
THOR
USER MANUAL

# Thank you

For the purchase of your new Thor drysuit.

You have joined countless divers - who use and trust our equipment. Within this manual you will find information on additional products, such as thermal protection, which you can use to configure your own ultimate drysuit system.

This manual provides you with easy access to the key features and functions of our thor drysuit, along with recommendations on how best to service and care for your suit.

Should you wish to know more about Northern Diver diving equipment, please visit our website **www.ndiver-commercial.com.**

# Contents

# Introduction

Congratulations on the purchase of a high quality Northern Diver drysuit. These products will open a new world of comfort and security in your diving adventures.

Drysuit diving demands specific techniques and training beyond those required for wetsuit diving. If you have not dived in a drysuit before, we strongly recommend you contact a local instructor for education and practice using your new drysuit under controlled conditions.

Both inexperienced and experienced users should thoroughly read and understand this manual before diving in the drysuit. If for any reason you have questions that are not covered by this manual or your instructor, do not hesitate to contact Northern Diver.

## WARNING

**ALL DIVERS MUST UNDERGO TRAINING AND FAMILIARISATION WITH A CERTIFIED INSTRUCTOR BEFORE USING THIS PRODUCT.**

The following are important safety guidelines every diver should adopt before diving in a drysuit:

Undertake a complete drysuit diving course with a certified instructor and from an officially recognized approved training agency.

Always dive with a buoyancy compensator.

Become familiar with all your equipment before diving.

Practice drysuit diving skills in safe conditions until confident of your ability. Ensure your buddy/partner is completely familiar with and understands all your drysuit diving systems.

Weight should be set to achieve neutral buoyancy with an empty tank. Do not add more weight than this. You should be able to achieve a 5-minute safety stop at 3 meters (10 feet), neutrally buoyant with a tank containing around 30 bar (500 psi) or less.

Inspect the zip, seals and valves for damage before each dive.

Perform regular preventative maintenance on the suit, valves, zip and seals.

Only allow qualified individuals to perform service on the suit.

Understand your personal diving limitations. Do not exceed them.

# Key specifications

This manual describes all types of Northern Diver tri-laminate drysuit styles. All suits share several basic features, including the main waterproof zip, inflation and exhaust valves, low-pressure inflator hose, vulcanised neoprene boots or socks, neoprene hood, and storage bag/changing mat. Each model is equipped with a specific maintenance kit.

***Membrane***
These suits are constructed from a three-layer fabric consisting of a middle waterproof barrier of butyl rubber sandwiched between a tough nylon exterior and special polyester blend interior. The suit is sewn together with a purpose-modified sewing machine that provides a stitch that stretches. Then the inside surface of the seam is treated with a special heat reactive polymer, and sealed with a waterproof tape applied with a computer-controlled hot air welding machine. Some heavy duty suits are sealed with a rubber tape. This provides an extremely dry and reliable seam. The membrane suit operates on a slightly different principle than the neoprene, as the membrane material has neither inherent buoyancy nor thermal protection. This style simply provides a waterproof shell under which the user can wear the correct choice of undergarments to suit the conditions.

Drysuits are tested to EN 14225-2:2017 and meet the regulation (EU) 2016/425 of The European Parliament and of the Council.

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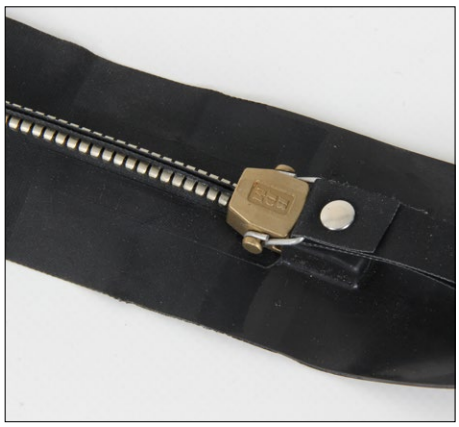
The EU Declaration of Conformity can be found on the Northern Diver (Int) Ltd product pages in the download section, please visit our website: www.ndiver-commercial.com

## WARNING

**NEVER DEPEND ON ANY DRYSUIT AS YOUR SOLE SOURCE OF FLOTATION AND BUOYANCY CONTROL. ALWAYS DIVE WITH A SUITABLE BUOYANCY CONTROL DEVICE EQUIPPED WITH A SEPARATE INFLATION SYSTEM.**

All of our brochures and manuals are available in various languages upon request and can be supplied on memory sticks or as a download from our website - **www.ndiver-commercial.com**

# Thor suit zip information



Your Thor drysuit will be fitted with either a BDM metal zip. Contact us if you are unsure as to which zip your drysuit is fitted with. The zip teeth must be kept clean to operate properly for long product life.

Your drysuit zip is situated either horizontally across the shoulders (rear entry).

It is usually positioned so that it closes from left to right. This is because most people are right handed and will be less likely to damage the zip, or catch clothes or foreign objects in the zip while closing it. You/your buddy must place one finger directly in front of the slider as it is closed, helping to guide the undergarment or foreign objects away from the zip teeth. Also make sure that you/your buddy fully tucks in the interior zip flap before closing the zip.

All drysuit zips should be washed after each dive and lubricated. Always pull the slider slowly and in the direction it is travelling (never pull it at an angle). Ensure that there is no hair or clothing caught in the zip and that the zip has been fully opened before you put on your drysuit. Failure to open completely may result in the zip being damaged.

The zip must be fully opened before you remove your drysuit. Clean the zip with fresh clean water. If the zip is particularly dirty, a toothbrush can be used. If using a toothbrush, do so gently. Mild soapy water can be used for heavy soiling. Close the zip when you hang / store the drysuit. Do not fold, bend or apply pressure to the zip (other than the small amount of pressure required to open and close it).

***Rear entry zips***

Do not attempt to close the zip yourself. To close the zip with the least chance of damage, extend your arms level in front of you. Advise your buddy to draw the zip closed from left to right, keeping one finger in front of the slider to prevent clothing and foreign object damage to the teeth. Make sure the slider is drawn tight up against the rubber stop on the right hand side. If the slider is not tight against the stop, the zip will leak.

## WARNING

**CLOTHING OR FOREIGN OBJECTS CAUGHT BETWEEN THE ZIP TEETH WILL CAUSE THEM TO SEPARATE, DESTROYING THE WATERPROOF INTEGRITY OF THE ZIP. THIS DAMAGE IS NORMALLY PERMANENT AND IS NOT NORMALLY REPAIRABLE. YOU/ YOUR BUDDY MUST EXERCISE CARE WHEN CLOSING/OPENING THE ZIP.**

**IF THIS HAPPENS GET A COMPETENT PERSON TO CHECK THE ZIP IS NOT DAMAGED BEFORE USING THE SUIT AGAIN.**

***BDM metal drysuit zip***
Before using the drysuit you must close the zip and lubricate it using Northern Diver Zip Wax (supplied with the drysuit), applying the lubricant to the brass elements on the outside and the teeth on the inside.

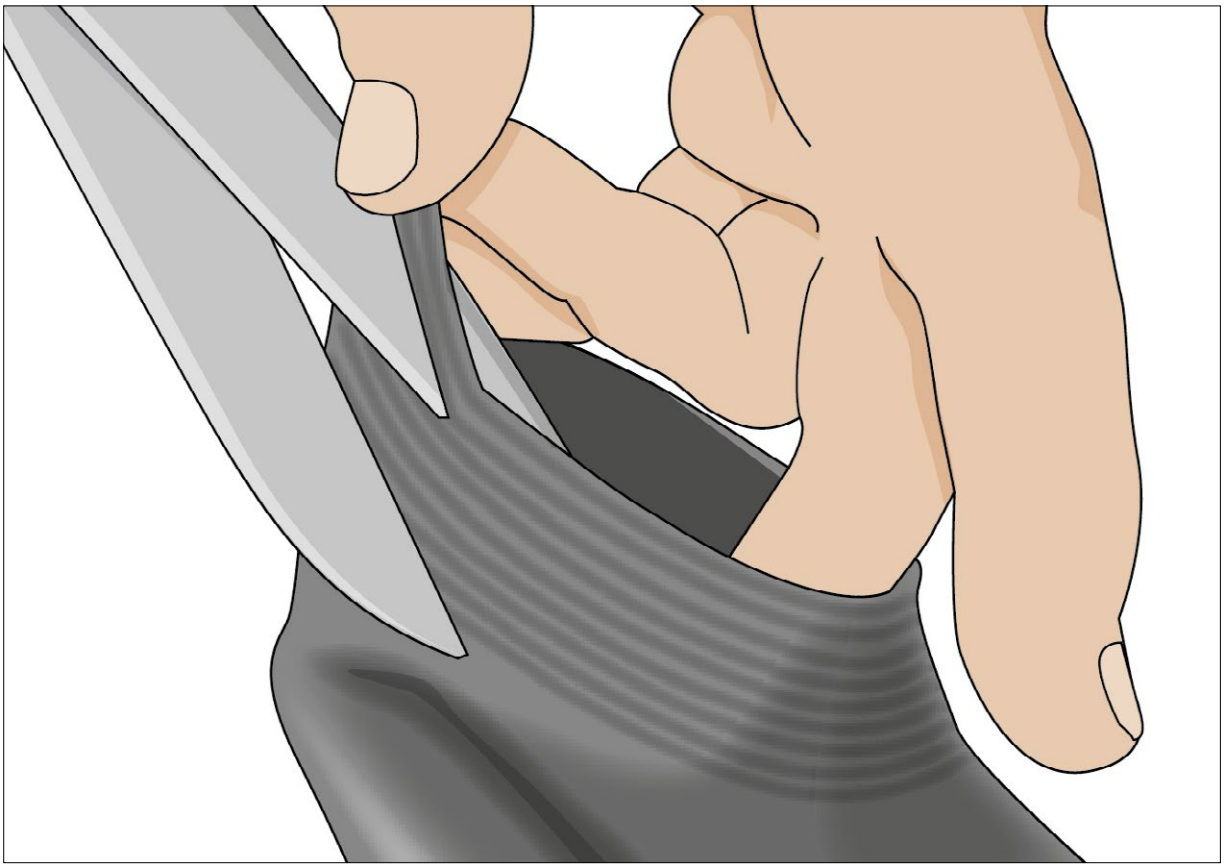
**Do not over lubricate the teeth, a light coating is sufficient**.

It is important to do this. If not regularly lubricated, the zip may seize up and possibly fail. If your drysuit is fitted with an anti-magnetic zip, the zip slider is connected to the pull handle by a special bronze wire. We advise you to lubricate the zip before every use to prevent the wire from detaching from the slider. If too much force is applied, which can be caused by lack of lubrication, this can make the zip difficult to close.

***Buy online at www.ndiver-commercial.com/zip-wax***


# Latex neck and wrist seals

Some models of Northern Diver drysuits are fitted with flexible latex neck and wrist seals for watertight integrity.



***Trimming latex seals to fit***

Latex seals have concentric raised ridges functioning as cutting guides to assist you to accurately trim the seals to fit. The seals are slightly tapered so they get larger when trimmed. Using a sharp pair of scissors, trim one ring off at a time until the seal is comfortable but still snug on your neck and wrists. Use care and precision with sharp scissors when trimming ridges. Leave a smooth surface, as ragged edges can allow tears to form, which will require replacement of the seal.

If you are in any doubt regarding your ability to trim the seal correctly, call into Northern Diver or return your suit with instructions of how many rings you require to be removed. This work will be carried out free of charge, but may be subject to postage/courier charges.

## WARNING

**Do not trim too much, or the seals become too loose and may leak. Make sure you cut the seals cleanly and leave no nicks that can develop into a tear. Blood flow can be restricted by seals that are too tight, which can ultimately lead to injury or death. Do not wear the seals too tight.**

***Storage & maintenance***
Store the drysuit so the seals are dry, cool (below 25°C) and out of direct sunlight. Ultraviolet light will degrade the latex over time. If the seals have been exposed to cold temperatures, they will become stiff and lose their flexibility. This condition is not permanent and can be resolved by a brief immersion in warm water. Before storing the suit for any length of time, dust the seals inside and out with pure talc (supplied in the maintenance kit) as a preservative. Do not use perfumed cosmetic talc, as it contains oils, which can damage the latex. Do not use oils or lotion on the seals. Avoid contact with copper.

***Possible allergy risk***
A small percentage of people have an allergic reaction to natural latex, the material from which the neck and wrist seals of some models are manufactured. This allergy can range from mild to severe skin rash and itching. It is the responsibility of the user to pre-determine if he or she has a latex allergy, or to recognise it during use, and discontinue use of the suit until the problem can be rectified. This usually means removing the latex seals, and installing new seals made of alternative materials.

***What is a latex allergy?***
A latex allergy is a reaction to certain proteins in latex rubber. The amount of latex exposure needed to produce sensitization or an allergic reaction is unknown. Increasing the exposure to latex proteins increases the risk of developing allergic symptoms. In sensitized persons, symptoms usually begin within minutes of exposure; but they can occur hours later and can be quite varied. Mild reactions to latex involve skin redness, rash, hives, or itching. More severe reactions may involve respiratory symptoms such as runny nose, sneezing, itchy eyes, scratchy throat and asthma (difficult breathing, coughing spells, and wheezing). Rarely, shock may occur; however, a life-threatening reaction is seldom the first sign of latex allergy.

## WARNING

**Determine if you have a latex allergy, and to what extent, before purchasing or using a drysuit with latex seals.**

# Fitting of a Thor drysuit

First remove your watch and any rings/jewellery that could tear wrist seals.

Drysuits in general and tri-laminate models in particular are designed to fit less snugly than neoprene wetsuits. However, a good fit is still required. You should be able to reach both hands over your head, and be able to squat on your knees without restriction, while wearing the drysuit and the heaviest undergarments you intend to wear.

The suit should not be tight in the crotch, or too long. If legs are too long, air volume in the suit can dislodge the boots off your feet if you become inverted.

***To ensure a good fit:***
Wear the bulkiest undergarment you are likely to wear under the suit.

Make sure the suit is not restrictive in any area.

Make sure you can raise both hands above your head, touch your toes, and squat to your knees without restriction.

Make sure the crotch (with braces properly adjusted) is not more than 10cm (10 inches) below your crotch.

Make sure you can easily reach both valves.

***Donning the drysuit***
First remove your watch as it could tear wrist seals, lay the suit out flat and do a quick overall inspection to ensure it is in good order.

Dust the inside of the latex seals with Northern Diver Talc or lubricate the neoprene seals using Northern Diver Drysuit Seal Lubricant (supplied in the maintenance kit).

Lubricate the zip with Northern Diver Zip Wax for BDM drysuit zips (supplied in the maintenance kit) or a suitable lubricant for YKK® Aquaseal® drysuit zips.

Remove all jewellery – sharp edges can destroy the seals.

Fold the torso of the suit inside out over the legs to about waist level, so the braces are exposed.

Make sure the braces are correctly attached, and are not tangled or twisted.

Sit down if possible and insert foot first into the suit, making sure you do not tangle foot in braces.

Grasp suit material at calf level and gently ease foot into boot. Pull up on leg.

Repeat with other leg.

Grasp torso and ease suit up so that the crotch of the suit is correctly positioned.

Raise braces over shoulders and adjust so they support the weight of the suit.

When present, fold the neoprene outer cuffs back away from the seals.

Insert first arm all the way, taking care with the seal when pushing hand through.

Repeat with second arm. Try to make sure the inside zip flap is not curled under during this process. Make sure that if the drysuit undergarment is equipped with thump loops, they are fully retracted, and not caught between the seal and your wrist. This will cause a leak.

Grasp the top edge of the neck seal with both hands, fingers on the inner surface, thumbs on the outside. Make sure your fingernails do not tear the latex or smooth skin neoprene. Spread the opening wide enough to draw the neck seal over your head, and adjust so it is comfortable. (Note: some divers prefer to don the neck seal first, inserting the arms after. This is a matter of personal preference).

If you have long hair, you may find it easier to wear a nylon stocking or similar over your head when pulling your head through the neck seal. If your drysuit has a neoprene neck seal, the neck seal should be inverted so that the smooth side is in contact with your skin; this forms the seal. Have your buddy make sure the drysuit undergarment is correctly positioned under the seal so that there will be no cold spots.

Instruct your buddy to draw the zip closed from left to right, keeping one finger in front of the slider to prevent clothing and foreign object damage to the teeth. Make sure the slider is drawn tight up against the rubber stop on the right hand side. If the slider is not tight against the stop, the zip will leak.

Attach the low pressure hose with quick disconnect fitting to the inflate valve by pulling back on the fitting and inserting it over the valve stem. Depress the side inflate button briefly to ensure the valve is working properly. Air will enter the suit, partially inflating it. Disconnect the low pressure inflate hose.

To check the proper function of the exhaust valve, turn it to the “OPEN” or “-” position and crouch to your knees. The suit should deflate and you should hear the air escaping from the valve.

Standard adjustable exhaust valve

Commercial double mushroom adjustable exhaust valve


Non magnetic adjustable exhaust valve


Locking cuff dump/ exhaust valve

***Removing the drysuit***

To take off the drysuit, follow the same procedures for donning the suit, but in reverse order.

# Applications for use

Our Thor drysuits are made of the finest materials and to extremely high standards of workmanship. However, they must be used within reasonable limits.

**WARNING - DO NOT:**
- Exceed the maximum depth to which you are currently certified.
- Use the drysuits in toxic or hydrocarbon-rich environments.
- Use the drysuit as a buoyancy-lifting device.
- Use the drysuit without a separate buoyancy control device.
- Use inflation gases other than air except argon (only use if you are qualified).
- Use the suit with any weight harness or other weight system that is not equipped with a quick-release system.

***Pre-dive suit checks***
Before ***EVERY*** dive, make sure the suit is in good condition by checking the following:

- No visible damage to materials or accessories anywhere on the suit.
- Check latex or smooth-skin neoprene seals for small tears or holes.
- Verify inflate and exhaust valves are intact and functioning properly.

Check low-pressure hose and fittings are intact, undamaged and properly connected. Inspect waterproof zip for excess wear or any damage.

***Post-dive suit checks***
After ***EVERY*** dive, complete all the pre-dive checks listed above, and inspect suit for any possible new damage. Repair any damage immediately, or take the suit to Northern Diver for repair.

When you have finished diving for the day, thoroughly rinse the outside of the drysuit with fresh clean water to remove any dirt, sand or salt. Any stubborn stains can be removed by rubbing the area gently with soapy water. Clean seals with fresh water. Occasionally rinse the inside, which can be treated with a proprietary deodoriser.

Always wear socks inside your drysuit, over a 1 hour dive i.e. kitting up to taking your drysuit off, you will perspire and produce an average half cup of liquid. If you are wearing light coloured under garments you may notice patches of liquid on the suit in the areas of the valves and zip where the perspiration condenses around these cold areas. Without socks your feet will become wet in some cases and this can make the suit smell.

***Inspection intervals***
In addition to the checks listed above to be performed before every dive, the valves should be inspected and serviced on an annual basis.

***Limitation of use***
Thor drysuits are designed for a maximum use of 2 continous hours.

# Risk assessment

Drysuit diving, as with any other aspect of advanced SCUBA diving activity, carries a degree of inherent risk. These include:

***Hyper/hypothermia***
Drysuits are often used in extreme temperature conditions, where there may be combinations of cold surface conditions and cold water, or hot surface conditions and cold water. It is important to know your own personal thermal safe range, to avoid over heating, or becoming chilled. While a drysuit and warm undergarment have excellent thermal protection, they do have limits and your safe and enjoyable time in the water is variable based on water temperature and condition, workload, and your own body type. Hypothermia is the cooling of the body core to unsafe levels. Hyperthermia is the overheating of the body core to unsafe levels. Hyperthermia in drysuit use is most often experienced during surface intervals in hot weather, or during periods of excessive workload in warm, shallow water.

## WARNING

**Learn your own limitations and learn to recognise discomfort as a danger signal. Avoid Hyperthermia & Hypothermia as both can be harmful or fatal. Monitor your work rate during all diving activities to avoid excessive air consumption, fatigue, over heating and other symptoms.**

***Change of buoyancy with depth***
Neoprene: all neoprene products used in scuba diving incorporate closed cell foam to provide thermal protection. Under increasing pressure as depth increases, these bubbles diminish in size, resulting in a loss of buoyancy as the diver descends. Learning to compensate for this loss of buoyancy is one of the vital skills that must be learned in the proper use of a drysuit.

Tri-laminate: as the tri-laminate material is a membrane and lacks a closed cellular structure, the material itself does not change buoyancy with depth. However, the air trapped within the suit by the thermal undergarment will be compressed and the diver compensates for this by adding air during descent and venting air during ascent, to remain neutrally buoyant.

## WARNING

**Buoyancy control in a drysuit is more complex than in a wetsuit and is a vital skill to be learned during the instruction in the use of a drysuit.**

***Loss of thermal insulation at depth***
Drysuits in general provide thermal insulation by creating an air space between the diver and the cold water.

Tri-laminate: as the material is a membrane only, the thermal insulation value of the material alone is minimal and does not change with depth. However, divers planning to spend time at greater depths must account for the colder temperatures normally found there by wearing added undersuit protection.

***Fitting the suit***
Proper fit in a drysuit is very important. Too loose a fit will allow such hazards as too much air moving around in the suit, difficult buoyancy control and if the legs are too long, the boots can slip off the divers' feet. Seals that are too loose will leak. Too tight a fit can result in restriction of blood flow causing loss of feeling in the extremities, or lack of oxygen to the brain. Seals that are too tight will also restrict blood flow.

***Inflation gases***
We recommend using air for inflation. Properly trained divers can use argon. Do not use gas mixes with elevated oxygen levels, or with helium (Tri-Mix, etc.). Helium is an excellent heat conductor, and will significantly reduce the thermal efficiency of the suit, risking hypothermia.

***Correct maintenance***
A drysuit is a complex piece of equipment designed to keep a diver comfortable in extreme conditions. Treat it with respect, maintain it correctly, and inspect it for wear and damage BEFORE & AFTER each dive. Failure to take these precautions may be hazardous.

***Allergies***
In addition to the possible allergic reaction to latex used in the neck and wrist seals, a small percentage of people are known to experience allergic reaction to neoprene. Although this is less of a problem with drysuits than with wetsuits, as the diver normally wears an undersuit to separate the drysuit from his or her body Some exposure can still result. Be sure to determine you are free from neoprene allergy before purchasing any neoprene product.

# Troubleshooting

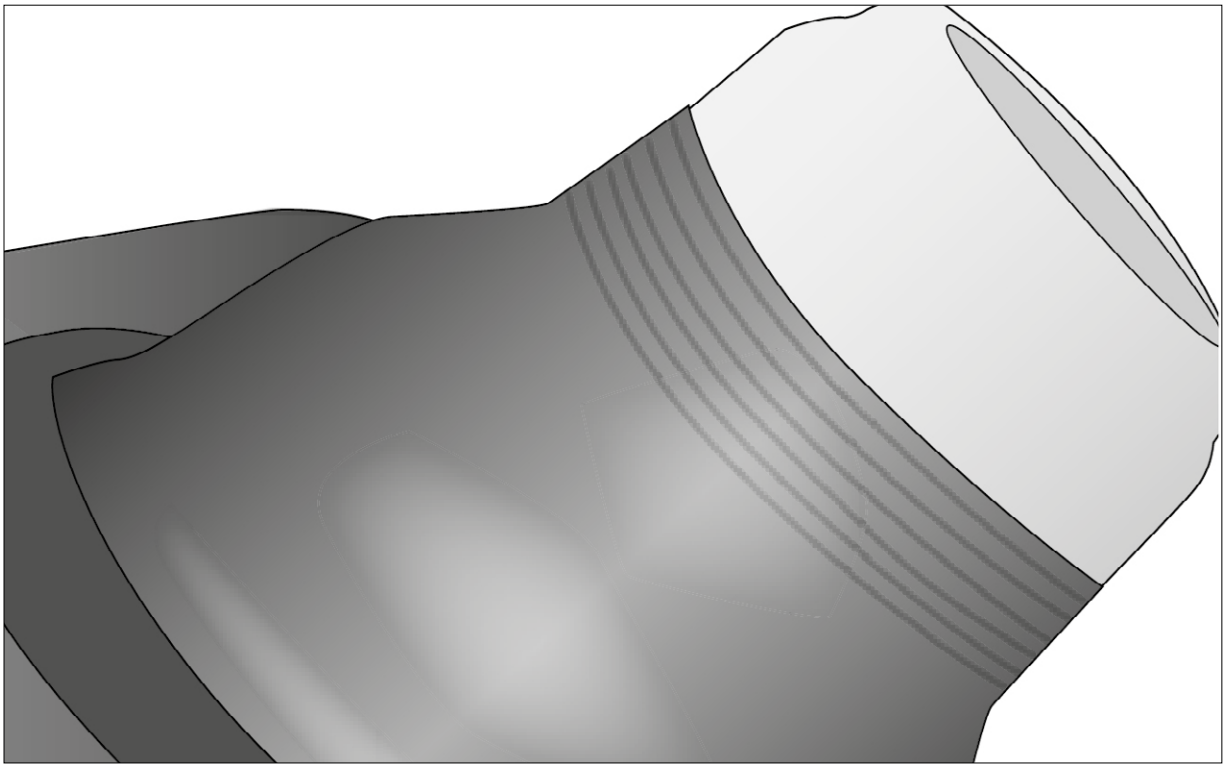
**NOTE:** A properly functioning drysuit is a closed environment and a certain amount of condensation on the inside of the suit is natural. Divers exerting a lot of energy or spending time above water on a warm day with the suit closed will notice this more.

***Zip leaks***
Slider not closed all the way – have your buddy check for full closure.
Zip has failed – inspect for split in closed teeth.
Zip material failed – can either be punctured or damaged by abrasion.
Foreign material caught in teeth – dirt, sand, debris, or the drysuit undergarment is frequently the trouble.
The zip is old, worn out, or damaged in some other way – have it replaced.
Improper or inadequate lubrication of the zip.

***Valve leaks***
Installation has loosened. Check back plate screw for tightness. This sometimes happens in neoprene suits, as the neoprene may continue to compress over time. Tighten if needed.
The exhaust valve may be improperly adjusted, or there may be debris (sand, hair, etc.) under the seal.
Valve parts may need servicing or replacement due to use and wear.

***Seal leaks***
Seals leak for two reasons, damage or interference.
Check the seals for holes or tears caused by sharp objects, wear and tear, or chemical damage.
Check that there are no foreign objects such as hair and sections of undergarment.
Check for over trimming.
Check they adjusted properly and do not have folds that can create leaking channels, especially around the tendons in wrists.

***Damage to suit fabric***
The suit fabric may leak due to wear, abrasion, puncture or tearing.
Avoid sharp and abrasive objects.
Divers exposed to corrosive chemicals must take extra care cleansing and rinsing the suit after each exposure. Some chemicals can degrade or de-laminate the suit materials to the point of failure.



***Leak testing your suit***

Your drysuit can be tested for leaks by plugging the wrist and neck seals with objects of suitable size, closing the zip and using the low-pressure inflation hose attached to the inflate valve to inflate the suit. Wrap an elastic band around the seal to help the plug stay in place under pressure. Start with the adjustable exhaust valve set at the lowest release pressure, and gradually increase until the suit is firm, but not hard. This way you will not stress the seals, fabric or seams of the suit.

## WARNING

**DO NOT use GLASS objects to plug the neck or wrist seals. Occasionally, the internal pressure will blow the plug out of the seal. Glass can shatter, causing injury.**

Once the suit is inflated, submerge it a section at a time in the bathtub, and inspect for leaks. Small bubbles will appear if a leak is present. Alternately, lay the inflated suit down outside, and slowly pour warm soapy water over the suspected areas. The soap solution will blow small bubbles, or create fine foam over the leak. Once the leaks are located, mark the area, rinse and dry the suit thoroughly, and repair the leak or book your suit in for a professional repair service at Northern Diver. In some cases if your suit is dry we can repair it immediately if you call to see us.

# Repairing a Leak

Ensure the drysuit is completely dry. Wear protective gloves, such as latex gloves. Mark the puncture on the outside of the drysuit, and use this mark to mark the same area on the inside of the drysuit, always make the repair on the inside of the suit. Clean the puncture area by rubbing with sandpaper or a stiff brush, and remove any loose particles. Apply 3 layers of Suit Seal (supplied in the maintenance kit), allowing 15 minutes' drying time between each application.

Note: Rub the first coat of Suit Seal in thoroughly until it soaks into the material – ensure the Suit Seal isn't just 'floating' on the material's surface, as this will make the repair less effective.

Apply 3 layers of Suit Seal to a repairs patch (supplied in the maintenance kit), again allowing 15 minutes' drying time between each application. Place repairs patch on the damaged area of the drysuit and use a roller to push out any air bubbles and ensure the patch and suit are firmly bonded together.

Allow 3 hours for the Suit Seal to dry, once dry test your suit again to ensure the leak has been repaired.

If you prefer, Northern Diver can provide this service.

With over 25 years' experience, our repairs and alterations department has your drysuit in safe hands. When suits come in for repair they are inspected, tested, worked upon and tested again before they return to the customer.

Custom options are also available on Northern Diver drysuits if you wish to add different elements to what you have purchased. We can change neck, wrists, socks, and boots to suit your requirements or add pockets, reflective panels and Kevlar® reinforcement on high wear areas.

Visit **www.ndiver.com/drysuits/drysuit-parts** for more details.

**If you would like your suit repairing please use our online booking service, visit our website www.ndiver-commercial.com**

# Emergency procedures

Diving should never be undertaken without adequate training under qualified supervision. We offer some suggestions for rectifying problems here, but this is merely scratching the surface and may not be suitable for any particular situation. Remember, training in a safe environment with a suitably qualified instructor is essential.

***Inflator valve is stuck open***
If your drysuit inflator valve becomes stuck open, meaning the drysuit is inflating uncontrollably, disconnect the inflation hose and press your dump valve at the same time. This exercise should be practised in a safe environment while wearing normal diving gloves. If you have a cuff dump, you will be able to dump the excess air by raising your arm. In an extreme case, such as when you can't vent sufficient air through the exhaust valve, raise your arm while lifting your wrist seal, or pull the neck seal away from your skin (no need to raise your arm). These procedures will allow air to quickly escape from the drysuit, but will also allow water to enter the drysuit.

If you experience an uncontrolled ascent due to over inflation, it is important to exhale as you ascend. We recommend that you do not undertake any diving without adequate backup or redundancy in your buoyancy device (ensure you are trained in the use of your buoyancy device) to ensure a safe return to the surface.

***Inflator valve is stuck closed***
Use your training to ascertain the correct method for returning to the surface, such as buoyancy control, ditching of weights etc.

***Exhaust valve is stuck open***
If your drysuit exhaust valve becomes stuck open, your drysuit will not retain air and will therefore not give proper buoyancy. Water is very likely to enter the drysuit via the valve. Abort the dive and use your buoyancy device to return to the surface, and follow what was learned in your training.

***Exhaust valve is stuck closed***
If your drysuit exhaust valve becomes stuck closed, it may not be possible to vent air from your drysuit. This could result in an uncontrollable ascent. Air can be dumped by pulling the wrist or neck seals away from the skin, allowing air to escape. This action may cause water to enter the drysuit.

***Water enters through exhaust valve***
This may be caused by dirt etc. under the valve or a damaged diaphragm. Abort the dive immediately and use your buoyancy device to return to the surface.

***Air leaks through inflator valve***
If this occurs, you should disconnect the inflator hose from your drysuit and use your buoyancy device to return to the surface. Air will need to be dumped as usual when ascending.

***Drysuit becomes flooded***
In the unlikely event of this occurring (probably caused by a tear, seal failure or zip failure etc.), use your buoyancy device to return to the surface.
It may help to keep the leaking area as low in the water as possible - this will help keep any remaining air inside the drysuit. Cold water in the drysuit means that it should be removed as soon as possible after surfacing.
Be aware that it is normal for the inside of a drysuit to be damp with perspiration, and a small amount of water should not be assumed to be because of a leak or drysuit failure.

***Dropped or lost weight belt***
To practise this procedure, do so with consultation and supervision from a suitably qualified instructor in a controlled environment – they will guide you through what to do.

Do not attempt to drop your weight belt until you are absolutely clear about the procedure. You must be thoroughly trained.
Remember, dropping your weight belt can injure other divers and marine life.

# Other important information

1. Follow all instructions. Improper use of a drysuit can cause loss of buoyancy control, including uncontrolled descents and ascents, and a risk of serious injury or death.

2. Improper use or misuse of a drysuit can result in exposure to thermal hazards and rapid body overheating or cooling, which could result in stroke, seizure, hypothermia and death.

3. This manual is **NOT** a substitute for proper qualified drysuit instruction and is **NOT** supplied as such. This manual is supplied as a guideline for drysuit maintenance only.

4. Diving in conditions that contain chemical, biological or nuclear contaminants is extremely hazardous and should **NOT** be attempted without being specially trained and equipped. In most cases, the Northern Diver drysuit you have purchased has **NOT** been adapted for use in polluted or abnormal conditions and is therefore **NOT** covered under warranty. Some drysuits that we manufacture are suitable for these conditions, but prior to use you **MUST** seek advice from us to ensure the drysuit will fully protect you.

5. Military drysuits – if the drysuit is to be used in conditions where the drysuit requires a non-magnetic signature, please carry out adequate checks to confirm that the zips and valves fitted to the drysuit comply with the directive relating to this use. Non-magnetic inflation and exhaust valves can be identified with this symbol -

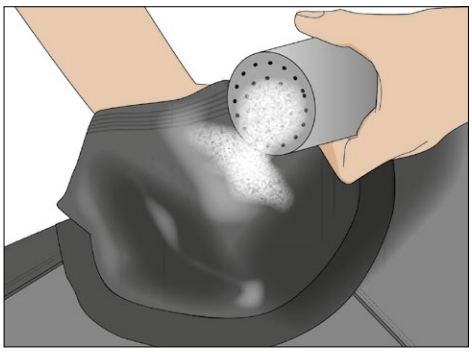

To use the non-magnetic symbol for our diving suits and equipment we have our products independently tested at QinetiQ, Portland. We advise you to ensure your kit has been tested before entering any hazardous area.

# Maintenance, repair & modification

It is not within the scope of this manual to provide complete and detailed repair instructions for all the situations that may be found. Basic maintenance for the suit, the materials and individual components such as zip, seals, and valves, etc., may be found under those individual headings.

***Cleaning, disinfection & decontamination***

***After each use:***
Rinse outside of suit with clean fresh water.
Wipe seals clean with clean fresh water.
Rinse valves with clean fresh water.
Hang suit upside down to dry.



***If the suit got wet inside***:
Clean inside with clean fresh water, or a disinfectant solution to prevent bacterial development.

***Latex seals***
Lightly dust with non-perfumed talc (supplied in the maintenance kit).
**Buy talc online at www.ndiver.com/talc**

***Degreasing***
If the suit is exposed to oil or grease, clean with a mild grease cutting detergent and a soft brush. Rinse with clean fresh water.

**DO NOT ALLOW OIL OR GREASE RESIDUE TO REMAIN ON SUIT FOR ANY LENGTH OF TIME – IT MAY DEGRADE THE MATERIAL.**

***Decontamination***
Commercial divers who may be forced to dive in contaminated conditions must identify the contaminant and take appropriate steps to remove the contaminant from the suit before it can be used again. Do not enter any contaminated area or water unless you have the required training and Personal Protective Equipment (PPE).

***Storage & Transport***
Once the suit is thoroughly clean and dry with the zip lubricated, store in a cool dry place out of the sun. Many suits have been damaged by cats and rodents nesting in them when in storage, take care to store the suit away from areas accessible to them. Keep copper away from the latex seals. Drysuits are best stored on the Northern Diver Multi Purpose Hanger (see page 27) that hangs the suit upside down by the feet with the zip closed. Additional advice may be found in specific sections above. Transport the suit in the storage bag / changing mat provided. Try to clean excessive dirt and sand from the suit before placing it in the bag.

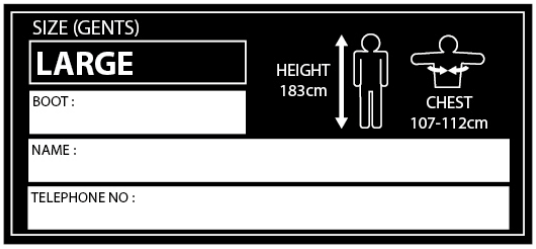
# Safe disposal, suit labels & details

If you need to destroy the drysuit please make sure to follow local regulations and prescriptions.

***Suit inner labels***

The drysuits primary internal label, located on the internal zip flap, is marked with the measurements that the drysuit has been designed to fit (see right most example).

The secondary internal label is located on the back panel of the drysuit, clearly visible when the zip is opened. This label gives more information on the suit and includes washing instructions, manufacture date and repairs/service log (your label may differ slightly).





***Your Drysuit Details***

Please note your drysuit details for future reference.

| |
|---|
| Drysuit serial number |
| Date of purchase |
| Colour(s) |
| Drysuit type |
| Suit Size |
| Boot size |
| Notes |

# What's included with my suit?

***Valves and inflation hose (supplied with selected suits)***
The valves should be periodically examined and tested by an authorised service technician. We recommend that this is undergone at least yearly – more if the drysuit is heavily used. Under no circumstances should you attempt to service the valves yourself as this may result in damage not covered by the warranty. If you experience problems with the operation or performance of your valves, please return them to Northern Diver for inspection.

For maximum life and performance rinse the valves with fresh clean water and allow to dry after every dive. When dry, lubricate the o-rings in your inflation valve with silicone spray. You can do this by spraying a few times into the coupling end of your drysuit inflation hose, connecting the hose to the valve and air supply, and pressing the inflation button on the valve – the o-rings will now be lubricated.

***Maintenance kit (supplied with the suit)***
You will receive a variation of the maintenance products listed below depending on the type of drysuit you have purchased and the zip it is fitted with.

***Packaging***
All Northern Diver packaging is supplied from sustainable sources wherever possible.

Drysuit & undersuit boxes have been redesigned to be more robust and take up as little space as possible. Where viable all packaging is recyclable.

Northern Diver is leading the way
with BSEN ISO 14001 Environmental
Management Systems status.

***12 Month Guarantee***
If you experience a fault within the guarantee period you can have the drysuit collected or call in with your suit.

We aim to have the problems resolved within a week of booking in the suit.

# Valve & hose information

***Inflation Valve Connections***

Northern Diver uses three types of inflation valve connection. Fig 3. Shows the CJEN fitting, Fig 4. Shows the Standard fitting and Fig 5. Shows the V-Tech fitting. The Standard fitting is the same fitting found on buoyancy device direct feeds and tends to be more widely used.

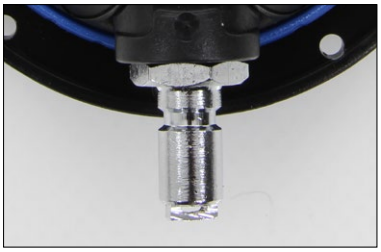


*Fig 3. (CJEN fitting) Normally used for commercial & military*

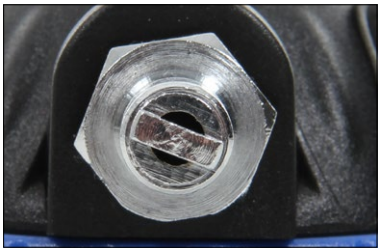


*Fig 4. (Standard fitting)*

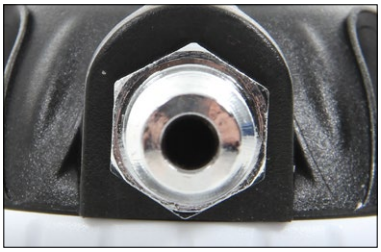
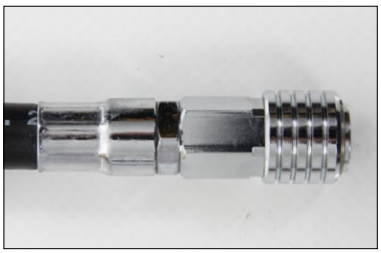


*Fig 5. (V-Tech fitting) Useful in cold environments when thick gloves are worn the large sliding collar is easier to grip.*

***Hose Connections***

There are three types of hose coupling to go with the inflation valve connections. Again these are CJEN couplings (fig 6.), Standard couplings (fig 7.) & V-Tech couplings (fig 8.) All fittings need to have the collar on the coupling pulled back whilst pushing it onto the inflation valve connection.



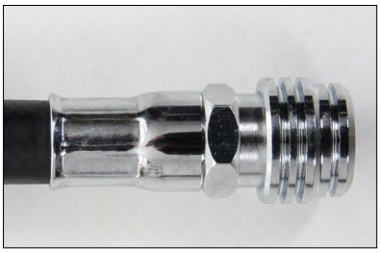


*Fig 6. (CJEN coupling)*

*Fig 7. (Standard coupling)*

*Fig 8. (V-Tech coupling)*

# Compatible Thor spare parts

All the spare parts listed can be bought as separate items or bought and fitted by Northern Diver's experienced repair and alterations department.

**DESCO NECK YOKE**

*CODE: NECK DAM DESCO*
**SIZE:** ONE

**GENESIS NECK YOKE**

*CODE: NECK DAM GENESIS*
**SIZE:** ONE

**KM NECK YOKE**

*CODE: NECK DAM-KM*
**SIZE:** 17C - 77

**AH NECK YOKE**

*CODE: NECK DAM-AH3/5*
**SIZE:** ONE

**BEANIE HOOD**

*CODE: THOR-BEANIE-SIZE*
**SIZES:** L, XL


**INFLATION VALVE**

*CODE: VALVE-ND-INFLATOR-CEJN*
**SIZE:** 80*80*45mm (3.1*3.1*1.8")


**MUSHROOM EXHAUST VALVE**

*CODE: VALVE-ND-EXHAUST-COMM*
**SIZE:** 85*85*35mm (3.3*3.3*1.4")


**LOCKING CUFF DUMP**

*CODE: ND0000878*
**SIZE:** 60*60*30mm (2.4*2.4*1.2")

**DRY GLOVE RING SYSTEM**

*CODE: GLDRY-SYSTEM-V4-SIZE*
**SIZE:** S, M, L, XL

## CUFF SYSTEM GLOVES

*CODE: CUFF RING-GLOVE-SIZE*
**SIZE:** M, L, XL

## CUFF SYSTEM W/SEALS

*CODE: CUFF RING + CUFF RING -LATEX SIZE + CUFF RING-O RING*
**SIZE:** M, L, XL

## LATEX WRIST SEALS

*CODE: SEAL-W-STYLE-SIZE*
**SIZE:** S, M, L, XL

## RUBBER BOOTS

*CODE: THOR-SOFT-BOOT-SIZE*
**SIZE:** UK 7-12

## SAFETY BOOTS

*CODE: THOR-BOOT-SIZE*
**SIZE:** UK 7-12


## SAFETY OVER BOOTS

*CODE: THOR-OVERBOOT*
**SIZE:** ONE

## LEAD INSOLES

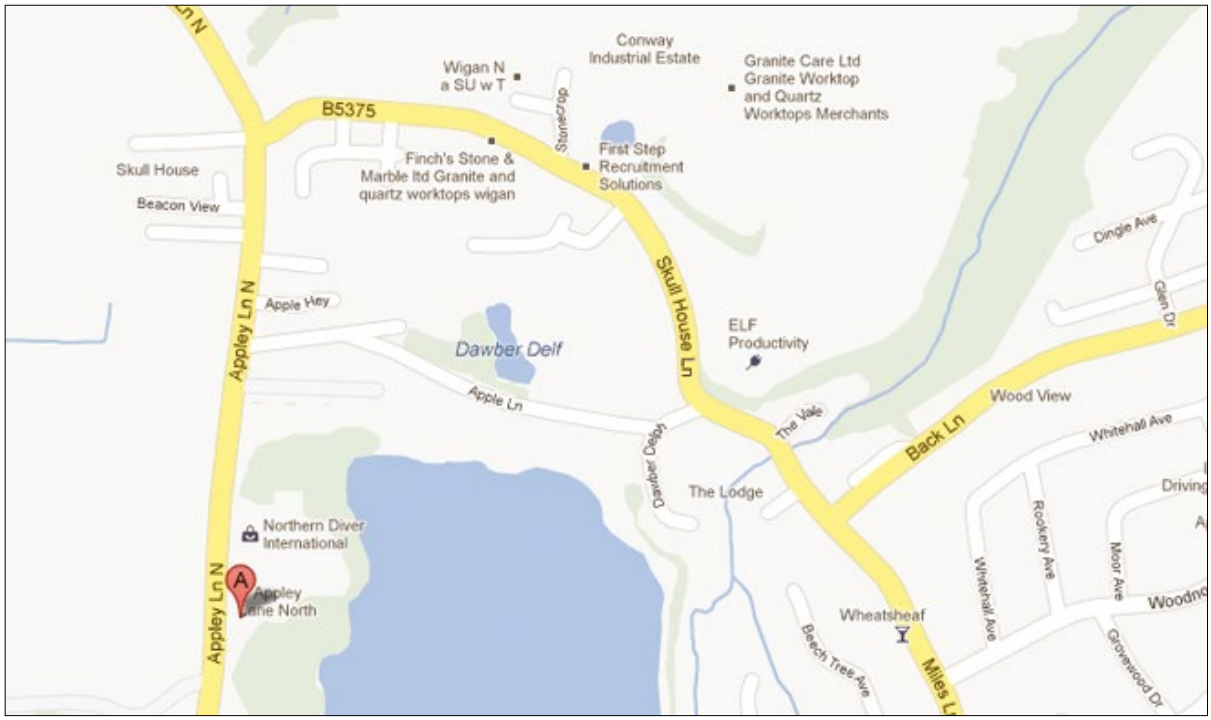
*CODE: LEAD-INSOLES*
**SIZE:** 2.6kg (5.7lbs) ea

# Finding Northern Diver

We are happy to answer any questions you may have.

We are located in Appley Bridge, Lancashire, UK - only 5 mins from the M6 motorway (J27). Manchester & Liverpool international airports are only 40 mins away. Wigan North Western rail station is 2 hours & 3 mins from London Euston.

We are more than happy to collect clients and return them after their visit.

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## OFFICE

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## VISIT US ONLINE

View our extensive product range
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NORTHERN DIVER
COMMERCIAL SUITS & EQUIPMENT

*Photo credit: @angelos_nic*