



Stichting Kwaliteit Gevelbouw

<b>Report number</b>	<b>10.1019 AS</b>	<i>bezoekadres</i> Nieuwe Kanaal 9F Wageningen
<b>Inspection date</b>	<b>28 May 2010</b>	
<b>Report date</b>	<b>4 April 2011</b>	<i>postadres</i> Postbus 362 6700 AJ Wageningen
<b>Requesting party</b>	<b>REYNAERS ALUMINIUM NV</b> Oude Liersebaan 266 B-2570 DUFFEL Belgium	T 0317 - 421 720 F 0317 - 421 677 E info@skg.nl I www.skg.nl
<b>Scope of the report</b>	This report comprises 6 pages and 1 annex	ABN-AMRO 50.84.85.800  IBAN.NR NL 33ABNA0508485800
<b>Subject</b>	Report on a test rig prototype inspection of a Reynaers Aluminium NV aluminium tilt and turn window with two fixed windows measuring 2850 x 2680 mm, manufactured from the CS 77-profile system.	BIC-CODE ABNANL2A  KVK Den Haag 41149617
<b>Inspector</b>	<i>ir.</i> J.Th. Rutgers	BTW nummer 004465520 B01
<b>Executive inspector</b>	<i>ing.</i> M. Boom	
<b>Conclusion</b>	The window of REYNAERS ALUMINIUM NV gives performances with regard to: <ul style="list-style-type: none"><li>• Deflection: <b>&gt; span/250 at 1500 Pa;</b></li><li>• Air infiltration at 75 resp. 150 Pa: <b>&lt; 1.0 L/s.m<sup>2</sup> resp. &lt; 1.6 L/s.m<sup>2</sup>;</b></li><li>• Air infiltration at - 75 resp. -150 Pa: <b>&lt; 1.0 L/s.m<sup>2</sup> resp. &lt; 1.6 L/s.m<sup>2</sup>;</b></li><li>• Water penetration resistance: <b>N6, C4 (1500 Pa);</b></li><li>• Ultimate strength test: <b>N4 (3000 Pa).</b></li></ul>	

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Eriend door de Raad voor Accreditatie



Lid ENOTA (European Organisation for Technical Approvals)

Notified Body  
NB 0960



## 1. Objective of the test

SKG was requested by Reynaers Aluminium NV of Duffel, the Belgium, to perform a test rig routine on an aluminium window with the objective of establishing the air permeability, water tightness and wind load resistance of the aluminium window and to classify in conformity with applicable Australian Standards.

The results of this test are intended for rating windows as referred to in **AS 2047: 1999, incl. Amdt 1: 2001, incl. Amdt 2: 2001** and are suitable for reference in the Building Code of Australia (BCA) as a Standard for regulatory reference.

For testing windows and doors SKG is registered in Europe as a Notified Body, namely NB 0960 and has a laboratory accreditation from the Dutch Accreditation Council (RvA). The National Association of Testing Authorities (NATA) and the Dutch Accreditation Council (RvA) are both full members of the International Laboratory Accreditation Cooperation (ILAC) and therefore considered competent for performing the requested tests.

## 2. Project details

The window of Reynaers Aluminium NV as tested by SKG was manufactured from the CS 77 profile system (Reynaers project nr. TC 10-043).

Drawings of the window were forwarded to us and are attached to this report.

The tilt and turn window was supplied with a Sobinco Chrono tilt and turn hardware with totally 9 locking points. Glazing: insulating glass unit 6-15-66.2.

## 3. Accountability and methodology

The aluminium window presented for testing and assessment was tested in a test rig on:

- **Deflection test:** tested in accordance with AS 4420.2: 1996;
- **Air infiltration test:** tested in accordance with AS 4420.4: 1996;
- **Water penetration resistance test:** tested in accordance with AS 4420.5: 1996 and
- **Ultimate strength test:** tested in accordance with AS 4420.6: 1996.

The tests were performed using a calibrated test rig and measuring equipment of Reynaers Aluminium NV situated in Duffel, Belgium, (calibrated on 11 May 2010) in conformity with the standards mentioned above.

The ambient temperature during tests was approx. 20 °C.

The air pressure was approx. 1015 hPa.

The air humidity was approx. 49 %.

Pre-loading: The test sample was operated five (5) times prior to the commencement of testing.



**4. Observations and results**

**4.1 Resistance to wind load: AS 4420.2**

Table 1 show the horizontal bending in mm over the normative span in response to various degrees of positive key pressure (pressure on the window). The normative span is 2600 mm.

Pressure in Pa (N/m <sup>2</sup> ) positive	V1	V2	V3	Bending in mm	Deflection/ span ratio
0	0.00	0.00	0.00	0.00	0
375	1,80	0,53	0,45	0,60	4333
750	3,98	1,28	0,90	1,16	2241
1125	6,00	1,95	1,43	1,76	1477
1500	8,25	2,78	1,88	2,29	1135
0	0.00	0.00	0.00	0.00	0

Table 1

Table 2 show the horizontal bending in mm over the normative span in response to various degrees of negative key pressure.

Pressure in Pa (N/m <sup>2</sup> ) negative	V1	V2	V3	Bending in mm	Deflection/ span ratio
0	0.00	0.00	0.00	0.00	0
- 375	1,95	0,60	0,60	0,68	3824
- 750	4,05	1,28	1,20	1,35	1926
- 1125	6,08	1,88	1,80	2,06	1262
- 1500	8,10	2,48	2,33	2,74	949
0	0.00	0.00	0.00	0.00	0

Table 2

Building type	Max deflection ratio	Serviceability design wind pressure
housing	1:150	1500 Pa
residential	1:180	1500 Pa
commercial	1:250	1500 Pa

Table 3

**Rating: Suitable for housing, residential and commercial buildings**



**4.2 Air infiltration test: AS 4420.4**

The results of the air permeability measurements under positive key pressure are shown in table 4.

Note:

Table 4 also shows the air loss in L/s and L/sm<sup>2</sup>; the surface of the tested window was 7.6 m<sup>2</sup>.

Pressure in Pa (N/m <sup>2</sup> )	L/s	L/sm <sup>2</sup>
75	0.23	0.03
150	0.39	0.05

Table 4

The results of the air permeability measurements under negative key pressure are shown in table 5.

Pressure in Pa (N/m <sup>2</sup> )	L/s	L/sm <sup>2</sup>
-75	0.23	0.03
-150	0.36	0.05

Table 5

Results:

- Air permeability based on overall area at 75 Pa:
- Air permeability based on overall area at 150 Pa:
- Air permeability based on overall area at -75 Pa:
- Air permeability based on overall area at -150 Pa:

$Q_{75} = 0.03 \text{ L/sm}^2$ , and  
 $Q_{150} = 0.05 \text{ L/sm}^2$ , and  
 $Q_{-75} = 0.03 \text{ L/sm}^2$ , and  
 $Q_{-150} = 0.05 \text{ L/sm}^2$

**Air infiltration test for air conditioned building type: Passed**  
(Maximum air infiltration < 1.0 L/sm<sup>2</sup> resp. < 1.6 L/sm<sup>2</sup>)



**4.3 Water penetration resistance test: AS 4420.5**

The results of the water tightness test are shown in table 6.

Note:

The amount of water used for spraying the window was **1370** litre per hour (0.05 L/m<sup>2</sup>.s).

Pressure in Pa (N/m <sup>2</sup> )	Time in minutes	Water leakage
0	5	No
1500	15	No

Table 6

Result:

The tested window was watertight up to a pressure of **1500 Pa** without uncontrolled penetration of water.

No failure has occurred during this test.

**Rating: This window can be classified for water penetration resistance in: N6, C4**

**4.4 Ultimate strength test: AS 4420.6**

The window was loaded to a positive and a negative key pressure of **3000 Pa**.

It was established that the window did not show any signs of distortion.

**Rating: This window can be classified for ultimate strength in: N4**



**5. Classification**

<b>Deflection</b>	<b>&gt; span/250 Housing, residential and commercial buildings</b>
<b>Air infiltration at - / + 75 Pa resp. - / + 150 Pa</b>	<b>&lt; 1.0 L/s.m<sup>2</sup> resp. &lt; 1.6 L/s.m<sup>2</sup> Air-conditioned buildings</b>
<b>Water penetration resistance</b>	<b>N6, C4 (1500 Pa)</b>
<b>Ultimate strength</b>	<b>N4 (3000 Pa)</b>

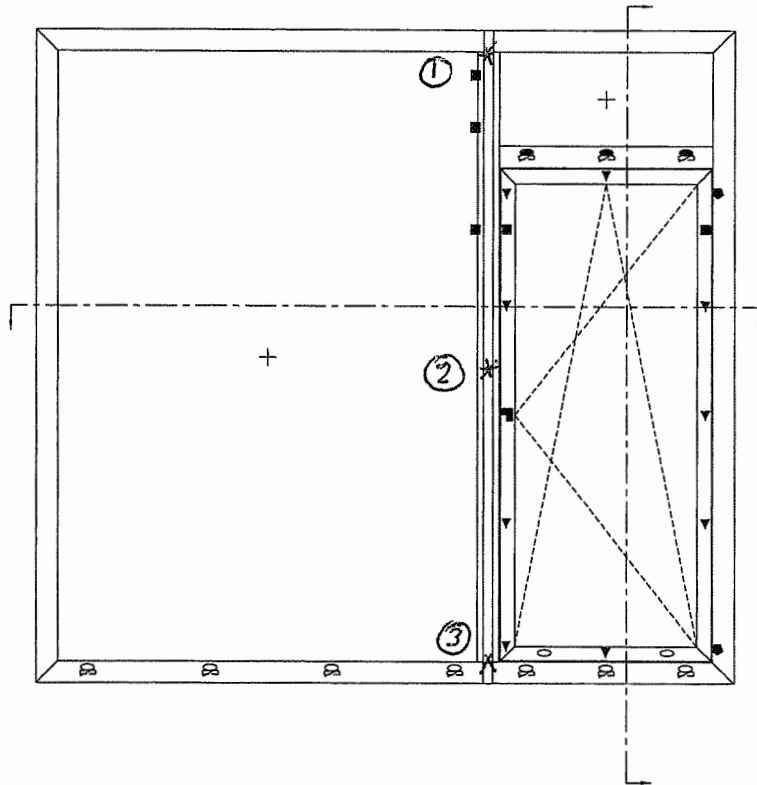
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Drawn up at Wageningen, the Netherlands, dated 4 April 2011



ir. J.Th. Rutgers, sector manager

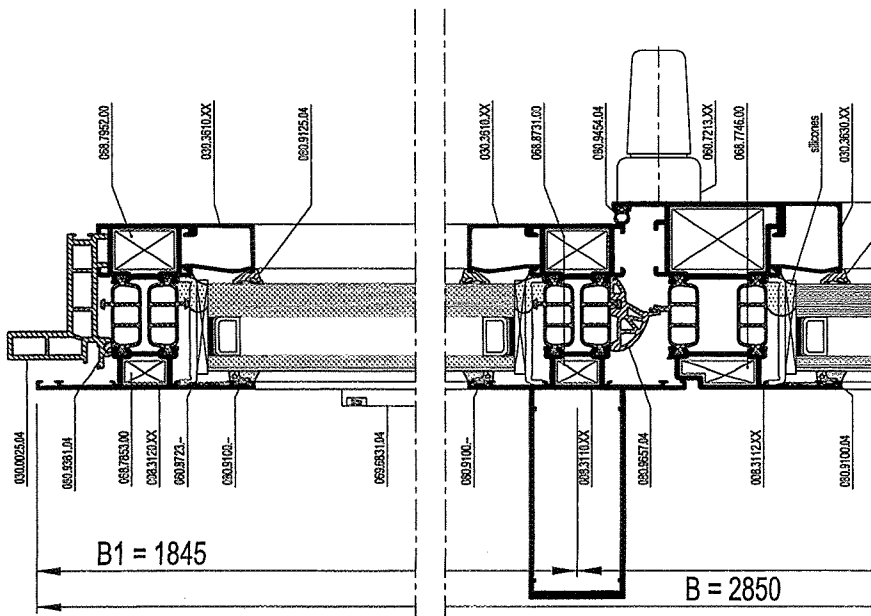
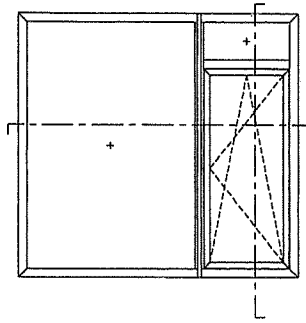
Annex 1: 3 drawings of the window (stamped by SKG).



- Decompression outer frame 50mm
- Decompression in vent and fixed panel Ø5mm
- Drainage vent slotted hole 5x15mm
- Drainage outer frame slotted hole 6x34mm
- ⊞ weaphole cover without membrane
- ▼ Locking points
- ☞ Handle
- ⚙ Hinges

CS 77  
RI Test - project TR - Nerimanov

composed window - test AWW

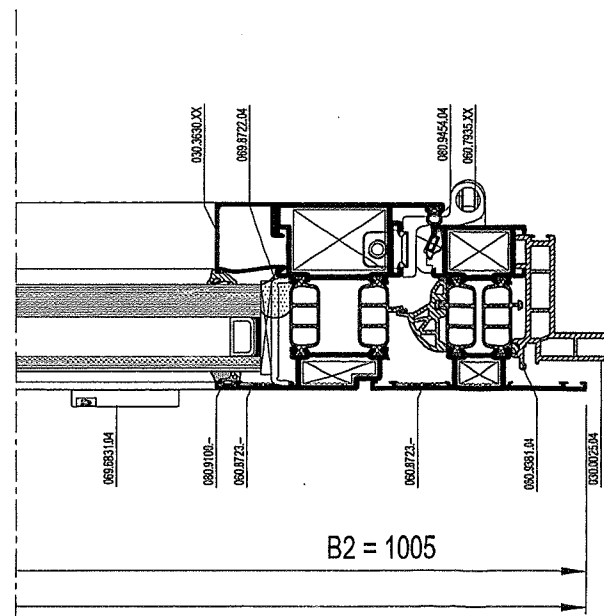


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30/3/2010

CS 77  
RI Test - project TR - Nerimanov

composed window - test AWW



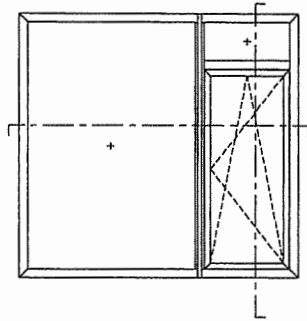
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CS 77  
RI Test - project TR - Nerimanov

composed window - test AWW



CS 77  
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