

Outdoor furniture: European standards now completely revised

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The normative history of outdoor furniture (seats and tables) is among the oldest in the work of TC 207 of CEN. Demanded initially (mid-90s) from France (at that time home to large companies in the sector) the first versions were published between 1997 and 2000.

Their use has followed the dynamics of the outdoor furniture sector, which in recent years has definitely had one of the most troubled lives.

In any case, for a country like Italy where from north to south for many months a year, the time spent outdoors is a significant part of our life, between the private and especially the public (eg bars, restaurants, etc.), this is one of the most relevant regulatory areas to which great attention has been paid and this attitude shall not be lacking in the future.



THE STANDARDS EN 581

The outdoor furniture, intended as seats and tables, is currently governed by the following three standards:

UNI EN 581-1:2017 *Outdoor furniture - Seating and tables for camping, domestic and contract use - Part 1: General safety requirements*

UNI EN 581-2:2015 *Outdoor furniture - Seating and tables for camping, domestic and contract use - Part 2: Mechanical safety requirements and test methods for seating*

UNI EN 581-3:2017 *Outdoor furniture - Seating and tables for camping, domestic and contract use - Part 3: Mechanical safety requirements for tables*

A particularity of this set of product standards should be emphasized. This is the only case within the furniture standards in which the general safety requirements, (design, sharp edges, moving parts, etc.) are grouped and listed in a specific standard, UNI EN 581-1, and not included within those that also define mechanical safety.

The reasons of this choice, made at the beginning of the 90s, also resided in the experimental evidence that many of the cases of accidents recorded in the European countries derived precisely from reasons attributable to the aspects mentioned above. Furthermore, the previous version of EN 581-1 (2006) is still included in the list of harmonized standards that give presumption of conformity to the General Product Safety Directive (2001/95/EC).

Now let's move on to the requirements contained in UNI EN 581-1. These concern the following aspects, directly related to the design, independently of the materials and/or construction processes:

- there shall be no accessible holes in the ends of tubular components with a diameter between 7 mm and 12 mm with a depth more than or equal to 10 mm;
- there shall be no shear or squeeze points, ie distances between 7 and 18 mm, between the moving parts other than those generated by folding furniture while being positioned for use;
- there shall be no shear or squeeze points between parts of the furniture operated by mechanisms such as mechanical springs or gas lifts;
- there must be no shear or squeeze points produced by the user's weight during normal movements and actions, e.g. attempting to move the seating by lifting the seat or adjusting the backrest.

Regarding this last point, the standard specifies the tests and clauses of the other two standards (EN 581-2 and EN 581-3) where to find the loads to be applied for the verification of shear and squeeze points. This is for the seats, sun loungers and tables.

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And this aspect introduces us authoritatively within the requirements of part 2 and part 3.

Part 2 defines the requirements of resistance and duration of sessions, including sunbeds (sundeck) defining three levels of severity depending on the intended use: camping, domestic and non-domestic. By way of example and not exhaustive, we show in table 1 the loads and cycles for the sessions. A similar table for sunbeds is within the standard.

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Part 2 defines the requirements of resistance and durability of seatings, including loungers (sunbeds) defining

three levels of severity depending on the end use: camping, domestic and non-domestic. By way of example and not exhaustively, we show in table 1 the loads and cycles for the seatings. The standard includes a similar table for loungers. As you can see the magnitude of the loads and the number of cycles increases changing from camping to non-domestic use. This not only due to the practical evidence of how outdoor furniture is used but also to reflect different design methods in the end uses referred to in the standard. Therefore while EN 581-1 is horizontal for all intended uses, part 2 makes this distinction which is absolutely realistic.

This part of the standard is also a revision and the figures it includes are the result of experiences of use in Europe, in which Italy has played its important and sometimes guiding role.

The standard requires the safety requirements described above in part 1 to be met both before and after the test sequence described here. In this way the two parts are tied to double thread obtaining a very strong and credible technical completeness and consistency.

A similar approach has also been adopted for the tables (Table 2) and also in this case, part 1 and part 3 become a whole that can not be broken down at will.

Part 3 has an additional safety requirement concerning glass. The required types of glass are the tempered and stratified. Also in this case, considering the outdoors environment and its peculiarity of random but likely events (especially in the non-domestic sphere) the requirement finds its logical foundation easily understandable and shareable.

Both for part 2 (seatings) and for part 3 (tables), after having carried out the relative test sequences, the two standards list a series of absolutely similar mechanical requirements:

- a. there are no fractures of parts or components,
- b. there are no loosening of joints/assemblies,
- c. the piece of furniture fulfils its functions after the tests
- d. the product shall not overturn when subjected to stability tests.

It should also be noted that for tables there is a stability test that takes into account the presence of a parasol.

We have therefore seen how the safety of outdoor furniture now has a set of rules that addresses design and mechanical safety in a modern, current way and provides repeatable and reproducible test methods for assessing the risks associated with their use and of which we all know, sometimes by direct experience, the entity and sometimes very serious consequences.

As said at the beginning, our country for many months a year carries out an intense life outdoors due to the enormous cultural and natural heritage that surrounds us. Such beauty must also find an equal in the safety of the furniture that is an important surrounding of our locations.

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Test	Reference (clause of EN 1728: 2012)	Parameter	End use		
			Camping	Domestic	Non domestic
1. Seat and back static load	EN 1728:2012, 6.4	Seat load, N Backrest load, N Cycles	1 100 - 10	1 600 410 10	2 000 560 10
2. Front edge static load	EN 1728:2012, 6.5	Seat load, N Cycles	1 100 10	1 300 10	1 300 10
3. Seat and back durability	EN 1728:2012, 6.17	Seat load, N Backrest load, N Cycles	1 000 250 12 500	1 000 333 25 000	1 000 333 50 000
4. Durability on seating with a multiposition backrest	EN 1728:2012, 6.19	Seat load, N Backrest load, N Cycles	750 190 500	750 250 1 000	750 250 2 000
5. Armrest vertical static load	EN 1728:2012, 6.11	Vertical force, N	-	700	900
6. Armrest durability	EN 1728:2012, 6.20	Load, N Cycles	400 5 000	400 10 000	400 30 000
7. Leg forward static load	EN 1728:2012, 6.15	Seat load, N Horizontal force, N Cycles	750 250 10	1 000 300 10	1 000 400 10
8. Leg sideways static load	EN 1728:2012, 6.16	Seat load, N Horizontal force, N Cycles	750 200 10	1 000 300 10	1 000 300 10
9. Seat impact	EN 1728:2012, 6.24	Drop height, mm Cycles	140 10	180 10	240 10
10. Footrest static load	EN 1728:2012, 6.8	Forza verticale, N Cycles	- 10	1 000 10	1 200 10
11. Stability	EN 1022				

Table 1 test sequence of outdoor seating (simplified version)

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Test	Reference (clause of EN 1728: 2012)	Parameter	End use		
			Camping	Domestic	Non domestic
1. Vertical static load (> 0,25 m ²)	EN 1730:2012, 6.3.1	Vertical load, N	300	750	1 000
		a. table height ≤ 950 mm	-	500	500
		b. table height > 950 mm	10	10	10
2. 1. Vertical static load (≤ 0,25 m ²)	EN 1730:2012, 6.3.1	Vertical load, N	150	300	500
		Cycles	10	10	10
3. Vertical static load ancillary surfaces	EN 1730:2012, 6.3.3	Vertical load, N	100	200	300
		Cycles	10	10	10
4. Horizontal fatigue	EN 1730:2012, 6.4.2	Mass, kg	50	50	50
		Force, N	100	150	300
		Cycles	5 000	10 000	20 000
5. Stability	EN 1730:2012, 7.2	Force, N			
		V ₁	200	200	200
6. Stability tables with extension elements	EN 1730:2012, 7.3	V ₂	200	400	400
		Force, N			
		V ₁	-	100	100
7. Stability tables with parasols	EN 1730:2012, 7.4	V ₂	-	200	200
		Force, N	30	30	30

Table 2 test sequence of outdoor tables (simplified version)

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