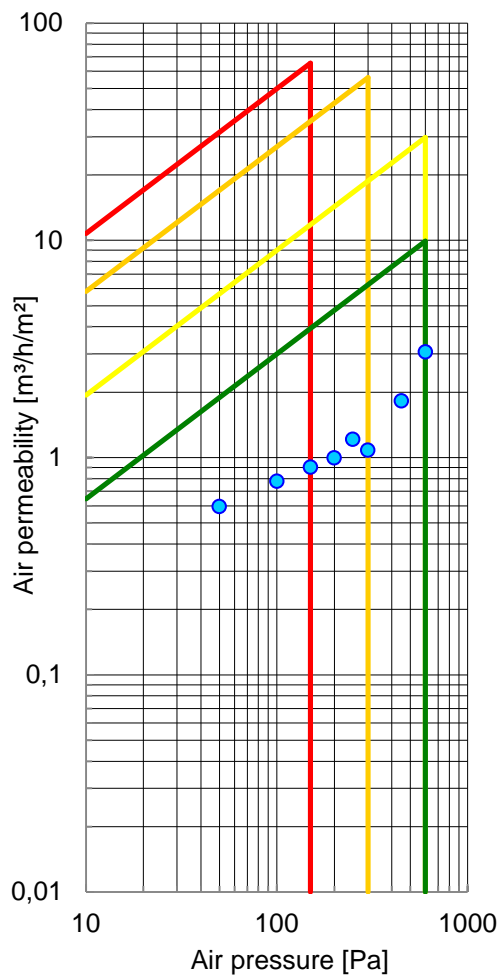


*Air permeability related to length of joint.*

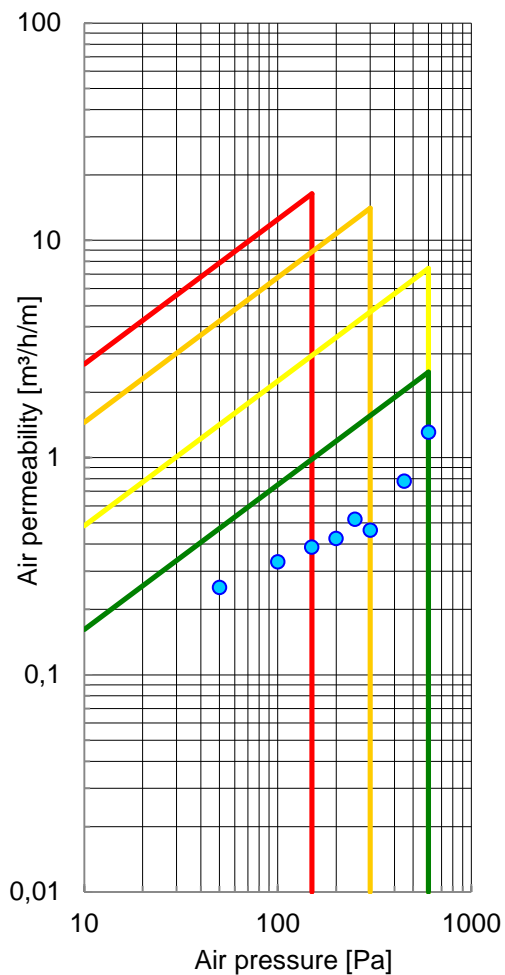
*The graphs show the classification in relation to the area and the length of joint.  
Classes 1-4 are indicated by red, orange, yellow and green fields respectively.*

## Test results – Average air permeability (in locked position)

Air pressure	Air flow	Air flow	Air flow	Class	Class
	Total	Area	Length of joint	Area	Length of joint
[Pa]	[m³/h]	[m³/h/m²]	[m³/h/m]	[-]	[-]
50	2,66	0,59	0,25	4	4
100	3,47	0,78	0,33	4	4
150	4,05	0,90	0,39	4	4
200	4,45	0,99	0,42	4	4
250	5,42	1,21	0,52	4	4
300	4,84	1,08	0,46	4	4
450	8,16	1,82	0,78	4	4
600	13,71	3,06	1,30	4	4



*Air permeability related to area.*

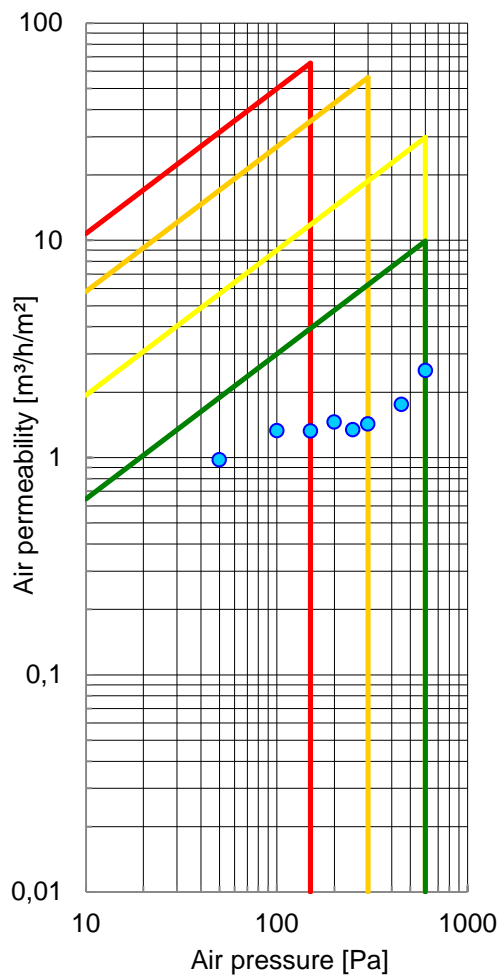


*Air permeability related to length of joint.*

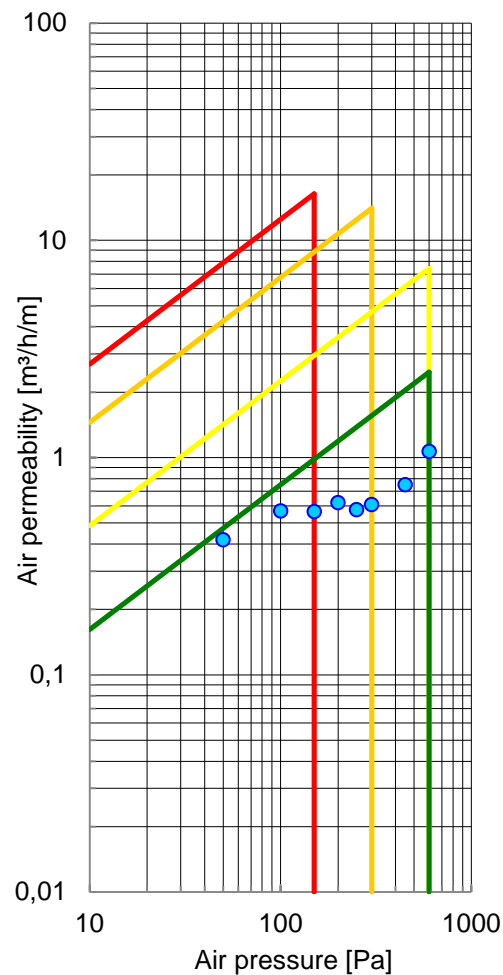
*The graphs show the classification in relation to the area and the length of joint.  
Classes 1-4 are indicated by red, orange, yellow and green fields respectively.*

## Test results – Air permeability – Positive air pressure (in latched position)

Air pressure	Air flow	Air flow	Air flow	Class	Class
	Total	Area	Length of joint	Area	Length of joint
[Pa]	[m³/h]	[m³/h/m²]	[m³/h/m]	[-]	[-]
50	4,36	0,97	0,42	4	4
100	5,95	1,33	0,57	4	4
150	5,92	1,32	0,56	4	4
200	6,51	1,45	0,62	4	4
250	6,02	1,34	0,57	4	4
300	6,38	1,43	0,61	4	4
450	7,84	1,75	0,75	4	4
600	11,24	2,51	1,07	4	4



*Air permeability related to area.*

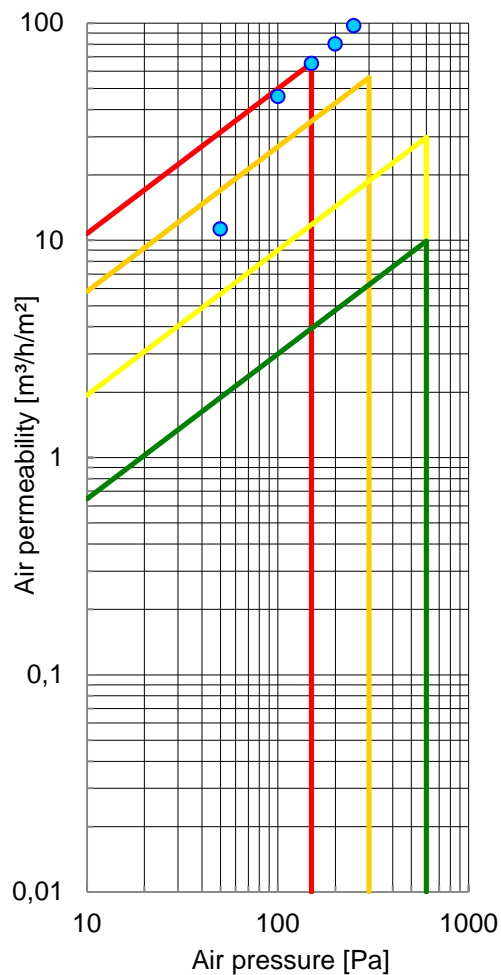


*Air permeability related to length of joint.*

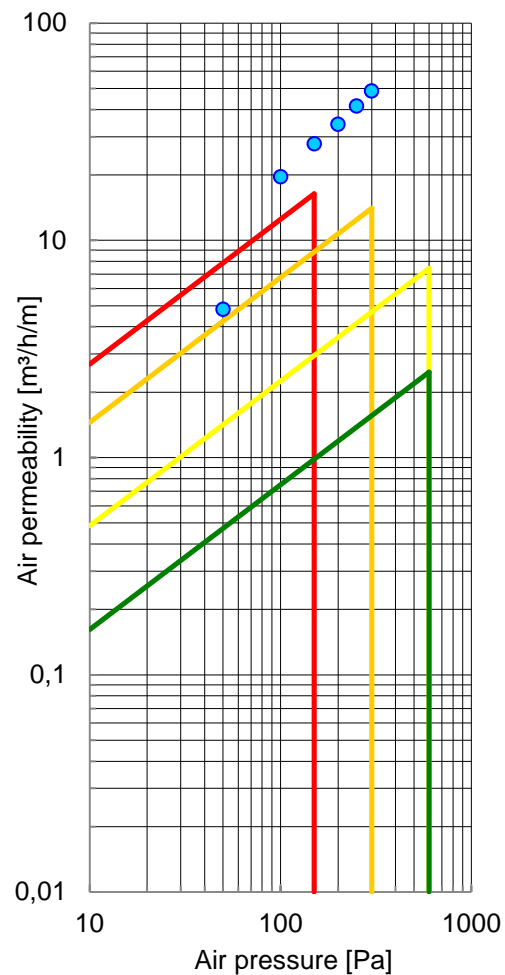
*The graphs show the classification in relation to the area and the length of joint.  
Classes 1-4 are indicated by red, orange, yellow and green fields respectively.*

## Test results – Air permeability – Negative air pressure (in latched position)

Air pressure	Air flow	Air flow	Air flow	Class	Class
	Total	Area	Length of joint	Area	Length of joint
[Pa]	[m³/h]	[m³/h/m²]	[m³/h/m]	[-]	[-]
50	50,53	11,27	4,80	2	1
100	205,95	45,95	19,58	1	0
150	291,50	65,04	27,72	1	0
200	358,57	80,00	34,10	0	0
250	435,98	97,27	41,46	0	0
300	511,09	114,03	48,60	0	0
450	-	-	-	0	0
600	-	-	-	0	0



*Air permeability related to area.*

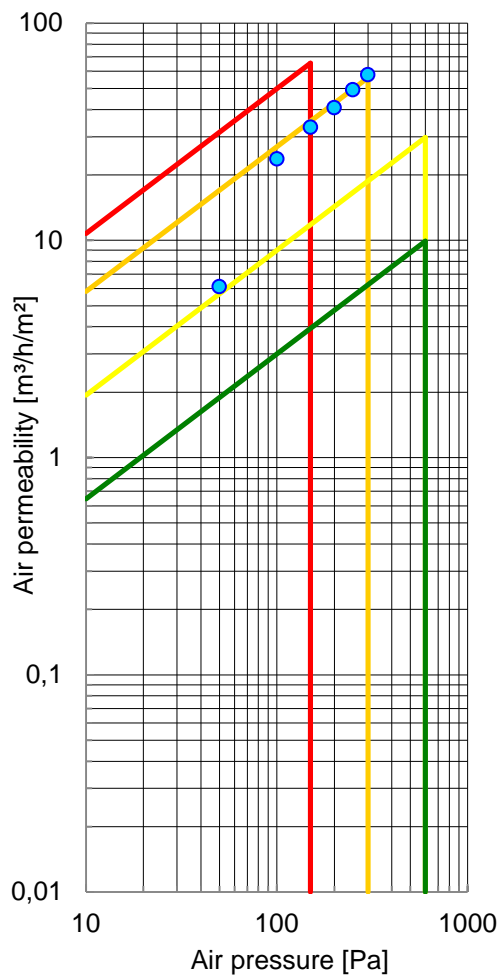


*Air permeability related to length of joint.*

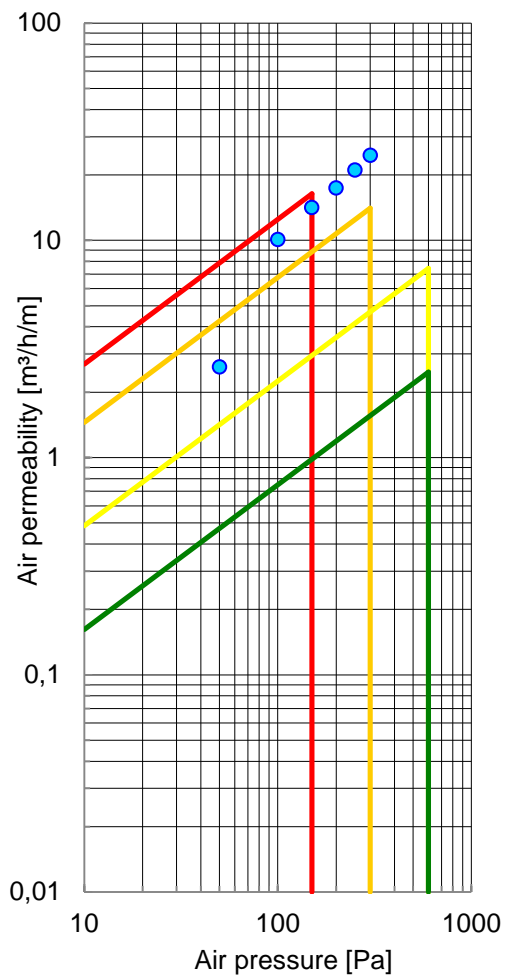
*The graphs show the classification in relation to the area and the length of joint.  
Classes 1-4 are indicated by red, orange, yellow and green fields respectively.*

## Test results – Average air permeability (in latched position)

Air pressure	Air flow	Air flow	Air flow	Class	Class
	Total	Area	Length of joint	Area	Length of joint
[Pa]	[m³/h]	[m³/h/m²]	[m³/h/m]	[-]	[-]
50	27,45	6,12	2,61	2	2
100	105,95	23,64	10,08	2	1
150	148,71	33,18	14,14	2	1
200	182,54	40,73	17,36	2	1
250	221,00	49,31	21,02	2	1
300	258,74	57,73	24,60	1	1
450	-	-	-	0	0
600	-	-	-	0	0



*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 (in locked position)

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



*Door during testing*

## Test results – Wind load (in locked position)

### Deflection test

Air pressure - P1	Displacement		Relative frontal deflection		Class
	Positive pressure	Negative pressure	Positive pressure	Negative pressure	
[Pa]	[mm]	[mm]	[-]	[-]	[-]
$\pm 1600$	2,7	2,9	1/770	1/730	C5



*The red circles indicate the displacement measuring points.*

## Pulsating air pressure test

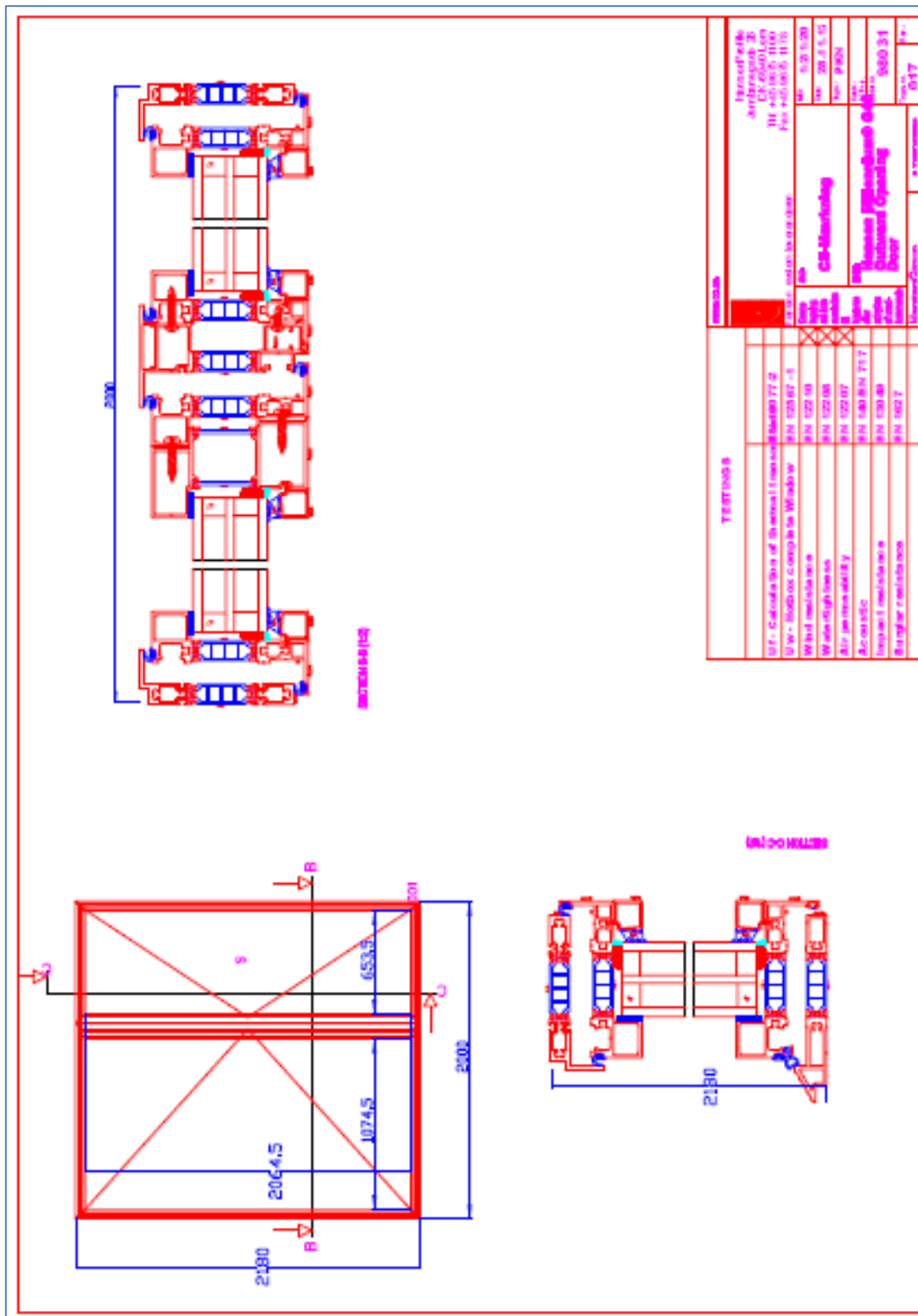
Air pressure - P2 [Pa]	Observations during testing [-]
± 800	The specimen remained closed and no damage or operating defects were observed.

## 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	3	4	4

## Safety test

Air pressure - P3 [Pa]	Observations during testing [-]
± 2400	The specimen remained closed and no damage or operating defects were observed.



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

## **DANAK**

The Danish Accreditation and Metrology Fund - DANAK - is managing the Danish accreditation scheme based on a contract with the Danish Safety Technology Authority under the Danish Ministry of Economics and Business Affairs who is responsible for the legislation on accreditation in Denmark.

The fundamental criteria for accreditation are described in DS/EN ISO/IEC 17025: "General requirements for the competence of testing and calibration laboratories". DANAK uses guidance documents to clarify the requirements in the standards, where this is considered to be necessary. These will mainly be drawn up by the "European co-operation for Accreditation (EA)" or the "International Laboratory Accreditation Co-operation (ILAC)" with a view to obtaining uniform criteria for accreditation worldwide. In addition, the Danish Safety Technology Authority issues Technical Regulations prepared by DANAK with specific requirements for accreditation that are not contained in the standards.

In order for a laboratory to be accredited it is, among other things, required:

- that the laboratory and its personnel are free from any commercial, financial or other pressures, which might influence their impartiality;
- that the laboratory operates a documented management system, and has a management that ensures that the system is followed and maintained;

- that the laboratory has at its disposal all items of equipment, facilities and premises required for correct performance of the service that it is accredited to perform;
- that the laboratory has at its disposal personnel with technical competence and practical experience in performing the services that they are accredited to perform;
- that the laboratory has procedures for traceability and uncertainty calculations;
- that accredited testing are performed in accordance with fully validated and documented methods;
- that accredited services are performed and reported in confidentiality with the customer and in compliance with the customer's request;
- that the laboratory keeps records which contain sufficient information to permit repetition of the accredited test;
- that the laboratory is subject to surveillance by DANAK on a regular basis;
- that the laboratory shall take out an insurance, which covers liability in connection with the performance of accredited services.

Reports carrying DANAK's accreditation mark are used when reporting accredited services and show that these have been performed in accordance with the rules for accreditation.