

**EN 1935:2002 Building hardware---Single-axis hinges -Requirements
and test methods**

FOR

Certificate Holder:	Martval OÜ
Address:	Sära tee 5 Peetri Rae vald 75312 Estonia
Product Type:	DOOR HINGE
Test Model:	MV3012
Test report Number:	2015JCDWZ0785
Date of issue:	Aug 18, 2015

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CHINA GH TL TEST LABORATORY CO., LTD

1.DESCRPTION

I.1-GENEAL INFORMATION

Martval OÜ, as referred to in this report is an Active Product.

And Product's details are presented Appendix C.

Note: The test data was only good for the test sample MV3012. It may have deviation from other test sample.

1.2 OBJECTIVE

The following Declaration of Conformity report of the equipment is prepared on behalf of Martval OÜ , In accordance with EN 1935:2002 Building hardware Single-axis hinges -Requirements and test methods

1.3 EQUIPMENT UNDER TEST (EUT) LIST AND DETAILS

Manufacture:	Martval OÜ
Description:	DOOR HINGE
Model:	MV3012
Serial Number:	N/A

1.4 VERDICT

- Complied with the Standard
- Failed
- Not Applicable

<p>Possible test case verdicts:</p> <p>- test case does not apply to the test object : N/A</p> <p>- test object does meet the requirement : Pass(P)</p> <p>- test object does not meet the requirement : Fail(F)</p>

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1-GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

The Martval OÜ 's product, model: MV3012 or the "EUT" as referred to in this report are Door Hinge.

1.2 Objective

The following Declaration of conformity of Hinges is prepared on behalf of the Martval OÜ. in accordance with EN 1935; 2002 specification for Single-axis hinges. The objective of the manufacturer is to demonstrate compliance with EN1935:2002, references eight tests to be performed.

They are as follows

NO	Clause of EN 1935; 2002	Description	Remark
1	Clause4	Classification	Pass
2	Clause5.1	Initial friction torque Measurements	Pass
3	Clause5.2	Static load	Pass
	Clause5.2.1	Load-deformation	Pass
	Clause5.2.2	Overload	Pass
4	Clause5.3	Shear strength	Pass
5	Clause5.4	Durability	Pass
6	Clause5.5	Corrosion resistance	Pass
	Clause5.5.1	Hinges not intended to be Protected after fitting	Pass
	Clause5.5.2	hinges intended to be protected after fitting	N.A
7	Clause5.6	Hinges for use on fire-resistant and/or smoke-control doors	Pass
8	Clause5.7	Hinges for use on burglar-resistant doors	Pass
9	Clause5.8	Families of hinges with common design features	pass
10	Clause8	marking	Pass

1.3 Test Methodology

All measurements contained in this report were conducted with clause 6 of EN 1935;2002 for Hinges.

1.4 Test Equipment List and Details

Manufacturer and Model	Instrument type	Instrument I.D	Cal Last Date	Cal Due Date
NAG ANO KEIKI, NKS	Piezometer	1MP a	12/18/14	12/18/15
Shanghai Huqi Test Equipment Co. Ltd.	High temperature cabinet	GDW-50	12/18/14	12/18/15
Vahalla 2101	Digital power Analyzer	3-4704	12/18/14	12/18/15
Vahalla 2101	Digital power Analyzer	3-3428	12/18/14	12/18/15
Tektronix DMM 916	Multiple-Voltmeter	153106	11/29/14	11/29/15
Kikusui Electronic Corp. PLZ303W	Electronic Load	CE002706	6/4/15	6/4/16
Hewlett Packard 54600B	Oscilloscopes	US38070219	8/4/15	8/4/16
ED&D LT-15	Leak age Currant Tester	05280074	6/4/15	6/4/16
ED&D GC-1000	Automatic Ground Impedance Tester	06980019	6/5/15	6/5/16
ED&D HP-2000	AC/DC Dielectric Tester	04980008	5/9/15	5/9/16
ED&D LT-952HC	Leak age current Tester	H01310138	1/26/15	1/26/16
Com-power Rs 368	Ringer Amplifier Tester	25021	1/26/15	1/26/16
Fluke 1410	AC/DC Current Clamp	77120835	6/4/15	6/4/16
ED&D PFI-500	Portable Force Indicator	00-0175-04	1/26/15	1/26/16

1.5 Equipment under Test (EUT) General Description

Manufacturer: Martval OÜ

Products Description: Door Hinge

Model: MV3012

Classification: 477114114

Category of use: Grade 4

Durability: Grade 7

Door mass: Grade 7

Corrosion resistance: Grade 4

Test Standards; Building hardware-Single axis hinges—Requirements and test methods (EN 1935:2002)

1.6 Test Result

Complied with the standard

Failed

2 -CLASSIFICAION

2.1 Test Method

Classification	Grade	Testing
Category of use (first digit)	Grade 1-Light duty	N.A
	Grade 2 – Medium duty	N.A
	Grade 3 – Heavy duty	N.A
	Grade 4 – Severe duty (hinge grades 12,13 and 14)	The device is Grade 4
Classification	Grade	Testing
<u>Durability</u> (second digit)	Grade 3:10 000 cycles	N.A
	Grade 4:25 000 cycles	N.A
	Grade 4:25 000 cycles	N.A
	Grade 7:200 000 cycles	The device is Grade 7
Door mass (third digit)	Grade 0:10kg	N.A
	Grade 1:20kg	N.A
	Grade 2:40kg	N.A
	Grade 3:60kg	N.A
	Grade 4:60kg	N.A
	Grade 5:100kg	N.A
	Grade 6:120kg	N.A
	Grade 7:160kg	The device is Grade 7
Classification	Grade	Testing
<u>Suitobirt for use on fire smoke doors</u> (fourth digit)	Grade 0:not suitable for use on fire resistant and/or smoke control door assemblies;	N.A
	Grade 1: suitable for use on fire /smoke resistant door assemblies subject to satisfactory assessment of the contribution of the hinges to the fire resistance of the specified fire/door assemblies. Such assessment is beyond the scope of this European Standard (see EN 1634-1)	The device is Grade 1
Classification	Grade	Testing
Safety(fifth digit)	Grade 1: safety requirement	The device is Grade 1

Classification	Grade	Testing
Corrosion Resistance (sixth digit)	Grade 0:no defined corrosion resistance;	N.A
	Grade 1:mild resistance	N.A
	Grade 2:moderate resistance;	N.A
	Grade 3 high resistance	N.A
	Grade 4:very high resistance	The device is Grade 4
Classification	Grade	Testing
Security-Burglar-resistance (seventh digit)	Grade 0:not suitable for use on burglar-resistant door assemblies	N.A
	Grade 1:suitable for use on burglar – resistant door assemblies, subject to satisfactory assessment of the contribution of the hinges to the burglar resistance of specified burglar- resistant door assemblies.	The device is Grade 1
Hinge grade (eighth digit)	Fourteen grades of hinge are identified in this European Standard, as listed in Table 1.	The device is Grade 14

2.2 Test Result

Classification

4	7	7	1	1	4	1	14
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Description This denotes a hinge for use in severe duty situations tested to 200 000 cydes. For use on doors with a mass up to 160kg, with no stated fie resistance, very high corrosion resistance, suitable for use on burglar resistant doors, and with a hinge grading of 14.

2.3 Verdict

(X)pass

()Fail

3 – Initial Measurements

3.1 Test Method

Requirement Terms	Testing
7.1.2 Initial al measurements	
Mount the hinge under test on the test apparatus specified in 6.1 using the appropriate method as specified in 6.3.	The hinges are mounted on the test apparatus.
Load the hinged test element to the mass specified in Table 1 according to the class of hinge under test.	Grade 14:160kg loads
Rotate the hinged element through the lesser of $92,5^\circ$, $\pm 2,5^\circ$ for 20 cycles without shock.	20 cycles, 39° rotation without shock
Measure and record the torque required to initiate movement of the hinged test element at opening angles of $0 \pm 5^\circ$, $30^\circ \pm 5^\circ$, $60^\circ \pm 5^\circ$ and $90^\circ \pm 5^\circ$.	Torque recorded
Measure and record the initial horizontal and vertical gaps between the hinge elements and the datum surfaces.	Gaps recomded

3.2 Test Result

Sample	Test Torque (5°)	Test Torque (30°)	Test Torque (60°)	Test Torque (90°)	Horizontal Gaps	Vertical Gaps
1#	2.5Nm	2.2Nm	2.4Nm	2.3Nm	1.23mm	3.0mm
/	/	/	/	/	/	/

- the maximum permissible frictional torque is 2 Nm for grades 1 to 7
 the maximum permissible frictional torque is 3 Nm for grades 8 to 11
 the maximum permissible frictional torque is 4 Nm for grades 12 to 14

3.3 Verdict

- pass
 Fail

4 – Load-deformation

4.1 Test Method

Requirement Terms	Testing
7.3.2 Load-deformation	According to classification of the device.
Apply without shock a further load maintaining the centre of gravity of the hinged element at the position specified in 6.1. Ensure that the magnitude of the additional load is such that the total mass of the hinged test element plus any additional load is equal to the load deformation specified in Table 2 for the specified hinge grade.	Grade 14 Total mass 320kg
Rotate the hinged test element through 20cycles as in 6.4 Measure and record the lateral and vertical gaps.	20 cycles rotation applied. Gaps recorded
Remove the load without shock. Allow between 1 min and 2 min to elapse ,and then rotate the hinged test element five times. Measure and record the lateral and vertical gaps.	1min to elapse a cycles rotation applied then, gaps recorded
Examine the hinge for any visible cracks, deformation or breakage of any component and record the results.	
Verify that the requirements of 5.2.1 are met.	Those requirements are complied with

4.2 Test Result

Sample	Horizontal gaps	Vertical gaps (after unloading)	Horizontal gaps (after unloading)	Vertical gaps (after unloading)
1#	1.23mm	3.0mm	1.24mm	3.1mm

- (X)the lateral displacement under load not exceed 2 mm.
- (X)the vertical displacement under load not exceed 4 mm.
- (X)the ateral and vertical residual displacements after unloading are within the shaded area of Figure G 1.
- (X)no breakage of any component nor any cracking visible to normal or corroded vision.

4.3 Verdict

- (X)pass
- ()Fail

5 - Overload

5.1 Test Method

Requirement terms	Testing
7.3.3 Overload	According to classification of the device
After completion of test 7.5 applies to the same hinges, without shock, a further load maintaining the centre of gravity at the position specified in 6.1. Ensure that the magnitude of the additional load is such that the total mass of the hinged test element plus any additional load is equal to the overload mass specified in Table 2.	Grade 14 Total mass:480kg
Rotate the hinged test element through five cycles.	5 cycles rotation
Sustain the load for 1 min to 2 min and then unload.	Loading for 1min
Examine the hinge for any visible cracks, deformation or breakage of any component and record the results.	
Verify that the requirements of 5.2.2 are met.	Those requirements are complied with

5.2 Test Result

5.2.1 Overload test:

Sample	Test Mass	Rotation Cycles	Test duration
1#	480kg	5	1min

5.2.2 Overload test after durability test:

Sample	Test Mess	Rotation Cycles	Test Duration
4#	480kg	5	1min

- no breakage of any hinge leaf, knuckle, barrel or pin nor any cracking or de formation Visible to normal or corrected vision;
- the hinged test element remain connected to the frame.

5.3 Verdict

- pass
- Fail

6. shear strength test

6.1 Test Method

Requirement Terms	Testing
7.4 Shear strength test	The hinges are lift-off type hinges with two knuckles, Not applicable
This test shall be performed on two separate hinges, with the hinge leaves alternately mounted to the fixed test block of Figure H.4. Mount the hinge under test on the test apparatus specified In 6.2 using the appropriate method as specified in 6.3.	N.A
Measure the relative lateral displacement between the hinge leaves.	N.A
Without shock apply the shear load as specified in Table 2 at a uniform rate within 30 s ± 5 s and maintain it for 1 min ± 10s. Remove the load without shock.	N.A
Re-measure the lateral displacement between the hinge leaves.	N.A
Verify that the requirements of 5.3 are met.	N.A

6.2 Test Result

Sample	Shear load	Lateral displacement	Lateral displacement after load
2#	/	/	/
3#	/	/	/

() no break age or cracking of any hinge leaf, knuckle barrel or pin or lateral deformation greater than 3mm

() the additional lateral and vertical displacements after test shall not exceed 1 mm and the hinge shall operate for 20 cycles without breakage of any hinge leaf knuckle, barrel or pin;

() for severe-duty hinges for use on burglar-resistant door assemblies grade 14 unlimited permanent deformation shall be regarded as permissible provided that the hinge can be opened to the lesser of 95° or the full angular movement initially permitted by the hinge at least once after test, by a torque not exceeding 220 Nm.

6.3 Verdict

pass

Fail

Not applicable

7 – Durability test

7.1 Test Method

Requirement Terms	Testing
7.5 Durability test	According to classification of the device
Mount the hinge on the test apparatus specified in 6.1 using the appropriate method specified in 6.3.	
Ensure that the hinge has not previously been subjected to any other tests.	Fresh sample
Load the hinged test element such that the total load is equal to the required test element mass as specified in Table 2.	Grade 14 Total mass 320kg
Rotate the hinged element through the lesser of 92,5° ±2,,5° for 20 cycles without shock.	92,5° rotations
Measure and record the initial horizontal and vertical gaps between the hinged element and the datum surfaces.	Gaps recorded
Measure and record the torque on the fixing screws at the beginning and end of the test.	Torque of fastenings Nm
Operate the hinged element through the lesser of 92,5° ±2,5° or the full; angular movement permitted by the hinge for the appropriate number of cycles specified in Table 1. the speed of operation is (600±30)cycles per hour.	200 000 cycles applied 600 cycles per hour.
After 200 000 cycles, measure and record the frictional; torque, final horizontal and vertical gaps between the hinged element and the datum surfaces, ensuring that the fastenings used to fix the hinge to the test apparatus maintain the same toque as at the beginning of the test.	After 200 000 cycles, frictional torque and gaps recorded
Before removing sample subject the hinge to the overload test 7.3.3.	
Verify that the requirements of 5.4 are met.	These requirements are complied with

7.2 Test Result

Sample	Initial gaps		Final gaps		Frictional torque	
	Horizontal	Vertical	Horizontal	Vertical	Initial	Final
4#	1.25	3.20	1.53	3.80	2.60	3.40

(×)the amount of lateral and vertical wear of the hinge under test ,measured as displacements from the datum surface, shall be within the shaded area of Figure G2;

(×)the maximum permissible frictional torque measured after the first 20 cycles and also after completion of the test shall be 4 Nm.

7.3 Verdict

(×)pass

()Fail

8 – Corrosion Resistance

8.1 Test Method

Requirement Terms	Testing
7.1.5 Corrosion resistance	
Corrosion resistance grade	Grade 4: very high resistance the products shall be exposed to a neutral salt spray test in accordance with EN ISO 9227, Grade 4:240h
One hinge of each type not intended to be protected after fitting shall be submitted to the testing procedures required to ensure compliance with the requirements of the appropriate grade of EN 1670. This hinge shall not previously have been subjected to any other tests.	Detailed in 5.6 of EN 1670:1998 Fresh samples
Hinges intended to be protected after fitting shall not be subjected to corrosion test.	Not applicable
After the corrosion test, the product shall be capable of functioning normally as required by the relevant product standard if available.	Functions are normal as required
Surfaces shall show no sign of tarnish visible to unaided normal or corrected vision as blackening or adverse discoloration of the surface-this does not include an acceptable patina.	Pass No such signs
Surfaces shall withstand exposure for the time specified without corrosion of the base metal substrate visible to unaided normal or corrected vision excepting an average of one spot per 650mm ² of significant surface and without any spots larger than 1,5 mm in any direction.	Pass
The degree of blistering of surfaces shall not be greater than density 2 and the size of any blisters shall not exceed size 3 as both designated in EN ISO 4628-2.	pass

8.2 Test Result

8.2.1 Salt Spray Test

Samples	Periods of Exposure	Temperature(°C)	pH
5#	240h	35°C	6.70

Functional acceptance condition requirements

Appearance acceptance condition requirements, Degree of rust and blistering.

8.3 Verdict

pass

Fail

9 – SUITABILITY FOR USE ON FIRE/SMOKE DOOR

9.1 Test Method

Requirement Terms	Testing
Grade 0: not suitable for use on fire resistant and/or smoke control door assemblies	
Grade 1: suitable for use on fire/smoke resistant door assemblies subject to satisfactory assessment of the contribution of the hinges to the fire resistance of the specified fire/door assemblies. Such assessment is beyond the scope of this European Standard (see EN 1634-1).	GTC Fire Resistance Test Report: Nr.59-5.2011.4 The device is grade 1

9.2 Test Result

The device not used on fire/smoke door

9.3 Verdict

- pass
 Fail
 Not Applicable

10 – SUITABILITY FOR USE ON burglar-resistant doors

10.1 Test Method

Requirement Terms	Testing
Grade 0: not suitable for use on burglar – resistant door assemblies	Not applicable
Grade 1: suitable for use on burglar – resistant door assemblies, subject to satisfactory assessment of the contribution of the hinges to the burglar resistance of specified burglar – resistant door assemblies. Such assessment is beyond the scope of this European Standard	The device is grade 1
Hinges shall conform to the requirements of severe – duty grades 12,13 or 14 as specified in 4.2.	Grade 14 The requirements are complied with
Fastenings shall not be accessible from the exterior face of the door when the hinge has been installed in accordance with the manufacturer’s instructions.	Fastenings are inaccessible
Hinges used on outward – opening external doors shall be either of such a design that the hinge pin can only be removed when the door is open or, alternatively, they shall incorporate hinge bolts within the hinge flap that enable the hinge to withstand the shear strength test loads specified in Table 2 (see 7.4) for grades 12,13 or 14. The hinge pin shall be removed for the test, the acceptance criterion being that the hinge elements shall not become separated whilst under load.	The design prevents that the hinge pin can be removed when the door is closed

10.2 Test Result

(X) The device are suitable for use on burglar – resistant doors

10.3 Verdict

(X) pass
() Fail

11. CE Mark Label Specification

Text is Black or house and similar in color and is left justified. Labels are printed in indelible ink on permanent adhesive backing and shall be affixed at a conspicuous location on the EUT or silk-screened onto the EUT.



11.1. The following information shall be quoted in the labeling, packaging or literature:

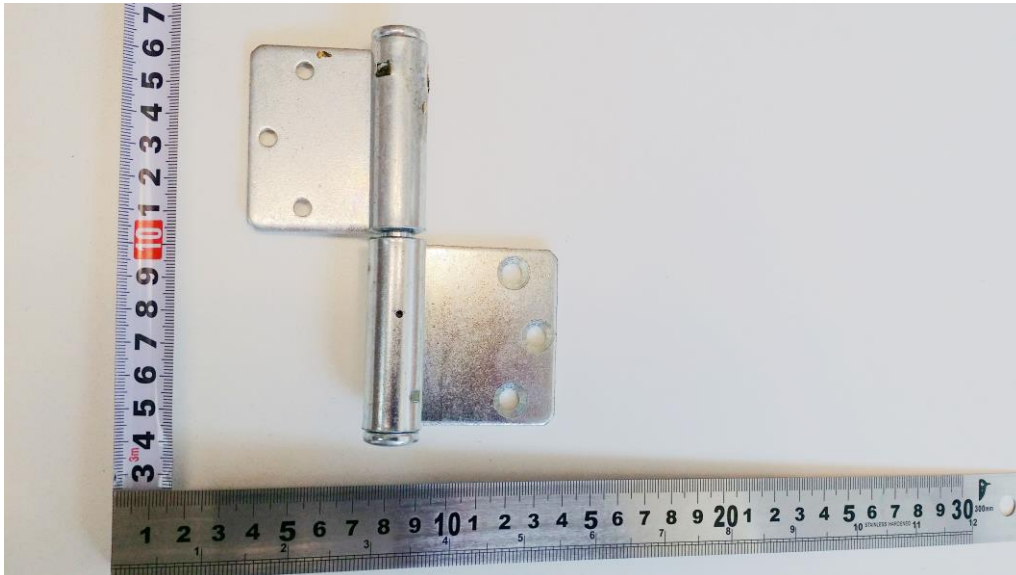
- a) Manufacturer’s name or trademark or other means of positive identification
- b) Clear product identification
- c) The hinge grade according to 4.9 of this European Standard
- d) Number and year of this European Standard

CE mark location



12. EUT PHOTOGRAPHS

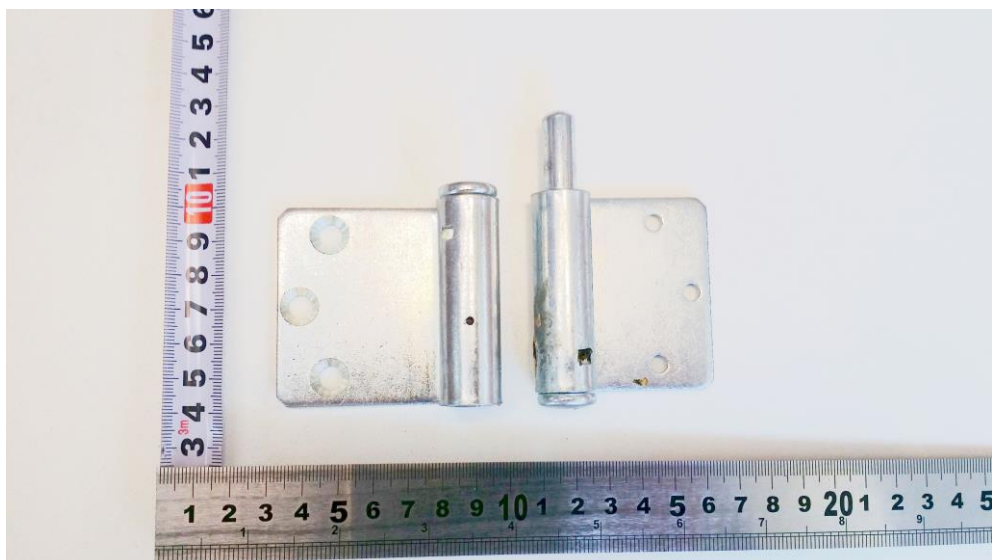
EUT Front View



EUT side view



EUT View



APPENDIX A – DECLARATION OF CONFORMITY

EC Declaration of conformity

WE, **Martval OÜ**
Sära tee 5 Peetri Rae vald 75312 Estonia

Certify that the equipment complies with the principal requirements of the Council Directive
Regulation (EU) No 305/2011 Construction products

Product Type: DOOR HINGE

Test Model: MV3012

Test report Number: 2015JCDWZ0785

Date of issue: Aug 2, 2015

The product has been assessed by the application of the following standards:

EN 1935:2002

Issue place and date

Company stamp and Signature
of authorized personnel

APPENDIX B – EUT DRAWINGS
