



APEX

E X O

USERS MANUAL

HeroWear Apex Exosuit User Manual

Applies to HeroWear Apex 2 exosuit components with the following SKUs:

Clutch SK-00214 SK-00213 Shoulder Straps: SK-00185 SK-00186 SK-00187 SK-00188 SK-00189 SK-00190 Thigh Sleeves SK-00191 SK-00192 SK-00193	Bands: SK-00223 SK-00224 SK-00225 SK-00226 SK-00227 SK-00228 SK-00229 SK-00230 SK-00231 SK-00232 SK-00233 SK-00234 SK-00235 SK-00236 SK-00237 SK-00238 SK-00239	Thigh Sleeve Anchors: SK-00210 Belts: A-AN01-121-11-BS A-AN01-121-11-BM A-AN01-121-11-BL Chest Straps: SK-00212
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See the product label on each component for the SKU.

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Apex is a trademark of HeroWear, LLC.

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USER MANUAL PART: 1



3 About the Apex 2 User Manual

This user manual documents the proper sizing, fitting, selection, adjustment, use, care, maintenance, storage, and disposal of the Apex 2 exosuit.

Apex 2 exosuit users and support personnel must read and familiarize themselves with the Apex 2 Wear and Use Guide included with each exosuit before using it for the first time.

4 Patents

Patent information may be found at – <https://HeroWearExo.com/patents/>

5 Intended Use

The HeroWear Apex 2 is intended to be used by adults for work performed in industrial environments. The Apex is designed to support and assist the low back (with secondary assistance for knees and hips) to reduce strain, fatigue, and risk for injury while performing bending, stooping, leaning, reaching, squatting, and lifting tasks. See [section 8.2 and 8.3](#) for a more comprehensive list of activities and when the exosuit should be engaged or disengaged.

Please note, the Apex 2 is not intended to allow users to lift objects that are heavier than they would normally lift or move more quickly than they would normally when performing tasks. The Apex 2 exosuit does not increase strength or prevent injuries that arise from improper lifting techniques.

5.1 Task Selection and Users

- Inappropriate user or task selection may result in personal injury or Apex 2 exosuit damage.
- It is critical for safety that Apex 2 exosuits are used by appropriate personnel for tasks that meet all criteria for the intended use.
- All users should receive training on any and all hazards, protective strategies, and personal protective equipment (PPE) to be used in conjunction with the Apex 2.
- Users should be selected based on their performance of work that can benefit from the intended use of the Apex 2 exosuit.

6 Caution for Users

The Apex 2 exosuit can only be used safely and reliably when the instructions contained in this user manual, including inspection guidelines, see [Chapter 10, Inspection, Storage, Care, and Maintenance](#) of Apex 2 are followed.

Avoid working with Apex 2 exosuits in ways not outlined or explained in this user manual without first consulting with knowledgeable HeroWear support staff. Inappropriate use may lead to injury, ineffective suit performance, or product damage.

6.1 Medical Clearance

Medical clearance should be obtained by users with the following conditions prior to using the Apex 2 exosuit or if any of the below occurs after the beginning of use:

- The presence of implanted devices such as but not limited to, cardioverter defibrillators, cardiac pacemakers, coronary stents, insulin pumps, intrathecal drug pumps, artificial hips, artificial knees, spine screws and/or rods, artificial discs and/or breast implants
- Previous musculoskeletal injuries of the neck, shoulders, back, hips, thighs, or knees
- Previous surgery for musculoskeletal problems of the neck, shoulders, back, hips, thighs or knees
- Skin diseases, cellulitis, injuries, inflammation, or prominent scars with associated swelling under the areas in contact with the Apex 2 exosuit.
- Allergies to latex or to synthetic fibers including rayon, nylon, and similar materials
Skin redness or overheating in the areas that are in contact with the Apex 2 exosuit
- Cardiovascular diseases
- Pulmonary diseases
- Renal diseases
Circulatory disorders of the upper extremities, back, hips, or lower extremities, such as severe varicosis, blood or lymphatic flow disorders, including swelling, inflammation, or edema distal to the body areas on which the Apex 2 exosuit is worn
- Congenital or acquired neurological disorders or other disorders causing motor and or sensory limitations or impairment

7 Apex 2 Support Personnel

- For each location where Apex 2 exosuits are in use, at least one member of the Apex 2 support personnel should be trained and present. We recommend support personnel be trained on each shift and within each group of users.
- Apex 2 Support Personnel training consists of user training, advanced Apex 2 exosuit training, and related tasks for which they are responsible (such as inspection and cleaning). These include but are not limited to fitting new users for Apex 2 exosuits, adjusting Apex 2 exosuits for users, and training new users.

Cautions for Apex 2 Support Personnel

- 7.1** For Apex support personnel, [see Chapter 10, Inspection, Storage, Care, and Maintenance](#) of Apex 2, you should familiarize yourself with this user manual to properly size, fit, adjust, use, and care for your Apex 2 exosuits, and to support others in their use.

We recommend you print and keep a copy of the User Manual and Inspection Guidelines, [Chapter 10, Sections 10.1 and 10.2](#), in an accessible location at your work or job site with other safety and compliance documentation.

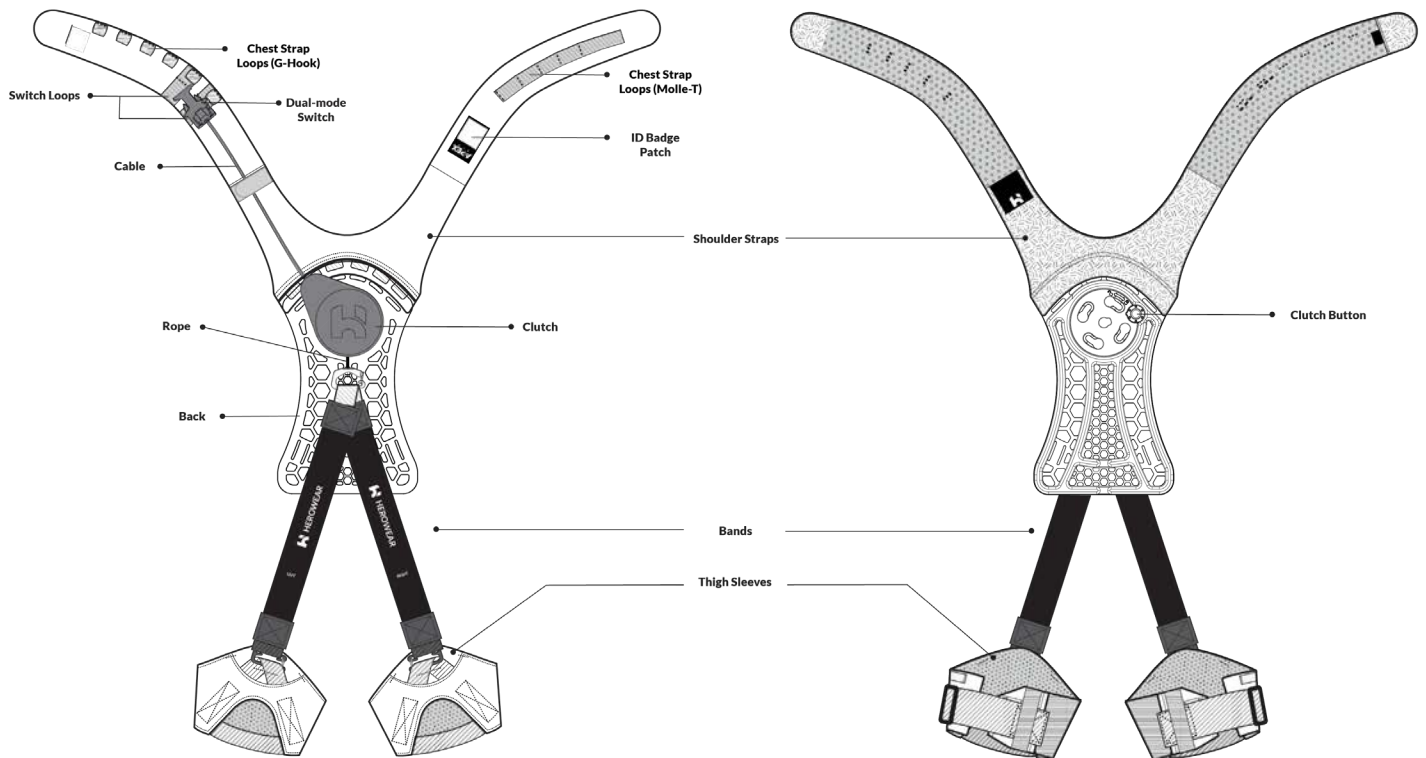
Ensure the Apex 2 User Manual, Apex 2 Wear & Use Guide, Apex 2 Inspection and Fitting Guidelines, and the HeroWear support website are available for all users.

8 About the Apex 2 Exosuit

The Apex 2 is an occupational exosuit designed to reduce strain, fatigue, and injury risk for the low back during work that requires the user to bend, lean, stoop, squat, or lift. The Apex 2 exosuit has a proprietary, patent-pending dual mode switch to engage and disengage passive support and assistance its elastic bands provide.

The Apex 2 exosuit does not increase strength, allow users to lift loads that are heavier than they can generally lift, or prevent injuries that arise from improper lifting techniques. For details on intended use, see Section 5 of this document

8.1 Parts and Operations



The Apex 2's shoulder straps are one component and are worn like a backpack. Thigh sleeves are worn around the thigh in a manner similar to athletic equipment like thigh pads or thigh compression garments.

The upper and lower body components are connected with high-strength elastic bands which stretch as the user bends, leans, stoops, squats, or lifts. The bands shorten when the user stands upright or lifts. It is this stretching/shortening action that assists the user when bending and lifting objects.

When the Apex 2's assistance is not needed, the user can disengage assistance by using the shoulder strap-mounted dual-mode switch to deactivate the clutch. Doing so allows the user to move about, climb, sit, or crawl freely.

We recommend using each Apex 2 lift assistance mode in the following conditions:

8.1.2 Lift Assistance On (Engaged)

- Bending
- Squatting
- Stooping
- Lifting from below the waist or extended forward from the body
- Leaning forward

Apex 2 exosuits can be used for all of the listed activities above while standing or kneeling. Likewise, lift assistance can remain on while walking short distances between bends or lifts and while stepping off certain equipment (standing forklifts, electric pallet jacks, etc.)

8.1.3 Lift Assistance Off (Disengaged)

- Walking long distances
- Running
- Climbing stairs, ladders, or scaffolding
- Sitting
- Operating equipment from a seated position (forklifts, tractors, etc.)
- Lying down
- Crawling
- Other awkward positions or movements where back assistance is not needed

8.2 The Apex 2 exosuit is not intended to be used in the following ways:

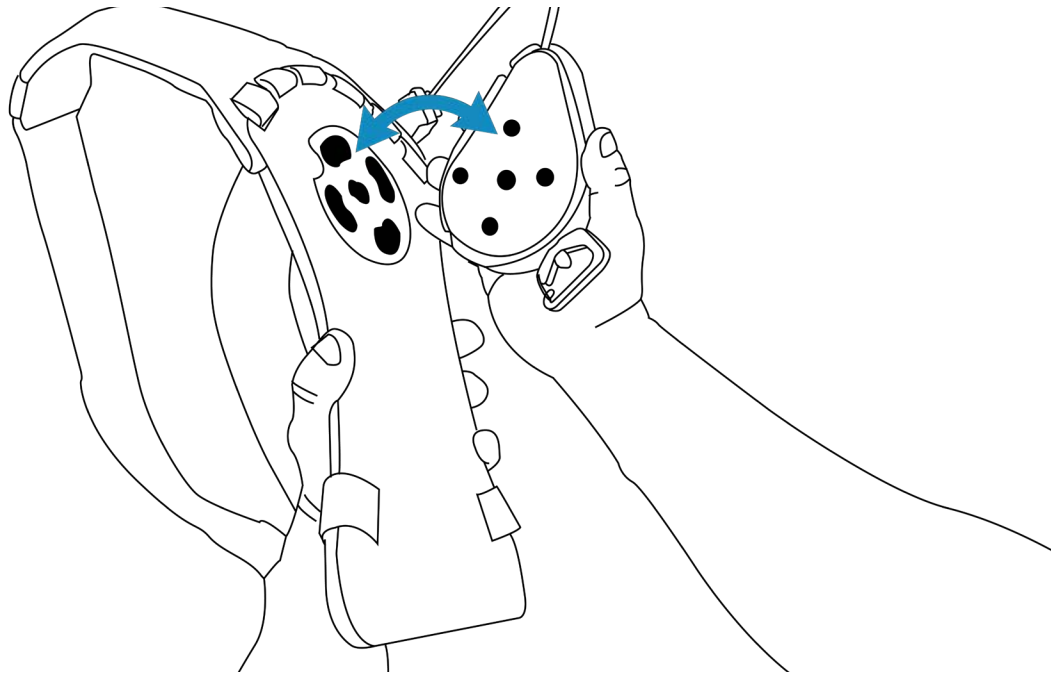
- Without proper cleaning, sanitization, or decontamination by a trained person
- Without user-specific fitting and adjustment by a trained person
- Without inspecting, repairing, or refurbishing by a trained person
- Without proper training, either by a qualified person or by referencing provided training materials
- To lift people or heavy objects that cannot be otherwise lifted safely by the user without the Apex 2

9 Using the Apex 2 Exosuit

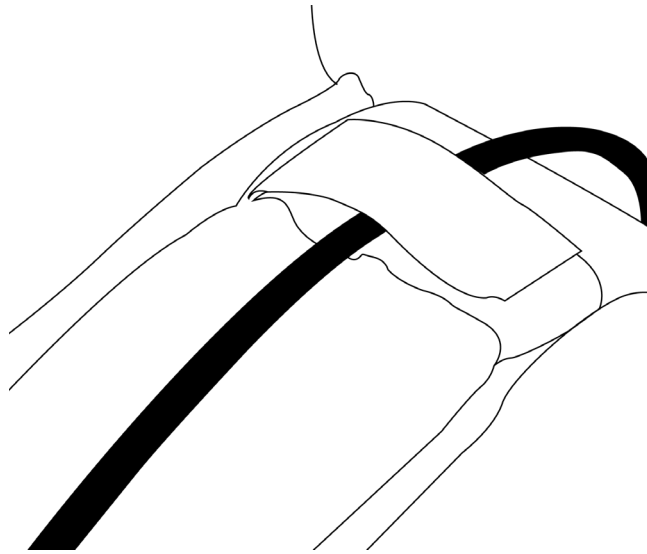
When the Apex 2 arrives from HeroWear, initial assembly of the suit may be required before first use.

9.1 Unpacking and Assembly

1. Open the box(s) containing the Apex 2 components carefully. If using a box cutter to open the boxes, please use caution and do not cut too deep as this would risk damage to the Apex 2.
2. Unpack required Apex 2 components out of the box.
For best fit, match the clutch length with the corresponding shoulder straps. The clutch length is indicated by a yellow dot on the inside of the clutch. The corresponding shoulder straps ([See Section 11.5](#)) will have a matching yellow dot on the outside of the back panel.
3. Take the clutch, with the logo facing your palm and the screws facing the holes on the back panel of the shoulder straps, and insert the four screws on the clutch into their respective round slots on the back panel, with the cable pointing towards the left shoulder strap.



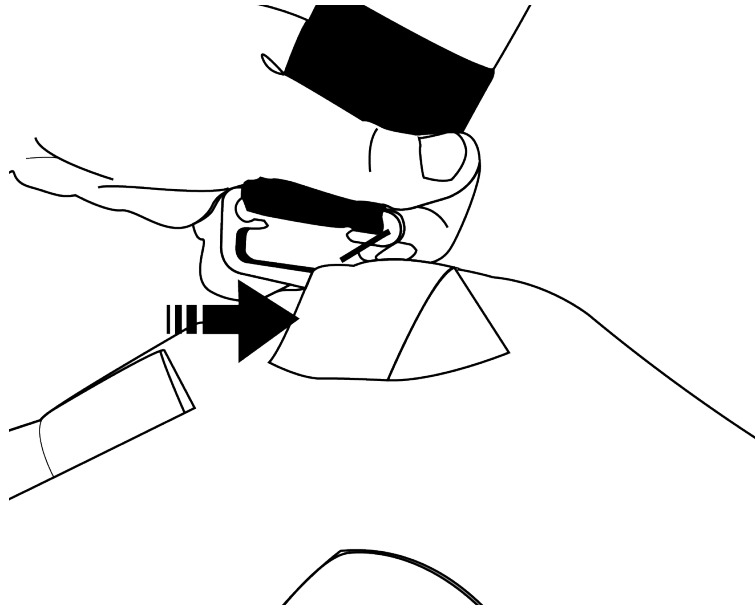
5. Once the clutch is rested, turn it to the left until it clicks and is secured.
6. Ensure the cable is captured by the hook and loop fastener on the upper left shoulder strap. Clip the switch to one of two switch loops on the left side of the shoulder strap.



7. Turn the upper body components over with the clutch facing up and shoulder straps facing down.
8. Connect the bands to the clutch by opening the metal gate of the carabiner at the bottom of the clutch with one hand and sliding the top loop of the bands onto the carabiner with your other hand. Ensure the metal gate of the clutch carabiner is closed before moving on.



- Note the labeled directionality (left and right) of the bands and thigh sleeves. Connect each band to its corresponding thigh sleeve by opening the gate of the metal carabiner at the bottom of the band and sliding the loop found at the top of the thigh sleeve into the opening of the carabiner. The metal carabiner opening should be closed and face in.



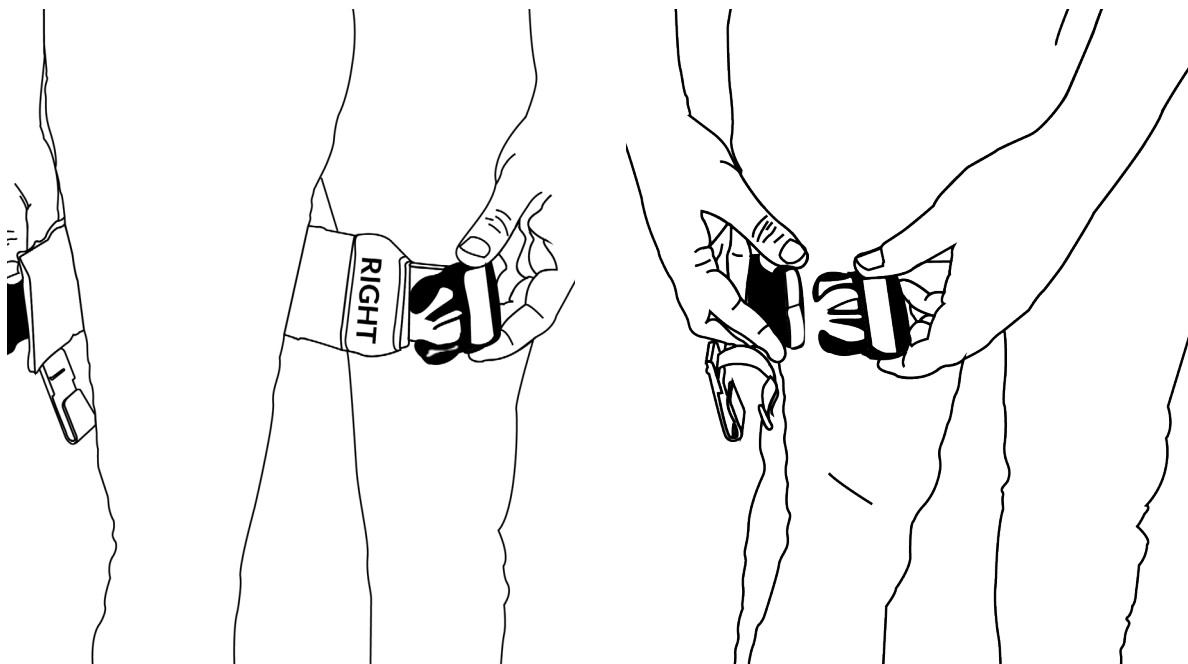
- The initial assembly of the Apex 2 suit is complete and ready for use.
- HeroWear also provides accessories such as a belt and secondary chest strap for your Apex 2 exosuit.
 - If users are experiencing any abnormal rubbing or irritation, the use of a secondary chest strap may be necessary see [Chapter 9, section 9.4 How To Move or Add a Chest Strap](#)
 - Users should use their own belt if possible, however a belt is provided and should be used when the user is not wearing their own belt.

9.2 Putting On (Donning) and Using Your Apex 2 Exosuit

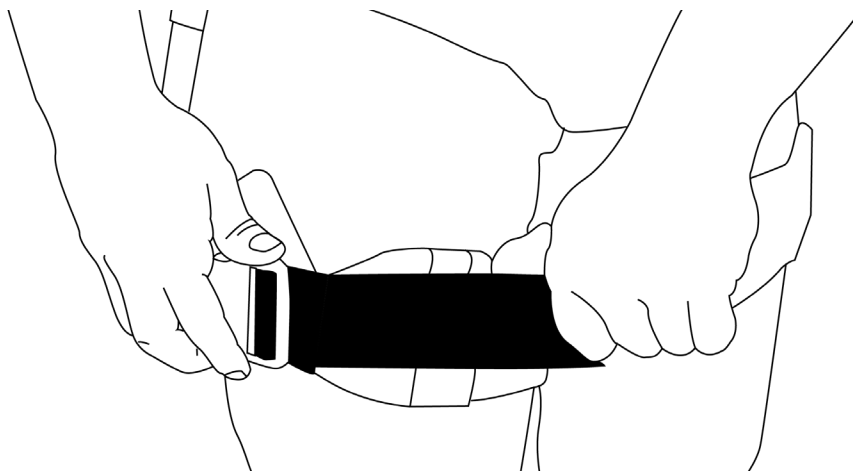
Your Apex 2 exosuit has been sized and assembled so you can wear it comfortably for a full work shift. Putting on the Apex 2 exosuit properly will ensure your exosuit works as intended and you remain comfortable all day.

- Perform visual inspection daily prior to use of the Apex 2 exosuit, see [section 10.1, Daily Inspection](#)
- After inspection, put on the Apex 2 exosuit like a backpack, beginning with the shoulder straps.

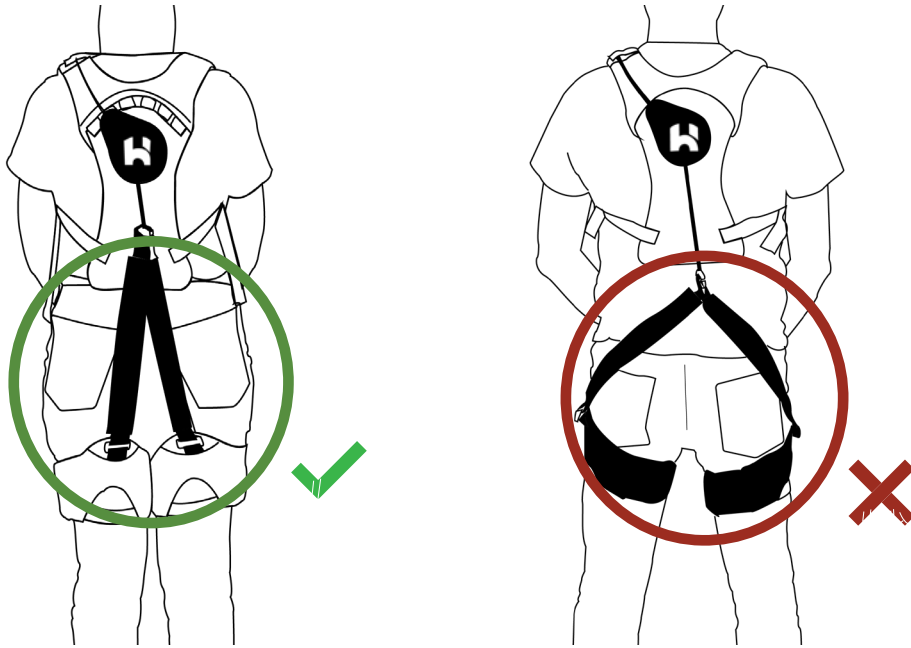
3. Connect the chest strap by hooking the end of the chest strap into the loop on the front of the left shoulder strap most closely aligned with the location of the MOLLE-T connection on the right shoulder strap. Tighten the shoulder straps first by pulling down and back on the webbing for each strap. Then tighten the chest strap so that it fits snug but comfortably.
4. To put on each thigh sleeve, note the left/right directionality and place the correct thigh sleeve on the corresponding leg. The side of the thigh sleeve with rubberized texture and printing on it should face your leg. Then reach between your legs and wrap the thigh sleeve around the front of your thigh about 5 inches (12 cm) below the groin. Next fasten the buckle so that the buckle is on the outermost part of your leg (usually this is along your pants seam).



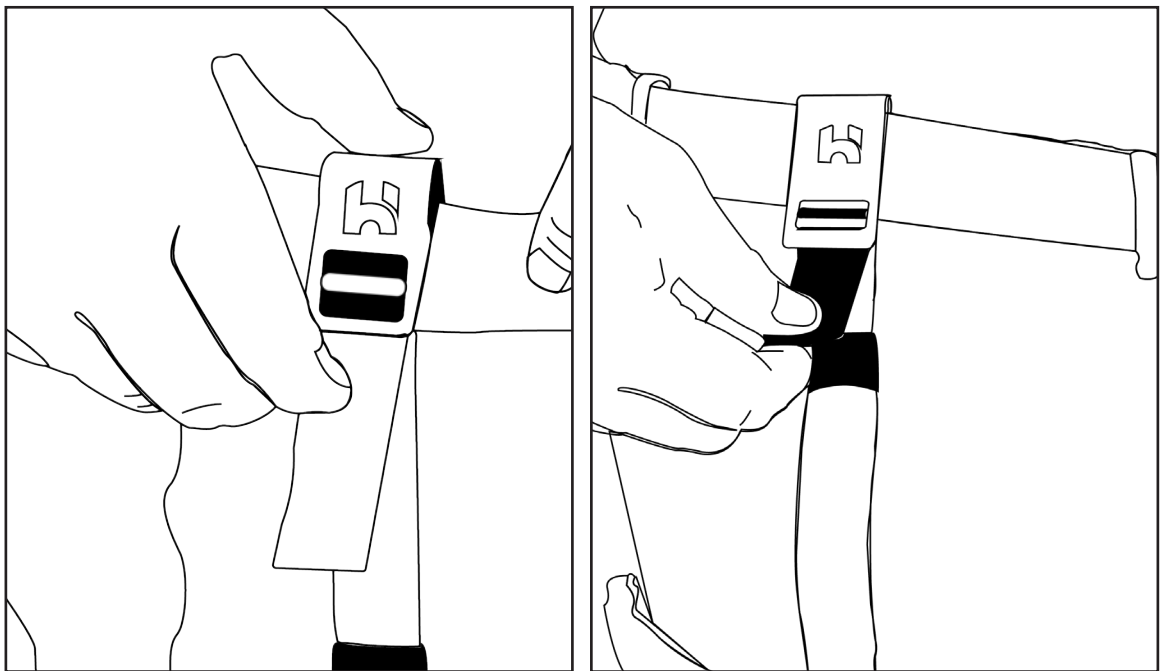
5. Adjust tightness until the thigh sleeve fits snugly on the thigh so that it will not slide or twist. You may find it easier to unfasten the buckle to adjust tightness and then reconnect the buckle.



6. Check to ensure the bands in the back are aligned with the middle of each buttock and adjust if necessary.



7. Ensure that the anchor is aligned with the outside seam of your pants, then hook the thigh sleeve anchor over your belt near your hip bone and tighten until there is no slack.

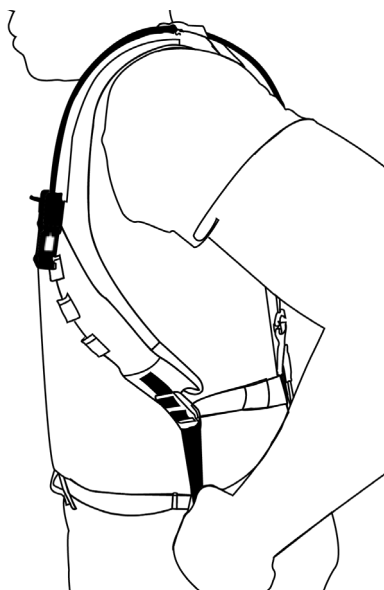


Please note: We recommend using your own belt, but a belt is included with each Apex 2 exosuit. Multiple belts are included Apex 2 bulk user kits .

8. Repeat for both legs.
9. Fold all loose webbing on the shoulder straps, thigh sleeves, and thigh sleeve anchors and secure them in their webbing keepers.

9.3 Adjusting the Apex 2

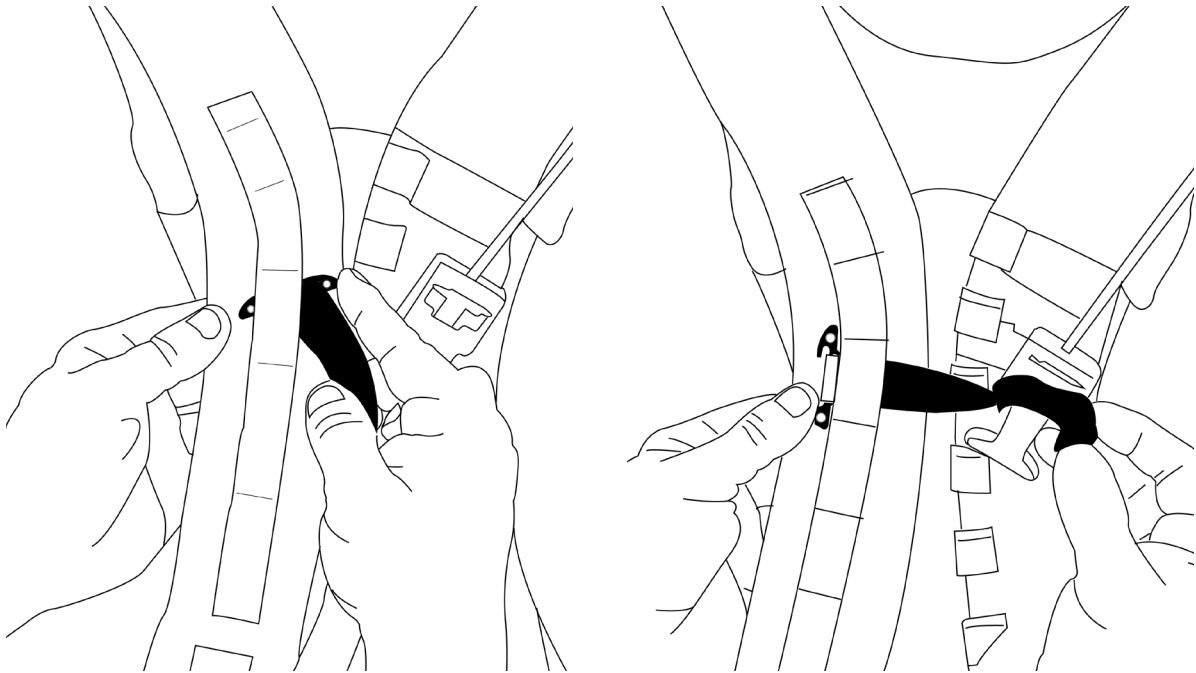
While wearing the exosuit, if at any point the device loses the proper adjustment or needs to be readjusted, users should stop what they are doing and adjust fit.



The shoulder straps are adjusted using the webbing under each arm. When adjusted properly, the switch should be located at or just below the level of the user's collarbone (clavicle), and the shoulder straps should be toward the inner part of the user's shoulder, away from the arms.

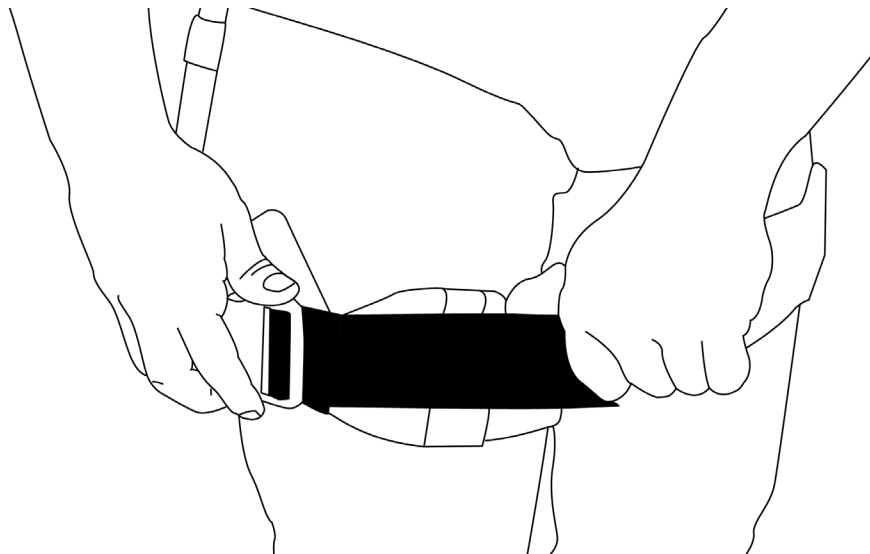
- The user should also be able to take a deep breath easily, reach forward without irritation, and move freely while not feel constricted in any way
- Tighten the webbing at the bottom of the shoulder strap by pulling down and behind the user.
- Loosen shoulder straps by lifting up on the ladder locks at the bottom of each shoulder strap and pulling forward.
- Generally any time you loosen the shoulder straps, you should tighten the chest strap. Likewise, any time you loosen the chest strap, you should tighten the shoulder strap.

9.4 How to Move or Add a Chest Strap



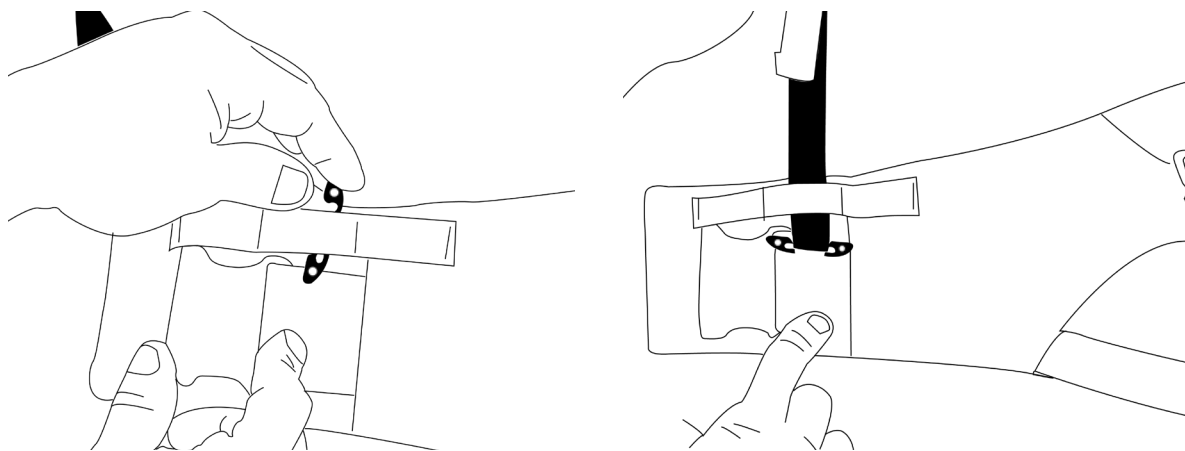
- The chest strap may need to be moved or a secondary chest strap added to fit the user properly. Adding or moving the chest strap can pull the shoulder straps toward the inner part of the user's shoulder, creating a vest-style fit. This can prevent or alleviate shoulder strap discomfort around the underarms and sensitive areas.
- To attach a secondary chest strap, start by inserting the MOLLE-T side of the chest strap into the loops on the right side of the shoulder straps.
- Ensure the MOLLE-T end is fully inserted into the shoulder strap loop and positioned vertically.

9.5 How to Adjust Thigh Sleeves



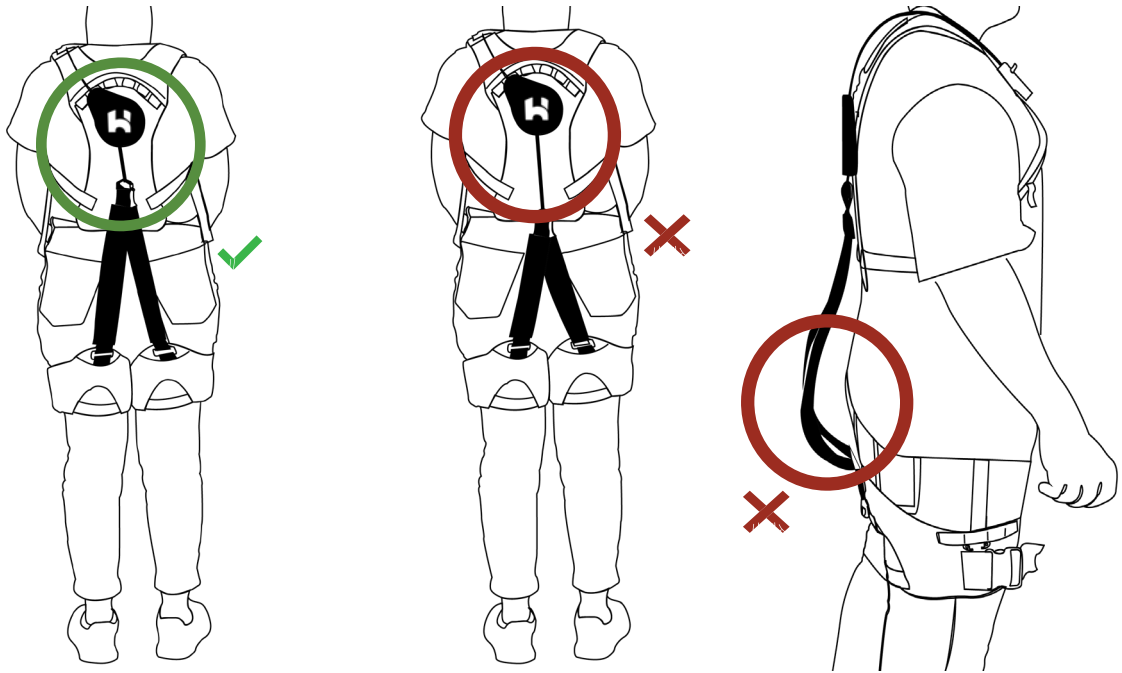
- To tighten thigh sleeves, hold the buckle and pull the webbing in towards the inner thigh. Once tightened ensure your bands are aligned along the center of the buttock and the buckle is aligned with the outside seam of your pants.
- To loosen thigh sleeves, lift at the bottom of the female-side of the buckle.
- Some users find it easier to unbuckle the thigh sleeve to adjust tightness before refastening the buckle.

9.6 How to Move or Replace Thigh Sleeve Anchors



- To attach the thigh sleeve anchors, take the MOLLE-T side of the anchor and insert it through one of the thigh sleeve anchor loops found outside the thigh sleeve near the buckle.
- Attach at least one thigh sleeve anchor to each thigh sleeve. A second thigh sleeve anchor can optionally be attached to each thigh sleeve for additional support.

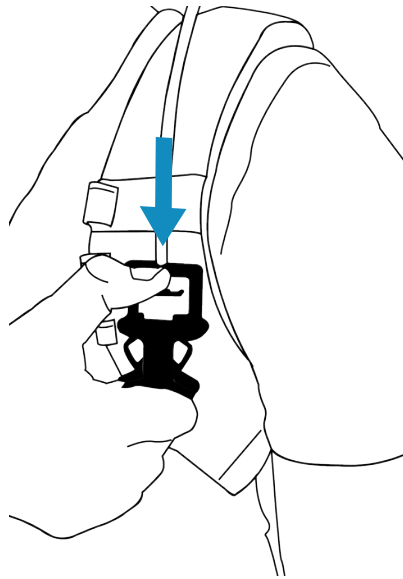
9.7 Ensuring Proper Use of Bands



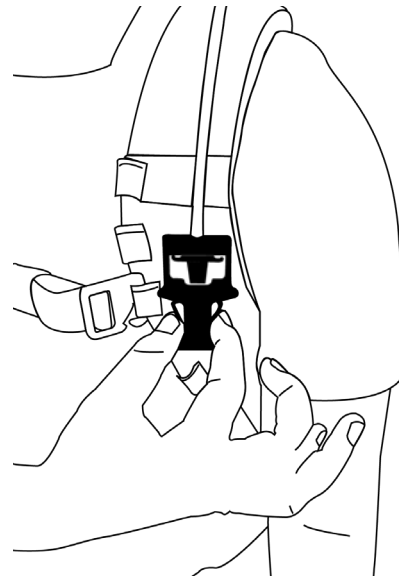
- There should be no slack in the bands when the user is standing upright.
 - Shorter bands should be used if there is less than one (1) inch (3 cm) of rope extended from the clutch when the user is standing upright.
 - Longer bands should be used if over four (4) inches (10 cm) of rope is exposed when the user is standing upright.

This is especially important in slight bends and lifting early in the range of motion. Ensure there is no slack in the bands, with one (1) to four (4) inches (3 to 10 cm) of rope exposed from the clutch.

9.8 Using the Switch to Operate Apex 2



On position, to engage assistance



Off position, to disengage assistance

1. To engage the suit, stand upright and pull downward on the upper yellow shelf of the switch until it clicks into the ON (engaged) position.
2. When assistance is not needed, stand upright, then pinch the yellow sides of the switch until the lever of the switch slides up into the Off (disengaged) position.

Note Auto Lock Feature: If you disengage the Apex 2 exosuit while the rope and bands are still under tension, the clutch will stay locked until there is no longer tension on the rope. The user may need to lean back slightly to disengage the bands.

9.8 Quick Function Test

1. To test the Apex 2 exosuit for proper functioning, begin with the switch OFF (disengaged) position. Then bend, squat, and march in place to ensure that the rope slides easily in and out of the clutch with each movement.
2. Now stand upright and press down on the lever of the switch into the ON position. Then bend, squat, and march in place to ensure that the rope does not move out of the clutch and the bands stretch in order to offer assistance with each movement.

In OFF (disengaged) mode, the rope should slide freely out of and back into the clutch. In ON (engaged) mode, the rope should not move from its position in the clutch. If either test fails, take the exosuit out of service and replace the clutch and/or contact support@HeroWearExo.com for assistance.

9.9 Wear Schedule

HeroWear recommends consulting an ergonomics or safety professional (with experience managing the use of exoskeletons in the workplace) for assistance with the development of appropriate wear schedules for Apex 2 exosuit users.

- Wear schedules can vary somewhat depending on the users and their tasks.
- HeroWear recommends the following wear schedule as a general rule of thumb for brand new users of the Apex 2 exosuit:
 - **Week 1:** Use for half of the needed duration (example: alternating 90 minutes on and 90 minutes off through the shift.)
 - **Week 2:** Use for three quarters of the needed duration (example: alternating 90 minutes on and 30 minutes off through the shift).
 - **Week 3:** Use full-time, with breaks as needed.

9.10 Taking Off (Doffing) Your Apex 2 Exosuit

1. To take off the Apex 2 exosuit, make sure the suit is in the OFF (disengaged) mode. Begin by unhooking each of the thigh sleeve anchors from the belt, leaving the thigh sleeve anchors attached to the thigh sleeves.
2. Unbuckle each thigh sleeve and leave the bands clipped to the thigh sleeves.
3. Unhook the left side of the chest straps and take the Apex 2 exosuit off, one shoulder strap at a time.

Note: Perform a visual inspection of Apex 2 exosuit daily, see [Section 10.1, Daily Inspection](#)

9.11 Apex 2 Reuse and Reassignment

During its service life, the Apex 2 exosuit can be reused/reassigned to different users under the following circumstances:

- The Apex 2 exosuit should be sanitized and cleaned thoroughly prior to reuse/reassignment.
- Verify size difference for shoulder straps, thigh sleeves, and bands if the suit is being reassigned and ensure the new user is properly fitted and trained on exosuit use, [see Section 11.5](#)
- The Apex 2 exosuit should be inspected by trained and qualified staff with respect to its condition, wear and tear, and/or damage.
- All worn or damaged components should be replaced prior to reissue.

Information on inspection, maintenance, repairs, and required supplies can be found in [Chapter 10, Storage, Care & Maintenance](#) of this manual.

9.12 Disassembly of the Apex 2

You may need to disassemble the Apex 2 for deep cleaning, maintenance, or to change certain parts. Follow the instructions listed below.

9.13 Removing Thigh Sleeve Anchors:

- Uninstall the thigh sleeve anchors from the MOLLE-T loops on the thigh sleeves. ([See section 9.6, How to Move or Replace Thigh Sleeve Anchors for directions](#))

9.14 Detaching Thigh Sleeves From Bands:

- Unclip the bands from the thigh sleeves by pulling the webbing loop away from the carabiner gate with one hand and opening the carabiner gate with the other hand. Slide the carabiner out of the thigh sleeve webbing.

9.15 Detaching bands from the Clutch:

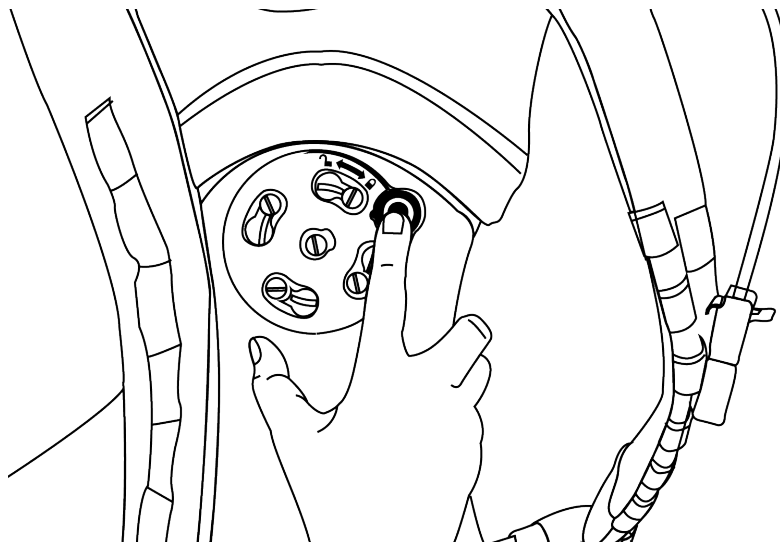
- Unclip the bands from the clutch by opening the gate of the carabiner attached to the clutch and sliding off the bands.

9.16 Detach Switch and Clutch from Shoulder Straps:

- Unclip the switch from the left side of the shoulder straps by pulling the bottom of the switch away from the shoulder strap, then pulling the switch off of the webbing on the shoulder straps.

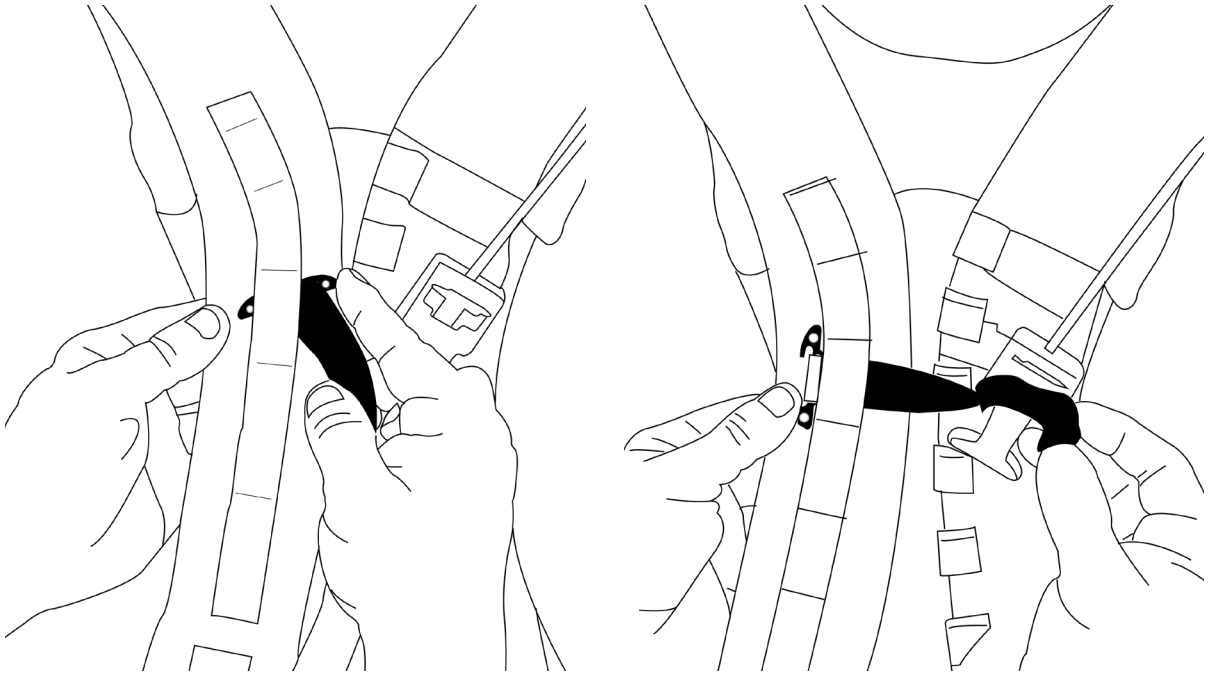
9.17 Detach Clutch from Back Panel of the Shoulder Straps:

- Remove the clutch by pressing the button found on the inside center of the back panel, then twist the clutch to the unlock position.



9.18 Remove Chest Strap from Shoulder Straps:

- Unhook the chest strap from the left shoulder strap if it is connected. Remove the MOLLE-T from the right shoulder strap by pulling the “T” bar away from the shoulder strap webbing. Then turn the “T” 90 degrees so that it is pointed to the webbing and guide it through.

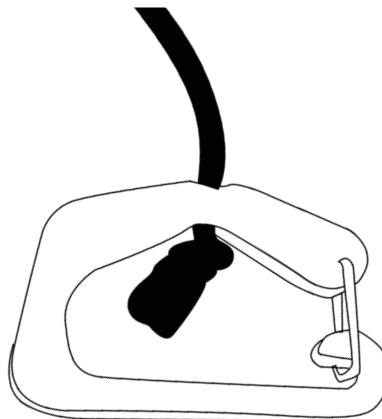


10 Inspection, Storage, Care, and Maintenance of Apex 2

10.1 How to Perform Daily Inspections

When inspecting the Apex 2 suit, check for the following conditions:

1. Wear and tear (e.g. rips, cuts, or fraying) on fabric components of the Apex 2 exosuit such as the shoulder straps, webbing, bands, or thigh sleeves that may impact function or make them unsafe to use
2. Ripped, cut, peeling, or missing pieces of foam on the back panel
3. Broken, cracked, or worn-out buckles on the thigh sleeves
4. Broken, cracked, or worn-out bands
5. Broken, cracked, bent, or damaged metal carabiners and carabiner gates on the bands and clutch
6. Worn spots or fraying on the rope exiting the bottom of the clutch, especially if the white core fibers are visible
7. Missing or loose rope stopper attached to the carabiner



8. Cut, broken, crimped, or detached cable connecting switch to clutch
9. The inability of the rope to enter and/or exit the clutch freely when the switch is in the off/disengaged position
10. Cracked or broken switch
11. Missing or loose screws on the back of the switch
12. Cracked or broken clutch casing
13. Missing or loose clutch mounting screws
14. Frayed, cracked, or broken belt

10.2 Weekly/Monthly/Other Inspection

In addition to the daily inspection described above, have the user make the following checks:

1. Visually inspect the bands – stretch them by hand, check for cracks, tears or other damage
2. Visually inspect the switch, clutch, and cable for any cracks, dents, missing screws, missing cover, frayed rope, or exposed rope's white core fibers
3. Ensure the clutch is securely in place on the shoulder straps and back

10.3 Test System Functionality

1. Don (put on) the exosuit and slide the switch to OFF (disengaged) mode.
2. Perform a number of cycles of bending or lifting to simulate the typical movements used at work in OFF (disengaged) mode.
3. In the standing position, switch the Apex 2 into ON (engaged) mode, and perform a number of cycles of bending or lifting to simulate the typical movements used at work in OFF (engaged) mode.
4. Look for any unusual sounds, vibrations, or behavior in both the OFF (disengaged) and ON (engaged) modes.

If the inspection reveals an area of concern, remove the affected components from use, take pictures of the problem, and contact HeroWear at support@HeroWearExo.com for further guidance. When possible, replace affected components with verified, inspected components to restore exosuit functionality.

10.4 Storage and Transport

- We recommend spraying all surfaces of the Apex 2 with an alcohol-based disinfectant spray after each day's use.
- Store the Apex 2 exosuit by hanging it by the shoulder straps on a rack, hook, or hanger with sufficient airflow to allow the device to dry thoroughly.
- Protect the exosuit from dust, moisture, extreme temperatures – lower than 32 degrees Fahrenheit (0 C) or higher than 122 degrees Fahrenheit (50 C) – and rapid, large temperature fluctuations by storing it in an area not subject to these conditions.
- If the exosuit is wet or damp, do not cover do not cover the Apex 2 in a manner that prevents airflow as doing so may allow bacteria growth.
- Improper storage may cause product damage or increase wear and tear. These conditions may void the warranty.
- Detach the switch from the shoulder strap loop if the Apex 2 will be compressed or flattened for storage or transit.
- No personal protective equipment is required for handling or transporting the Apex 2 exosuit.

10.5 Service Life of the Apex 2

The expected service life of the Apex 2 exosuit will vary depending on the amount and type of use to, the environment where it is used, and adherence to the recommended care and maintenance procedure outlined in this manual. Longer daily use in harsh environments will increase the wear and tear on the Apex and reduce its service life.

10.6 Device History

The full history of each Apex 2 exosuit's wear, use, care, and maintenance should be documented. A HeroWear template is provided for use in the appendix of this manual and is available for download from <https://support.HeroWearExo.com>

10.7 End of Use Considerations (Disposal)

There are no special considerations for Apex 2 exosuit disposal. Old Apex 2 exosuits can be returned to HeroWear for disposal or follow local guidelines and regulations for disposal of the Apex 2 components in trash and/or recycling.

10.8 Maintenance

1. Replace the assistive bands as needed, based on regular inspection and/or performance
2. Replace shoulder straps if there is any excess fraying of webbing, straps, missing switch loops, chest loop, cracking of the back panel, or peeling of foam.
3. Replace chest strap if there is any excess fraying of webbing on strap, missing hook, or MOLLE-T end
4. Replace thigh sleeves if there is any excess fraying of webbing, straps, or cracks to buckles

Your Apex 2 exosuit needs no other maintenance. If any other failure occurs, contact HeroWear at support@HeroWearExo.com or <https://support.HeroWearExo.com>

10.9 Sanitizing and Cleaning

Check the Apex 2 exosuit care labels located on the inside of the upper right shoulder strap.

HeroWear recommends daily sanitation of all surfaces in contact with the user with a non-bleaching, alcohol-based sanitizing fabric spray after each use. Apex 2 exosuits should be properly cleaned, sanitized, disinfected, and/or decontaminated regularly.

If available, waterless ozone cabinet disinfection and/or decontamination can be performed with no damage to Apex 2 components.

For a list of recommended cleaning supplies tested and approved for use on Apex 2 exosuits, please refer to the Care section of <https://support.HeroWearExo.com>

Cleaning and sanitizing Apex 2 exosuits with products other than those recommended may cause damage to the product and void warranty. For specific sanitizing/cleaning product details, direct inquiries to the manufacturer at support@HeroWearExo.com

10.10 Daily Sanitizing Instructions

- Hang the fully assembled Apex 2 exosuit on a hanger and spray it well with a sanitizing solution, avoiding directly into the rope hole.
- Disinfectant wipes may be used to wipe, clean, and sanitize any parts of the suit, including the switch, cable, clutch, clips, ladder locks, buckles, MOLLE-Ts, carabiners, and bands.
- Ensure adequate ventilation around the exosuit when stored and allow it to air dry thoroughly before the next use.

10.11 Periodic Cleaning

Perform as needed or when the Apex 2 exosuit becomes visibly dirty.

Hand Washing

- Ensure the clutch is OFF (disengaged) mode.
- You can hand wash the Apex 2 fully assembled or disassembled.
- Disconnect the bands from the clutch and thigh sleeves (See Chapter 9, Section 9.12 Disassembly of the Apex 2 for removal instructions)
- Ensure the switch - clutch is removed from the shoulder straps. (See Chapter 9, Section 9.12 Disassembly of the Apex 2 for removal instructions)
- The shoulder straps (including back panel), thigh sleeves, and bands can be
- hand washed with a moist, soapy rag (mild detergent with cold or warm water).
- The switch, cable, and clutch can be cleaned with a disinfectant wipe. Take care
- not to submerge these parts in water.
- Air dry wet components thoroughly.

The above sanitization and cleaning instructions should be effective for cleaning/sanitizing the Apex 2 exosuit after being exposed to dust, dirt, mud, and other forms of physical contamination.

These instructions should also be effective for biological contamination such as most known bacteria, viruses, fungi, mold, and other types of germs.

However, these instructions may not be effective for removing all types of radioactive or chemical contamination such as oil, grease, or other types of chemicals that might come in contact with the Apex 2 exosuit. Contact the chemical manufacturer with any questions regarding cleaning of synthetic fabrics and plastic.

Advanced Fitting, Care and Safety Instructions



11 Advanced Fitting, Care and Safety Instructions

11.1 Selection, Sizing, and Fitting

- Apex 2 support personnel must read, understand, and perform the following procedures to ensure the Apex 2 exosuit performs correctly. Sizing, fitting, and adjusting should only be performed by qualified HeroWear staff and Apex 2 support personnel.

11.2 General Information on Sizing, Fitting, and Adjusting the Apex 2 Exosuit

- Apex 2 support personnel see [Chapter 7](#), Apex support personnel should be trained prior to performing sizing, fitting, and adjustment of Apex 2 exosuits for themselves and/or other users.
- In the event that components do not properly fit individual users and additional parts are needed, contact HeroWear.
- Use the recommended measurements and size chart to identify the correct size exosuit components when you place your order or when sizing users with the extra components included in a Research Kit or Bulk User Kit.
- For additional assistance selecting components visit: <https://support.HeroWearexo.com>.

11.3 Before Sizing, Fitting, and Adjusting the Apex 2 Exosuit

It is recommended that sizing, fitting, and adjustment be performed in a private, quiet, adequately-sized space, separate from the users' typical workplace and job duties.

11.4 How to Size and Fit Users with an Apex 2 Exosuit

The following are needed to size and fit users with an Apex 2 exosuit:

- User(s)
- Apex 2 exosuit User Kit or Research Kit or a selection of Apex 2 components in various sizes.
- Soft tape measure
- Sizing, Fitting & Selection Instructions
- Apex 2 Sizing Chart or Online Size Calculator
- Training on how to assemble an Apex 2 exosuit ([see Chapter 9, Section 9.13 Unpacking and Assembly](#))

Measure each user, recording their measurements on the Apex 2 Measurement Form, then identifying their Apex 2 components sizes using the Size Chart.

NOTE: Taking measurements can be a sensitive area for specific users. We recommend asking users to take measurements on themselves when possible, while monitoring them for proper measurement technique. If you take the measurements yourself, take extra care to explain precisely what you will do and why, and avoid making accidental physical contact with sensitive body parts.

If using a Research Kit or Bulk User Kit, always sanitize the kit components after each user is finished and before introducing them to another user ([See Chapter 10, Section 10.8 Sanitizing and Cleaning](#)).

11.5 Apex 2 Exosuit Component Size Chart

SHOULDER STRAPS Use height and chest circumference or t-shirt size					
UNDER 6' TALL Under 1.8 m tall				6' TALL AND UP 1.8 m and up	
Size 1: 30" - 34" 74 cm - 86 cm T-shirt Size: XS	Size 2: 34" - 38" 86 cm - 92 cm T-shirt Size: S	Size 3: 38" - 42" 86 cm - 103 cm T-shirt Size: M	Size 4: 42" - 47" 103 cm - 119 cm T-shirt Size: L - XXL	Size 5: 42" - 47" 103 cm - 119 cm T-shirt Size: M - L	Size 6: 48" - 54"+ 123 cm - 134+ cm T-shirt Size: XL - XXL

Clutch Lengths: While all clutches are compatible with any shoulder strap, we recommend:

- Short clutches should be used with shoulder strap sizes 1 - 4.
- Long clutches (indicated by a yellow dot on the back of the clutch) should be used with shoulder strap sizes 4-6 has a yellow dot.

THIGH SLEEVES Use thigh circumference measurement		
Size 1: 17" - 24" 44 cm - 60 cm	Size 2: 22.8" - 27.5" 58 cm - 70 cm	Size 3: 25.9" - 31.4" 66 cm - 80 cm

BANDS Use individual height measurement						
S1000 Strength	Size 1: 5'3" and shorter 160 cm	Size 2: 5'3" - 5'7" 160 cm - 170 cm	Size 3: 5'7" - 6'0" 170 cm - 183 cm	Size 4: 6'0" - 6'4" 183 cm - 193 cm	Size 5: 6'4" - 6'7" 193 cm - 200 cm	Size 6: 6'7" + 200 cm+
S1500 Strength	Size 1: 5'3" and shorter 160 cm	Size 2: 5'3" - 5'7" 160 cm - 170 cm	Size 3: 5'7" - 6'0" 170 cm - 183 cm	Size 4: 6'0" - 6'4" 183 cm - 193 cm	Size 5: 6'4" - 6'7" 193 cm - 200 cm	Size 6: 6'7" + 200 cm+
S2000 Strength		Size 2: 5'3" - 5'7" 160 cm - 170 cm	Size 3: 5'7" - 6'0" 170 cm - 183 cm	Size 4: 6'0" - 6'4" 183 cm - 193 cm	Size 5: 6'4" - 6'7" 193 cm - 200 cm	Size 6: 6'7" + 200 cm+

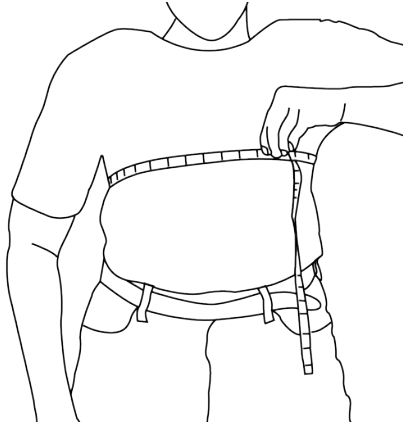
Band strength is determined by job task, assistance level, and user comfort. We recommend starting with S1500 strength and adjusting to comfort.

NOTE: We recommend using our mobile-friendly online sizing resources, available at – <https://support.HeroWearExo.com/>

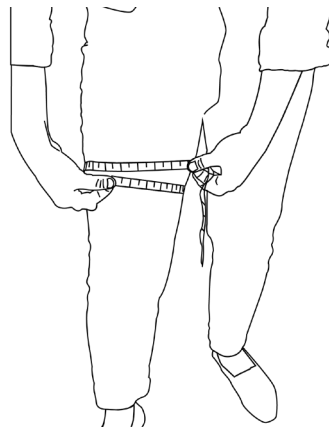
11.6 Taking a User's Measurements for Apex 2 Exosuit

Step 1: Users should stand with feet about shoulder width apart.

Step 2: Measure and record the chest circumference two (2) inches (5cm) below the armpit. Ask the user to assist by holding the end of the tape measure in the center of their chest so you can wrap the tape measure around their body without making unnecessary physical contact.



Step 3: Measure and record thigh circumference around the larger (usually dominant leg) thigh five (5) inches (12 cm) below the groin. To prevent unnecessary contact, ask the user to assist by having them measure their thigh circumference while you ensure the measuring tape is level and at proper placement.



Step 4: Record the user's height.

Using the recorded measurements and visual observation of the user's body shape and size, identify the needed Apex 2 component sizes using the Size Chart found in [Chapter 11, Section 11.5](#) or by using the online sizing resources available at — <https://support.HeroWearExo.com/>

- If you are not immediately fitting and training them, inform the user of the next steps and the schedule for Apex 2 exosuit delivery and user training.
- Assemble the Apex 2 exosuit(s). ([See Chapter 9, Section 9.1 Unpacking and Assembly](#))
- Fit each user on how to put on and use the Apex 2. ([See Chapter 9, Section 9.2 Putting On \(Donning\) and Using Your Apex 2 Exosuit](#)).
- Repeat these steps with all users who will be wearing an Apex 2 exosuit until all measurements are documented, all components and sizes are selected, Apex 2(s) assembled, and everyone has been fitted.
- Answer any user questions once the measurements, sizing, and fitting are complete.

12 Hazards and Protective Strategies

12.1 Unguarded Moving Parts

- a. **Switch** - potential pinch point
 - **Protective Strategies:** Keep fingers clear of the space between the upper and lower portion of the switch when pulling it down into On (engaged) mode. Keep fingers clear of the top of the switch when pinching the button to disengage the Apex
 - **Optional PPE:** Gloves
- b. **When moving or removing switch from loop**
 - **Protective Strategies:** Ensure the switch is in OFF (disengaged) mode before removing the switch
 - Once the switch is removed, be mindful of not letting the switch and cable swing uncontrolled in the air.
 - **Optional PPE:** Eye Protection
- c. **Clutch** - Potential pinch point
 - **Protective Strategies:** Keep fingers clear of the bottom of where the rope enters and exits the housing.
 - **PPE:** Gloves
- d. **When Installing and Removing the Clutch** - Potential pinch point
 - **Protective Strategies:** Keep hands and fingers clear of the clutch screws when locking (shifting left) or when unlocking (shifting right) the clutch on the back.
 - **PPE:** Gloves
- e. **Carabiners (Clutch and Bands)** - Potential pinch or catch points
 - **Protective Strategies:** Avoid getting fingers caught or pinched in the carabiner gates when connecting the bands.
 - **PPE:** Gloves
- f. **Thigh Sleeve Buckles** - Potential pinch point
 - **Protective Strategies:** Avoid getting pinched by thigh sleeve buckle when connecting Donning (putting on), adjusting or Doffing (taking off) your thigh sleeves
 - **PPE:** Gloves

12.2 Parts with Rough Surfaces

- a. **Rope** - Burns caused by rope exiting the bottom clutch housing
 - **Protective Strategies:** Keep fingers and hands clear of the rope entering and exiting the bottom of the clutch housing.
 - **PPE:** Gloves
- b. **Thigh Sleeve Anchors** - Scratches to the skin by the hook of the thigh sleeve anchor

- **Protective Strategies:** Be mindful of hooking the thigh sleeve anchor onto the belt to prevent hooking the anchor onto the pants from irritating skin.

12.3 Parts with Sharp Edges

- a. The Apex 2 includes metal and plastic components such as but not limited to MOLLE-T connectors, chest strap G-hook, thigh sleeve buckle, and metal carabiners and gates which could break and become sharp.
 - **Protective Strategies:** Always inspect your suit daily for damage that can cause sharp edges on parts of the suit.

12.4 Snag, Catch, or Drag Points

- a. The Apex 2 and its components can snag on objects, workpieces, clothing, or body parts.
- b. **Protective Strategies:**
 - Always wear a properly fitted and adjusted Apex 2 exosuit.
 - Use Webbing Keepers to manage loose webbing.
 - Be mindful of proximity to body parts (e.g. fingers, hair, etc) or stationary or moving objects to avoid snags.
 - Be mindful of the connected bands by ensuring the bands are not too loose to avoid accidental snags on stationary or moving objects.
 - Thigh sleeve anchors should be adjusted to fit flat against thigh with loose webbing folded in webbing keeper to avoid accidental snags on stationary or moving objects.
 - Be mindful of the cable running from the switch, over the left shoulder strap and down to the clutch housing to avoid accidental snags on stationary or moving objects.
 - Ensure the cable is captured by the hook and loop fastener on the upper left shoulder strap.
 - **PPE:** A protective garment or cover can be worn over the Apex 2 or the body if needed.

12.5 Slips, Trips, and Falls

- a. **Personal Injuries** - While the Apex 2 should not increase the risk of such injuries, users may still slip, trip, or fall while walking, running, climbing, working at heights, or otherwise moving in the Apex 2 exosuit
- b. **Protective Strategies**
 - We recommend using current safety guidelines and controls recommended by OSHA or similar regulatory body to eliminate and reduce these hazards.
 - Use fall protection equipment when working at heights. We recommend wearing the Apex 2 under most fall protection equipment, depending on the method and nature of the equipment. **CAUTION:** Do not wear an Apex 2 exosuit with fall protection until a safety advisor has evaluated and approved wearing the Apex 2 underneath the fall protection.

12.6 Radiation or Hazardous Substances Used in the Workplace

- a. **Harm to user or exosuit** - Interaction between radiation, hazardous matter, or substances that come in contact with the Apex 2 exosuit.
- b. **Protective Strategies:**
 - Exhaust or remove hazardous matter or substances at their point of release.
 - Ensure adequate ventilation.
 - Remove the Apex 2 exosuit immediately if it comes into contact with hazardous matter or substances.
 - Ensure access to medical professionals in the event of an emergency.
 - **PPE:** Wear protective clothing or cover over the Apex 2 exosuit that allows the switch to be utilized.

12.7 Fire

- a. **Interaction with Fire** - Harm to the user and/or product damage.
Note: The Apex 2 is not Flame-resistant (FR) and is not designed to be used near open flame, equipment that may generate sparks, or other sources of ignition.
- b. **Protective Strategies:**
 - Identify sources of ignition and eliminate them if possible.
 - Mark fire hazards in the workspace.
 - Follow all company local or federal regulations.
 - Ensure there is access to medical professionals in the event of an emergency.
 - Remove the Apex 2 immediately if it comes in contact with fire
 - **PPE:** Fire-resistant or fireproof cover and/or clothing worn over the Apex 2.

128 Contact with Heat Sources Other Than Fire

- a. Risk of burn injury and/or Apex 2 exosuit damage may occur if users come in contact with heat sources.
- b. **Protective Strategies:**
 - Keep the Apex 2 exosuit away from all heat sources.

129 Viruses, Bacteria, Mold, Fungi or Other Hazardous Biological Agents

- a. **Biological Agents** - If exposed to biological agent and/or if not properly cleaned, some parts of the exosuit could harbor viruses, bacteria, mold, fungi, or other hazardous biological agents which can harm users.
- b. **Protective Strategies:**
 - Clean and sanitize the Apex 2 exosuit regularly.
 - Wear clothing under the Apex 2 exosuit.
 - Store the Apex 2 exosuit properly.
 - Ensure good ventilation around the Apex 2 exosuit when storing.
 - Wash hands regularly with soap and water.
 - **Optional PPE:** Protective clothing under the Apex 2 exosuit.

12.10 Contact with Hot and Cold Media

- a. Extreme Temperature Contact - Product failure and/or harm to the User if the Apex 2 exosuit comes in contact with hot or cold surfaces or media.
- b. **Protective Strategies:**
 - Insulate the Apex exosuit against heat or cold.
 - Avoid contact with hot or cold media and exercise caution when working in hot or cold environments.
 - Ensure access to medical professionals in the event of an emergency.

12.11 Heat-Related Illness

- a. **Heat Exhaustion or Heat Stroke**

Note: Use of the Apex 2 may increase heat retention for some Users, especially those working in hot environments
- b. **Protective Strategies:**
 - Take off the Apex 2 to cool before resuming work with the Apex 2.
 - Take frequent breaks in a cool shaded area or air conditioning and get out of the hot environment often enough to avoid overheating.
 - Stay properly hydrated.
 - Loosen thigh sleeves and shoulder straps during breaks.
 - Reduce Apex exosuit wear time in hot environments or peak temperatures throughout the day.
 - Ensure there is access to medical professionals in the event of an emergency.

12.12 Poor Weather Conditions While Working Outside

- a. **Product Damage** - Damage or excessive wear and tear due to poor weather conditions.
- b. **Protective Strategies:**
 - Avoid exposing the Apex 2 exosuit to poor weather conditions such as precipitation (including rain, hail, snow, or ice) or extreme hot or cold temperatures.
 - **PPE:** Wear rain, cold, or foul weather gear over the Apex 2 exosuit.

12.13 Incompatibility with Equipment and/or PPE

- a. **PPE or Equipment incompatibility** - Failure of PPE to protect users or interference with equipment used at work.
- b. **Protective Strategies:**
 - Ensure the Apex 2 exosuit is compatible with the workplace, environment, equipment, and tools used by each user.
 - Test the Apex 2 exosuit with all required and optional PPE to ensure compatibility.
 - Avoid the use of the Apex 2 exosuit if it is not compatible with the workplace, environment, and equipment tools and/or required PPE.

12.14 Allergic Reactions

- a. **Allergic Reaction** - User reaction or response to certain materials used in Apex 2 construction such as latex

Protective Strategies:

- Review Apex 2 exosuit materials to ensure they will not cause allergic reactions. A list of materials used may be found on the information tag located on the right shoulder strap.
- Do not use the Apex 2 exosuit if allergic to materials.
- Always wear the Apex 2 exosuit suit over the clothing.
- Avoid physical contact with materials that might cause an allergic reaction.
- Ensure there is access to medical professionals in the event of an emergency.
- **PPE:** Gloves, Protective Clothing

12.15 Carcinogens

- a. **California Proposition 65 Exposure** - Contact with some of the materials and substances in the exosuit containing chemicals known in the state of California to cause cancer. For more information, please see the HeroWear support page.

Note: The Apex 2 is designed so that all components are safe for use. Some chemicals are used in the production of the Apex 2 or in internal components which are identified on California's Proposition 65 Exposure Warning list

12.16 Mental Stress

- a. **Mental Stress** - Challenges in wearing or using the Apex 2 in the working environment.

b. **Protective Strategies**

- Conduct training and information events on the subject of exosuits and their benefits.
- Create opportunities for user communication with management about the user of exosuits.
- Make the use of the exosuit optional (where not required as PPE).
- Conduct user trials before introducing exosuits on a large scale.

12.17 Physical Stress Caused by the Apex 2 Exosuit

- a. **User Harm or Injury** - Forces on the skin and body as a result of wearing the Apex 2 exosuit or an exosuit malfunction can cause harm to users.

b. **Protective Strategies:**

- Wear clothing under the Apex 2 exosuit so that no bare skin is in contact with any exosuit components.

- Adjust the Apex 2 exosuit properly to ensure the fit is not too tight which can cause rubbing on the skin or put stress on the body.
- Complete full inspection before and after using the Apex 2 as described in Section 10: Inspection, Storage, Care, and Maintenance.

12.18 Misunderstanding of Apex 2 Exosuit Technology

- User Harm or Injury** - Risk from inadequate training and inaccurate understanding of the Apex 2 exosuit.
 - Do not use the Apex 2 exosuit to extend the duration of time Users spend working without sufficient breaks.
 - Do not use the Apex 2 exosuit to increase the amount of weight Users can safely lift or the speed at which Users can safely move.
 - Provide training for the safe use of the Apex 2 exosuit.
 - Use the Apex 2 exosuit only when other ergonomic equipment such as lifting, handling, and transporting devices cannot be used.

12.19 Working in an Inappropriate Posture Position

- User Injury** - Working in awkward postures is inherently risky despite using the
- Apex exosuit
- Protective Strategies:**
- Do not use the Apex 2 in an otherwise unsafe lifting or bending position.
 - Do not use the Apex 2 exosuit to extend work for longer than normal durations.
 - Place tools, equipment, and objects close by so they are easy to reach.
 - Adjust the Apex 2 exosuit properly to prevent it from loosening, slipping, or shifting on the body while in use.
 - Fit each worker individually with the Apex 2 exosuit.

12.20 Poor Fit and/or Poorly Adjusted Apex 2 Exosuit

- User Harm or Injury** - Risk from poorly fit and or adjusted Apex 2 exosuit resulting in their failure to work as intended.
- Protective Strategies:**
 - Fit and train each worker individually with the Apex 2 exosuit.
 - Adjust the Apex 2 exosuit properly.
 - Pause work occasionally to allow users to verify comfort and fit.

12.21 Inadequate Training for Use of the Apex 2 Exosuit

- User Harm or Injury** - For human error or unsafe use of the Apex 2 exosuit
- Protective Strategies:**
 - Provide training to all Apex 2 exosuit users by qualified staff and/or HeroWear support personnel.

- Ensure users don't develop a false sense of security while using the exosuit.
- Provide ergonomics and body mechanics training to ensure users engage in the safest possible movement patterns, postures, and ergonomic best practices.

12.22 Improper Cleaning, Sanitation, Disinfection and/or Decontamination

- User Harm or Injury** - Skin irritation, inflammation, and certain forms of eczema and/or infections due to contamination may occur if Apex 2 exosuits are not properly cleaned, sanitized, disinfected, and/or decontaminated.
- Protective Strategies:**
 - Follow regular sanitizing and cleaning instructions in [Chapter 10, Section 10.8 Sanitizing and Cleaning](#)
 - Do not share the Apex 2 exosuit between users without full sanitizing and cleaning.

12.23 Obstruction of Senses

- User Harm or Injury** - From obstructed senses as a result of using the Apex 2 exosuit
- Protective Strategies**
 - Be mindful of sensory limitations and changes as a result of wearing the Apex 2 exosuit.
 - Be mindful that tactile sensation may be diminished on the body areas where the Apex 2 Exosuit is worn. Users may not be able to experience touch or pressure as they normally do on the skin underneath the Apex 2 exosuit.
 - Be mindful of noise emitted by the Apex 2 exosuit.

12.24 Emergencies and Evacuations

- User Impediment** - From added complexity in movement in the event of an emergency or evacuation.
- Protective Strategies:**
 - Practice removing the Apex 2 exosuit during emergency and or evacuation drills.
 - If time allows, take off the Apex 2 exosuit in the event of an emergency or evacuation.
 - Switch the Apex 2 to OFF (disengaged) to move more freely if unable to remove in the event of an emergency and or evacuation.
 - Practice working around and or removing the Apex 2 from casualties/victims during emergency and or evacuation drills.
 - **First Responders Only** - Proper training and practice drills are recommended for using the Apex 2 exosuit for bending and or lifting during an emergency.

12.25 Exosuit Malfunction

- a. **Product Malfunction** - From the failure of Apex 2 component and parts
- b. **Protective Strategies:**
 - Inspect the Apex 2 exosuit for broken, cracked, defective or worn out parts before and after each use.
 - Instruct users to doff the Apex 2 exosuit and inspect it at the first sign of a potential problem.
 - Remove any Apex 2 exosuits with broken, cracked, defective or worn out parts for service.

13 Additional User Safety Considerations

13.1 Reuse on Other People

Injury or Apex 2 exosuit damage may occur when devices are reused by and/or reassigned to people for whom the device was not fit or adjusted for.

It is recommended that each Apex 2 exosuit be used by and assigned to only one person at a time.

13.2 Improper Cleaning, Sanitation, Disinfection and/or Decontamination

Skin irritation, inflammation, and certain forms of eczema and/or infections due to contamination may occur if Apex 2 exosuits are not properly cleaned, sanitized, disinfected, and/or decontaminated.

This applies to Apex 2 exosuit used by only one person as well as those that might be reused by other people or shared amongst a group of users (which is not recommended). We advise that Apex 2 exosuits not be shared amongst users on the same day.

13.3 Direct Contact with Users' Skin

Skin irritation may occur with direct or in some cases indirect (over clothing) contact with skin. Do not continue to use the Apex 2 exosuit if skin irritation occurs without attempting remediation or addressing the source of the irritation.

13.4 Excessive Strain on the Apex 2 Exosuit

Injury or Apex 2 exosuit damage due to changes in or loss of functionality can occur when the device is exposed to excessive strain. Only use the Apex 2 exosuit as it is intended to be used.

If the Apex 2 exosuit has been exposed to extreme strain, including but not limited to a fall, on the mechanical components or a snag resulting in forceful shock to the device, inspect the exosuit and if needed, remove it from use for repair, replacement, or return to HeroWear.

13.5 Contact with Salt Water, Chlorinated Water, or Dirty Water

While the Apex 2 can be used in generally wet environments, damage or premature wear and tear may occur when the Apex 2 exosuit is in contact with salt water, heavily chlorinated water, dirty, or otherwise contaminated water. Particular care should be used to prevent water from entering the clutch housing.

- Promptly clean, sanitize, disinfect and/or decontaminate the Apex 2 exosuit thoroughly after contact with salt water, heavily chlorinated water, dirty, or otherwise contaminated water.
- Allow the Apex 2 exosuit to dry thoroughly after contact with salt water, heavily chlorinated water, or dirty water and subsequent cleaning, sanitizing, disinfection and/or decontamination.
- Waterless ozone cabinet disinfection and/or decontamination is recommended for all Apex 2 exosuits that come in contact with dirty or otherwise contaminated water.

13.6 Contact with Clean Water

While the Apex 2 can be used in generally wet environments, damage or premature wear and tear may occur when the Apex 2 exosuit is used in extreme wet weather or when it is heavily splashed and/or soaked with water. Particular care should be used to prevent water from entering the clutch housing.

- Allow the product to dry thoroughly after contact with clean water.

13.7 Contact with Abrasive Substances and/ Or Materials Such as but Not Limited to Dust, Sand, Dirt, or Mud

While the Apex 2 can be used in dusty or dirty environments, damage or premature wear and tear may occur when the Apex 2 exosuit is in contact with abrasive substances and/or materials such as but not limited to dust, sand, dirt, or mud.

Particular care should be used to prevent contaminants from entering the clutch housing. Promptly clean, sanitize, disinfect and or decontaminate the Apex 2 exosuit thoroughly after contact with abrasive substances and/or materials such as but not limited to dust, sand, dirt, or mud.

- Allow the product to dry thoroughly after contact with abrasive substances and/ or materials such as but not limited to dust, sand, dirt, or mud and subsequent cleaning, sanitizing, disinfection, and or decontamination.
- Perform a function check after cleaning to ensure that the clutch, carabiners, and other mechanical components operate as intended.

13.8 Exposure of Apex 2 Exosuits to Unsuitable Environment Conditions

Damage or premature wear and tear may occur when the Apex 2 exosuit is in contact with unsuitable environmental conditions.

- Store Apex 2 exosuit according to the recommended storage methods and environmental conditions.
- Avoid contact with wet, abrasive, or other substances which are not included in the Apex 2 exosuits' intended use.
- Do not expose Apex 2 exosuits to temperatures below 0 degrees Celsius (32° Fahrenheit) or above 50 degrees Celsius (122° Fahrenheit) in conditions such as but not limited to extremely hot and sunny environments (e.g. deserts), drying on heat sources (e.g. radiators) or other extremely cold environments (e.g. Arctic).

13.9 Use With Personal Protective Equipment (PPE)

- Apex 2 exosuits can be worn with typical PPE including but not limited to hard hats, safety glasses, hearing protection, gloves, knee pads, safety shoes/boots, and fall protection harnesses.
- Fall Protection
- Apex 2 exosuits are compatible with many common fall protection harnesses.
- In the event that a fall protection harness must be worn with an Apex 2 exosuit, we generally recommend that fall protection harness should be worn over the Apex 2 exosuit.
- We recommend qualified experts perform a safety test (drop testing) with the fall protection harness and Apex 2 exosuit worn together. use, we recommend a safety test (drop testing) with the fall protection harness and Apex exosuit worn together should be performed by qualified experts. Do so before working at heights to ensure that both the fall protection harness and Apex 2 exosuit work properly together.
- The combination of any specific fall protection harness and the Apex exosuit should be approved for each use case by a qualified safety professional.
- In the event a fall protection harness and Apex 2 exosuit do not work well together, fail the safety test (drop testing), and/or there is evidence that either piece of equipment will not work properly or fail when used in conjunction with each other, they should not be used together.

14 Technical Information

14.1 Weights and Dimensions

COMPONENT	MINIMUM WEIGHT	MAXIMUM WEIGHT
Clutch w/ Switch	10 oz (0.3 kg)	10 oz (0.3 kg)
Shoulder Straps	11 oz (0.3 kg)	14 oz (0.4 kg)
Assistive Bands	4 oz (0.1 kg)	12 oz (0.3 kg)
Thigh Sleeves	15 oz (0.4 kg)	18 oz (0.5 kg)
Thigh Sleeve Anchors (pair)	1 oz (< 0.1 kg)	1 oz (< 0.1 kg)
Belt	2 oz (< 0.1 kg)	3 oz (0.1 kg)
Chest Strap	1 oz (< 0.1 kg)	1 oz (< 0.1 kg)
Full Apex 2 exosuit	45 oz (1.3 kg)	61 oz (1.7 kg)

COMPONENT	LENGTH	WIDTH	HEIGHT
Assistive Bands S1000 L1 (smallest)	12.5 in (32 cm)	1.8 in (4 cm)	0.5 in (1 cm)
Assistive Bands S2000 L6 (largest)	22.5 in (57 cm)	2.5 in (6 cm)	0.5 in (1 cm)
Apex 2 Clutch & Switch - Long	23.5 in (60 cm)	4 in (10 cm)	1.1 in (3 cm)
Apex 2 Clutch & Switch - Short	21.5 in (55 cm)	4 in (10 cm)	1.1 in (3 cm)
Shoulder Strap Size 1 (smallest)	15 in (38 cm)	9.5 in (24 cm)	2.5 in (6 cm)
Shoulder Strap Size 6 (largest)	19 in (48 cm)	12 in (30 cm)	2.5 in (6 cm)
Chest Strap	10 - 24.3 in (25 - 63 cm)	2 in (5 cm)	1 in (3 cm)
Thigh Sleeve Anchor (each)	7 - 14.8 in (18 - 37 cm)	2 in (5 cm)	0.8 in (2 cm)
Thigh Sleeve Size 1 (smallest)	26 in (66 cm)	8 in (20 cm)	1 in (3 cm)
Thigh Sleeve Size 3 (largest)	29.5 in (75 cm)	8.5 in (22 cm)	1 in (3 cm)

14.2 Product Noise Emissions

- 68.7 dB(A) max to engage switch
- 85.2 dB(A) max to disengage switch
- 65.6 dB(A) max to unbuckle thigh sleeves
- 82.8 dB(A) max to buckle thigh sleeves
- 107.3 dB(A) max for sudden retraction of carabiner without bands attached
- 86.5 dB(A) max when opening hook and loop support for bowden cable
- 55.3 dB(A) max when closing hook and loop support for bowden cable

Noise Measurement Method: NIOSH Sound Level Meter on iPhone XR measured one (1) inch away from the external auditory meatus of the tester's left ear.

Hearing protection is not required unless otherwise required due to noise levels in the environment where the Apex 2 exosuit will be used. Refer to company, agency or institution policies for hearing protection.

14.3 Environmental Conditions for Intended Use

- **Operating Temperatures Range:** 32 F to 122 F (0 C to 50 C)
- **Storage Temperature Range:** 32 F to 122 F (0 C to 50 C)
- Before using the Apex 2 exosuit, a qualified expert should perform an evaluation to ensure there are no hazards or risks that could pose a danger to users.
- **The Apex 2 exosuit is intended to be used in the following environment:**
 - Indoor controlled climate
 - Outdoors, day or night, sunny, dry, overcast and/or windy
 - Light precipitation and wet or humid conditions, provided there is no risk of water entering the clutch housing.
- The Apex 2 exosuit should not be used in a unsuitable working environment.
- The Apex 2 exosuit is not intended to be used in the following environmental conditions:
 - Explosive
 - Abrasive (e.g. Dust, sand, dirt, mud)
 - Corrosive and/or caustic (e.g. Chemical)
 - Toxic and or contaminated (e.g. Chemicals, biohazards, radiation).
 - Submerged or in other extremely wet environments (e.g. heavy precipitation, heavy splashing, or situations where moisture could enter the clutch)
- Assistance in the bands may vary in extreme temperatures.

15 Warranty

HeroWear warrants this product to be free from defects in workmanship and materials under intended use and conditions for a period of two (2) years from the original shipment date, with the exception of the assistive elastic bands, which are warranted against defects in workmanship and materials under intended use and conditions for a period of one (1) year from the original shipment date.

HeroWear agrees, at its option during the warranty period, to repair any defect in material or workmanship; or to furnish a repaired, refurbished, or new product of equal value or function in exchange without charge except for a fee for shipping, handling, packing, return postage, and insurance, which will be paid by the customer.

Such repair or replacement may be subject to verification of the defect or malfunction and proof of purchase.

15.1 Limitations of this Warranty

HeroWear does not warranty:

- Normal wear and tear, including color fading, which can be caused by overexposure to sunlight or other environmental conditions
- Product damage or failure resulting from any use for which the product was not intended
- Product damage or failure resulting from incorrect or inadequate assembly, storage, maintenance, or care
- Product damage or failure from misuse, abuse, negligence, accidents, or shipping damage
- Dissatisfaction due to buyer's remorse
- Damages incurred during transportation by the user to and from the worksite

15.2 No Other Warranties Made or Implied

HeroWear makes no express warranty or condition whether written or oral and HeroWear expressly disclaims all warranties and conditions not stated in this limited warranty. To the extent allowed by the local law of jurisdictions outside the United States, HeroWear disclaims all implied warranties or conditions, including any implied warranties of merchantability and fitness for a particular purpose. For all transactions occurring in the United States, any implied warranty of condition of merchantability, satisfactory quality, or fitness for a particular purpose is limited to the duration of the express warranty set forth above.

15.3 Times Limits May Not Apply

Some states or countries do not allow a limitation on how long an implied warranty lasts or the exclusion of limitation of incidental or consequential damages for consumer products. In such states or countries, some exclusions or limitations of this limited warranty may not apply to the Purchaser. For consumer transactions, the limited warranty terms contained in this statement, except to the extent lawfully permitted, do not exclude, restrict, or modify but are in addition to the mandatory statutory rights applicable to the sale of this Product to the Purchaser.

15.4 Warranty Claims

The original purchaser of this product (or their authorized representative) must file all warranty claims with the authorized distributor, seller, or retailer of this product, who in turn is to contact the manufacturer (HeroWear, LLC) regarding any warranty return or replacement.

Please retain invoices for a minimum of two (2) years for warranty verification purposes.

