

elQuip™

Test report

On the

Flexiline® workbench for laboratories

According to

EN 13150:2001

Workbenches for laboratories – Dimensions, safety
Requirements and test methods

Tests and report: July 2015

Introduction:

The EN 13150:2001 standard specifies safety requirements and test methods of workbenches for laboratories and provides recommendations for their dimensions.

This report will refer to the EN 13150:2001 standard concerning the description of the tests to be performed and test devices to be used.

The safety tests are carried out with an un modified Flexiline worktable of standard length 1800mm equipped with a melamine table top (depth 900mm) and a melamine overwork bench shelve (depth 400mm). The 1800mm worktable is the largest in the Flexiline programme and therefore the mechanically the most vulnerable with respect to vertical loading in the middle of the worktable i.e. the mechanical safety test are applicable to all other types of Flexiline worktables.



Standard 1.8m Flexiline worktable with overwork bench shelve.

General recommendations and safety requirements of EN 13150:2001:

The dimensional recommendations (§4 of EN 13150) and the general safety requirements (§5 of EN 13150) are both fulfilled by the Flexiline workbench product line in all possible configurations and dimensions.

Surface reflection.

The Flexiline worktables can be equipped with three different types of table top shelves for the main work surface and for the overwork bench shelve i.e. melamine, HPL or ESD-safe (to EN 61340-5-1). All three different shelve types fulfil the surface reflection requirements stated in §6.4 of EN 13150:2001.

Electrical safety.

The Flexiline worktables can be equipped with internally built-in electrical blocks with different functionality options. The electrical blocks are interconnected with standard wiring equipped with GST-18 connectors. All parts have past the relevant VDE tests and therefore fulfil the relevant EN 61010-1 requirements.

Mechanical Safety testing:

In reference to §6.3, table 3 and annex A of EN 13150:2001 the following relevant safety tests have been carried-out:

Horizontal static load.

Test set-up in general: Restrain one worktable leg on the floor in both horizontal perpendicular directions and apply a horizontal force of 600N on the edge of work surface using the specified loading pad (see figure A.2.1 of annex A). Apply force 10 times on each of the 4 edges of the worktable. (See annex A §3.1)

Results: The worktable does not overturn and is not permanently deformed.

Conclusion: The worktable fulfils this safety test.

Vertical static load.

Test set-up in general: Apply a vertical downward force of 2000N on the main work surface by means of the specified loading pad (A.2.6 of annex A). Apply this force 10 times at different positions in the work surface likely to cause failure but not less than 100mm from any edge.

Repeat this test on the overwork bench shelve but with a force of 500N.

Results: The weakest point on the work surface turns out to be in the middle of the worktable 10cm from the front edge. A 2000N load caused about 1.5cm deflection. Other positions on the surface resulted in lower deflections. For the overwork bench shelve the deflection in the middle under a 500N load was less than 0.5mm (measurement accuracy limit).

In order to obtain more information on the strength of the worktable the first test on the work surface was repeated with a 2500N load and with a 3000N load on the weakest point. In both cases there was no permanent deformation or damage caused to the worktable.

Conclusion: The worktable fulfils this safety requirement and w.r.t the work surface the worktable exceeds with at least 1.5 times this safety requirement without any permanent damage.

Sustained vertical load test for the work surface.

This test is not required because the worktable fulfils the previous vertical static load test. Since all necessary items were in place for executing the different tests we decided to carry out this test anyway.

Test set-up in general: Load the work surface with a uniformly distributed load of 1.25 kG/dm². In practice this was carried out with sand bags of each 25kG resulting in an average surface load of 1.29kG/dm². The load should be applied for 24 hours and then removed. Deflection should be measured after 24h loading and 24h after unloading.

Results: The deflection measured after 24h was 8 mm in the middle of the worktable on the front edge (the weakest point). Deflection measured 24h after removing the load was below the measurement accuracy limit.

Conclusion: The worktable fulfils this safety requirement

Deflection of overwork bench shelves.

Test set-up in general: Load the work surface with a uniformly distributed load of 1.25 kG/dm². In practice this was carried out with sand bags of each 25kG resulting in an average surface load of 1.45kG/dm². The load should be applied for 24 hours and then removed. Deflection should be measured after 24h loading and 24h after unloading (the deflection limit under load is span/200 = 8.6mm and permanent deflection limit is span/1000 = 1.7mm, ref. §6.2).

In order to obtain more information on the strength of the overwork bench shelfe the first test was repeated with a double load of 2.9kG/dm², in total 200kG.

Results: for the first test the deflection measured in the middle of the shelfe after 24h was below the measurement accuracy limit. For the second test, with double load, the deflection measured after 24h loading was about 0.5 mm (measurement accuracy limit). No measurable deflection was detected 24h after removing the load of the second test.

Conclusion: The worktable fulfils this safety and deflection requirement and w.r.t. overwork bench shelfe the worktable exceeds with at least 2 times this safety and deflection requirement without any permanent damage.

Horizontal impact stability test of free standing worktables.

Test set-up in general: Restrain the worktable leg on the floor on the opposite side of where the impact force will touch the worktable such that the worktable cannot move in direction of the impact force vector. Impact the worktable using the defined horizontal impactor (see figure A.2.3 of annex A), with a mass of 50kG and falling through the specified height of 40mm. Position the impactor such that the impactor strikes the worktable at the position likely to have the most adverse effect.

Results: The worktable does not overturn and is not permanently deformed.

Conclusion: The worktable fulfils this safety test.

Vertical load stability test of free standing worktables.

Apply a vertical downward force of 1000N on the main work surface by means of the specified loading pad. Apply this force at any point of that edge which may produce the most adverse result. The centre of gravity of the load shall be 50mm from the outer edge of the worktable top. Repeat the test on one short edge at the centre of this short side.

Results: The weakest point on the work surface turns out to be in the middle of the worktable 5cm from the front edge. The 1000N load caused on the front edge 8mm deflection. Deflection on the short edge was below the measurement limit. In both cases there was no permanent deformation or damage caused to the worktable.

Conclusion: The worktable fulfils this safety requirement.