Test Report

Report No.: 829645-1

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Laha/jjoh/hbs
Order no.: 829645
No. of appendices: 3

Assignor: Lammhults Biblioteksdesign
Dalbækvej 1
DK-6670 Holsted

Subject: Model: 60/30 Classic steel shelving

Type:	Storage Unit				
Length:	1035 mm	Width:	362 mm	Height:	2110 mm
Weight	34.8 kg				
Materials:	Steel				

Sampling: The test material was sampled by the client and received at the Danish Technological Institute 17-09-2018.

Method: **EN 14073-2:2004** Office furniture - Storage furniture - Part 2: Safety requirements
EN 14073-3:2004 Office furniture. Storage furniture. Test methods for the determination of stability and strength of the structure

EN 16121:2013+A1:2017 Non-domestic storage furniture – Requirements for safety, strength, durability and stability – Test severity 1 + Annex A

EN 16122:2012 Domestic and non-domestic storage furniture – Test method for the determination of strength, durability and stability

Period: The testing was carried out from 18-09-2018 to 26-09-2018.

Result: Model 60/30 Classic Steel Shelving fulfils the requirements of EN 16121:2017+A1:2017 and EN 16122:2012.

Individual results appear from Appendices 1 and 2.

Storage: The test material will be destroyed after 1 month, unless otherwise agreed.

Terms: The accredited test was carried out according to DANAK's general conditions see www.danak.dk and according to the General Terms and Conditions regarding Commissioned Work Accepted by the Danish Technological Institute, which apply at the time of signing the agreement. The test is only valid for the tested specimen. The test report may only be extracted, if the laboratory has approved the extract.

Date/place: 26-09-2018, Danish Technological Institute, Wood and Biomaterials, Taastrup

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ilac-MRA DANAK TEST Reg.no. 2

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Test EN 14073-2:2004 Table 2 – Test sequence for floor standing units – free standing or attached to the building		**Clause in test method**	**Result**
1	Pull out of shelves	EN 14073-2, 5.3.1	Passed
2	Strength of shelf supports	EN 14073-2, 5.3.2	Passed
3	Strength of top surfaces	EN 14073-2, 5.4	N/A
4	Strength of extension elements	EN 14074, 6.2.1	N/A
5	Slam open of extension elements	EN 14074, 6.2.3	N/A
6	Interlock test	EN 14074, 6.2.4	N/A
7	Vertical load on pivoted door	EN 14074, 6.3.1	N/A
8	Slam shut/open of sliding doors and horizontal roll fronts	EN 14074, 6.4.2	N/A
9	Strength of flaps	EN 14074, 6.6.1	N/A
10	Floor standing units attached to the building	EN 14073-3, 5.7	Passed
11	Stability [a]	EN 14073-3, 5.5.1 and 5.5.2	N/A

[a] In the case of units, which might not fulfil the stability requirements before carrying out any tests, the applicable stability tests may be carried out before starting the sequence of tests specified in the table

N/A Not applicable

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EN 16121:2013

5. Safety Requirements

The tests contained are only considered to affect the safety when:

- the height of the centre of gravity of the unit, or any part, is >650 mm above the floor and the total mass is >10 kg

or

- when the potential energy of the unit or any part is >65 Nm and the height of the centre of gravity of the unit, or any part, is ≤650 mm

Table 4 – Safety Tests

Test no.	Test	Reference EN 16122:2012	Loading	Requirement	Result
5.7.1.1	Static load test for tops and bottoms	6.2.2	Force, N Cycles	750 10	N/A
5.7.1.2	Shelf retention test – horizontal outward	6.1.2	Force, N	50% of unloaded shelf weight	Passed
5.7.1.3	Shelf retention test – vertical downward	6.1.3	Force, N	100	Passed
5.7.1.4	Strength of shelf supports	6.1.5	Cycles Mass per unit area, kg/dm^2 Steel impact plate EN 16122:2012. Table 1	10 0.65 1	Passed
5.7.1.5	Vertical load on pivoted doors	7.1.2	Mass, kg 10 cycles	30	N/A
5.7.1.6	Horizontal load on pivoted doors [a]	7.1.3	Force, N 10 cycles	60	N/A
5.7.1.7	Strength of bottom-hinged flaps	7.3.1	Force, N Cycles	200 10	N/A
5.7.1.8	Strength of extension elements [b]	7.5.2	Force, N Cycles	200 10	N/A
5.7.1.9	Slam shut and open of extension elements [c]	7.5.4	Velocity, m/s at calibration points Slam open 5 kg Slam shut 35 kg Factor K Mass in drawer	1.30 1.00 2.5 See table 1	N/A
5.7.1.10	Interlock test	7.5.6	Force, N Cycles	200 10	N/A
5.7.1.11	Test for structure and underframes	6.4.1	Force, N Cycles	350 10	N/A
5.7.1.12	Test of unit with castors or wheels [d]	6.4.3	Cycles	2.000	N/A
5.7.1.13	Overload test	10.1.3	Mass per unit area, kg/dm^3	2.5	N/A
5.7.1.14	Dislodgement test	10.1.4	Force, N	100	N/A
5.7.1.15	Units supported by the floor	10.2	Force, N	200	Passed
5.7.2	Structural safety requirements				
	a) There are no fractures of any member, joint or component				Passed
	b) Units attached to the structure of the building shall remain attached and carry the test load				Passed
	c) The storage unit fulfils the stability requirements (5.6)				N/A

[a] This test shall only be applied to doors with an opening angle less than or equal to 135º
[b] The extension element shall be loaded in accordance with Table 1
[c] For safety tests only the slam open test shall be performed. Table 5 contains requirements for slam shut test
[d] This test shall be performed on a horizontal, smooth steel surface
N/A Not applicable

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5.6 Stability

The requirements for stability only apply to units, where the height to the top of the unit is 650 mm or more above the floor level, and when the potential energy, exceeds the value 65.

Where specified, the unit shall be loaded in accordance with the loads specified in Table 2. When the unit or component is conspicuously and durably marked by the manufacturer with a maximum load, the unit or component shall be loaded with the stated maximum load multiplied by 0.5, but the load shall not exceed the value calculated using Table 2.

Table 3 – Stability Tests

Test no.	Test	Reference EN 16122:2012	Loading	Requirement	Result
5.6.1	Doors, extension elements and flaps closed, all storage units unloaded – units that are, or can be, adjusted to a height of 1000 mm or less	11.2.1	Vertical force, N	750	N/A
5.6.2	Doors, extension elements and flaps closed, all storage units unloaded – units that are, or can be, adjusted to a height of more than 1000 mm or less	11.2.2	Vertical force, N Outward force, N	350 50	N/A
5.6.3	All storage areas unloaded and all doors, extension elements and flaps open	11.4.1	-	-	N/A
5.6.4	All storage areas unloaded with overturning load	11.4.2	Vertical force, N	100	N/A
5.6.5	All storage areas loaded with overturning load	11.4.3	Vertical force, N	20% of total mass (3.5) of the unit but not greater than 300 N	N/A
5.6.6	Doors, extension elements and flaps closed and locked	11.5	Outward force, N	100	N/A
5.6.7	Dynamic stability test for units with castors [a]	11.6	-	-	N/A

[a] The test shall be carried out in accordance with EN 16122:2012, 11.6 except that the stops shall be 12 mm high with square edges
N/A Not applicable

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6. Strength and Durability

Table 5 – Strength and Durability Tests

Test no.	Test	Reference EN 16122:2012	Loading	Test severity		Result
				1	2	
6.1.1	Strength of clothes rail supports	6.3.1	Mass per unit length, kg/dm Time	4.0 1 h	4.0 1 h	N/A
6.1.2	Strength of coat hooks	9.1	Force per hook, N Cycles	40 10	150 10	N/A
6.1.3	Durability of pivoted doors	7.1.5	Cycles	40.000	80.000	N/A
6.1.4	Slam shut test of pivoted doors	7.1.4	Mass, m_2, kg Cycles	3 10	4 10	N/A
6.1.5	Slam shut/open of sliding doors and horizontal roll fronts	7.2.2	Mass, m_2, kg Cycles	4 10	6 10	N/A
6.1.6	Durability of sliding doors and horizontal roll fronts	7.2.3	Cycles – sliding doors Cycles – roll fronts	20.000 10.000	40.000 20.000	N/A
6.1.7	Durability of flaps	7.3.2	Cycles	10.000	20.000	N/A
6.1.8	Durability of vertical roll fronts	7.4.2	Cycles	10.000	20.000	N/A
6.1.9	Durability of extension elements	7.5.3	Cycles – extension elements Cycles – trays	40.000 20.000	80.000 40.000	N/A
6.1.10	Slam shut and open of extension elements [a]	7.5.4	Velocity, m/s, at calibration points Slam open 5 kg Slam shut 35 kg Factor K	1.30 1.00 2.5	1.30 1.00 2.5	N/A
6.1.11	Displacement of extension element bottoms	7.5.5	Force, N Cycles	60 10	70 10	N/A
6.1.12	Strength test for locking and latching mechanisms for extension elements	7.6.2	Force, N Cycles	200 10	200 10	N/A
6.1.13	Strength test for locking and latching mechanisms for doors, flaps and roll fronts	7.6.3	Force, N Cycles	200 10	200 10	N/A
6.1.14	Drop test	6.4.2	Drop height, mm	-	50	Passed
6.1.15	Deflection of shelves	6.1.4	Mass per unit area, kg/dm^2	1.5	2.0	Passed
6.1.16	Dislodgement of clothes rails	6.3.2	Mass per unit length, kg/dm	5	5	N/A
6.1.17	Drop test for trays	8.3	Drop height, mm Cycles	350 10	700 10	N/A
6.1.18	Sustained load test for trays	8.2	Kg/dm^3	0.65	1.0	N/A
6.2	Strength and durability requirements					
	a) There are no fractures of any member, joint or component					Passed
	b) There are no loosening of joints intended to be rigid					Passed
	c) The storage unit fulfils the stability requirements (5.6)					N/A
	d) The storage unit fulfils its functions after removal of the test loads					Passed
	e) There shall be no deflection of shelves that exceeds 0.5% of the span of the shelf when tested in accordance with test no. 6.1.15 (see Table 5)					Passed

[a] For strength and durability tests, only the slam shut test shall be performed. Table 4 contains requirements for slam open test
N/A Not applicable

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Annex A

		Result
A.2	Modified requirements for schools, kindergartens and similar applications	
A.2.1	**General** Storage furniture specifically designed for use in schools and kindergartens shall fully comply with this European Standard with the exception of the following modifications:	
A.2.2	**Definition – shear and squeeze points** A shear and squeeze point exists if the distance between two accessible parts moving relative to each other can be less than 25 mm or more than 7 mm in any position during movement	Passed
A.2.3	**Principles of safety requirements** The requirements of 5.1.1 shall be modified such that the tests contained in Table 4 are only considered to affect safety when the height of the centre of gravity of the unit, or any part is >350 mm above the floor and the total mass is >5 kg.	Passed
A.2.4	**General safety requirements** In addition to the requirements contained within 5.2, all accessible parts where the probability of contact by the user is high shall be rounded with a minimum 2 mm radius or chamfer	Passed
A.2.5	**Shear and squeeze points under the influence of powered mechanisms** In addition to the requirements contained within 5.3.2, it is recommended that there should be no gap greater than 7 mm between the hinged edge of a door or flap and the main body of the product, or any hinge component, when assembled/adjusted for normal use.	N/A
A.2.6	**Shear and squeeze points during use** In addition to the requirements contained within 5.3.3, it is recommended that there should be no gap greater than 7 mm between the hinged edge of a door or flap and the main body of the product, or any hinge component, when assembled/adjusted for normal use.	N/A
A.2.7	**Glass** Glass shall fulfil the fragmentation test requirements of EN 12150-1:2000, Clause 8, or has a mode of breakage (β) according to EN 12600:200, Type B or Type C	N/A
A.2.8	**Stability** The requirements for stability contained in 5.6 shall apply to units where the height to the top of the unit is 450 mm or more above the floor level.	N/A
A.2.9	**Strength and durability – drop test for trays** The test shall be carried out in accordance with the drop test for trays (test 6.17, table 5), with the exception that the drop height for test severity 1 shall be 600 mm and drop height for test severity 2 shall be 900 mm	N/A
A3	**Finger entrapment** There shall be no accessible holes greater than 7 mm or less than 12 mm with a depth greater than 10 mm when assessed in accordance with 5.3.1 of EN 716-2:2008+A1:2013	Passed

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Photo