

Technical specifications stairs

1. Configuration

The staircase is based on straight flights in the following configuration (please select one):

1. In line stairs: all flights are in one line, with a landing at least every 17 steps (Belgium), or according to local specifications;
2. Crossed stairs, parallel to the façade: all flights are parallel to the wall. The staircase is composed of two crossed flights per story, one access landing per exit and one intermediate landing in between two stories;
3. Crossed stairs, perpendicular to the façade: all flights are perpendicular to the wall. The staircase is composed of two crossed flights per story, one access landing per exit and one intermediate landing in between two stories. The intermediate landings are braced to the wall in order to improve stability;
4. Rectangular stair layout: flights laid out in a square so that they are alternatively parallel and perpendicular to the wall. In between two flights a landing is put at each corner of the square. Each story has one access landing, three intermediate landings and four flights.

2. Materials

Only materials not subject to corrosion can be used: extruded profiles and plates of high resistance aluminum alloy, anodized 10 micron, natural mat finishing; fasteners of stainless steel, A2-70 DaN/mm².

No protective treatment, painting or maintenance is required, except when exposed to aggressive environments.

Welding is not allowed. Only 45° corners of landing frames, if applicable, can be reinforced via welding.

Besides for fasteners, steel is excluded, except in cases of extreme span, in which case an adequate isolation between steel and aluminum shall be applied, to prevent any electrolytic coupling.

The staircase can be factory painted in any RAL color by polyester powder coating (option).

3. Composition

The staircase is partly pre-assembled in the factory, using bolts and rivets. Final assembly of the staircase is executed on the construction site. The staircase is fixed to the wall using bolts and aluminum alloy profiles.

3.1 Stringers

The stringboards are made of hollow profiles of 8-3/16" x 1-3/16" x 5/64" or 208 x 30 x 2 mm with double chamber. Their slope is 37° (or 45°; other angles on request). They make up straight flights that have a useful width of ... ft / cm (between 1'11" or 60 cm and 3'11" or 120 cm).

3.2 Steps

The steps are made of aluminum alloy extruded profiles. They have an anti-slip tread:

1. Steps based on extruded profiles covered with anti-slip tread plates with five-bar pattern, thickness 3/32" to 5/32" (2.5 to 4 mm);
2. Steps based on profiles with extruded longitudinal grooves and machined transversal grooves;
3. Steps based on extruded profiles covered with anti-slip tread plates with perforations (Ø 3/8" or 9 mm and Ø 9/16" or 14 mm) with standing edge, thickness 1/8" or 3 mm.

Rise height: ± 7" or 18 cm

Tread length: 9-7/8" or 25 cm

Nosing: 1-3/8" or 3.5 cm

Risers available on request (option)

3.3 Landings

The frames of the landings are composed of hollow profiles of 8-3/16" x 1-3/16" x 5/64" or 208 x 30 x 2 mm with double chamber. Joists of no less than 1'11" x 13/16" x 5/64" or 60 x 20 x 2 mm spaced at no more than 1' or 30 cm are fixed in this frame. These joists support a deck made of aluminum alloy tread plates that are perforated to drain rain water. The tread plates are riveted to the joists. The allowed tread plates are either five-bar pattern plates with thickness 3/32" to 5/32" (2.5 to 4 mm), or plates with perforations (\varnothing 3/8" or 9 mm; and \varnothing 9/16" or 14 mm) with standing edge and thickness 1/8" or 3 mm.

The minimal width of the landings will be at least 5" or 15 cm in excess of the useful width of the steps.

3.4 Guardrails

The guardrails of flights and landings are linked. They are made of a handrail of at least 1-15/16" or 50 mm wide, having rounded edges (radius at least 1/16" or 1.5 mm) and mounted onto hollow pickets of 2-3/8" x 1" x 1/8" or 60 x 25 x 3 mm with rounded edges. The pickets are fixed into the stringers and in the landing frames at least every 2'5" or 74 cm. In between these pickets is constructed:

1. Either a guardrail with three round tubes of 1 1/16" x 5/64" or 18 x 2 mm, set parallel to the handrail and running through the pickets;
2. Either a guardrail with square tubes of 1' x 1' x 1/16" or 25 x 25 x 1.5 mm with rounded edges, put parallel to the pickets and spaced at 4-3/8" or 11 cm; these tubes are fixed into the handrail at the top and in a square tube of 1-3/16" x 1-3/16" x 5/64" or 30 x 30 x 2 mm at the bottom. The pickets run through this tube;
3. Either a custom made guardrail according to agreed specifications.

The height of the guardrail is at least 3'3" or 1 m on the landings and at least 2'11" or 90 cm on the flights, measured at the step nosing.

For secure evacuation, no part of the stair shall interfere with the flowing line of the handrails. The handrails are at least 1-1/2" or 40 mm cleared from all obstacles.

On request, the manufacturer can provide a children's handrail at intermediate height.

3.5 Supporting structure

Depending on the type of stair, the supporting structure shall consist of columns or of wall bracings.

The columns and / or bracings are made of U-shaped or L-shaped channels of appropriate sizes, with rounded edges. They will provide the required mechanical resistance (see item 4). The columns will be constructed on an adequate foundation. The wall bracings are fixed to the wall by anchor bolts of adequate sizes and numbers.

4. Mechanical properties

The stair will be able to support a uniformly distributed load of 102 lb/ft² or 500 Kg/m² on the flights (on the surface projected on the horizontal plane) and landings as well as a point load of 440 lb or 200 Kg applied anywhere on the steps or landing deck (standards NBN 1-50 and NFP 06-001).

The guardrails will withstand a horizontally applied uniform load of 67 lb/ft or 100 Kg/m without permanent deformation (standards NBN 03-103, NFP 06-001 and NFP 01-012).

The manufacturer shall share, on request, his calculations of stability, deformations and stresses.

5. Counterbalanced stair

In order to prevent improper use and / or limit the use of space at ground level, the lower flight of the staircase can be counterbalanced (option).

5.1 Pivoting

The pivoting system is comprised of two guiding rings of polyamide reinforced by fiberglass and a spindle in drawn stainless steel of 13/16" or 20 mm diameter.

5.2 Counterweight

Two types of counterweight positioning are possible:

1. System based on prolonged stringers. The lower flight has two prolonged stringer sides which project over the rotation point. The counterweight is put inside these stringers. Thanks to the counterweights, the flight is in equilibrium at its rotation point.
2. Cable and pulley system. The counterbalance is applied to the tip of the stair flight via a system of one or more stainless steel cables and pulleys. The cable connects to counterweights that move inside a hollow profile, which is positioned vertically.

5.3 Blocking

The flight is blocked in its upper position by a mechanism controlled by a small gate on the access landing. Opening the gate automatically releases the flight. The counterweights ensure a soft descent of the flight.

6. Paneling

The manufacturer can provide a staircase paneling (option). This paneling consists of:

1. Either a curtain of vertically positioned aluminum alloy hollow profiles, mounted on two horizontal structures per story. The profiles will be (Please select):
 - square (1" x 1" or 25 x 25 mm), positioned every 4" or 100 mm, leading to 3" or 75 mm wide openings between the profiles;
 - rectangular (2-3/8" x 1" or 60 x 25 mm), positioned every 4-3/4" or 120 mm, leading to 2-3/8" or 60 mm wide openings between the profiles;
 - rectangular (4" x 3/4" or 100 x 18 mm), positioned every 5-1/2" or 140 mm, leading to 1-9/16" or 40 mm wide openings between the profiles;
 - circular (7/8" or 22 mm diameter), positioned every 4" or 100 mm, leading to 3-18" or 78 mm wide openings between the profiles;
 - another structure, to be specified.
2. Either perforated aluminum alloy plates, with 5/64" or 2 mm thickness and perforations of Ø 3/16" or 5 mm (or a different type of plate).
3. Either a different solution to be specified.

7. Guarantee

The staircase and its installation have to be inspected. The inspection report needs to be submitted to the client within one month after the installation.