

User manual: self-supporting pyramidal structure

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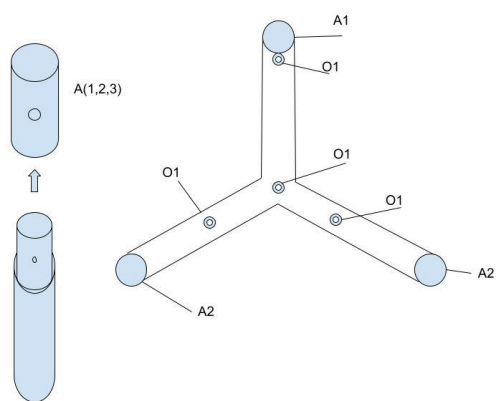


Product description

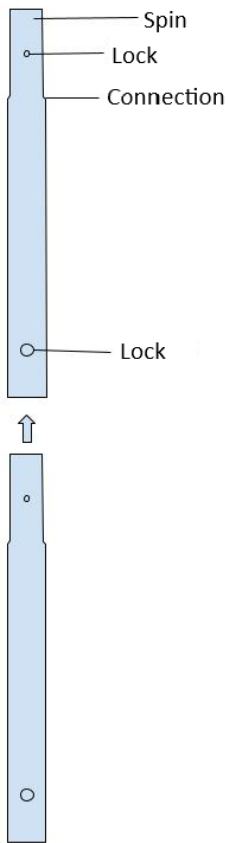
The self-supporting pyramidal structure is a versatile and practical suspension system. Safe and easy to assemble.

His planning is based on some needs, the first one being always safety. Both during use, assembly and transport phase. The other needs are balanced according to the specific needs you want to satisfy.

It is composed of a central head, a number of poles depending on the model, height and section also depending on the model, and three rope tie rods.



Headboard of our structures is realized as in the figure. Components A (1,2,3) are equipped with a hole whose purpose is to prevent the accidental leak of the section. And with an eyelets system (O).

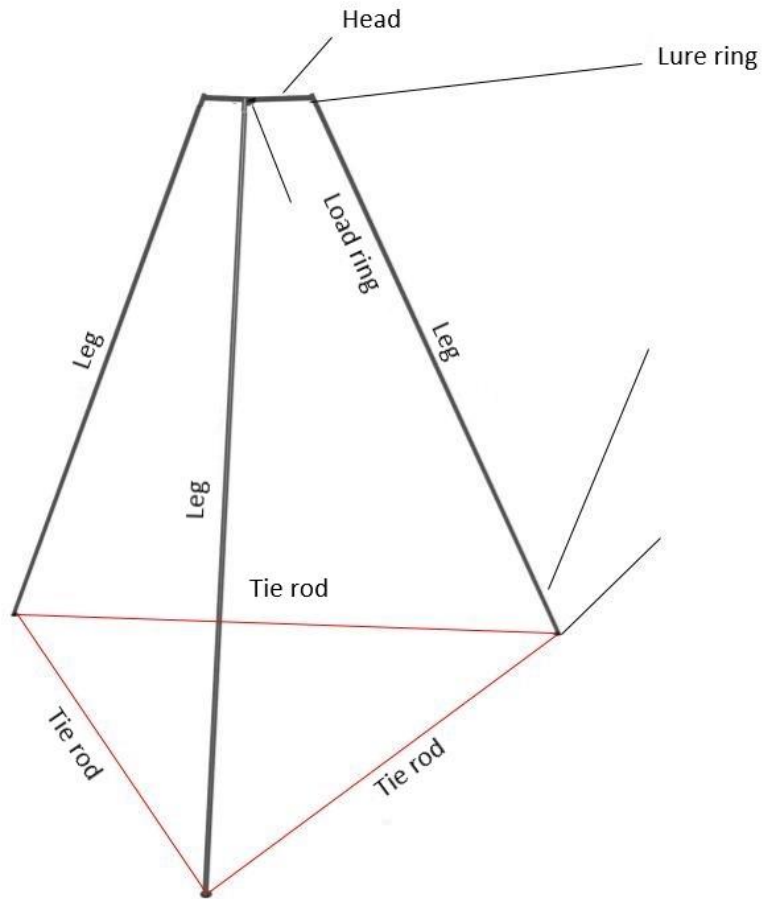


Every structure is made up of a number of variable poles. The basic structure is constant. We chose to always integrate the pins into the poles, this allowing lighter and quick to assemble structures. The type of lock depends on the structures. But every lock works in the same way: they prevent the poles from accidentally slipping out during assembly. Once assembly is completed locks cease their function completely. Therefore we prefer them to be quick and easy to couple in order to make assembly easier and safer.

As a whole the structure works in a very simple way that will be clarified later in the paragraph "To stay safe".

Nomenclature related to the figure alongside will be very useful and will be repeated several times throughout this manual.

Technical characteristics are always assembly height and footprint. Correlated according to simple geometric formula.



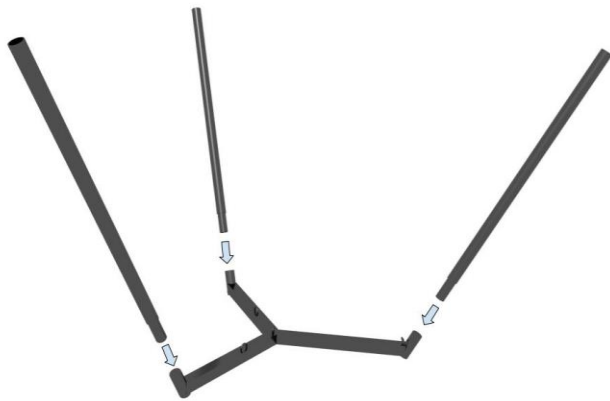
Correct assembly

The structure was planned to be assembled as described in this chapter. Any other procedure could cause damage to equipment and people.

Structures are easy to assemble and all were assembled and disassembled by the writer without the help of other people. However, for structure higher than 4 meters, we recommend carrying out the assembly at least in two people.

We guarantee the stability of the structure if and only if it has been assembled as follows:

Assembly of parts



- 1) Lay down the head on a stable ground. Insert three poles making sure the lock fits (tighten the screws or make sure the spring latch has clicked into the corresponding hole).
- 2) Gently turn the structure upside down.
- 3) Anchor the tools.

a) Direct anchoring: Connect, through suitable carabiners, the tool that will be used once assembly is completed.

b) Anchoring with return: Connect the friction reduction means you prefer to the specific eyelets, fastening ring and lure ring. We suggest climbing pulleys and connecting links of appropriate size. Prepare a rope long at least twice the height of the structure,

centering it in relation to the two eyelets. Continue with the assembly. Once assembly has been completed, anchor your tool to the part of the rope that hangs from the load ring, lift it until the desired height; if it corresponds to the height of the structure leave a few cm of rope free. Anchor the corresponding foot to the lure ring. In some models you will find a specific ring, otherwise one of the two for the tie rods is fine.

- 4) To continue assembly, lift a leg and insert one of the poles. Make sure the screw or the latch stop the pole from accidentally slipping out. Lift a second leg, insert another pole, and finally a third one. At this point you will have assembled two "levels". Repeat this operation until only the feet remain, recognizable because they are equipped with a base and rings for anchoring the tie rods.



5) Anchor each tie rod to a foot, making sure that, in the models that have two eyelets, all are facing in the right direction (tie rod "A" anchored to the eyelet in the direction of foot "B", "B" towards "C", "C" towards "A"). Gently move the feet together until you can easily anchor the other end of the tie rod. In models that have several mountings, make sure you have used the eyelet corresponding to the number of poles assembled. Once all the anchorings have been made, then with all tie rods well secured, distance the feet until the right distance allowed by the tie rods.

- 6) On slippery grounds apply a base under the feet, in wood for alphet, sand and stone, rubber for other terrains.

At this point the structure is **Ready for use**.

During the assembly phases **it is important to ensure** that:

- All parts are clean and not slippery.
- Whoever lifts the leg has an adequately firm grip; if it slipped from his hand he would risk injuring himself and people around him, in addition to ruin the edge of the pole making it useless.
- The slope of the terrain and the wind speed are not higher than those indicated on the certificates, and in general are not excessive.

Geometric accuracy control

Each part of the structure is designed to have a specific length.

Before going into how to check this accuracy, let's take a step back: what are the criteria with which we design our structures?

I think they can be organized in this way:

1. Safety during use
2. Safety during assembly and disassembly
3. Easy transportation
4. Durability
5. Cost
6. Beauty
7. Pleasantness of use

Naturally this brings with it some compromises; the most evident, in our experience, concerns the tolerances of the pins.

Very tight tolerances make assembly and disassembly dangerous, favouring pieces getting stuck. Pulling and yanking a seven meters high structure while your friend holds the pole for you is not a good idea. One of the main risks during assembly phase is dictated by this. So find different types of structures. Most of these have a flat spin terminal, both ours and our competitors' ones. This produces, when the structure is perfectly assembled, a free movement of one pole into the other horizontally.

By slightly sacrificing the cost, we have introduced, in most of our products, a conical fitting that prevents this movement. However this is not a problem for criteria 1 to 4.

To examine geometric accuracy, observe the structure by moving around it. Legs must be straight and subjected to curves, as identical as possible to each other. Tie rods must be completely extended and must not find any obstacles in their path (differences in height or various objects).

The tool must always fall within the perimeter drawn by the tie rods, even during use.

Test correct assembly:

If the structure does not have conical fittings, it is easy to understand that all geometries are correct because tolerances are unloaded, that is free to move. In models with conical fittings, instead, it is necessary to carefully observe that the geometries are all correct, no curves, no asymmetries. **Before the performance**, make sure that there are no people around the structure within a radius equal to its height. Carry out a load test (3 people are enough) hanging on the tool and swinging within the perimeter. After the test, the geometries must still be perfect.

During all these phases, **carefully follow the warnings**.

To stay safe

Let's get back our little drawing.

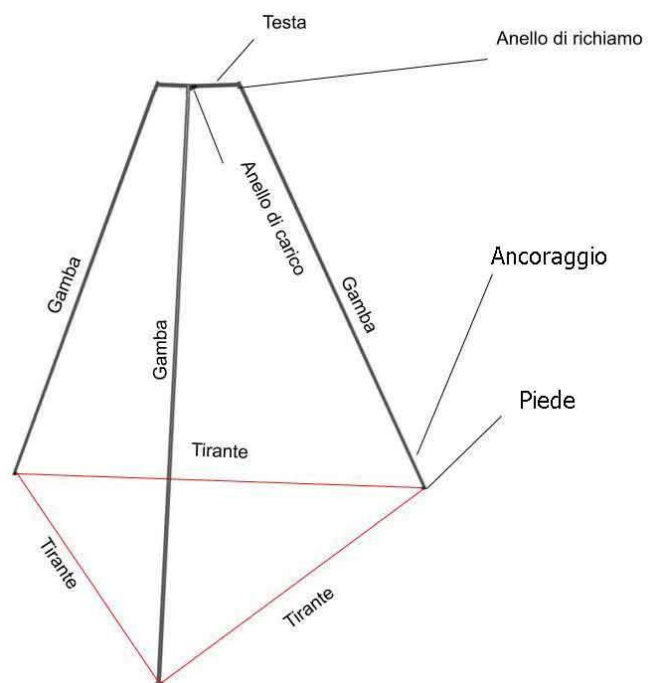
Before living it up, remember it is very dangerous to fall from a height greater than 2 meters. It seems trivial but let's remember it.

The pyramidal structure is designed only and exclusively to support vertical loads applied to the load ring. Any other force, especially horizontal ones, can be dangerous, so it is important to understand some concepts. The first one is the normal functioning of the distribution of forces. Ideally they press the head down, thus to the legs, up to the feet.

As long as these are straight, there will be two components of the weight force that insist, precisely, on the feet. A vertical one, which crushes them to the ground, and a horizontal one, which is balanced by the tie rods (and by friction... but we won't entrust our safety to friction, right?). So it is very important to avoid things that bend the legs

combined with heavy loads. A performer giving his

performance is not to be considered an "important load". But I like to feel safe. When you have an advantage, it's better to keep it. For this reason, read carefully the list of things not to do and try to understand the principles, so as to avoid other things that my imagination and that of my clients has not yet caught.



Suspensions, knots and cordage

The head of the structure already has some fastening eyelets and can, of course, be used to anchor other objects using lifting slings. With the necessary precautions (that is making sure the weight is as centered as possible).

A correct anchoring can make the difference.

We suggest climb carabiners or connecting links of appropriate size (whose shank is at least 8 mm).

Regarding knots, we can open an entire long chapter. We always suggest using a bowline and enriching it with some clove hitches. You can easily find tutorials on this knot.

We suggest using three-strand ropes, in other words those that have a structure made up of three easily recognizable braided parts. Ropes, indeed, tend to wear out precisely in the points where you tie knots more often. Ropes with several strands show clear signs of slowing down and are, on average, stiffer. Alternatively you can use climbing ropes. Always check the data sheets and consider triple the estimated load at least. For example: an athlete who weighs 55 kg is unlikely to be able to apply a pressure exceeding 200 kg to his suspensions without getting hurt. So 255 multiplied by 3 is 765. Therefore use ropes with a load capacity of no less than 800 kg.

Ropes are mainly used with returns. It is recommended to use two connecting links for each eyelet and always provide for a contingency cord. Especially if everything is rarely checked by unprepared personnel.

Maintenance and wear parts

Ours, like most products, are made of structural steel. A material with perfect characteristics for these purposes. Even for maintenance we can consider our systems exactly like scaffolding modules. Structural steel is not stainless! A stainless steel structure, being "weaker", would weigh more and cost several tens of thousands of euros. Regarding aluminium, the scarce hardness of the material would make the joints more fragile, and the cost would still be too high for marketable products with one criterion.

But don't worry: your cars are also made, to a large extent, of this material.

Therefore it is important to check that the oxidation state is not catastrophic (holes or thinning in the material).

It is recommended to grease the inside of parts with spray grease or the same grease used for windows and doors. You can find it for a few euros in any hardware store.

Before each assembly **inspect all parts**. Round profiles lose a lot of load capacity if they have even minimal dents.

After trying different surface treatments we opted for the classic painting. The reasons are very simple: with equal protection in relation to cold galvanizing, it offers greater maintainability and remains aesthetic over time. It can be repaired easily and at a modest cost. Scenographically, at night, the output of a black structure is much better and we can also provide other coloring that recall your favorite colors. Compared to heat galvanizing, it does not add weight to the structure. It lasts longer.

To resume painting in an "autonomous" way we recommend simple ready-to-use enamel spray. After cleaning and degreasing the surface and lightly sanding the worn out paint, apply a couple of coats following the paint manufacturer's directions. Both synthetic and water-based enamels for external use are fine.

How to:

Keep the structure outdoor (periodic maintenance and control over the parts)

After having internally greased and assembled the structure, following the following the "**Anchoring with return**" instructions, apply some bases that isolate it from the ground. After using it, disassemble the tool, especially when it comes to fabrics that can easily increase the "sail" of the structure. In case of strong winds, apply counterweights on the feet, sandbags or something, or anchor to the ground using a loose rope.

Move a mounted structure

Lift all feet at the same time (Sollevare contemporaneamente tutti i piedi (3 people are enough, one per foot). The tallest structure we have weighs 80 kg, so it can be lifted effortlessly by 3 people. Move you together keeping the distance between the feet constant (the tie rods easily serve as a reference, keep them taut). Place it gently on the ground (especially for the safety of the ground).

Change the tool

If you have assembled with "**Anchoring with return**", furl the tool in use and change it with the new one. Lift it and anchor it again (knot or carabiner depending on what you have prepared).

In case you have mounted two tools at the same time, we remind you that it is not recommended to hang them to the legs so as not to keep them on stage. If you really can't do without it, in addition to not holding us responsible for damage to the structure or to yourself, do it gently and without hanging you on to make it "climb" along the pole itself. The ideal would be to use one tool at a time and disassemble the structure to change it... that with our smaller structures is faster than tying knots!

Conditions of use and warnings

When you purchase a product, always read this section of the user manual. It often contains pearls of authentic humor which however hide some horrifying realities. For example, the iconic warning “do not use the oven to dry live animals”, or the equally tragicomic “remove the child before closing the stroller”.

Did I scare you? I really hope so.

My premise is "**before doing something other than the normal use of the structure, think about it carefully! And if you can, always carry out load tests safely.**"

Below are the basic warnings, read them carefully. According to European laws, any danger deriving from use not strictly recommended by the manufacturer or implicit in the sold object is the buyer's responsibility. And a tripod is an object, in an ideal world, whose use is extremely obvious. Like a chair or a table knife.

But being exonerated from a legal point of view does not also exonerate us from a moral point of view.

And since imagination always surpasses the expectations of those who plan, here is a nice round up of things not to do.

1. Do not use the structure differently from its intended use, that is to suspend objects anchored to the load ring.
2. Never load the structure without having well anchored the tie rods provided by the manufacturer or ropes of identical length and adequate strength.
3. Use safe means for anchoring. The “knot” is among these. Its "properly realization" is the operator's responsibility together with the resulting risks.
4. When using returns to lift the tools, always use a contingency rope when the hanging loads exceed two quintals.
5. Do not use external lifting means, blocks and tackles, hoists etc, to activate the return ropes.
6. Always leave a few cm of rope free, never tighten the rope used to lift the tool.
7. Always use safety mattresses during performances.
8. Do not tow the structure with ropes. If it is necessary to move it while assembled, follow the instructions in the specific paragraph.
9. Do not turn the structure upside down.
10. Do not apply forces to the poles, so do not wrap tools around the poles, do not use them for climbing, do not tie or hang things from the poles. Poles must not be subjected to bending of any kind during use.
11. Do not use the structure if you are not sure that everything is in optimal conditions of use.
12. Do not subject the tops of structures to any force that is not vertical and facing downward. That is, anything that is not a force that "squeezes" the head downward. You cannot use the structure to tie horizontal ropes on which to hang various objects, even light ones. You cannot use the structures as bases for a zip line. You can ask us for a project about it, but you cannot use this one. You cannot use it to lift clothes that shade you or any other object that is not **anchored to the fastening hook** and whose weight does not **fall within the perimeter described by the tie rods**.
13. Do not take initiatives without contacting our assistance service.

Assistance service

This manual is freely available both in PDF and on our website <https://www.dedaloproduct.it/>

On the website you will find all our contacts.

Ask us any questions you can think of, whether about ours or **any other structure**. We will be happy to answer you and help you solve any problem concerning your equipment.

You can book a **free telepresence consultation** to check your mountings and trimmings.