

Test Report No. 7191273309-MEC21/01-MHA
dated 07 Feb 2022



PSB Singapore

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SUBJECT:

Hardware test on "d Line" U19 lever handle submitted by d line as.

TESTED FOR:

d line as
Roskildevej 22
2620 Albertslund
Denmark

DATE SUBMITTED:

16-Nov-2021

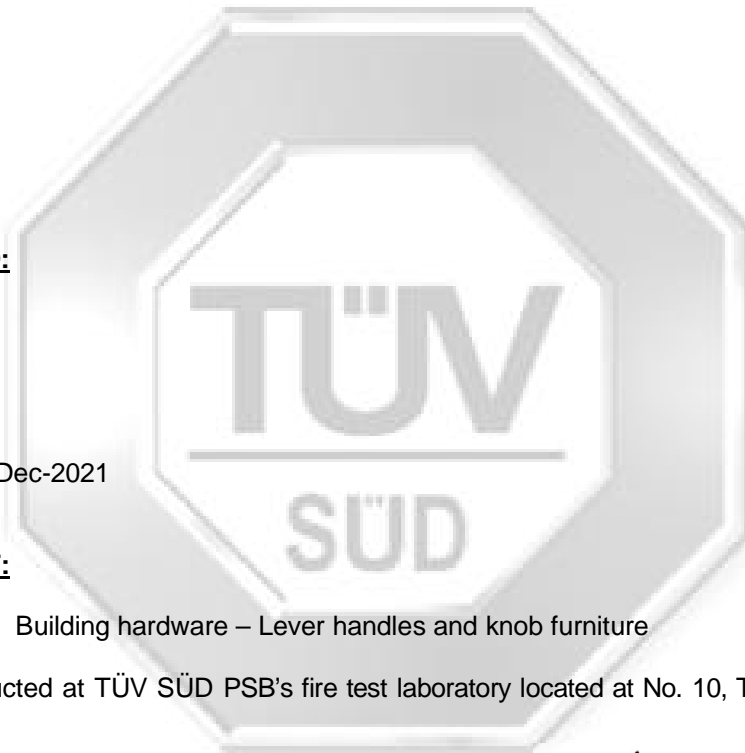
TEST DURATION:

03-Dec-2021 to 15-Dec-2021

METHOD OF TEST:

BS EN 1906 : 2012, Building hardware – Lever handles and knob furniture

The test was conducted at TÜV SÜD PSB's fire test laboratory located at No. 10, Tuas Avenue 10, Singapore 639134.



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LA-2007-0380-A LA-2007-0386-C
LA-2007-0381-F LA-2010-0464-D
LA-2007-0382-B LA-2018-0702-B
LA-2007-0383-G LA-2018-0703-G
LA-2007-0384-G LA-2020-0747-L
LA-2007-0385-E

The results reported herein have been performed in accordance with the terms of accreditation under the Singapore Accreditation Council. Inspections/Calibrations/Tests marked "Not SAC-SINGLAS Accredited" in this Report are not included in the SAC-SINGLAS Accreditation Schedule for our inspection body/laboratory.

Laboratory:
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Co. Reg : 199002667R

Regional Head Office:
TÜV SÜD Asia Pacific Pte. Ltd.
15 International Business Park
TÜV SÜD @ IBP
Singapore 609937
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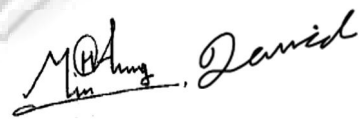
EXECUTIVE SUMMARY:

Three sets of lever handle identified as “d Line” U19 lever handle were submitted for the test BS EN 1906 : 2012, – Lever handles and knob furniture. Compliance with this European standard ensures a margin of strength in excess of that needed for normal operation.

All characteristics included in the standard for which the sponsor of test declares performances has been tested and listed under the test results. The summary of the test results is available in page three.

In accordance with the specification of the test conducted, the submitted lever handle demonstrate compliance with this European Standard, BS EN 1906 : 2012 and achieved a classification as follows:

Category of use	Durability	Door mass	Fire resistance	Safety	Corrosion resistance	security	Type of operation
3	7	-	0	0	0	0	U





SUMMARY OF TEST RESULTS:

Clause No.	Description	Results
5.2	Check of spindle and fastening elements	Compliant
5.4	Axial strength of lock or latch furniture and fastening elements	Compliant
7.3.7	Repeat test of axial strength and methods of fastening	Compliant
5.5	Free play and safety	Compliant
5.6	Free angular movement or misalignment	Compliant
7.3.9	Repeat measurement of free angular movement	Compliant
5.7	Torque of return mechanism	Compliant
7.3.10	Repeat test of torque of return mechanism	Compliant
7.3.6	Durability of mechanism	Compliant
7.3.8	Repeat check of free play	Compliant
7.3.12	Rotational strength	Compliant
8	Marking	Compliant
7.4	Corrosion resistance	Not Applicable

Note: Tests marked 'NA' are not applicable to the tested classification and /or device.

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PRODUCT INFORMATION DECLARED BY TEST SPONSOR:

Brand	D LINE
Model	19U
Markings in the labelling, packaging or literature	Written declaration of marking in production
Manufacturer	D Line A/S, Denmark
Place of manufacture	LITHUANIA
Material	Refer to bill of material
Remarks	Solid handle

REPORTS TO BE USED IN CONJUNCTION:

None



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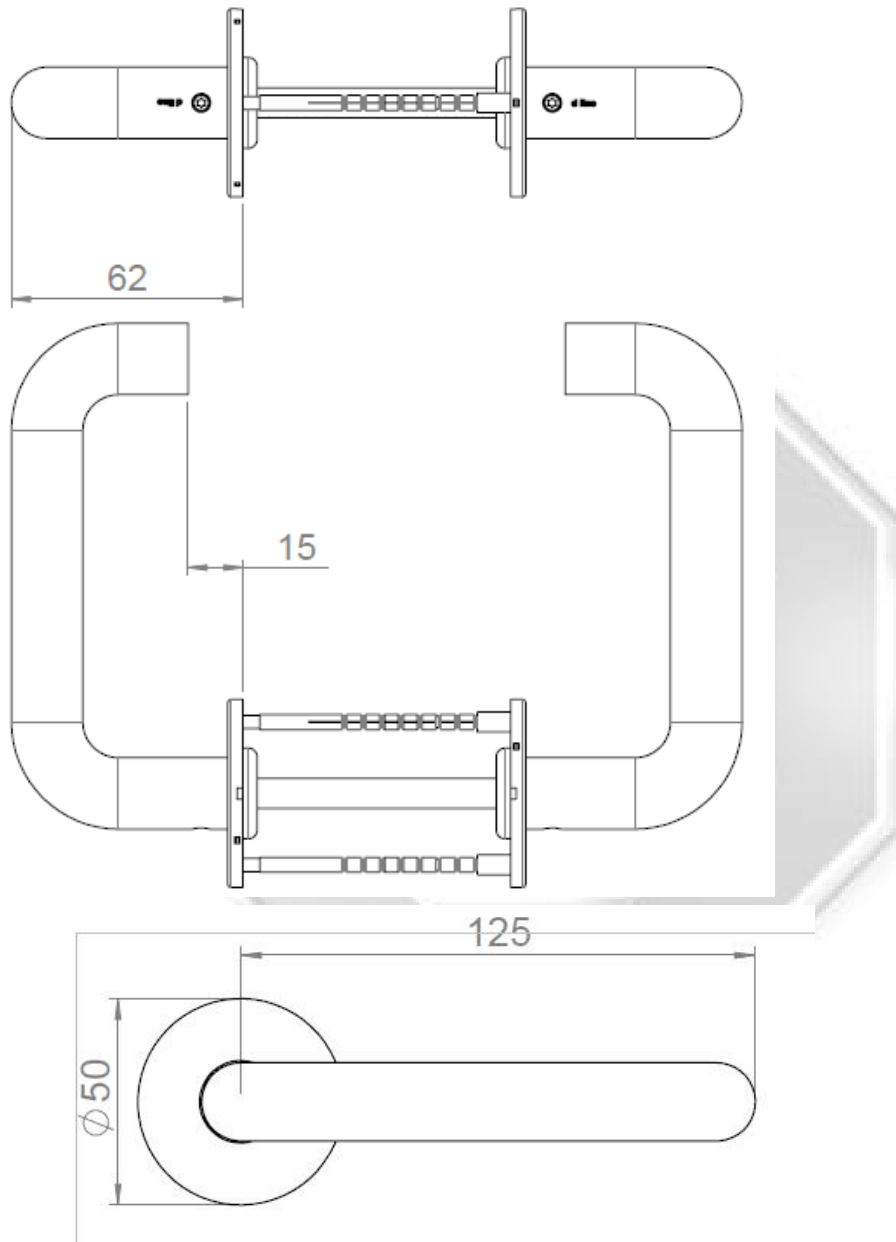
INITIAL OBSERVATIONS:

Plate 1 reflects images of tested sample.



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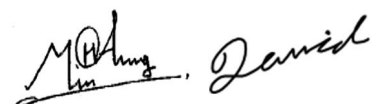
DIMENSIONED DRAWING:



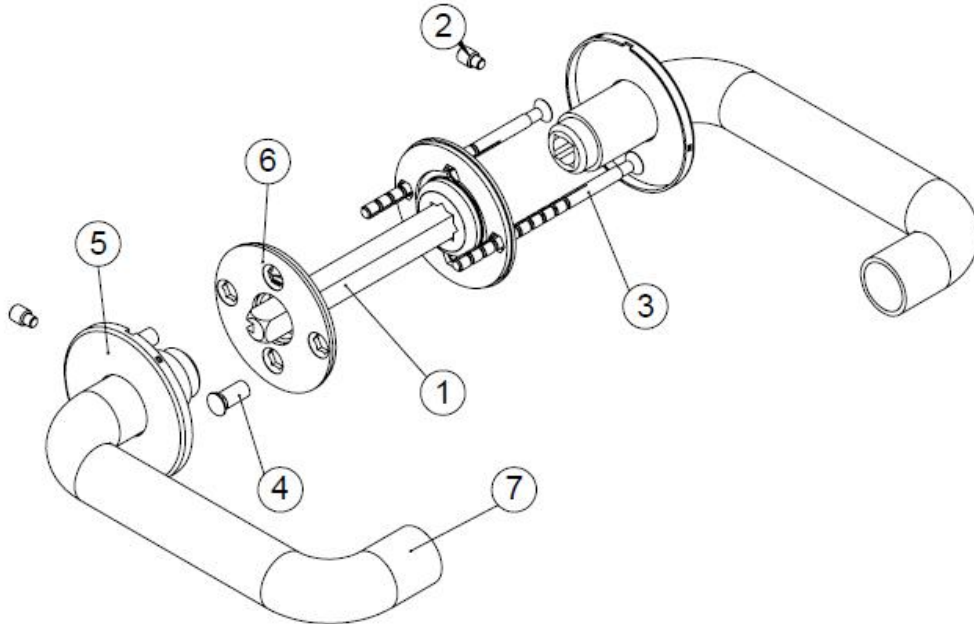
Note: handle diameter 19mm
: Spindle of 8mm x 8mm.

All dimensions in mm
Scale: Not to Scale

Figure 1: Lever handle



BILL OF MATERIAL:



Item	Material
1	AISI 316 stainless steel
2	AISI 316 stainless steel
3	AISI 316 stainless steel
4	AISI 316 stainless steel
5	AISI 316 stainless steel
6	AISI 316 stainless steel
7	AISI 316 stainless steel

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TEST RESULTS:

Check of spindle and fastening elements – clause 5.2

Descriptions	Results	Requirements
Declared door thickness	33mm to 200mm	The manufacturer should specify the door thickness or range of door thickness for which the furniture is suitable.
Angle of rotation	NA	Declared angle of rotation possible by design for spring loaded and spring assisted furniture.

**Axial strength of lock or latch furniture and fastening elements – clause 5.4 and
Repeat test of axial strength and methods of fastening – clause 7.3.7**

Descriptions	Results		Requirements
	Before durability test	After durability test	
Test force applied	800N	800N	Test force to be applied and maintained for 60s. <input type="checkbox"/> Grade 1 : 300N <input type="checkbox"/> Grade 2 : 500N <input type="checkbox"/> Grade 3 : 800N <input type="checkbox"/> Grade 4 : 1000N
Functionality	Compliant	Compliant	There shall be no failure of any component and lever handles or knob shall still operate after the test.
Deformation	1.0 mm	0.9 mm	Permanent deformation at the reference point 75mm from the axis of rotation shall not increase by more than 2mm.

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Free play and safety – clause 5.5

Descriptions	Sample		Requirements
	At rest position	At rotated position	
Rotation of furniture	-	60°	Furniture to be rotated to a position of 60°±5° or at the maximum angle of rotation possible by design
Maximum total movement towards furniture with a 15N force applied towards the furniture	0.9 mm	1.1 mm	-
Maximum total movement away from furniture with a 15N force applied away from the furniture	0.8 mm	1.3 mm	-
Free play	Compliant	Compliant	The maximum total movement shall not exceed the following <input type="checkbox"/> Grades 1 and 2 ≤ 10mm <input type="checkbox"/> Grades 3 and 4 ≤ 6mm
Safety	Compliant		There shall be no sharp edges, screws above backplate or rose. Fastening elements must not protrude by more than 1mm and finger trapping shall not be possible over the range of rotation

**Free angular movement or misalignment – clause 5.6 and
Repeat measurement of free angular movement – clause 7.3.9**

Descriptions	Results		Requirements
	Before durability test	After durability test	
Displacement at 75mm from the axis of rotation	0.2 mm	0.4 mm	The free angular movement shall not exceed the following <input type="checkbox"/> Grades 1 and 2 ≤ 10mm <input type="checkbox"/> Grades 3 and 4 ≤ 5mm

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**Torque of return mechanism – clause 5.7 and
Repeat test of torque of return mechanism – clause 7.3.10**

Spring-loaded type – clause 5.7.4 (Not applicable)

Unsprung and spring assisted type – clause 5.7.2

Descriptions	Results		Requirements
	Before durability test	After durability test	
Operating angle	60°		To have a minimum operating angle of 60° or designed angle of rotation
Torque to operate lever handle or knob to operating angle	NA	NA	For spring assisted lever handle, torque shall be no greater than below for category of use, <input type="checkbox"/> Grade 1 & 2 : 1.5Nm <input type="checkbox"/> Grade 3 & 4 : 2.4Nm
Torque to return lever handle to at rest position	5°	0.2Nm	The return torque shall be no greater than below for category of use, <input type="checkbox"/> Grade 1 & 2 : 0.6Nm <input type="checkbox"/> Grade 3 & 4 : 1.5Nm
	10°	0.2Nm	
	15°	0.2Nm	
	20°	0.2Nm	
	25°	0.2Nm	
	30°	0.2Nm	
	35°	0.2Nm	
	40°	0.2Nm	
	45°	0.2Nm	
	50°	0.2Nm	
	55°	0.2Nm	
	60°	0.2Nm	

Unsprung knobs – clause 5.7.3 (Not applicable)

Durability of mechanism – clause 7.3.6

Descriptions	Results	Requirements
Durability grade	7	<input type="checkbox"/> Grade 6 : 100 000 cycles <input type="checkbox"/> Grade 7 : 200 000 cycles
Difference in position of lever handle after durability test	0°	<input type="checkbox"/> Grade 1 : ±4° <input type="checkbox"/> Grade 2 : ±2° <input type="checkbox"/> Grade 3&4 : ±1°
Integrity after test	Compliant	After the test, the handle is operable and there shall be no failure of any component.

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Repeat check of free play – clause 7.3.8

Descriptions	Sample		Requirements
	At rest position	At rotated position	
Rotation of furniture	-	60°	Furniture to be rotated to a position of 60°±5° or at the maximum angle of rotation possible by design
Maximum total movement towards furniture with a 15N force applied towards the furniture	1.9 mm	0.9 mm	-
Maximum total movement away from furniture with a 15N force applied away from the furniture	1.2 mm	2.6 mm	-
Free play	Compliant	Compliant	The maximum total movement shall not exceed the following <input type="checkbox"/> Grades 1 and 2 ≤ 10mm <input type="checkbox"/> Grades 3 and 4 ≤ 6mm
Safety	Compliant		There shall be no sharp edges, screws above backplate or rose. Fastening elements must not protrude by more than 1mm and finger trapping shall not be possible over the range of rotation

Rotational strength – clause 7.3.12

Descriptions	Results	Requirements
Torque applied	40 Nm	<input type="checkbox"/> Grade 1 : 20 Nm <input type="checkbox"/> Grade 2 : 30 Nm <input type="checkbox"/> Grade 3 : 40 Nm <input type="checkbox"/> Grade 4 : 60 Nm
Torque holding time	60 sec	Torque to be maintained for 60s
Permanent deformation	0.6 mm	Permanent deformation shall be ≤5mm

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Marking – clause 8

Descriptions	Results	Requirements
Marking in the labelling, packaging or literature	Written declaration of marking in production	a) Manufacturer's name or trademark or other means of positive identification b) Clear product model identification c) Number of this European Standard and classification according to clause 4 of EN 1906 d) Year and week of manufacture

Corrosion Resistance – clause 7.4

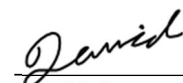
Descriptions	Results	Requirements
Corrosion resistance	Not Applicable	Test shall conform to EN 1670.

CONCLUSION:

According to BS EN 1906 : 2012 – Lever handles and knob furniture, the results obtained demonstrate that the specimen tested complied with the relevant clauses and is classified as follows:

Category of use	Durability	Door mass	Fire resistance	Safety	Corrosion resistance	security	Type of operation
3	7	-	0	0	0	0	U


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 Higher Associate Engineer


David Ang
 Assistant Vice President
 Fire Testing
 Mechanical Centre

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PSB Singapore

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Effective 26 January 2021

