

## KLAVER TREND

DATE DE L'ESSAI 01/02/10 AU 05/02/10

OBJET test acide peracétique et peroxyde hydrogène

Produit employé

Peroxyde hydrogène 35% nom H2O2 35%

Peroxyde hydrogène 50% nom H2O2 50%

Acide peracétique 5% + peroxyde hydrogène 30% nom APA 5%

Acide peracétique 0.04% + peroxyde hydrogène 6% nom Creedo 100 v2001

Acide peracétique 0.15% + peroxyde hydrogène 12% nom Creedo 300

Acide peracétique 0.2% + peroxyde hydrogène 18% nom Creedo 500

Après une semaine de trempage nous ne constatons pas de dégradation sur la poignée en surface.

L'intérieur a été un peu dégradé mais cela ne devrait pas se produire une fois mise en place

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## NORME EN 1906

## 1. Data concerning product and tests

## 1.1 Object of testing

– Sets of plastic lever handles : Ulna Initial marked in the laboratory with the identification number LOW-1581-10-1-x and Ulna Sensial marked with the identification number LOW-1581-10-2-x. These samples were constituted by spring-loaded lever handles fitted with floating spindling system and fastened to door leaves with screws. Spindle and fastening elements were delivered together with each set of hardware.

## 1.2 Documents concerning tests

## 1.2.1 Reference document :

– EN 1906 : 2010 „Building hardware – Lever handles and knob furniture – Requirements and test methods”.

## 1.2.2 Test procedures and methods :

– EN 1906 : 2010, 7.3.2 „Axial strength of furniture and fastening elements”.

– EN 1906 : 2010, 7.3.3 „Free play and safety”.

– EN 1906 : 2010, 7.3.4 „Free angular movement or misalignment”.

– EN 1906 : 2010, 7.3.5 „Torque of return mechanism”.

– EN 1906 : 2010, 7.3.6 „Durability of mechanism”.

– EN 1906 : 2010, 7.3.11 „Axial strength of special safety furniture”.

– EN 1906 : 2010, 7.3.12 „Rotational strength”.

– EN ISO 9227 : 2006, 3.2.2 „Corrosion resistance in neutral salt spray”.

## 1.2.3 Associated documents :

– EN 1670 : 2007 „Building hardware – Corrosion resistance – Requirements and test methods”.

## 2 Test results

## 2.1 Verification of axial strength of furniture and strength of fastening elements

2.1.1 Requirements – according to EN 1906 : 2010, 5.4.

2.1.2 Test method – according to EN 1906 : 2010, 7.3.2.

2.1.3 Test devices, apparatus and measuring means used – test apparatus for axial strength tests LOW-114 together with force gauge LOW-048, electronic timer LOW-053, electronic slide

caliper LOW-158.

## 2.1.4 Test results obtained:

The furniture LOW-1581-10-1-1 was mounted on the test block of the test apparatus LOW-114. The lever handle was subjected to the pre-load of 15 N applied at a distance of 50 mm from the axis of rotation and the reading was taken.

Next, the test force of 300 N was applied without shock in a direction away from the test block and perpendicular to it. The test force was maintained for 60 s and slowly reduced back to the pre-load value and then the reading was taken again. The permanent deformation measured at the distance of 75 mm from the axis of rotation amounted to 1,8 mm. After the test, no damages of furniture components were observed and lever handles functioned properly. The test force was increased to 500 N. The measured permanent deformation amounted to 4,2 mm and it exceeded the allowable value.

The test was repeated for the test sample LOW-1581-10-1-2. Under the applied test force of 300 N, the permanent deformation amounted to 1,7 mm.

## 2.2 Verification of free play and safety

2.2.1 Requirements – according to EN 1906 : 2010, 5.5.

2.2.2 Test method – according to EN 1906 : 2010, 7.3.3.

2.2.3 Test devices, apparatus and measuring means used – test block, electronic slide caliper LOW-158, electronic force gauge LOW-217.

## 2.2.4 Test results obtained :

The lever handles fitted to the test block have not sharp edges that can cause injury. Fastening elements that secure the lever handle to the spindle do not project above the surface by more than 1 mm after fitting. The design of the furniture does not allow to trap fingers between lever handle and the test block over the full range of rotation of the lever handle.

With the furniture LOW-1581-10-1-1 fitted to the test block, the force of 15 N was applied to one lever handle in its two positions (“at-rest” and rotated to 60°), at a point 50 mm from the axis of rotation, alternately towards and away from the test block, in a direction perpendicular to the face



of the test block. The maximum total movement measured at the point 75 mm from the axis of rotation amounted to 2,3 mm. The test was repeated for the test samples LOW-1581-10-1-2 and LOW-1581-10-1-3. The maximum total movements amounted to 2,5 mm and 2,8 mm, appropriately. All test results obtained did not exceed the allowable value.

### 2.3 Verification of free angular movement

2.3.1 Requirements – according to EN 1906:2010, 5.6.

2.3.2 Test method – according to EN 1906 : 2010, 7.3.4.

2.3.3 Test devices, apparatus and measuring means used – test block, electronic slide caliper LOW-158, electronic force gauge LOW-217.

2.3.4 Test results obtained :

The furniture LOW-1581-10-1-1 was fitted to the test block with one lever handle held against rotation. The other lever handle was rotated by the force of 15 N, applied at a point 50 mm from the axis of rotation, in a parallel plane to the face of the test block. The displacement of the lever handle at a point 75 mm from the axis of rotation amounted to 2 mm. The test was repeated for the test samples LOW 1581-10-1-2 and LOW-1581-10-1-3. The displacements amounted to 1,8 mm and 1,5 mm, appropriately. All measured displacements of the lever handles did not exceed the allowable value of 6 mm.

### 2.4 Verification of torque of return mechanism

2.4.1 Requirements – according to EN 1906:2010, 5.7.

2.4.2 Test method – according to EN 1906:2010, 7.3.5.

2.4.3 Test devices, apparatus and measuring means used – test rig for testing of return torque of lever handle LOW-150, electronic force gauge LOW-217.

2.4.4 Test results obtained :

The furniture was fitted to the test rig. The torque was applied to the spindle and measured, sufficient to rotate the lever handle in the normal operation direction, through its designed angle of rotation.

The test results obtained are shown in the table below :

Sample No	Torque values [Nm]			
	allowable	measured		
LOW-1581-10-1-1	max.1,5	1,06	1,15	1,09
LOW-1581-10-1-2		1,13	1,17	1,20

After the torque gradually was removed, lever handles returned to their original "at rest" position within  $\pm 2^\circ$ . These tests were repeated for angles of rotation between  $5^\circ$  and the designed angle of rotation. The recorded the "at-rest" position for each test interval did not exceed deviation of  $\pm 1^\circ$ .

### 2.5 Verification of durability of mechanism

2.5.1 Requirements – according to EN 1906:2010, 5.8.

2.5.2 Test method – according to EN 1906 : 2010, 7.3.6.

2.5.3 Test devices, apparatus and measuring means used – test stand for endurance tests of lever handles LOW-135, electronic slide caliper LOW-158.

2.5.4 Test results obtained :

100 000 test cycles of rotation of lever handles LOW-1581-10-1-1 and LOW-1581-10-1-2 were performed. The lever handles were released in position of  $10^\circ$  before maximum angle of rotation was reached. After the tests, no damages of any furniture components were observed and the lever handles functioned properly.

### 2.6 Repeated verification of axial strength

2.6.1 Requirements – according to EN 1906:2010, 5.9.

2.6.2 Test method – according to EN 1906 : 2010, 7.3.7.

2.6.3 Test devices, apparatus and measuring means used – test apparatus for axial strength tests LOW-114 together with force gauge LOW-048, electronic timer LOW-053, electronic slide caliper LOW-158.

2.6.4 Test results obtained :

The axial strength tests were performed as in 2.1.4.

The furniture LOW-1581-10-1-1 – the force value of 300 N – permanent deformation amounted to

1,9 mm.

The furniture LOW-1581-10-1-2 – the force value of 300 N – permanent deformation amounted to 1,9 mm..

The permanent deformations did not exceed allowable value of 2 mm and after the tests the lever handles functioned properly.

#### 2.7 Repeated verification of free play

2.7.1 Requirements – according to EN 1906 : 2010, 5.10.

2.7.2 Test method – according to EN 1906 : 2010, 7.3.8.

2.7.3 Test devices, apparatus and measuring means used – test block, electronic slide caliper LOW-158, electronic force gauge LOW-217.

2.7.4 Test results obtained :

The free play tests were performed as in 2.2.4.

The furniture LOW-1581-10-1-1 – the maximum total movements amounted to 2,3 mm.

The furniture LOW-1581-10-1-2 – the maximum total movements amounted to 2,2 mm.

The movements did not exceed allowable values.

#### 2.8 Repeated verification of free angular movement

2.8.1 Requirements – according to EN 1906 : 2010, 5.11.

2.8.2 Test method – according to EN 1906 : 2010, 7.3.9.

2.8.3 Test devices, apparatus and measuring means used – test block, electronic slide caliper LOW-158, electronic force gauge LOW-217.

2.8.4 Test results obtained :

The tests of free angular movement were performed as in 2.3.4.

The furniture LOW-1581-10-1-1 – displacement of 2,0 mm.

The furniture LOW-1581-10-1-2 – displacement of 1,9 mm.

The displacements did not exceed allowable values.

#### 2.9 Repeated verification of torque of return mechanism

2.9.1 Requirements – according to EN 1906 : 2010, 5.12.

2.9.2 Test method – according to EN 1906 : 2010, 7.3.10.

2.9.3 Test devices, apparatus and measuring means used – test rig for testing of return torque of lever handle LOW-150, electronic force gauge LOW-217.

2.9.4 Test results obtained :

The tests of return torque were performed as in 2.4.4.

Sample No	Torque values [Nm]			
	allowable	measured		
LOW-1581-10-1-1	max.1,5	1,10	1,13	1,15
LOW-1581-10-1-2		1,16	1,16	1,19

After the torque gradually was removed, lever handles returned to their original "at rest" position within  $\pm 2^\circ$ . These tests were repeated for angles of rotation between  $5^\circ$  and the designed angle of rotation. The recorded the "at-rest" position for each test interval did not exceed deviation of  $\pm 2^\circ$ .

#### 2.10 Verification of axial strength of special safety furniture

2.10.1 Requirements – according to EN 1906:2010, 5.13.

2.10.2 Test method – according to EN 1906:2010, 7.3.11.

2.10.3 Test devices, apparatus and measuring means used – test apparatus for axial strength tests LOW-114 together with force gauge LOW-048, electronic timer LOW-053, electronic slide caliper LOW-158.

2.10.4 Test results obtained :

The lever handles LOW-1581-10-1-1 and LOW-1581-10-2-1 were mounted on the test block of the test apparatus LOW-114. The force up to 1500 N was applied to lever handle at a point 50 mm from the axis of rotation, away from the test block, in a direction perpendicular to the face of the test block. When the force was increased, under loading of 650 N the fastening elements were



extracted from the test block. These tests were repeated for samples LOW-1581-10-1-2 and LOW-1581-10-2-2 and obtained test results were identical.

#### 2.11 Verification of rotational torque strength

2.11.1 Requirements – according to EN 1906:2010, 5.3.

2.11.2 Test method – according to EN 1906:2010, 7.3.12.

2.11.3 Test devices, apparatus and measuring means used – Test apparatus for rotational torque strength test LOW-113, dial gauge LOW-018, electronic timer LOW-053, electronic slide caliper LOW-158.

2.11.4 Test results obtained :

The lever handle LOW-1581-10-1-1 was mounted on the test block and fitted to the test apparatus LOW-113. The lever handle was subjected to the pre-torque of 1 Nm and the reading from a dial gauge was taken. Next, the torque of 30 Nm was applied without shock, maintained for 60 s and slowly reduced back to the pre-load value and then the reading was taken again. The permanent deformation measured at the distance of 50 mm from the axis of rotation amounted to 3,7 mm and it did not exceed the allowable value of 5 mm. After the test, no damages of furniture components were observed and lever handle functioned properly. Next, the test torque of 40 Nm was applied to the lever handle. The permanent deformation amounted to 5,2 mm and it exceeded the allowable value of 5 mm.

The test was repeated on the furniture LOW-1581-10-1-2 with the test torque of 30 Nm. The permanent deformation amounted to 3,5 mm and it did not exceed the allowable value. After the test, no damages of furniture components were observed and lever handle functioned properly.

#### 2.12 Verification of corrosion resistance

2.12.1 Requirements – according to EN 1906:2010, 5.14.

2.12.2 Test method – according to EN ISO 9227 :

2006, 3.2.2 pH-value of sodium chloride solution prepared for spraying in NSS test amounted to  $6,90 \div 6,95$  (permissible pH-value:  $6,0 \div 7,0$ ). During the test, pH-value of sprayed solution collected within the test cabinet amounted to  $7,03 \div 7,06$  (permissible pH-value:  $6,5 \div 7,2$ ). The temperature in the salt spray chamber during the test was  $35^{\circ}\text{C} \pm 1,0^{\circ}\text{C}$  (permissible:  $35^{\circ}\text{C} \pm 2^{\circ}\text{C}$ ). The rate of the solution collected in the test cabinet during the test amounted to  $1,21 \div 1,35\text{ml/h}$  (permissible:  $1,2\text{ml/h}$ ).

2.12.3 Test devices, apparatus and measuring means used – visual assessment, apparatus (test chamber) for NSS tests LOW-064.

2.12.4 Test results obtained :

The corrosion resistance of the furniture was tested in neutral salt spray for 96 h.

After the test, no signs of corrosion were observed on all surfaces which are visible when fitted in service. The lever handles met requirements corresponding to class 3 of corrosion resistance.

3 Classification of lever handles of Initial i Sensial type 3 7 - 1 0 3 0 B Responsible for the testing :

Catégorie d'utilisation : 3

Cycles d'essai : 7

Masse de la porte : -

Résistance au feu : 1

Sûreté des personnes : 0

Résistance à la corrosion : 3

Prévention contre le vol : 0

Type d'opération : B

extracted from the test block. These tests were repeated for samples LOW-1581-10-1-2 and LOW-1581-10-2-2 and obtained test results were identical.

#### 2.11 Verification of rotational torque strength

2.11.1 Requirements – according to EN 1906:2010, 5.3.

2.11.2 Test method – according to EN 1906:2010, 7.3.12.

2.11.3 Test devices, apparatus and measuring means used – Test apparatus for rotational torque strength test LOW-113, dial gauge LOW-018, electronic timer LOW-053, electronic slide caliper LOW-158.

2.11.4 Test results obtained :

The lever handle LOW-1581-10-1-1 was mounted on the test block and fitted to the test apparatus LOW-113. The lever handle was subjected to the pre-torque of 1 Nm and the reading from a dial gauge was taken. Next, the torque of 30 Nm was applied without shock, maintained for 60 s and slowly reduced back to the pre-load value and then the reading was taken again. The permanent deformation measured at the distance of 50 mm from the axis of rotation amounted to 3,7 mm and it did not exceed the allowable value of 5 mm. After the test, no damages of furniture components were observed and lever handle functioned properly. Next, the test torque of 40 Nm was applied to the lever handle. The permanent deformation amounted to 5,2 mm and it exceeded the allowable value of 5 mm.

The test was repeated on the furniture LOW-1581-10-1-2 with the test torque of 30 Nm. The permanent deformation amounted to 3,5 mm and it did not exceed the allowable value. After the test, no damages of furniture components were observed and lever handle functioned properly.

#### 2.12 Verification of corrosion resistance

2.12.1 Requirements – according to EN 1906:2010, 5.14.

2.12.2 Test method – according to EN ISO 9227 :

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2.12.3 Test devices, apparatus and measuring means used – visual assessment, apparatus (test chamber) for NSS tests LOW-064.

2.12.4 Test results obtained :

The corrosion resistance of the furniture was tested in neutral salt spray for 96 h.

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Catégorie d'utilisation : 3

Cycles d'essai : 7

Masse de la porte : -

Résistance au feu : 1

Sûreté des personnes : 0

Résistance à la corrosion : 3

Prévention contre le vol : 0

Type d'opération : B