Hinges for furniture a matter of durability and resistance...

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Many storage units that furnish our homes are equipped with a basic element that allows you to connect the door to the structure of the furniture itself and allows it to be opened and closed in all its rotation: **the hinge.**

The use of hinges in furniture, especially those on a vertical axis, has an ancient history, it had a development in the early 1900s with the production of concealed hinges made of iron or brass and recorded the first great innovation at the end of the fifties with the filing of the first international patent covering a concealed self-closing furniture hinge.

For a long time it was considered **a marginal accessory**, both by furniture manufacturers and by the end customer, but in recent years the hinges have become a design element that enhances the door or the furniture on which they are mounted.

The evolution of this product has not only been focused **on improving the aesthetic appearance, but also on the functionality and performance** it can provide.
On the market you can find hinges with different opening angles, with soft close mechanism or with self-close, hinges for glass, panel and metal doors. Hinges for every taste and every need.

However, these products must not only satisfy our aesthetic taste, they must also ensure the safety of the user by preventing the door detaching from the furniture, they must guarantee the performance for which they are intended and last over time.
Their frequent use and the effort to which they are subjected make them one of the components of the furniture subject to greater wear.

The standards in the furniture sector help us to verify their resistance and durability.
There are standards that can be used by the manufacturers of the hinges and standards that can be used by the furniture manufacturer to ensure that the hinge that he purchased and installed on the door guarantees the required performance.

When we talk about hinges on vertical axis, hinge manufacturers can apply the **EN 15570:2008 "Hardware for furniture - Strength and durability of hinges and their components - Hinges pivoting on a vertical axis".**
This European Standard specifies test methods and requirements for the strength and durability of all types of hinges pivoting on a vertical axis and their components for all fields of application.

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The tests consist of the application of loads and forces simulating normal functional use, as well as misuse, that might reasonably be expected to occur.

The test parameters shown in Table B.2 and Table B.3, column 1, 2 and 3 are considered suitable for hinges for most fields of application from domestic to contract use.

For example, the durability test (clause 6.3.7) requires to perform the following cycles in accordance to the performing level:

Test		1	2	3
Durability clause 6.3.7	cycles	20.000	40.000	80.000

In addition to the tests to be performed, EN 15570 defines the maximum opening and closing forces and the maximum allowable deflection (sagging) of the door after the durability test.

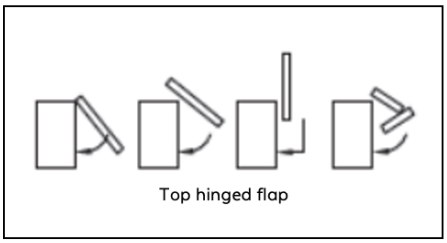
The standard has been taken as a model for the development of an ISO standard (International Organization for Standardization).

The **EN 15828:2010 "Hardware for furniture - Strength and durability of hinges and their components – Stays and hinges pivoting on a horizontal axis"**, can be used by the manufacturers of these products intended for doors with horizontal axis opening (top hinged flap or bottom hinged flap).
This standard specifies test methods and requirements for the strength and durability of all hinges, stays and systems which include hinges and stays pivoting on a horizontal axis and their components for all fields of application.

Also the EN 15828 provides stresses that reproduce normal functional use and any misuse that is reasonably conceivable and differentiates the tests in relation to the type of door opening (downwards or upwards).

To cover most of the fields of application, from domestic use to non-domestic use, this standard also includes tables B.2 and B.3, structured on three levels.
For example, the durability test (clause 6.3.6), requires to performing the following cycles accordance to the chosen level and to the type of door opening:

Test		Top hinged flap		
		1	2	3
Durability, clause 6.3.6	cycles	10.000	20.000	40.000



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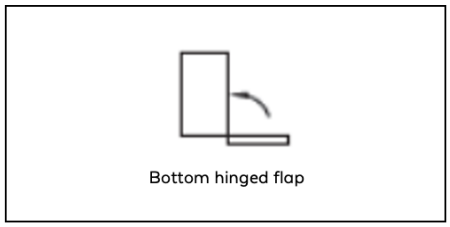
Test		Bottom hinged flap		
		1	2	3
Durability, clause 6.3.6	cycles	5.000	10.000	20.000



The document also defines the maximum opening and closing forces and the maximum allowable deflection (sagging) of the door after the durability test.

The EN 15570 and EN 15828 requires the tests to be carried out on a test frame with specific properties and the hinges shall be mounted on a particle board, with specified properties, unless otherwise specified by the manufacturer.
For both standards the determination of corrosion resistance according to **EN ISO 6270-2 "Paints and varnishes - Determination of resistance to humidity -- Part 2**: **Condensation (in-cabinet exposure with heated water reservoir)"** is also requested.
After 3 cycles in a wet-static chamber according to the AHT method (1 cycles= 24hours of testing), with the exception of cutting edges, screw slots, rivet heads, aluminum and molded parts of zinc, all parts which are visible when the hinges are mounted shall show no corrosion. The function shall be maintained.

The two standards foresee carrying out the tests using three groups of hinges:
- the first set shall be used for the overload tests
- the second set shall be used for the functional tests
- the third set shall be used for the corrosion test

Finally, the two documents require the manufacturer to provide a series of information on the product in order to assist furniture manufacturers/developers in choosing the correct hinge for a given purpose.
The product information shall include:
- information regarding the material(s) for which the hinge(s) are suitable, e.g. solid wood, particle board, glass.

- information regarding the test results carried out in accordance with the relevant standards
- information regarding the mass in kg, the size of the door and number of hinges for which the hinge(s) will fulfil the requirements of this standard
- information regarding the presence of adjustment systems and spring and damper mechanisms.
- information on whether the corrosion test has been carried out and whether the requirement has been fulfilled.

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