The safety and durability of office furniture

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Contents and news about UNI EN 527-2: 2016 “Office furniture - Work tables - Part 2: Safety, strength and durability requirements”.

Introduction

The office furniture in Italy has changed appearance with regards to the companies of producers, the production numbers (and related incomes), as well as to the shape, functionality and flexibility of the equipment part of it, and this is true also when speaking about desks. The technical standardization (national and European) has carefully followed these changes and evolutions, sometimes very profound, first defining the relevant requirements of geometry and size (EN 527-1 in 2012) and now also introducing the safety, strength and durability requirements. The subject has always been complex and even contradictory, and this is also reflected in the temporal distance between the publication dates of the two standards, approximately four years.

Of note is also the fact that the current version replaces the previous one of 2003. All the things that have changed in these years are under everybody’s eye, with regard to the way we work in the office, the attention to these aspects and the expectations/requests, clear or implicit coming from the users of these products.
UNI EN 527-2 edition 2017 (published by CEN in December 2016) collects all these requirements and provides a tool for evaluating them.

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The standard EN 527-2

As mentioned in the introduction, this is the revision of the 2003 version (whose genesis dates back to the early 90's) and it is useful to begin the explanation of the standard highlighting of the main differences between the two versions.
The first difference is already in the title: 2003 version reported "mechanical safety requirements" while the current version speaks about safety, strength and durability. This change finally clarifies the great discussion between safety and the other nouns by explaining how these are an integral and essential part of safety.

Reading on the standard and comparing it with the previous version, we note immediately that with regard to the safety distances between the moving parts the lower limit is no longer "not more than 8 mm" but has been moved to 7mm. The topic of finger trap is one of the most controversial in the furniture world and perhaps this year a shared document (FprCEN/TR 17202) to define horizontally the approach to this safety requirement will be published.

Another novelty of this version compared to the previous one lies in the fact that the normative reference for the test methods is unique for tables/desks: the European standard EN 1730 in its latest version of 2012. We recall that in the previous version of EN 527 there was also a part 3 that defined the test methods for office desks. Today, almost 20 years after the beginning of CEN's work on furniture, we have come to simplify and parameterize the test methods (at least with regard to seating, storage units and tables) and therefore the attention can be focused on the definition of safety requirements for furniture that is continuously changing. An analogue path and similar timings have been made for other end uses of tables like domestic, non-domestic and outdoor use.

To understand the scope of this standard in the perspective outlined above, we propose a synthetic version of the test sequence with the required loads and cycles. The table we provide is a simplification of the one in EN 527-2, which we refer to for a careful and rigorous reading when approaching the evaluation of a desk/work table.

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Table of the sequence of tests on desks/work tables (simplified version)

Test	Reference standard (clause of EN 1730: 2012)	Parameter	Loads/cycles
Durability of height adjustments mechanisms (only for electrically operated desks)	Clause 8	Minimum mass on the table top, kg: Cycles:	50 1000
Horizontal static load test	Clause 6.2	Load on the table top, kg: Force N: Minimum force, N: Cycles:	50 450 300 10
Additional horizontal static load test for adjustable tables with a height more than 950 mm	Clause 6.2	Load on the table top, kg: Momento, Nm: Cycles:	50 285 10
Vertical static load	Clause 6.3.1	Force N: Cycles:	1 000 10
Additional vertical static load test for adjustable tables with a height more than 950 mm	Clause 6.3.1	Force N: Cycles:	500 10
Horizontal durability	Clauses 6.4.1, 6.4.2	Load on the table top, kg: Force N: Cycles:	50 300 10 000
Stiffness of the structure	Clauses 6.4.1 and 6.4.3	Load on the table top, kg: Force N:	0 200
Vertical durability	Clause 6.5	Force N: Cycles:	400 1000
Durability of tables with castors	Clause 6.8	Load on the table top, kg: Cycles::	50 2 000
Vertical impact	Clause 6.6	Drop height, mm : Cycles:	140 10
Drop test	Clause 6.9	Nominal drop height, mm:	100
Stability	Clause 7.2	Force N:	750
Stability for work tables extension elements	Clause 7.3	Force N:	400

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A careful reading of the table shows some facts that I consider fundamental in the evolution and thus in the revisions of a technical standard.
First of all, the magnitude of stresses (load values and number of cycles) of the tests, have not changed compared with those of the previous version. This cannot be taken for granted and it is an important aspect as it does not modify designs that have been modulated on these values and have already proven in use that have not led to situations critical for the user's safety.

The test sequence takes into consideration also two aspects that characterize modern desks. Similarly to what is described in part 1 of EN 527 (Dimensions), desks are not limited to sitting posture but also contemplate standing with the possibility of switching from one posture to the other using the same product. It is clear that even the stresses to which they are subjected to in the "stand" configuration should be considered as an additional requirement (although smaller as it is shown by the table numbers).
It is therefore clear that also the operation that allows to move from sitting to standing position should be evaluated for durability. The standard provides a number of fatigue cycles that, according to experiences gathered at European level, has been considered appropriate for office work as we see it more frequently nowadays.
The requirement only applies to electrically operated work desks, and only concerns the functionality of the system; the requirements concerning electrical safety are governed by the relevant standards developed by Cenelec.
Also the long-standing requirement about the rigidity of the structure, that is, the tendency of the table to oscillate under horizontal stresses, has been resolved by considering it in the normative part of the standard and not in an informative attachment as in the previous version.

This made it possible to delete the type A deviation that had been granted to Germany.
In an information attachment, however, the requirement for deflection of table tops was introduced, requiring exquisitely performance and not safety features.
The standard is a complete document as regards to the mechanical safety of today's office tables and desks, and is a fundamental support for a more general risk analysis that will also address other aspects of furniture products/equipment in continuous evolution and increase of the operations complexity.

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