

**OS SYSTEMS DRYSUITS  
USE & CARE MANUAL  
SPIRIT DRYSUIT**

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## **THE SPIRIT DRYSUIT SHELL USE AND CARE MANUAL**

### **A) SPIRIT SPECIFICATIONS -**

The SPIRIT Drysuit Shell is a full body garment designed to prevent the intrusion of water into the shell when the wearer is immersed in water. The SPIRIT is a fabric drysuit and does not provide any significant thermal protection by itself. Each user must wear the appropriate undergarments for thermal protection

The main body of the SPIRIT shell is made from the MICRO waterproof/breathable fabric. The MICRO fabric is a three layer laminate having an exterior base/face fabric, a hydrophilic, waterproof/breathable, polyurethane, barrier membrane, and a protective tricot fabric inside layer. The face fabric is treated with a DWR (Durable Water Repellent) solution treatment to aid in evaporation of water vapor.

The SPIRIT Drysuit Shell is equipped with a front diagonal entry, a #8 diving quality, brass tooth zipper, and a MICRO fabric Zipper Cover. This allows easy and fast donning and doffing, and guaranteed water tightness.

Knee and Butt pads are Cordura® for protection and increased traction. Cordura® Elbow/Forearm pads are available as an option.

The waist of each SPIRIT Drysuit is secured by an adjustable cord waist inside the SPIRIT so that nothing is external, exposed and vulnerable to being snagged.

External pockets can be installed, Cargo Pockets for the arms and Bellows Thigh Pockets for the thighs. These pockets are secured with sandwich style Velcro flap/closures. Quick drain mesh is installed on each pocket.

Each SPIRIT Drysuit is equipped with Longlife Latex? rubber neck and wrist seals, and MICRO fabric socks, to prevent water intrusion. Please specify foot size.

LongLife seals are thicker (minimum thickness specification is .026"), more durable than standard recreational seals, and are easily replaced. The instructions for seal replacement are in the Repair Center section below. Additional instructions and helpful hints are available at "[www.ossystems.com/repair/repr.htm](http://www.ossystems.com/repair/repr.htm)", and at "[www.ossystems.com/repair/seals.html](http://www.ossystems.com/repair/seals.html)".

A Neck Wrap? covers and protects the neck seal, and uses a zipper to effect closure.

Wrist Wraps<sup>9</sup> cover and protect the wrist seals. Ankle Wraps<sup>9</sup> cover the fabric socks and close tight around the tops of the non-attached footwear.

Seams are double stitched for strength, and fusion sealed on the inside for water tightness.

The SPIRIT Drysuit Shell is designed with Freedom Cut<sup>9</sup> features to maximize user mobility. Sidearm Panel Gussets<sup>9</sup> extend from the elbows all the way down the arm and past the waist. The Crotch gusset extends from one ankle through the crotch and all the way down to the opposite ankle for unparalleled fit, function and freedom of movement. The SPIRIT Drysuit will not restrict the user's physical mobility.

Each SPIRIT Drysuit Shell is individually tested under pressure and under water to guaranty water tightness.

Each SPIRIT Drysuit Shell carries a two year limited warranty. See the Warranty Page at the back of this Manual.

**NOTE:** The Use & Care information and procedures described in this Manual are fully applicable to all Waterproof/Breathable surface drysuits. However, OS SYSTEMS PB-300 glue may not be compatible with the glue other drysuit manufacturers use to glue their seals to the fabric. See the Seal Replacement Sections below.

## **B) USAGE -**

The Usage of SPIRIT drysuit shells includes the following:

1. Sizing;
2. Donning (dressing);
3. Wearing;
4. Doffing (undressing); and
5. Storing.

### **1. Sizing -**

The first step in wearing SPIRIT is to make sure that your SPIRIT is the correct size drysuit for you.

Height is the most important measurement to consider. The MICRO fabric does not stretch. The SPIRIT Drysuit Shell that you select must have adequate room in the ease of the pattern to allow you to reach, bend over, squat, and move around, without feeling any restrictions from the SPIRIT. Do not select a SPIRIT size that is

designed for a person who is shorter than you. See the Drysuit Sizing Page at the end of this Manual.

## **2. Donning -**

Dress in the combination of undergarments that you anticipate needing for your metabolic and activity level in, and length of exposure to, the environment you anticipate encountering.

Make sure that you have applied UV TECH to the inside and outside of your neck and wrist seals. Make sure you have Zipease recently applied to the teeth of the zipper so that the zipper slider will open and close easily. Check to make sure there is no sand or other material caught in the Zipease that might obstruct the zipper teeth when closing. Remove any watches, rings, earrings, or any item that might catch and tear the seals, and trim any long or jagged fingernails.

Open the Zipper cover and fold it back so that the Velcro on the cover will not catch on anything. Open the zipper to its maximum opening. Unzip the Neck Wrap, and open the Wrist and Ankle Wraps fully to allow for the easiest entry.

Begin donning by sitting on a chair and inserting one leg into that leg of the SPIRIT like you step into your trousers, with the zipper in front. Extend your leg and foot down into the shell and into the fabric sock, pushing your toe all the way into the end of the sock. If there is any extra room in the sock, fold the extra fabric over at the back of the sock. Put your shoe or boot on now and lace it up.

Repeat this process for your other leg.

Grab the waist of your SPIRIT and Pull the waist band of the SPIRIT up and set it into position so that the crotch area is snug yet comfortable (setting the crotch).

Put on and adjust the suspenders.

Insert your left hand and arm into the left arm of your SPIRIT. Pull the left shoulder of your SPIRIT fully over your left shoulder, extending your left arm down into the sleeve and to the wrist seal. Hold your straightened fingers together so that they form one single unit pushing through the wrist seal. As your fingers emerge through the wrist seal, open your fingers and continue pushing and working your fingers, then your hand, and finally your wrist through the wrist seal opening and into the proper position. The sealing area of the wrists seal should be at or just above your wrist bone. Make sure the wrist seal lays flat on your wrist.

Raise both arms high above your head pulling the SPIRIT up again to reset the crotch.

Repeat the sleeve entry process for the right sleeve. Again, pull Your SPIRIT up and reset the crotch.

Insert four fingers from each of your hands, spread widely apart, into the top of the circular opening of the neck seal. Stretch the neck seal carefully open and down over your head and onto your neck. The neck seal lays flat on the neck with its upper edge slightly below your chin level. Adjust the neck seal up or down for comfort and improved sealing. Work out any wrinkles or folds in the neck seal. Zip the Neck Wrap closed.

Neck seal adjustment is discussed in the Maintenance Section of this SPIRIT Manual.

Use your left hand to hold the SPIRIT fabric and entry zipper of the SPIRIT above your left shoulder. Slowly pull the zipper slider, with your right hand, along the line of the zipper, as parallel to the teeth as practical. After your zipper is closed, give the slider one final pull to make sure it is fully closed. Fold the zipper cover down over the zipper and attach the Velcro to Velcro to secure it.

You now are watertight, but your SPIRIT is probably full of air. You need to burp your SPIRIT. Stand straight up with one finger from each hand in the opening of the neck seal, pulling it slightly off of the neck. Squat slowly with your elbows pressing tightly against your sides. You will feel and hear the extra air rushing out through the neck seal opening.

When the air has stopped flowing out, remove your fingers from the neck seal, allowing the seal to return to its sealed position against your neck. Stand up. You are now burped and vacuum packed. You may remove additional air by repeating this process. If you feel a little too squeezed, you may add a little air back into your SPIRIT by slightly opening the neck seal. Find your own comfort level.

Determine your final comfort level, and once again, set the crotch!!

Additional burping may be done when you enter the water. Submerge yourself up to the level of your arm pits. Bring your arms in close against your body. With one hand, reach up and vent your neck seal until sufficient air has escaped. Do not lower the neck seal into the water or water will flood into your SPIRIT!

If your SPIRIT is equipped with suspenders, the crotch will remain properly positioned and set.

### 3. Wearing -

Once you have donned your SPIRIT, double check the size. Make sure that your crotch remains set. If the crotch of your SPIRIT rides up too tightly, you will feel obvious pain. If it rides down too far, you will feel restrictions in moving your legs.

Stand up straight and reach high over your head. Reach down and touch your toes, Reach from side to side. Pick one foot up and step over some obstruction. Duplicate any motions you anticipate needing to be able to do in the SPIRIT.

Refer to the Maintenance Section of this Manual for techniques to fit neck and wrist seals to make them more comfortable.

Your SPIRIT Drysuit Shell can be worn continuously, as an outside garment, or inside, under additional clothing. The MICRO fabric is waterproof and highly breathable (Water Vapor Transmissible). Water stays out, but your sweat will be transmitted through the waterproof/breathable membrane and will evaporate from the outside, base fabric. Wearing your SPIRIT Drysuit under additional clothing will reduce breathability.

The engine that drives the process of breathability in the SPIRIT drysuit shell is the heat your body generates from activity. Be sure to wear undergarments that are compatible, and will transmit water vapor (wick sweat) away from your skin and out to the shell. The membrane of the shell will transmit the water vapor to the outside face fabric where it will evaporate. DO NOT WEAR COTTON OR WOOL OR ANY OTHER FABRIC THAT HOLDS MOISTURE OR INTERFERES WITH THIS MOISTURE VAPOR TRANSMISSION

Within reason, you will stay comfortable in warmer and colder climates, dry or wet. For extreme activity conditions, no drysuit fabric can immediately transmit the heat you generate, but the SPIRIT will rapidly catch up once your activity level slows down.

Remember that the rubber neck and wrist seals are not breathable. Sweat will build up under those seals.

Rubber seals are very susceptible to punctures and tears. All drysuit fabrics must be kept unpunctured to be dry. The SPIRIT has reinforcing pads, Wraps, and covers in critical areas to protect the SPIRIT fabric. See the Repair Section of this Manual for repair procedures.

#### **4. Doffing -**

Remove your SPIRIT Drysuit by reversing the Donning procedures. Protect the rubber seals by removing any watches, etc. that might cut or tear the rubber. When grabbing, stretching or pulling seals, you should use several fingers to spread out the stress.

#### **5. Storing -**

Clean the rubber seals, zippers, and MICRO fabric of your SPIRIT Drysuit as described in the Maintenance Section of this Manual. Apply UV TECH, Zipease, and DWR treatments as indicated.

**Make sure the front entry and relief zippers are left in the fully open position. DO NOT CLOSE ANY BRASS TOOTH ZIPPER WHEN STORING.**

Make sure your SPIRIT is dry before closing any pockets or rolling or folding your SPIRIT. The best way to dry your SPIRIT is to hang it in a shaded area where there is a breeze, out of the sun and away from the heat.

Reattach all Velcro Zipper Covers and pocket flaps.

Lay your SPIRIT Drysuit flat, zippers facing down, and, beginning with the toes of the fabric socks, roll the SPIRIT up all the way to the neck seal. Fold the arms of the SPIRIT over the rolled up SPIRIT and lightly secure the bundle with a strap or rubber band. Place your SPIRIT in a storage bag.

Store your SPIRIT protected from exposure to heat, UV radiation, and ozone, as much as possible.

#### **C) SPIRIT INSPECTION CHECKLIST -**

##### **1. Inspect your SPIRIT (before & after) Each Use -**

###### **(a) Neck & Wrist Seals -**

Look at the outer edge of all latex seals. Look for a V notch starting that can lead to seal splitting. Look for cracking or checking in the latex material. Look for a soft/gummy feeling to the latex.

If you find **ANY** of these problems do not use the suit. Replace the seal.

If there are any areas where the latex is lifting slightly from the SPIRIT, apply a small touch of PB-300 to the area and press the seal back down to the fabric.

## **(b) Entry and Relief Zippers -**

With the zippers FULLY in the open position, inspect the brass rivets that line each side of the zipper opening. Drape each side of the zipper over your non-dominant hand (the edge of the zipper will form a U shape) pass all of the brass rivets over the top of your hand while you look for any that are broken or misaligned.

Look for excessive wax buildup and dirt in between the rivets. Clean with a toothbrush and mild soap if you find either. Reapply Zipease to the teeth of the zipper.

Inspect the small teeth on the inside edge of the zipper. These teeth interlock to hold the sealing area of the zipper together. Look for any missing or misaligned teeth. Look for wax or dirt (there should be none). Clean with a toothbrush and mild soap if you find wax or dirt.

Apply Zipease to the outer rivets ONLY. Open and close the zippers once before donning the suit.

## **(c) Shell Fabric (MICRO)-**

Turn the suit inside out and look for holes, punctures and tears paying special attention to the bottom of the attached socks. Patch as needed.

Look at the seams and the taping. If any is lifting, apply a touch of PB-300 and press the seam down.

Now turn the suit right side out and inspect for holes, punctures and tears paying special attention to the bottom of the attached socks, and patch as needed.

Inspect the pockets, zipper covers, Neck, Wrist and Ankle Wraps for signs of wear or separation from the body of the suit.

If you find any of these problems do not use the suit until it is repaired.

## **2. Inspect your SPIRIT every 30 days -**

Conduct the same inspection of your SPIRIT every 30 days, even if you have not used it. Exposure to heat and the elements can cause deterioration that might require some repair.

## **D) MAINTENANCE -**

### **1. Shell Fabric (MICRO)-**

After each use, gently wash the inside of the MICRO fabric with a mild solution of hand washing or dishwashing soap. Then spray or rinse the inside and outside of the fabric with clean water. Hang dry the inside and outside of your SPIRIT, out of the sun and away from heat.

Wash the outside of the MICRO fabric with soap only when it cannot be cleaned with just water. The DWR treatment can be removed prematurely by excessive washing, usually requiring more than 50 washings.

Test the DWR by dripping water on the outside face fabric. If the water beads up and is not soaked into the fabric, the DWR is functioning properly. If the water soaks into the fabric, clean the face fabric, dry your SPIRIT, and then apply any one of the readily available commercial DWR treatments to reactivate the water repellency. Some examples of DWR treatment products are Scotchguard, Revivex, Nikwax, etc,

Do not apply the DWR treatment to the inside of the MICRO fabric.

### **2. Seals -**

OS Systems recommends and uses bottle style wrist seals, with uniquely designed sealing rings. They are more comfortable and provide the best watertight seal. The sealing area around the wrist is a full 1" tube (more sealing area = more watertight). This larger sealing area spreads out the squeeze pressure that makes the watertight seal, eliminating any single point contact and enhancing user comfort.

OS Systems recommends and uses bell style neck seals. The bell style neck seal comes with sizing rings on the upper cone portion of the neck seal. These rings can be trimmed to accommodate different sized necks, within limits. OS Systems offers three sizes of adult neck seals, each with conical sizing rings which can be trimmed to achieve precise individual fit.

#### **(a) The Composition of LongLife Latex Seals -**

OS SYSTEMS designs and owns all of the molds used to dip its LongLife Latex Seals. LongLife Latex Seals are dipped from only the best high modulus natural gum latex rubber to maximize memory and longevity. The latex rubber is surgical grade, with the addition only of black dye, a minimum amount of ozone inhibitor and a long life sealant.

LongLife Latex Seals are not hypoallergenic; however, each does undergo a triple leeching process to minimize the protein content. Protein content is thought to be a contributing factor in some allergic reactions to rubber.

**(b) Why does rubber degrade?**

All rubber, as well as all synthetics, degrades over time. All of these materials, including natural gum rubber, contain special oils that are essential structural components called plasticizers. Over time these plasticizers migrate to the surface of the material and evaporate. This is called "outgassing". As these plasticizers are lost, the rubber degrades and becomes brittle, developing cracks and losing elasticity. These are signs that the useable life of the product is being shortened.

The degradation of rubber is accelerated by increased exposure to UV light from the sun, to ozone, to heat and to petrochemicals, but this degradation can be dramatically slowed. Examples of petrochemicals include gasoline, sun tan lotion, scented talcum powder, and the propellants in some spray cans.

**(c) The Care and Maintenance of LongLife Latex Seals -**

1. After every usage, wash the latex seal inside and outside with a mild soap and warm water solution (if available) to remove all contamination that comes from body oils, pollution, lotions, etc.
2. Apply UV Tech<sup>®</sup> to the cleaned latex both on the inside and on the outside of the seal.
3. Store the suit rolled up in its bag to minimize the airflow around the seals. This allows the UV Tech to better protect the latex.
4. Apply UV Tech to all seals again prior to using the suit.

**NOTE:** Applying UV Tech to a contaminated seal will only trap contaminants and accelerate the deterioration.

**(d) UV Tech -**

UV Tech is environmentally friendly, water based, industrial quality protectant and replasticizer that helps preserve natural gum rubber. UV Tech actually replaces lost plasticizers and helps seal in existing plasticizers, maintaining the integrity, suppleness and elasticity of rubber. UV Tech penetrates rapidly, delivering rejuvenating plasticizers deep into the material and protecting existing plasticizers. UV TECH does not just remain on

the surface after application, simply making it shiny. UV Tech leaves surfaces dry and non-glossy, and will not attract dirt.

UV Tech contains UV blocking sunscreen that bonds to surfaces, providing durable protection from UV, ozone, rain-borne soils and contaminants. A single coat of UV Tech will help considerably, but for best results use UV Tech once before every usage, and before each storage. Spray UV Tech liberally over the inside and outside surfaces of the rubber, or spray on a rag and apply with a wiping motion. When stored away from sunlight, your seals will not need to be treated as often. The protection provided by UV Tech will generally survive several washings and/or usages.

### **(e) Fitting New Seals -**

New neck, wrist or ankle seals may feel tight or restrictive at first but will relax a little with use. Seals will feel tighter in a warm indoors area than they will feel in the cold water environment.

You can pre-stretch your seals. Pull the wrist seals over a small bottle. Pull the neck seal over a larger bottle, approximately 23" in circumference. Leave the seals in a stretched position for only 6 hours at a time. Test fit the seals after the first 6 hours and repeat the 6-hour sessions as needed until the seals are comfortable. Make sure that you have applied UV Tech to the latex prior to stretching.

OS SYSTEMS manufactures 4 sizes of neck seals and 3 sizes of wrist seals. Make sure that you have the correct size seal installed on your drysuit BEFORE you start any stretching of the seals.

**WARNING!!** Never use a seal that is so tight that blood flow is restricted to the head or hands. **Too tight of a neck seal can lead to a life-threatening situation once in the water.**

See the Drysuit Sizing Sheet at the back of this Manual for seal and sock sizings.

### **3. Zipper -**

When opening or closing your zipper, pull the zipper head directly along the line of the zipper, but at a slight angle up from the fabric of the drysuit. This will keep the zipper head from diving into the teeth of the zipper.

**Store the zipper only in the OPEN POSITION.** Close the zipper only when the drysuit is being used. If you bend the zipper backward or forward at a sharp angle, especially when the zipper is zipped closed, you can break the stabilizer cord that holds the teeth in

place. The zipper teeth will then become dislodged and you will have to replace the zipper, at a great expense to you.

Periodically clean the zipper teeth with a tooth brush and soap and water. Be sure to remove all sand and any other foreign particles at every opportunity. After cleaning, lubricate the zipper teeth with Zipease beeswax lubricant.

**NOTICE:** This zipper is not warranted by the zipper manufacturer. Take care of your zipper and it will work well for you for years.

## **E) FIELD REPAIR -**

### **1. SPIRIT Field Repair Kit -**

#### **(a) Contents**

|                         |                         |
|-------------------------|-------------------------|
| 4oz Can PB-300 Adhesive | Small brush (2)         |
| MICRO Patching Material | Latex Patching Material |
| Instructions            |                         |

#### **(b) Methyl Ethyl Keytone (MEK)**

Methyl Ethyl Keytone (MEK) is an organic solvent. MEK is used in many plastics, including the polyurethane in the PB-300 adhesive and the waterproof/breathable polyurethane membrane in the MICRO fabric. MEK is the best solvent to clean oils from the areas to be glued, to clean old PB-300 from the area to be glued, and to thin the PB-300 used to glue seals or MICRO fabric.

**NOTE:** MEK does dissolve polyurethane. If you use excessive MEK on the MICRO fabric, you will dissolve the polyurethane and seriously damage the fabric itself. Use the smallest amount of MEK possible to accomplish what you need to do!

### **2. Patching Holes and Punctures in the MICRO Fabric -**

All suit holes and punctures are patched from the inside of the SPIRIT drysuit. Cut a patch of appropriate size from the SPIRIT material that is supplied. The patch should be round or oval shaped, NO CORNERS THAT CAN CATCH AND PULL UP!

**Install the patch, tricot backing to tricot backing.** The tricot is the protective inner lining on the SPIRIT fabric.

Using the MEK, clean the area that will be patched, wipe dry with a CLEAN absorbent material. Apply 3 coats of PB-300 to the patch and the area of the suit where that patch will be applied (go ¼ of an inch beyond the edges of your patch). Allow 3 minutes drying

time between applications of the PB-300 adhesive. After the 3<sup>rd</sup> application of the PB-300 adhesive has dried for 2 minutes, and is still tacky, place the patch over the hole or puncture and apply firm pressure to affect a good bond between the two pieces. The suit is ready for use in 30 minutes

For larger punctures and tears, make your patch a sandwich patch, one on the inside and one on the outside. For the outside patch glue the tricot of the patch fabric to the face of the drysuit fabric.

### **3. Patching holes and punctures in the latex seals -**

The preferred procedure for repairing holes in LongLife Latex Seals is to replace them. However, if you do want to patch the hole, an inner tube tire patch kit can be used effectively. Follow the kit instructions.

Holes in LongLife Latex seals can also be patched using OS SYSTEMS PB-300 glue.

All seal holes and punctures are patched from the outside of the seals. Cut a patch of appropriate size from latex rubber material that is supplied. The patch should be round or oval shaped, NO CORNERS THAT CAN CATCH AND PULL UP!

Using MEK, clean the area of the rubber seal and the rubber patching material, where the PB-300 is to be applied. Wipe the areas dry with a CLEAN absorbent material.

Apply 2 coats of PB-300 to the patch and to the area of the seal where that patch will be applied (go ¼ of an inch beyond the edges of your patch). Allow 3 minutes drying time between applications of the PB-300 adhesive. After the 2nd application of the PB-300 adhesive has dried for 3 minutes and is still tacky, place the patch over the hole or puncture and apply pressure to affect a good bond between the two pieces.

The suit is ready for use in one hour.

## **F) REPAIR CENTER -**

### **1. Contents -**

|                        |                               |
|------------------------|-------------------------------|
| (2) Repair Wrist Molds | Repair Neck Plate             |
| (3) 4oz. cans PB-300   | (5) sets LongLife Latex seals |
| (1) Repair Roller      | (10) glue brushes             |
| Practice wrist tube    | Practice neck pieces          |
| Absorbent squares      | (5) Wooden applicators        |

You easily replace neck and/or wrist seals with a few additional supplies and equipment, and have your SPIRIT back in operation within 1 hour or less. This can be done in the field. However, you would not want to transport the stainless steel molds and large plastic neck plates that make seal replacements easy. The Repair Center is designed to be used at a home base, where additional storage and work space is available.

The instructions for seal replacement come with both the Field Repair Kit and the Repair Center. Additional instructions and helpful hints are available at

"[www.ossystems.com/repair/repr.htm](http://www.ossystems.com/repair/repr.htm)", and at

"[www.ossystems.com/repair/seals.html](http://www.ossystems.com/repair/seals.html)".

## **2. Testing the SPIRIT Shell -**

To test a SPIRIT Drysuit, first fully close the relief zipper. Then turn the SPIRIT inside out and reach through the neck to fully close the front entry zipper.

There are two basic methods of closing off the wrist and neck seals, plug and secure, or fold and clamp. To plug and secure, insert two small cans, or sand filled bottles (cups filled with sand and sealed with duct tape work well) into the wrist seals. One of these plugs should have an air connection so that it will allow air from a compressor or HP air cylinder to inflate the suit. One large can will likewise fill the neck seal. Secure these plugs with stretch Velcro, strong rubber bands/tubes such as surgical tubing, etc. to keep air from escaping from around the seals.

The other method for closing off the seals is to fold the ends of the seals over and clamp them off with some form of clamps that are strong enough to hold the pressure, but soft enough to not puncture the seals themselves. Again, you must have a method of inflating air into the SPIRIT.

Lay the suit (front zipper up) on a large worktable. Fill the suit just to the point where the neck seal just barely starts to bulge out (the suit will feel somewhat rigid).

With a sponge or spray bottle, apply a soapy water solution to the entire suit while working on an area no larger than 12 inches by 12 inches. DO NOT become distracted while looking for leaks!!!! Mark any holes or punctures.

## **3. Repairing Punctures and Holes -**

Once you have located the hole, puncture, or seam leak, patch the hole in the same way described above in the Field Repair Section.

#### **4. Replace Wrist Seals -**

Pull the Wrist Wraps up the sleeve to expose the wrist seal. Using extremely sharp scissors (trauma sheers), trim the old wrist seal off, even with the end of the fabric. Leave the 1" band of latex remaining still glued to the fabric sleeve of the SPIRIT. Insert the squeeze style stainless steel Wrist Repair Mold, larger end first, into the wrist opening. Leave about 1.50 inches of metal mold showing out the end of the sleeve.

You will want to keep the sleeve secure and stationary while you are working on it. Cut off a length of duck tape 1.50 inches long. Cut that piece lengthwise so that you will have two pieces approximately 1.00 x 1.50 inches. Roll each piece length wise to create a small tube that has adhesive all around the outside. You will want at least three of these duct tape tubes to place on the mold, and under the sleeve fabric, at even points near the furthest edge of the sleeve. Leave some of each of the tubes sticking out past the sleeve, so that you can use these protruding edges to secure the new wrist seal that you will be installing on the sleeve.

Turn a new wrist seal inside out and install it over the tool while pulling the edge of the new wrist seal even with the edge of the band of old wrist seal that is still attached to the material. Press the new latex seal against the protruding pieces of duck tape. Roll the edge of the new wrist seal up until all of the band, that is still glued of the original seal, is visible.

Wipe the original and the new seal with MEK and dry with a clean absorbent material. Apply one coat of PB-300 adhesive to both seals and wait 3 minutes. Apply a second coat PB-300 to both seals and wait 2 minutes. Insert the flat wooden applicator into the folded area of the new seal and gently break the bond of any adhesive that overlapped when you were applying the PB-300. Now "walk" the new seal over the original seal area so that it exactly overlays the still glued band of the old wrist seal. Press the new seal firmly using your fingers. Allow the suit to set up and cure for 2 hours, longer is better.

#### **5. Replacing the Neck Seal -**

Unzip the Neck Wrap. Using extremely sharp scissors (trauma sheers), trim the old neck seal off, even with the end of the MICRO fabric neck hole. Leave the 1" band of the old neck seal that is glued to the MICRO fabric. Turn the suit inside out to expose the neck seal.

If possible, attach the Repair Neck Plate on the end of some clean box or bucket, like a 5 gallon pickle bucket, to raise it up and let the SPIRIT fall gently down. This will better expose the neck area for working.

Place the SPIRIT, inside out, over this Repair Neck Plate and bucket, letting the fabric hang down. Center the neck hole of the SPIRIT on the Repair Neck Plate and pull the material tight. Clamp or weight the SPIRIT to hold the MICRO fabric against the Neck Plate.

The original neck seal (what is left after trimming) should be centered on the plate, with the rubber facing up. Wipe the top of the base of the new neck seal, and the exposed band of rubber on the old neck seal, with MEK. Wipe both dry with a clean (lint free) cloth. Apply one coat of PB-300 adhesive to the original and new neck seal, where new seal will overlay the original seal. Wait for 3 minutes, and apply a second coat of PB-300 adhesive to the same two parts. Let sit for 2 minutes. If the PB-300 dries a little too much, simply apply an additional light coat and then install.

Install the new seal over the original seal using the edges of the two seals for alignment. Press the new seal firmly using your fingers. Allow the PB-300 to dry and cure suit for at least two hours. Longer is better.

**THANK YOU -**

This Drysuit Use and Care Manual describes, in great detail, many procedures you can do to maintain your SPIRIT and greatly extend its useful life, and your enjoyment.

You will be able to make field and base repairs. If you are unable to do all of the recommended maintenance, and do all of the repairs, OS SYSTEMS is available to assist you. We maintain complete drysuit repair and rehabilitation facilities.

Thank you for purchasing an OS SYSTEMS SPIRIT. We appreciate your business.

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**DRYSUIT & SEAL SIZING PAGE**

**A) DRYSUIT SIZING CHART -**

| SIZE       | CHEST | WAIST | HIPS  | WEIGHT  | HEIGHT     |
|------------|-------|-------|-------|---------|------------|
| <b>XS</b>  | 33-35 | 26-28 | 34-36 | 90-115  | 4'11"-5'2" |
| <b>SM</b>  | 35-38 | 28-30 | 36-38 | 115-135 | 5'3"-5'6"  |
| <b>MED</b> | 38-40 | 30-34 | 38-42 | 135-160 | 5'7"-5'11" |
| <b>LGE</b> | 42-44 | 34-38 | 42-44 | 165-200 | 5'10"-6'1" |
| <b>XLG</b> | 46-48 | 38-42 | 44-48 | 200-230 | 6'1"-6'3"  |
| <b>XXL</b> | 50-52 | 44-48 | 48-52 | 230-260 | 6'2"-6'4"  |

Custom sized SPIRIT Drysuits are available. The Custom Measurement Sheet is available on the OS SYSTEMS website, [www.ossystems.com](http://www.ossystems.com).

**B) SEAL SIZING CHART --**

**Wrist Seals (DLS-2/DLSC-2)**

| SUIT Size | SEAL Size | WRIST Circumference |
|-----------|-----------|---------------------|
| XXS       | XS        | 4" - 5½"            |
| XS        | XS        | 4" - 5½"            |
| S         | S/M       | 5½"- 6½"            |
| M         | S/M       | 5½"- 6½"            |
| L         | L/XL      | 6 5/8" +            |
| XL        | L/XL      | 6 5/8" +            |
| XXL       | L/XL      | 6 5/8" +            |

**Neck Seals (DLS-1/DLSC-1)**

| SUIT Size | SEAL Size | NECK Circumference |
|-----------|-----------|--------------------|
| XS        | XS/S      | 12"-14"            |
| S         | XS/S      | 12"-14"            |
| M         | M/L       | 14"-16"            |
| L         | M/L       | 14"-16"            |
| XL        | XL/XXL    | 16"-19"            |
| XXL       | XL/XXL    | 16"-19"            |

**C) SOCK SIZING CHART -**

| SPIRIT SIZE | MEN'S SHOE SIZE |
|-------------|-----------------|
| XS          | 4.0 - 5.5       |
| S           | 6.0 - 7.5       |

|     |             |
|-----|-------------|
| M   | 8.0 - 9.5   |
| L   | 10.0 - 11.5 |
| XL  | 12.0 - 13.0 |
| XXL | 13.5 - 15.0 |

## OS SYSTEMS WARRANTIES

1. All **HDPro, ULPro, VULCAN, SARR, NAUTILUS, MANTA, STREAM COUNT, STEALTH MAS, COAST GUARD EXPOSURE, STEALTH WADER, TRAVEL WADER, BREEZE, SPIRIT, PADDLING** drysuits, jackets, and waders, are warranted against defects in workmanship and sewn seam construction for a period of two years.
2. All **DOLPHIN** drysuits are warranted against defects in workmanship and sewn seam construction for a period of one year.
3. All diving drysuit inlet and exhaust valves, in the drysuit of original installation, are warranted against defects in materials and workmanship for a period of three years.
4. All **STEALTH WADERS** and **TRAVEL WADERS** are additionally replacement warranted against any and all sewn seam leaks for a period of one year. If your OS Wader develops a sewn seam leak in the first year, OS SYSTEMS will replace it.

### **Additional terms and conditions of all OS SYSTEMS Warranties:**

All warranties are to the original purchaser only, and commence on the date of purchase from an authorized OS dealer. Proof of purchase is required for all warranty repairs. OS SYSTEMS reserves the right, at its own discretion, to repair the defect at its factory in Oregon, or to replace the product. All freight charges are to be paid by the purchaser. This special limited warranty is void if the product has been abused, misused, or not cared for properly. OS SYSTEMS does not warrant, or extend any warranties provided by the original manufacturers on the waterproof zippers. Undergarments and Longlife Latex seals are warranted for 60 days.

**THE FOREGOING WARRANTIES ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTIES OF MERCHANTABILITY, OR FITNESS FOR A PARTICULAR PURPOSE.**



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