



Exos

Exos Armor

3D printed, breathable back braces | www.exosarmor.com



Exos

The new generation of biomedical devices

Exos is an Italian startup that produces biomedical devices by employing state-of-the-art additive technologies and 3D modelling softwares, as well as an original production process.

Our goal is to use innovative materials and advanced technologies to create biomedical devices that improve the quality of life of those who wear them.

Product Line-up

Exos Armor – Back braces

3D printed, breathable braces. Built with a strong focus on structural and functional design. They are an all-around improvement over traditional braces for scoliosis and spinal deformities.

They currently share the corrective mechanism of the most common types of back braces (Cheneau, Boston, etc), but in the future they will be based on our own proprietary corrective mechanism.

Other biomedical devices

In addition to back braces, we'll also produce splints, prosthesis and 3D printed models for medical or surgical use.



Photos of the prototypes of the wrist brace (left) and the first “Exos Armor” brace.



Exos Armor – features

State-of-the-art technologies

The **3D printing and 3D modelling** technologies we employ, as well as the original production process, are what allows us to achieve the characteristics of our braces and products.

Breathable

We use holed patterns that provide mechanical strength while allowing the skin to breathe, making it possible to **wear them for long periods of time** without causing any discomfort. Even during the summer season.

Reduced thickness and weight

Exos armor is on average **38% thinner and 30% lighter** compared to the conventional braces. We are on our way to achieve a 50% weight reduction.

Tailored-fit, highly comfortable

Each brace is tailored with millimetric precision. This, coupled with breathability, lightness and many other details that we consider during the design process, make our braces more comfortable and in turn considerably **improves patient compliance**, which is the main factor in determining the effectiveness of therapies with back braces.

Customisable design

An entirely customisable design based on the patient's preferences can result in a **positive psychological impact**, which carries huge implications for children and adolescents (the vast majority of cases of scoliosis).

Wide choice of materials

We have a range of materials at our disposal, that we use to guarantee structural and bio-compatibility features without compromising the functionality of the device.

Drastically reduced production times

Lead times (from the first patient's visit to the delivery of the back brace) are **reduced by 90%** – from 20-28 days of the current process, to about **2-3 days**.

This allows to promptly intervene in correcting (or preventing the worsening of) spinal deformities, especially important in young growing patients where every day matters.



The Production Process

We make use of advanced technologies to achieve **low production times and costs**, while having top-notch quality and high reproducibility in the production of our devices. Furthermore, it is an **eco-sustainable** and **waste-free** process.

We can even carry the entire production remotely, directly inside our collaborating clinic. This brings huge benefits in terms of scalability, which will further increase once the process becomes fully autonomous.

1. First visit and 3D Scan

Once a patient visits one of our affiliated clinics, he/she is given a 3D scan of the torso (or limb, depending on the needed device). This is a process that takes a couple of minutes, it is extremely precise and much less intrusive than the typical plaster casts.

The scan is then virtually modelled by the orthopaedic technician (through the use of proprietary software), which will become the basis onto which the medical device is modelled and built.

2. 3D Modelling of the brace

Once the clinic gives us the 3D model of the torso, we model the back brace onto it - following the specifications from the technician. This process is partially automated and takes at most 1 hour.

3. 3D printing

Next, the modelled device is printed using an industrial-grade FDM 3D printer (and in some cases also SLA printers). In back braces this process can take from 1 to 3 days, depending on the size and complexity of the brace. The printing process can happen either in our studio or directly inside the clinic.

4. Review and final touches

Finally, the device is inspected and reviewed by the orthopaedic technician. Since it comes complete even with a closure system, this process tends to be very fast. Once it's tested on the patient, the brace is immediately ready for being used.

Current / future developments

We are about to commercialise our back braces in Italy, by collaborating with specialised clinics.

In the next months, we will continue improving our existing product line, while working on the next version of Exos Armor and proprietary corrective mechanism.

We're also on the lookout for potential partners and clinics interested in supporting and collaborating with us.