DANAK
TEST Reg.No. 2

MODTAGET
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HSH LEM

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Order no.	407180 – Rev. 1
Project no.	C004-0301
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Initials	MJLD/vem

CE 1235
EU Notified Body

Test report

This is a revised version of the original report of 2010-11-15, with added drawing in the appendix.

Test specimen: Inward opening tilt and turn door-height window, 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 2010-11-05. The test specimen was marked "407180" by the laboratory.

Method:

EN 14351-1 (2006):	Windows and doors - Product standard, performance characteristics - Part 1: Windows and external pedestrian doorsets without resistance to fire/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 2010-11-10.

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 ±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 C3 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.

2011-04-08, Danish Technological Institute, Building Technology, Aarhus

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Description of test specimen

The test specimen consists of a tilt and turn door-height window made of aluminium with thermal barrier, see drawings in appendix 1.

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

Width [mm]	Height [mm]	Area [m²]	Length of joint [m]	Temperature [°C]	Atmospheric pressure [hPa]
1450	2350	3.41	7.50	21.0	980

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

Product name	Millennium
Gaskets	See app. 1
IGU	See app. 1
Hardware	Winkhaus GmbH & Co. KG

Window during testing

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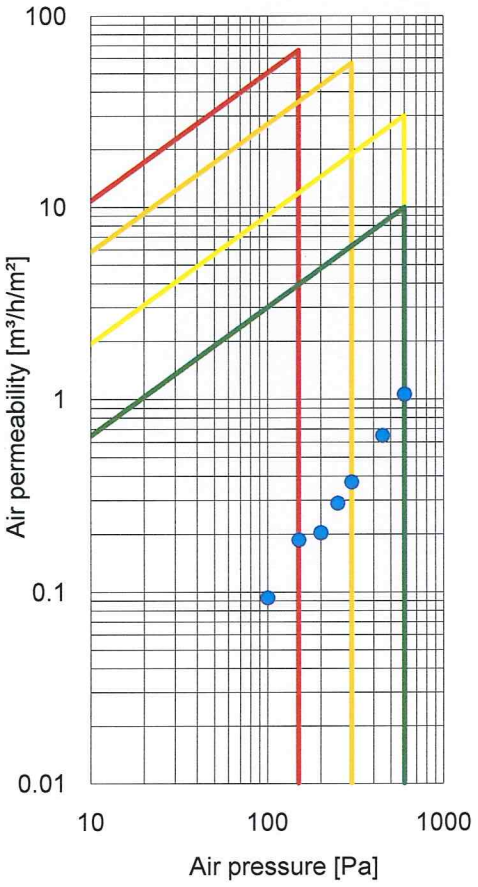
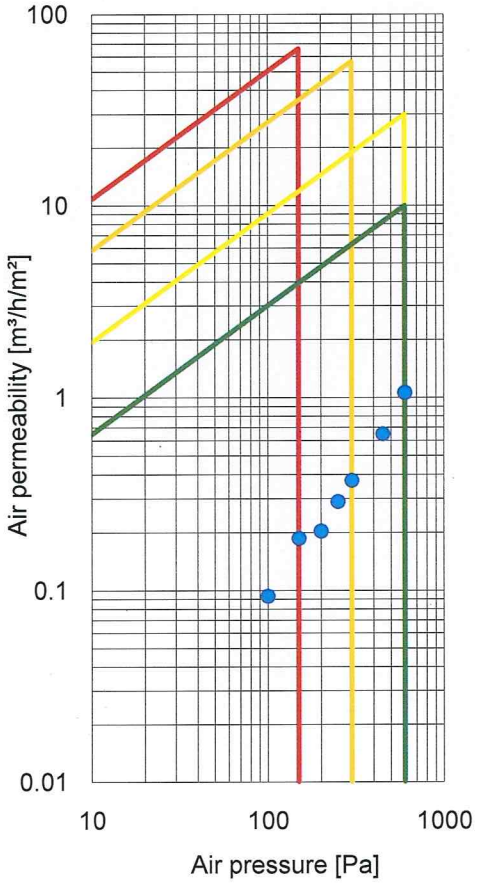
Test results – Air permeability – Positive air pressure

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	0.00	0.00	0.00	4	4
100	0.32	0.09	0.04	4	4
150	0.64	0.19	0.08	4	4
200	0.71	0.20	0.10	4	4
250	0.99	0.29	0.13	4	4
300	1.29	0.37	0.17	4	4
450	2.21	0.65	0.29	4	4
600	3.62	1.06	0.48	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

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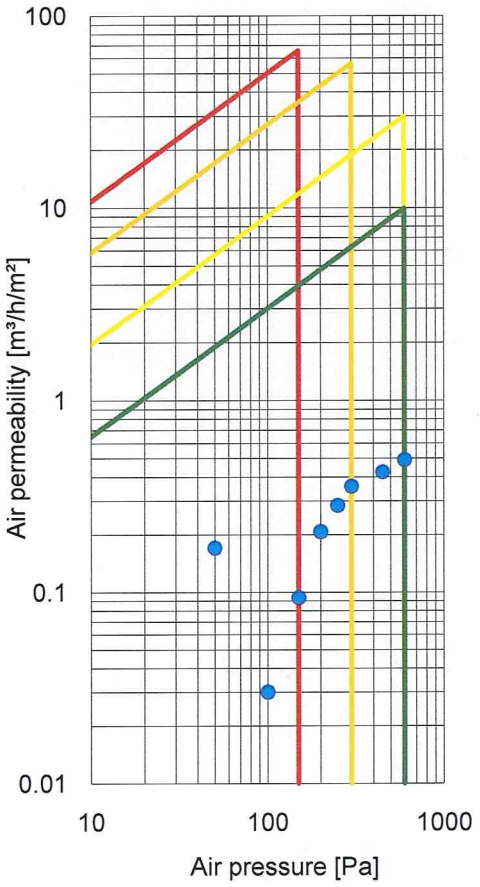
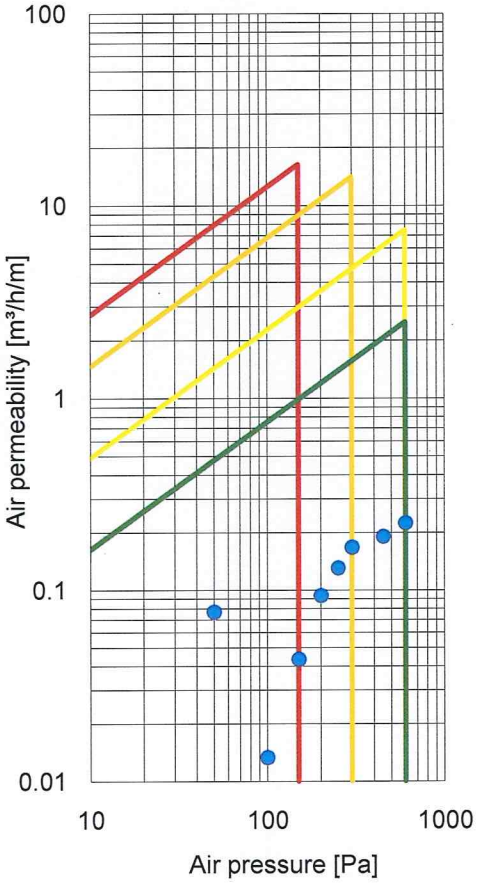
Test results – Air permeability – Negative air pressure

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	0.58	0.17	0.08	4	4
100	0.10	0.03	0.01	4	4
150	0.32	0.09	0.04	4	4
200	0.71	0.21	0.09	4	4
250	0.96	0.28	0.13	4	4
300	1.22	0.36	0.17	4	4
450	1.45	0.42	0.19	4	4
600	1.67	0.49	0.22	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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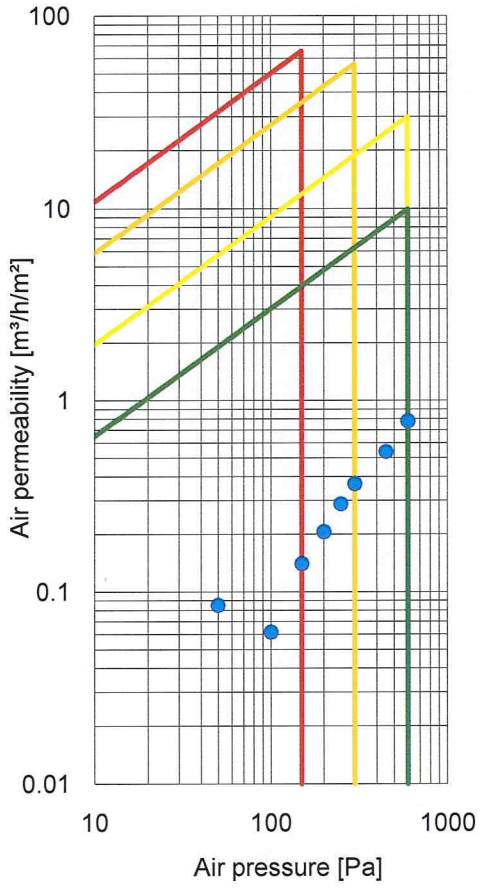
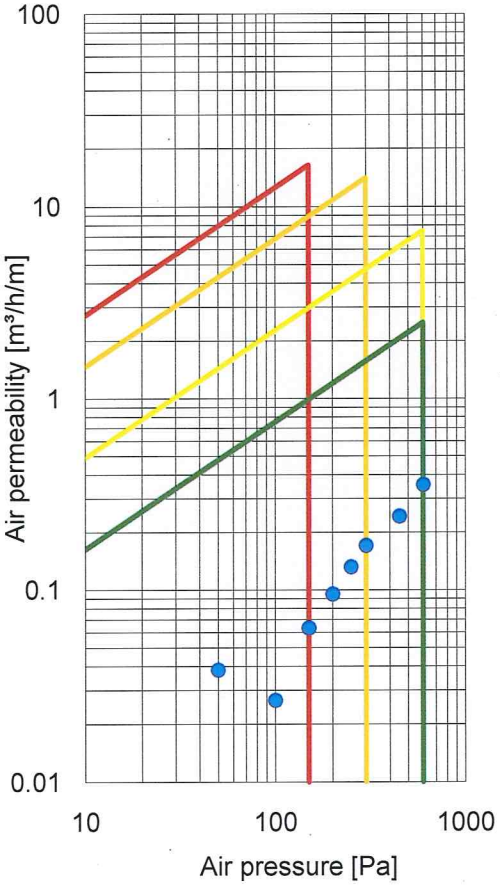
Test results – Average air permeability

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	0.29	0.08	0.04	4	4
100	0.21	0.06	0.03	4	4
150	0.48	0.14	0.06	4	4
200	0.71	0.20	0.09	4	4
250	0.98	0.29	0.13	4	4
300	1.25	0.36	0.17	4	4
450	1.83	0.53	0.24	4	4
600	2.65	0.77	0.35	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
750	5	No water penetration	E750
900	5	No water penetration	E900
1050	5	No water penetration	E1050
1200	5	No water penetration	E1200

Window during testing

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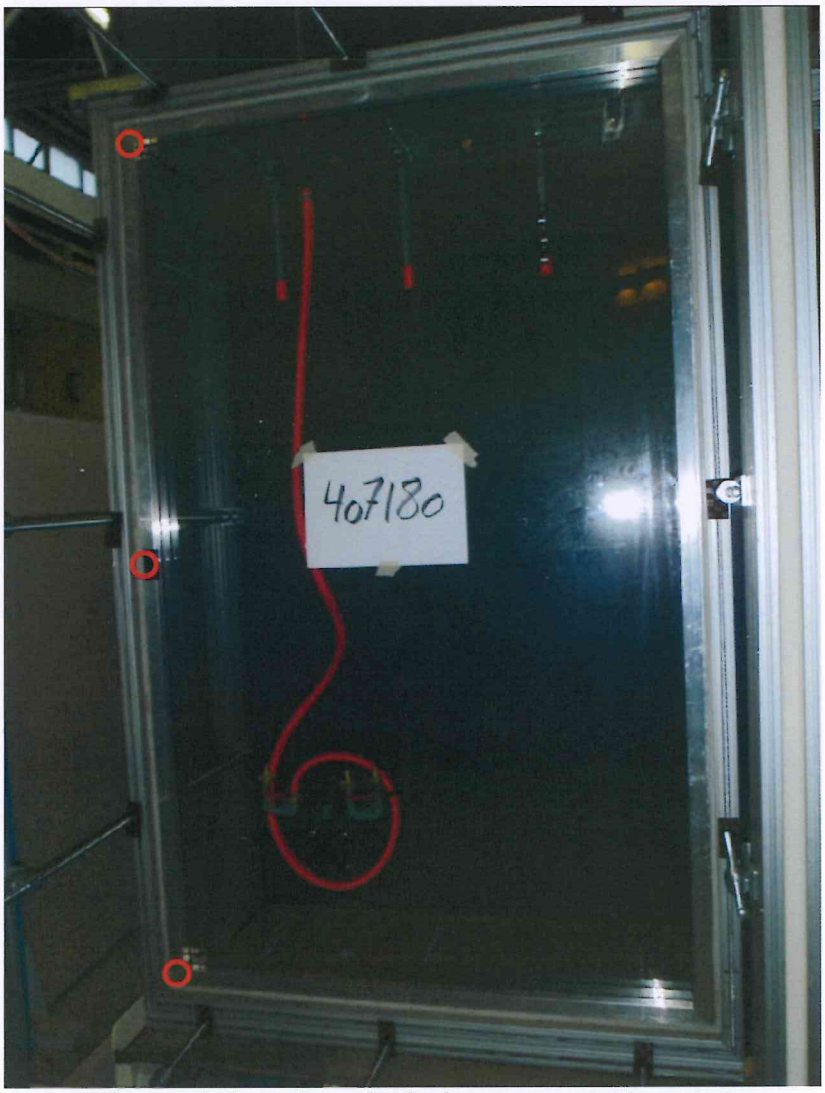
Test results – Wind load

Deflection test

Air pressure - P1	Displacement		Relative frontal deflection		Class
	Positive pressure	Negative pressure	Positive pressure	Negative pressure	
[Pa]	[mm]	[mm]	[-]	[-]	[-]
± 1200	0.8	1.0	1/2838	1/2270	C3



The red circles indicate the displacement measuring points

Pulsating air pressure test

Air pressure - P2	Observations during testing
[Pa]	[-]
± 600	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]	[-]
± 1800	The specimen remained closed and no damage or operating defects were observed.

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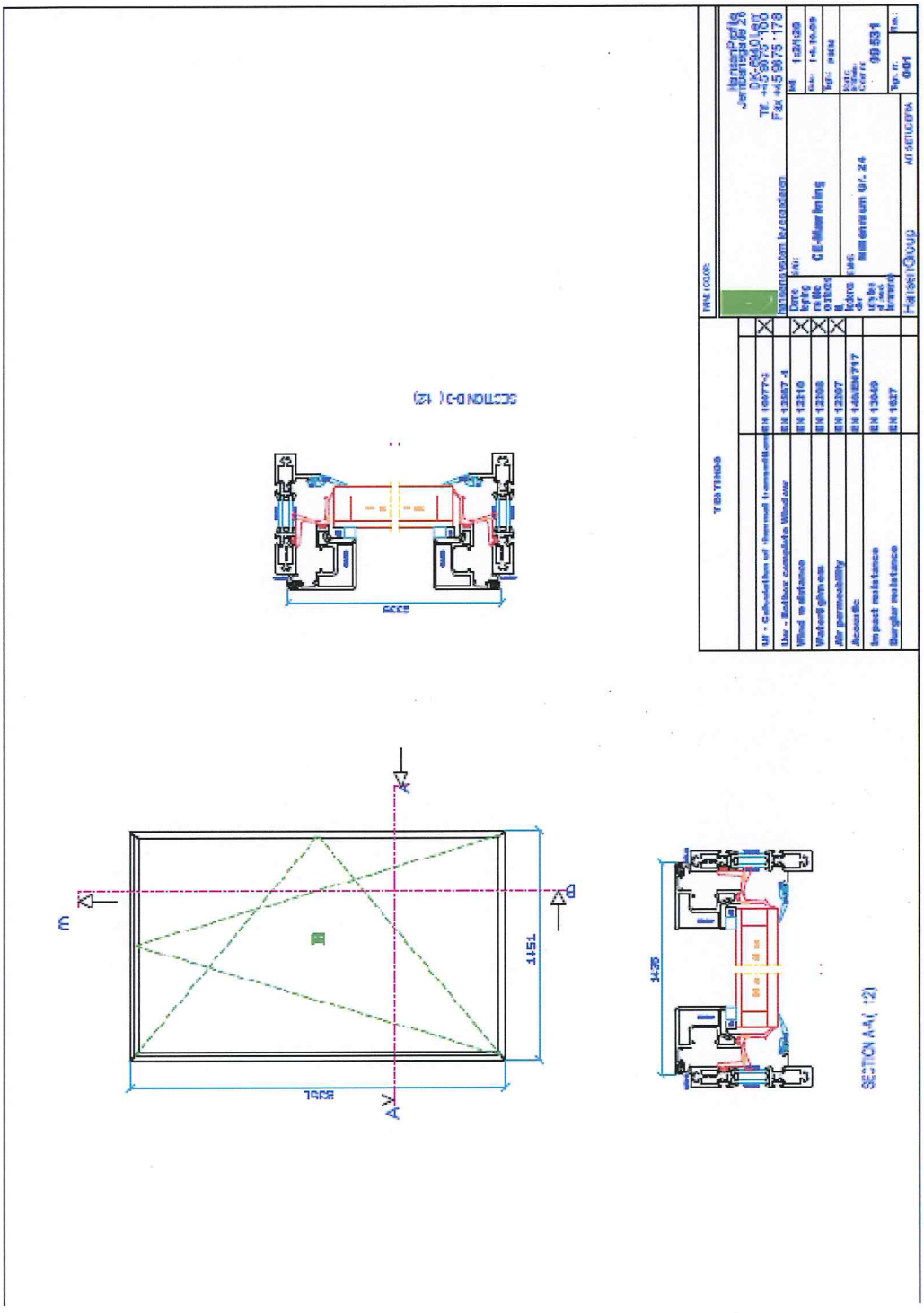

Section of window

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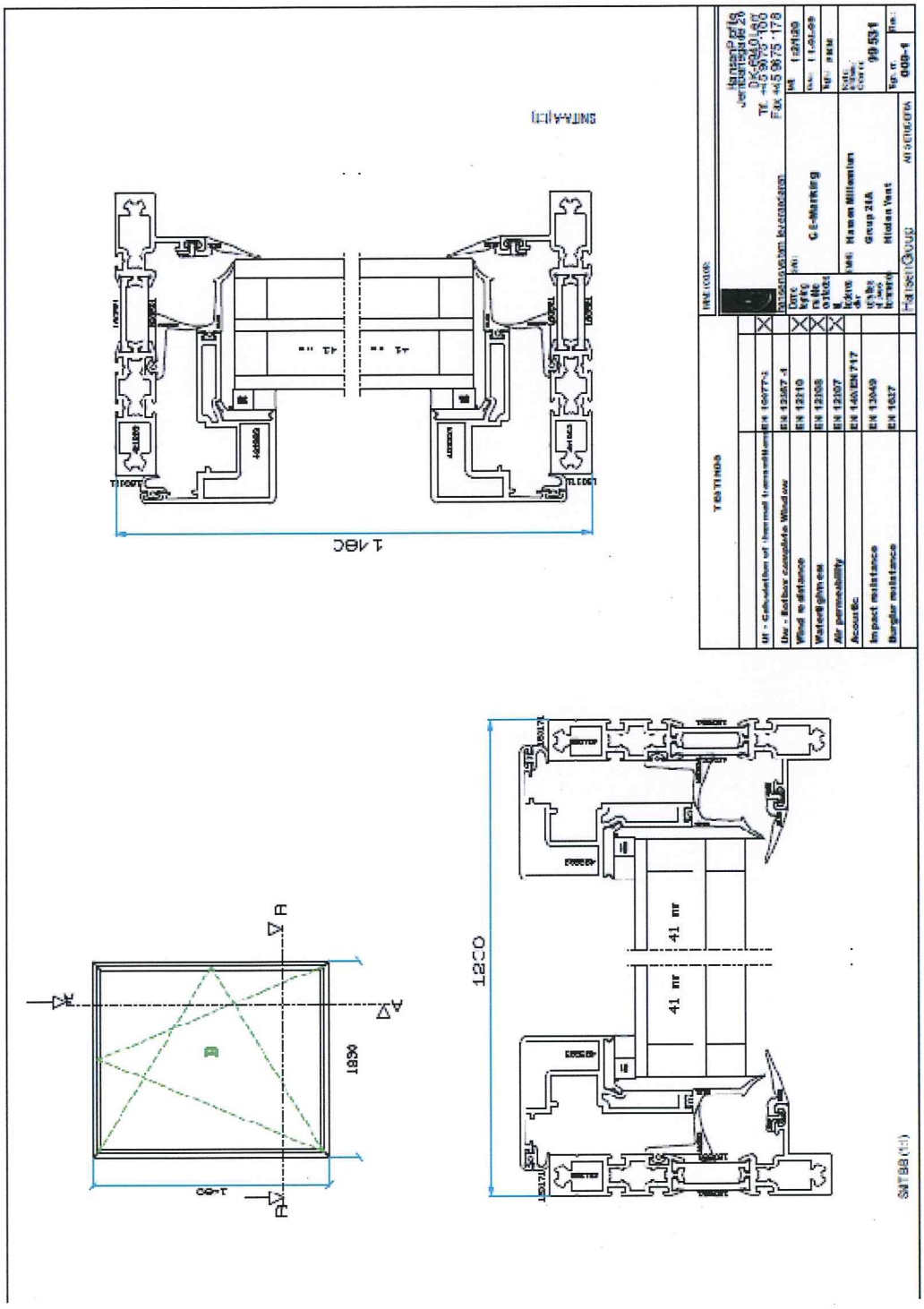

Section of window of another size, but with the same profile system

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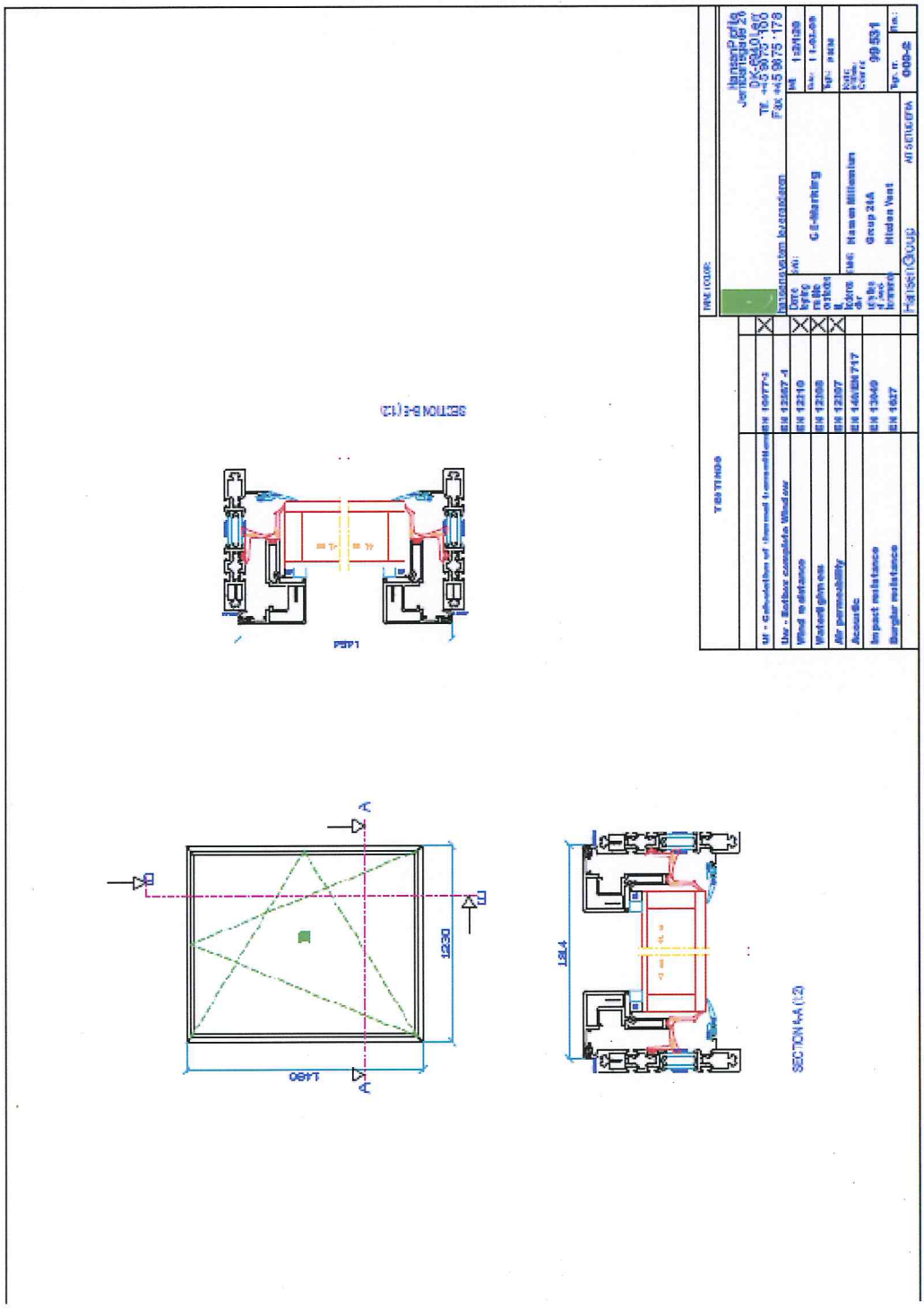

Section of window of another size, but with the same profile system

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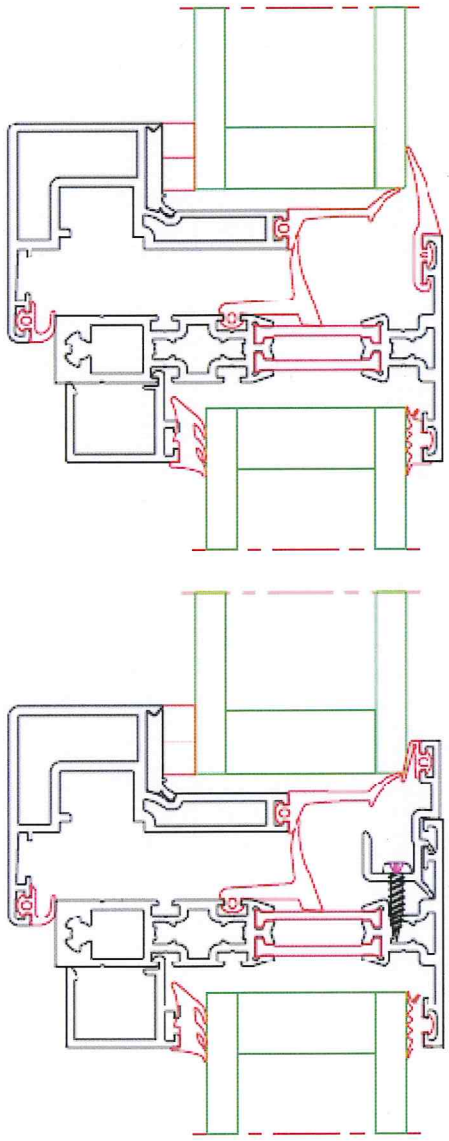
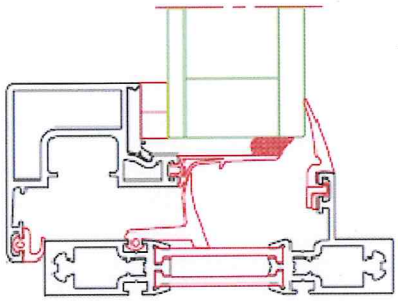
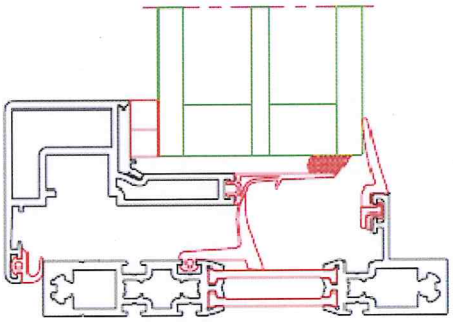


Section of window with the same weather stripping system, but with another glazing bead



G30

Samme tætninger som G24
men med 30mm Isolator



G30A

Samme tætninger som G24A
men med 30mm Isolator

Section of window with the same weather stripping system, but with another insulator (drawing added in this version of the report)

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.