

TEST REPORT

CUSTOMER: **ENEA EREDU S.COOP.**

PERSON REQUESTING THE TEST: **IÑAKI ELIZEGI**

ADDRESS: **APARTADO 97
20250 LEGORRETA (GIPUZKOA)**

MATERIAL TESTED: **«BIO» SERIES CHAIRS**
PURPOSE OF THE REQUEST: **TESTS IN ACCORDANCE WITH UNE-EN
15373:2007**

DATE OF RECEIPT: **03.12.2007**
TEST STARTING DATE: **10.03.2008**
TEST COMPLETION DATE: **08.04.2008**
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The results included in this report only refer to the material received and subjected to testing in this Research Centre on the dates indicated.

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FEATURES OF THE SAMPLES

On the 3rd of December 2007, CIDEMCO received two chairs from the «**BIO**» series from the company ENEA EREDU S.COOP., with the following features:



Chair with armrests and 4 feet

Office chair with armrests and wheels



TESTS REQUESTED

The tests requested are those set out in the UNE-EN 15373:2007 standard: *"Furniture. - strength, durability and safety - requirements for non-domestic seating."*

The test level requested has been 3, which corresponds to severe use.

The tests have been divided according to the type of chair and relevant regulations, and are as follows:

1. **Stability tests**, in accordance with UNE-EN 1022:2005

- 1.1. Forward overturn (sec. 6.2)
- 1.2. Lateral overturn, for chairs with armrests (sec. 6.5)
- 1.3. Backward overturn, for chairs with back (sec. 6.6)

2. **Static load tests**, in accordance with UNE-EN 1728:2001

- 2.1. Static load on seat and back (sec. 6.2.1)
- 2.2. Static load on the front edge of the seat (sec. 6.2.2)
- 2.3. Lateral static load on armrests and wings (sec. 6.5)
- 2.4. Static load on armrests subjected to a downward vertical force (sec. 6.6)

3. **Durability tests**, in accordance with UNE-EN 1728:2001

- 3.1. Combined fatigue test on seat and back (sec. 6.7)
- 3.2. Fatigue on the front edge of the seat (sec. 6.8)
- 3.3. Fatigue on armrests (sec. 6.10)

4. **Tests on feet**, in accordance with UNE-EN 1728:2001

- 4.1. Static load on front feet (sec. 6.12)
- 4.2. Lateral static load (sec. 6.13)

5. **Impact tests**, in accordance with UNE-EN 1728:2001

- 5.1. Impact on seat (sec. 6.15)
- 5.2. Impact on back (sec. 6.16)
- 5.3. Impact on armrests (sec. 6.17)
- 5.4. Drop test (sec. 6.18)



6. Rolling resistance tests on the non-loaded chair, in accordance with UNE-EN 1335-3:2001.

6.1. Determination of drag force (sec. 6.1)

6.2. Rolling fatigue test (6.2)

Tests 2.3, 2.4, 3.3, 5.3 and 6 have been carried out on the chair with wheels, and the rest on the one with 4 feet.

TESTS CARRIED OUT AND RESULTS

1. STABILITY DURING USE

The test was carried out in accordance with the UNE-EN 1022:2005 standard: «*Domestic Furniture. Seats. Determination of Stability*»

The chair should not tilt under the following conditions:

- a) When pressing the front edge of the surface of the chair in the most adverse position
- b) When leaning back on an armrest
- c) When leaning on the back
- d) When the user sits on the front edge of the seat.

RESULT: SATISFACTORY

1.1. Forward overturn test (sec. 6.2), in accordance with the UNE-EN 1022:2005 standard

A vertical force of 600 N is applied 60 mm from the front edge, at the point that is most susceptible to fault, and a forward horizontal traction force of 20 N is applied for at least 5 seconds.

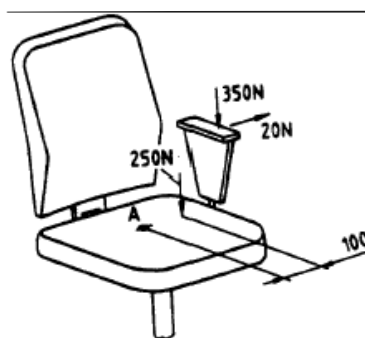


RESULT: SATISFACTORY

1.3. Lateral overturn test. Chairs with armrests (sec. 6.5), in accordance with the UNE-EN 1022:2005 standard

A vertical force of 250 N is applied on the seat 100 mm from the axis of symmetry of the seat towards the side of the locked feet, and between 175 mm and 250 mm in front of the back part of the seat. A vertical force of 350 N is applied on the arm axis 40 mm from the outermost edge of the latter, in its most adverse position.

A horizontal force of 20 N is applied towards the outside of the chair for a minimum duration of 5 seconds.



RESULT: SATISFACTORY

1.4. Backward overturn test. Chairs with back (sec. 6.6), in accordance with the UNE-EN 1022:2005 standard

The test involves applying a vertical force of 600 N on the load point of the seat and another of 80 N at the load point of the back.

The chair does not tend to overturn during the application of the above forces.

RESULT: SATISFACTORY

2. STATIC LOAD TESTS

The tests were carried out in accordance with the UNE-EN 1728:2001 standard: «Domestic furniture. Seats. Test methods for the determination of Strength and Durability»

2.1. Static load test on seat and back (sec. 6.2.1), in accordance with the UNE-EN 1728:2001 standard

After immobilizing the chair with stops on the back part of the base, a force of 2000 N is applied on the seat and another of 700 N on the back. 10 cycles are completed in this way.

No damage was caused to the chair as a consequence of the tests, and it continued functioning properly.

RESULT: SATISFACTORY

2.2. Static load test on the front edge of the seat (sec. 6.2.2), in accordance with the UNE-EN 1728:2001 standard

After immobilizing the chair with stops on the back part of the base, a force of 2000 N is applied 80 mm from the front edge, on the front axis. 10 cycles are completed in this way.

No warping is noted as a consequence of the tests.

RESULT: SATISFACTORY

2.3. Lateral static load test on armrests (sec. 6.5), in accordance with the UNE-EN 1728:2001 standard

A load of 600 N is applied outwards simultaneously on each armrest, at the point on them considered the most unfavourable, but at least 100 mm from either of the ends of the armrest structure. These forces are applied 10 times.

No warping was noted following the test.

RESULT: SATISFACTORY



2.4. Static load test on armrests subjected to a downward vertical force (sec. 6.6).
in accordance with the UNE-EN 1728:2001 standard

A vertical force of 1000 N is applied at the points of an armrest considered most unfavourable.

No warping was noted following the test.

RESULT: SATISFACTORY

3. DURABILITY TESTS

3.1. Combined fatigue test on seat and back (sec. 6.7). in accordance with the UNE-EN 1728:2001 standard

A vertical load of 1000 N is applied at the load point of the seat while at the same time applying another horizontal force of 300 N at the load point of the back.. Both loads are then removed – first that of the back and then that of the seat – and the process is repeated for 200,000 cycles.

No warping was noted following the test.

RESULT: SATISFACTORY

3.2. Fatigue test on the front edge of the seat (sec. 6.8), in accordance with the UNE-EN 1728:2001 standard

The test involves applying two vertical loads of 1000 N, alternating between two points located 80 mm from the front edge of the seat and as close as possible to the lateral edges, albeit at a distance of over 80 mm from the aforementioned edges. 100,000 cycles are completed in this way.

No warping was noted following the test.

RESULT: SATISFACTORY

3.3.- Fatigue test on armrests (sec. 6.10), in accordance with the UNE-EN 1728:2001 standard

The test involves immobilizing the chair and applying a vertical load of 400 N at 100 mm from the front edge of each armrest, forming a 10° angle to the vertical. 100,000 cycles are completed in this way.

No warping was noted following the test.

RESULT: SATISFACTORY

4. TESTS ON THE FEET

4.1. Static load test on front feet (sec. 6.12), in accordance with the UNE-EN 1728:2001 standard

Once the chair has been immobilized by stops on the front feet and after placing a load of 1000 N on the seat, a horizontal force of 500 N is applied at the mid point of the back edge of the seat towards it. This force is applied 10 times.

No warping was noted following the test.

RESULT: SATISFACTORY

4.2. Lateral static load test (sec. 6.13), in accordance with the UNE-EN 1728:2001 standard



Once the chair has been immobilized by stops on the feet of one side and after placing a load of 1000 N on the seat, a horizontal load of 400 N is applied on the opposite side of the seat to the stops, at a point no more than 150 mm from the edge. This force is applied 10 times.

No warping was noted following the test.

RESULT: SATISFACTORY

5. IMPACT TESTS

5.1. Impact test on seat (sec. 6.15), in accordance with the UNE-EN 1728:2001 standard

The test involves placing a piece of foam on the seat at the load point, and dropping an impactor from a height of 240 mm 10 times.

No warping was noted following the test.

RESULT: SATISFACTORY

5.2. Impact test on back (sec. 6.16), in accordance with the UNE-EN 1728:2001 standard

The test involves placing the chair with its front feet attached to stops to prevent forward movement. The upper part of the back is hit in the centre 10 times with an impact hammer. The hammer is dropped from a height of 330 mm at the following positions on the back:

RESULT: SATISFACTORY

5.3. Impact test on armrests (sec. 6.17) in accordance with the UNE-EN 1728:2001 standard



The test is carried out in the same way as the impact test on the back (6.16), but in this case the hammer is dropped from a height of 660 mm.

RESULT: SATISFACTORY

5.4. Drop test (sec. 6.18), in accordance with the UNE-EN 1728:2001 standard

The effective weight transmitted to the feet is assessed on the right and left sides of the seat (for instance, using scales), and the drop height is determined – in this case, 150 mm of space.

The seat is raised at one end/side and dropped freely from the height specified in such a way that the feet or wheels hit the floor. The test is carried out 5 times at the other end of the seat.

RESULT: SATISFACTORY

6. ROLLING RESISTANCE TESTS ON THE NON-LOADED CHAIR

6.1. Test to determine drag force (sec. 6.18), in accordance with the EN 1335-3:2000 standard

The seat must be placed on a test surface and pushed or dragged over a distance of at least 5500 mm at the constant speed of (50 ± 5) mm/second. Force must be applied at a height of (200 ± 50) mm above the test surface.

The force used to push or pull the chair is determined before and after the fatigue test. The mean value of the forces measured over the space between 250 mm and 500 mm equals the rolling resistance. The force needed is 15 N.

6.2. Test to determine drag force (sec. 6.19), in accordance with the EN 1335-3:2000 standard



The chair must be placed in its normal position of use on a rotating platform of the test machine equipped with a test surface; the rotation axis of the chair must coincide with the test machine platform. The foot of the chair must be fastened in such a way that it does not rotate, but *does* influence the natural movements of the wheels. The wheels must be able to rotate freely. The rotation speed of the platform must be 6 min^{-1} . Rotation will be from 0° to 180° and back. After each half-turn, the direction of rotation of the desk is the opposite and there must be a pause for rest of 2 seconds' duration between rotations after each change of direction. During the entire test, the seat must be alternately loaded for 60 seconds with a 75 kg mass at point "A" and unloaded for 30 seconds. Fatigue test duration is 100 hours.

No breakage or fault was noted following the test.

RESULT: SATISFACTORY