



Instytut Techniki Budowlanej
ZESPÓŁ LABORATORIÓW BADAWCZYCH
akredytowany przez Polskie Centrum Akredytacji
certyfikat akredytacji
nr AB 023



AB 023

BUILDING HARDWARE AND IRONMONGERY DEPARTMENT
BUILDING HARDWARE AND IRONMONGERY LABORATORY

1486/13/R05OWN TEST REPORT VALIDATION NO. LOW-661.1/P/2009

Client: GAMET S.A.

Client address: ul. Kociowska 22
87-100 Toruń

Information on tested products

Tested product: Door furniture sets
name, description, condition and marking
Tested product received: 29/10/2009
Tested product received for validation: 13/09/2011
Tested product receipt report no.: LOW-661/2009
Tested product validation receipt report no.: LOW01-1486/11/R02OWN
Tested product receipt procedure: PZ ZLB 18

Information on testing

Start date: 29/10/2009
End date: 24/11/2009
Validation start date: 15/09/2011
Validation end date: 16/09/2011

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1. Information on product and testing

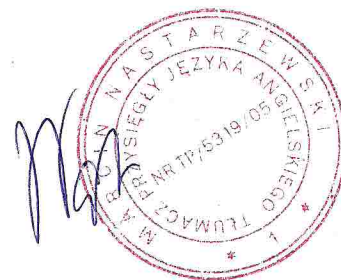
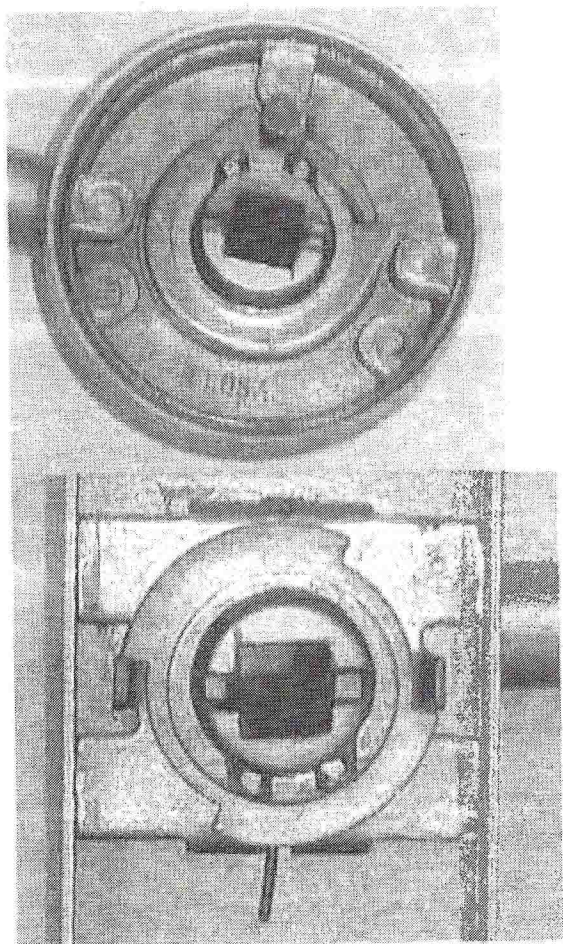
1.1. Tested product

The tests were carried out on Basic Line door furniture sets for internal doors. The sets include a pair of handles with backplates or a pair of handles with escutcheons and cylinder lock or key escutcheons. Each door handle is spring loaded.

Tested product markings:

- door furniture with backplates DH-97A-14S-N-72 (marking LOW-661-9-1-1÷2)
- door furniture with backplates DH-98A-15S-N-72 (marking LOW-661-9-2-1÷2)
- door furniture with backplates DH-98A-15S-Y-72 (marking LOW-661 -9-3-1÷2)
- door furniture with escutcheons DH-96A-24Z (marking LOW-661-9-4-1÷3)
- door furniture with escutcheons DH-97A-24Z (marking LOW-661-9-5-1)
- door furniture with escutcheons DH-98A-24Z (marking LOW-661-9-6-1÷3)
- door furniture with escutcheons DH-99A-24Z (marking LOW-661-9-7-1)
- cylinder lock escutcheons PLT-25Z-Y (marking LOW-661-9-8-1÷2)
- key escutcheons PLT-25Z-N (marking LOW-661-9-9-1÷2)

The door furniture received for testing has two types of spring mechanism (different for the escutcheons and backplates), shown below:



The following products has been received for the test report validation (product marking in parentheses):

- door furniture with backplates DH-98A-15S-Y-72 (marking LOW-1486-11-R02-1-1÷2)
- door furniture with escutcheons DH-96A-24Z (marking LOW-1486-11-R02-2-1÷3)
- door furniture with escutcheons DH-98A-24Z (marking LOW-1486-11-R02-3-1÷3)

1.2. Test documentation

1.2.1. Relevant documents:

PN-EN 1906:2012 Building hardware. Lever handles and knob furniture. Requirements and test methods.

1.2.2. Test methods and procedures:

PN-EN 1906:2012 Building hardware. Lever handles and knob furniture. Requirements and test methods.
PN-EN 13018:2004 Non-destructive testing. Visual testing. General principles.

1.2.3. Related documents:

PN-EN 1670:2008 Building hardware. Corrosion resistance. Requirements and test methods.
PN-76/H-04603 Metal corrosion. Accelerated laboratory tests in inert salt mist.

2. Test results

2.1. Check of spindle and fastening elements

2.1.1. Requirements as per PN-EN 1906:2012, Clause 5.2.

2.1.2. Test method as per PN-EN 13018:2004.

2.1.3. Measuring devices, apparatus and instruments

Luxmeter LOW-184.

2.1.4. Test results

The spindle and fastening elements are included with each door furniture set. The escutcheons and backplates are fixed to the doors with wood screws. The escutcheons include a base escutcheon and a decorative plate. The spindles feature a joint adjustment. All handles are spring-loaded.

2.2. Rotational torque strength

2.2.1. Requirements as per PN-EN 1906:2012, Clause 5.3.

2.2.2. Test method as per PN-EN 1906:2012, Clause 7.3.12.

2.2.3. Measuring devices, apparatus and instruments

Tester LOW-113, dial gauge LOW-141, stopwatch LOW-053, digital caliper LOW-158.



2.2.4. Test results

Initial 1 Nm torque was applied to LOW-661-9-3-2 and the value was read. The torque was increased gradually to 30 Nm, maintained by 60 seconds and reduced gradually to its initial value. The measurement was repeated. Plastic strain in the distance of 50 mm from the rotation axis was 1.2 mm and did not exceed the limit values. Similar tests were carried out on LOW-661-9-4-3 and LOW-661-9-6-2. Plastic strain was 1.6 mm and 1.4 mm, respectively and did not exceed the limit values. The test did not show any damage to components, the handles were functioning properly.

2.3. Axial strength of lock furniture or latch furniture and fixing

2.3.1. Requirements as per PN-EN 1906:2012, Clause 5.4.

2.3.2. Test method as per PN-EN 1906:2012, Clause 7.3.2.

2.3.3. Measuring devices, apparatus and instruments

Tester LOW-114 with force gauge LOW-048, stopwatch LOW-053, digital caliper LOW-158.

2.3.4. Test results

LOW-661-9-3-2 was fixed to a test block of LOW-114 tester. Initial 15 N load was applied to the handle in the distance of 50 mm from the rotation axis and the value was read. The force (500 N) was gradually applied outwards perpendicular to the backplate. After 60 seconds, the force was reduced to its initial value. The measurement was repeated. Plastic strain in the distance of 75 mm from the rotation axis was 1.8 mm and did not exceed the limit value of 2 mm. Similar tests were performed on LOW-661-9-4-3 and LOW-661-9-6-2. Plastic strain was 1.6 and 1.9 mm, respectively and did not exceed the limit values. The test did not show any damage to components, the handles were functioning properly.

2.4. Free play

2.4.1. Requirements as per PN-EN 1906:2012, Clause 5.5.1.

2.4.2. Test method as per PN-EN 1906:2012, Clause 7.3.3.

2.4.3. Measuring devices, apparatus and instruments

Test block, digital caliper LOW-158, force gauge LOW-042.

2.4.4. Test results

A force (15 N) perpendicular to the backplate surface was applied to a single handle, in the distance of 50 mm from its rotation axis (outwards and inwards, alternately). The total displacement in the distance of 75 mm from the rotation axis was measured. The displacement was approx. 1 mm for LOW-661-9-3-2, LOW-661-9-4-3 and LOW-661-9-6-2 and did not exceed the limit value of 10 mm.



2.5. Safety requirements

2.5.1. Requirements as per PN-EN 1906:2012, Clause 5.5.2.

2.5.2. Test method as per PN-EN 13018:2004, visual inspection.

2.5.3. Measuring devices, apparatus and instruments

Luxmeter LOW-184.

2.5.4. Test results

The door furniture sets do not have any sharp edges that may result in an injury. The screw heads do not protrude over the escutcheon or backplate surface. The design prevents fingers getting seized between the handle and the escutcheon or backplate within the full range of handle movement.

The door furniture sets do not have any sharp edges that may result in an injury. The screw heads do not protrude over the escutcheon or backplate surface. The fastening elements holding the handle and the spindle do not protrude more than 1 mm over any surface. The design prevents fingers getting seized between the handle and the backplate within the full range of handle movement.

2.6. Free angular movement

2.6.1. Requirements as per PN-EN 1906:2012, Clause 5.6.

2.6.2. Test method as per PN-EN 1906:2012, 7.3.4.

2.6.3. Measuring devices, apparatus and instruments

Test block, digital caliper LOW-158, force gauge LOW-042.

2.6.4. Test results

LOW-661-9-3-2 was fixed to a test block and one handle was locked. A 15 N force was applied to the second handle in the distance of 50 mm from its rotation axis perpendicular to the backplate. Handle displacement in the distance of 75 mm from the rotation axis was approx. 1 mm. The test was repeated for LOW-661-9-4-3 and LOW-661-9-6-2. The displacement was 1.5 and 1.3 mm, respectively and did not exceed the limit values.

2.7. Torque of return mechanism

2.7.1. Requirements as per PN-EN 1906:2012, Clause 5.7.4

2.7.2. Test method as per PN-EN 1906:2012, Clause 7.3.5.3.

2.7.3. Measuring devices, apparatus and instruments

Tester LOW-150, force gauge LOW-042.

2.7.4. Test results

The handle with the backplate was fixed to a test block. A torque sufficient to displace the handle in the normal direction by a structurally feasible angle was applied to the spindle and the value was measured.



The results are shown in the following table:

specimen no.	torque (Nm)			
	as per	Results		
		mean value (3 measurements)		
LOW-1482-11-R02-1-1	max.1.5	1.4	1.4	1.5
		1.4		
LOW-1482-11-R02-2-1		1.3	1.4	1.4
		1.4		
LOW-1482-11-R02-3-1		1.3	1.2	1.3
		1.3		

After the torque was gradually released, the handles returned to their initial position without exceeding the limit value of $\pm 2^\circ$.

2.8. Durability of mechanism

2.8.1. Requirements as per PN-EN 1906:2012, Clause 5.8.

2.8.2. Test method as per PN-EN 1906:2012, Clause 7.3.6.

2.8.3. Measuring devices, apparatus and instruments

Test stand LOW-135, protractor LOW-003, digital caliper LOW-158.

2.8.4. Test results

LOW-661-9-3-2, LOW-661-9-4-3 and LOW-661-9-6-2 were tested. Each handle was subject to 100,000 displacement cycles. The handle was released approx. 10° before the maximum angular displacement was reached. The tests did not show any damage to components, the handles were fully functional.

2.9. Repeat test of axial strength

2.9.1. Requirements as per PN-EN 1906:2012, Clause 5.4.

2.9.2. Test method as per PN-EN 1906:2012, Clause 7.3.2.

2.9.3. Measuring devices, apparatus and instruments

Tester LOW-114 with force gauge LOW-048, stopwatch LOW-053, digital caliper LOW-158.

2.9.4. Test results

Test of axial strength was carried out as per item 2.3.4.

Door furniture LOW-661-9-3-2 - strain 1.5 mm.

Door furniture LOW-661-9-4-3 - strain 1.3 mm.

Door furniture LOW-661-9-6-2 - strain 1.2 mm

Plastic strain did not exceed the limit value (2 mm) and the handles functioned properly.



2.10. Repeat test of free play measurement

2.10.1. Requirements as per PN-EN 1906:2012, Clause 5.5.1.

2.10.2. Test method as per PN-EN 1906:2012, Clause 7.3.3.

2.10.3. Measuring devices, apparatus and instruments

Test block, digital caliper LOW-158, force gauge LOW-042.

2.10.4. Test results

Free play was measured as per item 2.4.4.

Door furniture LOW-661-9-3-2 - displacement 1.4 mm.

Door furniture LOW-661-9-4-3 - displacement 1.3 mm.

Door furniture LOW-661-9-6-2 - displacement 1.3 mm.

The displacement did not exceed the limit value of 10 mm.

2.11. Repeat test of measurement of free angular movement

2.11.1. Requirements as per PN-EN 1906:2012, Clause 5.6,

2.11.2. Test method as per PN-EN 1906:2012, Clause 7.3.4.

2.11.3. Measuring devices, apparatus and instruments

Test block, digital caliper LOW-158, force gauge LOW-042.

2.11.4. Test results

Free angular movement was measured as per item 2.6.4.

Door furniture LOW-661-9-3-2 - displacement 2.1 mm.

Door furniture LOW-661-9-4-3 - displacement 2.4 mm.

Door furniture LOW-661-9-6-2 - displacement 2.2 mm.

The displacement did not exceed the limit value of 10 mm.

2.12. Repeat test of torque of return mechanism

2.12.1. Requirements as per PN-EN 1906:2012, Clause 5.7.4.

2.12.2. Test method as per PN-EN 1906:2012, Clause 7.3.5.3.

2.12.3. Measuring devices, apparatus and instruments

Tester LOW-150, force gauge LOW-042.

2.12.4. Test results:

The torque was measured as per item 2.7.4.

Specimen no.	torque (Nm)	
	as per	mean value (3 measurements)
LOW-661-9-3-2	max.1.5	1.3
LOW-661-9-4-3		1.4
LOW-661-9-6-2		1.0



After the torque was gradually released, the handles returned to their initial position without exceeding the limit value of $\pm 2^\circ$.

2.13. Corrosion resistance

2.13.1. Requirements as per PN-EN 1906:2012, Clause 5.14.

2.13.2. Test method as per PN-EN 1906:2012, Clause 7.4.

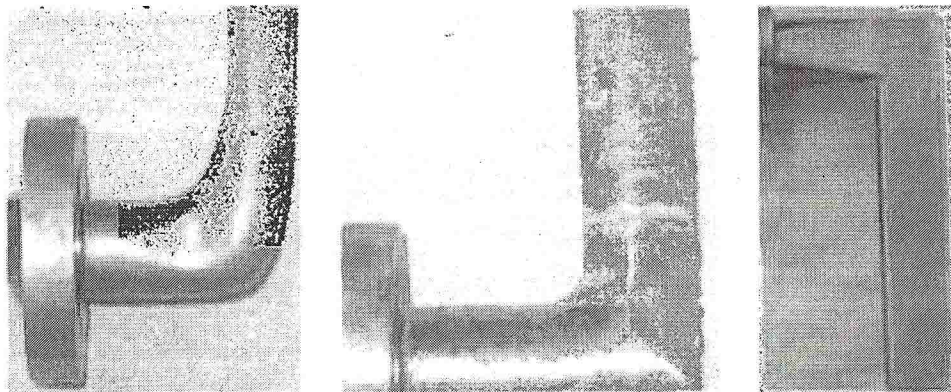
2.13.3. Measuring devices, apparatus and instruments

Visual inspection, corrosion test chamber LOW-064.

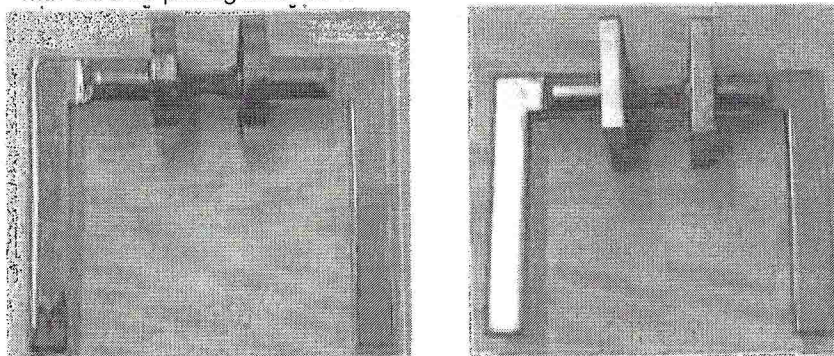
2.13.4. Test results

The door furniture was tested for corrosion resistance in inert salt mist. All surfaces visible during operation were checked. No corrosion was observed after 24 hours on any door furniture. Corrosion was observed after 48 hours on nickel plated door furniture: G0006, G0007 and G00AB. No corrosion was observed after 96 hours on chrome plated door furniture: G0004 and G0008. The nickel plated door furniture meets Class 1 corrosion resistance requirements, and the chrome plated door furniture meet Class 3 corrosion resistance requirements. The illustrations show specimens after testing:

-with nickel plating after 48 h



- with chrome plating after 96 h



3. Classification

Door furniture with nickel plating:

2	6	-	0	0	1	0	B
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Door furniture with chrome plating:

2	6	-	0	0	3	0	B
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Tested by
mgr Krzysztof Matysek
/-/ illegible signature

mgr inż. Stefan Nowakowski
/-/ illegible signature
Signature

Authorized by
mgr inż. Wojciech Kujawski
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LOW-661.1/P/2009 report issue date
LOW-661.1/P/2009 test report validation date

Poznań, 24.11.2009
Poznań, 09.05.2013

The Research Laboratory hereby declares that the test results apply to the tested product only. The report may be reproduced as a whole, and may not be reproduced in part without a written permission of the Research Laboratory. The report is not a permission for sale or use in the building industry.

The validation involves analysis of changes in test methods due to the release of PN-EN 1906:2012 replacing PN-EN 1906:2010. The previous report version issued on 24/11/2009 was based on PN-EN 1906:2003. The validation was based on a test report no. LOW-661.1/P/2009 checked for conformity with PN-EN 1906:2010. New standard version compared to PN-EN 1906:2010 does not introduce any changes within the scope of tests presented in the report. The results in 2.7 are based on the tests carried out on 15-16.09.2011 to validate the previous version of the report for conformity with PN-EN 1906:2010. The new report also updates the test method referred to in PN-EN 1906:2003 (corrosion resistance) to the test method defined in PN-EN ISO 9227:2007 as referred to in PN-EN 1906:2010.

END OF REPORT

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I, Marcin Nastarzewski, a sworn translator herewith certify the translation as being correct and conforming to a copy of the document in the Polish language.

Date: 08 January 2015

Repertory number: 15/2015

