

Auxivo® LiftSuit® FAQ

To be update regularly and provided to all
Auxivo employees and distribution
partners.

Date : 24.02.2023
Version : 2.0

Q: What Load is supported:

A: Any load is supported, from 0kg to 30kg. The reason for that is that the upper body weight is around 60% of the overall body weight. So, this weight has to be lifted or stabilized in any case (typically around 30-50kg), even if you do not lift additional load with your hands.

Q: What level of support is provided?

A:

- General: Depends on the movement, load and person.
- Lifting: Reduction of muscle activity in the lower back and hip muscles by up to 35%.
- Forward-bending: Reduction of muscle activity in the lower back and hip muscles by up to 45% (in 60° working angle).

Q: What are the long-term benefits/experiences?

A: At the moment, we do not have any approved long-term benefits. That is because the product is quite young (launch June 2020). A long-term evaluation is part of our current/next steps.

Q: Why should a potential customer buy the LiftSuit, based on lacking long-term benefits/experiences?

A: Our customers buy the LiftSuit as they face at least one of the following issues and believe that the LiftSuit can be the solution to fix the issue:

- Recruitment: As physically demanding work is for most people unattractive, the recruiting new, young people takes a long time and is expensive. → Make job more attractive by offering an exoskeleton assisting the worker and therefore make the work task less physically demanding.
- Exhaustion: As physically demanding work is exhausting, people's productivity decreases over a work shift. → Increase productivity
- Injury: Because of the tough circumstances, often people get injured short-/mid-term over time as there is a constant overloading during work → Injury prevention
1 day of injury: € 1,000 - € 2,000 / day
- Early retirement: As people performing physically demanding work more often get injured, over years of work they need to retire early as their body gets weak → Keep employees in the job longer, so many years of experience remain in the company
- Disability: People performing physically demanding work have a higher probability for work-related injuries and to get injured long-term (disability). → Prevention of long-term injuries / disability

Q: What type of feedback are we asking for?

A: We ask for:

- LiftSuit: Yes/No?
- Proper fit
- Support-level
- Comfort
- Usability

Q: How should you start working with the LiftSuit?

A: We highly recommend to take some time and therefore not to wear the LiftSuit over the whole shift in the beginning. A reasonable introduction process regarding time of wearing the LiftSuit is:

Week 1	Week 2	Week 3	Week 4
2h / day	4h / day	6h / day	8h / day (= whole shift)

Q: Do people like the LiftSuit? Acceptance?

A: Overall, the feedback is positive and people like the LiftSuit. We have seen that there are people that really like the LiftSuit and do not want to work without it anymore. Of course, there are also some that not even give it a try and walk away while we present the LiftSuit.

Q: Are both types of lifting technics (“proper lifting” using the legs vs “unproper lifting” by bending-forward without using the legs) supported?

A: Yes, the LiftSuit makes no difference between un-/proper lifting technics. In case that one lifts the unproper way, the LiftSuit does not only support lifting, it also supports bending forward – that is why some people feel more support while lifting the unproper way. The LiftSuit reminds the user to lift properly.

Q: Does the LiftSuit support rotary movements?

A: Yes, it does. As the straps on the back are crossed, the user also profiteers from rotary lifting movements.

Q: What is the lifespan/warranty of the LiftSuit?

A: The LiftSuits comes with a warranty of 1 year on the textiles (the suit). The elastic energy storages can be replaced by the user itself.

Regarding the lifespan, we expect 2 years on the textiles and in most cases at least 1 year on the elastic energy storages as we tested 150,000 cycles (=lifting movements) without any issues afterwards.

The reason for the discrepancy between lifespan and warranty is because our customers use the LiftSuit in completely different environments and perform completely different numbers of repetitions (100 lifts/hour vs. 1,000 lifts/hour).

Q: Can the elastic energy storages be replaced?

A: Yes, the replacement can easily be done by the users themselves.

Q: How to recognize wear and tear?

A: While doing a visual inspection, you will see that the textiles have signs of abrasion (if there are any). Further, while tensioning/relieving the elastic energy storages by hand, you will recognize that they feel weak (if they are).

Q: Do you need to readjust the LiftSuit between different loads/positions?

A:

- The LiftSuit must not be readjusted from load to load. You can adjust the LiftSuit once and then work without any adjustments.
- In case that you change your position, e.g. changing from working while standing to working on your knees, we recommend readjusting the LiftSuit for comfort reasons.

Q: Is the LiftSuit just for injury prevention or is it also useable for reintegration of already partly injured people?

A: The LiftSuit is designed to reduce the workload of its user which is achieved by reducing the muscle fatigue and therefore the exhaustion. Thus, the LiftSuit should prevent the user. We have not tested the LiftSuit for reintegrating injured people so far. Therefore, we always recommend consulting a doctor.

Q: Are there negative effects on other muscles / bodyparts?

A: The elastic energy storages store the energy while one bends forward. Therefore, there is no additional load on other muscles / bodyparts.

Q: Does the LiftSuit weaken the human muscles over time?

A: No, the LiftSuit aims to reduce the overload of the muscles. The users still need to do the task by themselves.

Note: Overloading the muscles negatively affects the muscles and can weaken them.

Q: What happens if someone does not adjust the LiftSuit properly?

A: In case that the LiftSuit is not properly adjusted, the user feels uncomfortable (e.g. pressure points) and therefore takes off the LiftSuit. For example, if someone pretensions the LiftSuit too much while activation, you will see that the person makes a strong hollow back (like a banana).

Q: Are there any limitations regarding size/gender?

A: In general, the LiftSuit can be worn by women and men.

The LiftSuit comes in two main sizes (S/M, L/XL) with adjustment possibilities.

Therefore, the LiftSuit fits almost everyone.

Q: Is the LiftSuit certified? Is there any certification requirement?

A: The LiftSuit is CE certified based on machine guidelines. Regarding our discussions with ANSI (US), DGUV (Germany) and SUVA (Switzerland), the LiftSuit is seen as a machine. So, the LiftSuit has been developed according to the requirements of the machine regulatory.

Q: How to clean the LiftSuit?

A: Machine wash at up to 60°C without the elastic energy storages. Do not use fabric softener. Use mild detergent. Wash separately. Only gentle spinning. Do not tumble-dry.

Q: How to store the LiftSuit?

A: The LiftSuit should be stored in a dry and ventilated place without direct sunlight.

Q: Does the LiftSuit require maintenance? How to perform an inspection?

A: The LiftSuit does not require frequently maintenance. We recommend to conduct a visual inspection of your LiftSuit at least once a month to ensure that there are no problems caused by wear and tear. In case you identify a possible problem, remove the LiftSuit from operation and contact the manufacturer.

Q: Does the LiftSuit compress the spine of its users?

A1: No! It is very normal that during forward leaning the human muscles of the torso contract and compress the spine. This is a natural process and even necessary to stabilize the spine. The support force of the LiftSuit only replaces a part (around 20-40%) of the muscle force and does not add additional forces on the spine.

A2-Optional to follow up and give it a positive spin: The positive thing about this support is that it reduces the muscle load and muscle fatigue which is very important because it has been shown that rested muscles are better at preventing injuries.

Q: Given the competition from active systems, what guidance would you have in formulating value proposition beyond cost/benefit (although that's a big one in our opinion) specific to active systems?

A:

- LiftSuit comes at a **low price** and causes only **minimum follow-up costs** as costs for maintenance, service needs and associated are highly affordable. This allows that not only individual workstations/employees can be equipped, but entire areas if required.
- LiftSuit is a **very small** and **lightweight** solution because it is a passive, textile system.
 - Typically, active systems are heavier and larger, as they have motors, electronics and power supply integrated. This typically results in a situation, where the workers have to move around with the additional weight which in itself makes the movement exhausting.
 - LiftSuit can be used in confined spaces and worn underneath a jacket.
 - Textile solution does not lead to movement constraints which increases user acceptance and safety. E.g. the user can sit down, take a break or drive a vehicle while wearing the LiftSuit.
 - LiftSuit is so lightweight and small that the user can keep it on when momentarily not working. A larger, heavier active device the user might want to take off when taking a short break.
 - LiftSuit is a passive system and does not need recharging after a certain amount of lifts / time of use. This enables the user to take it with him anywhere without the need to organize recharging the batteries.
- LiftSuit is **washable** → That's why it can also be used at places where hygiene is highly important.
- **Simple to use.** Passive system without the need to boot it up first.
- **Comfortable** as it is a textile solution.