NORTHERN DIVER

WETSUIT MANUAL

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This manual describes materials, construction, use, care, maintenance, repair, and inherent risks involved in the use of neoprene wetsuits for SCUBA Diving.

Introduction and safety advice
Thanks for choosing the high quality of a Northern Diver wetsuit, ensuring a new level of comfort and safety for all your diving adventures.

If you desire more information or have questions not answered in this manual, please do not hesitate to contact Northern Diver.

NOTE: NORTHERN DIVER RECOMMENDS THAT ALL DIVERS OBTAIN THE REQUIRED TRAINING AND LEARN HOW TO USE THIS PRODUCT UNDER THE SUPERVISION OF A CERTIFIED DIVING INSTRUCTOR BEFORE USE UNDERWATER.

The amount of weights used must be enough to achieve neutral buoyancy with an empty tank; it is not required to have any more weight than this. With the correct amount of weight you should be neutrally buoyant at a depth of 3 meters (10 feet) to make a 5-minute safety stop with 30bar (500 psi) or less of tank pressure. Check the zip operation before using the wetsuit. Only trained personnel must service the suit and/or Northern Diver.

Information and specifications
This manual covers Northern Diver neoprene wetsuits, protective clothing manufactured with neoprene: a special insulating material designed to reduce the flow of water next to the diver's skin and thus reduce dissipation of body heat. Northern Diver manufactures wetsuits of various thickness and designs to adapt to differing thermal conditions and uses.

ATTENTION!
DO NOT RELY ON THE WETSUIT AS A BUOYANCY/SAFETY DEVICE.

Zip
Northern Diver wetsuits adopt plastic zips that can be located in a diagonal or vertical position on the front or back of the wetsuit or horizontally across the shoulders.

Front and back zips are installed to close from the bottom-up, while across-shoulders zips are closed with a left-to-right movement. This choice is based on the fact that the majority of people are right handed and so will find it easier to close the zip without damaging it. When an across-shoulders zip is present ask your dive buddy to keep one finger in front of the zip slider while closing it; this allows the flattening of any neoprene that might interfere with closing the zip and also keeps skin/neoprene away, that could get trapped in the zip teeth. Before closing ensure that the inner gusset has been correctly deployed under the zip. All slide fasteners are equipped with gussets or flaps that reduce the water flow through the closure. External flaps are secured in position by Velcro fasteners.

Open and close all vertical zips while standing, this prevents the formation of folds along the zip length. To minimize the chances of damage, all across-shoulder zips should be closed while keeping your arms extended in front of you when zip is in the back. Closing a horizontal front zip requires a slightly different technique. To make donning easier, the arm that is NOT holding the zip slider should be positioned to facilitate the alignment of the zip and the movement of the slider.

The left arm should be straight and pointing backwards when the slider is engaged and then, the right arm should be pointing backwards when the left hand pulls the slider to the stopper. Do not hesitate to firmly pull the slider to initiate closure. Make sure that the zip slider is brought to rest against the stop at the right end of the zip. If the slider is not completely closed, water will be able to enter the suit and cause the zip to open.

Zip maintenance
After each dive rinse the zip with clean fresh water to prevent salt deposits which could cause the zip to block. This is especially important for zips equipped with a metal slider.

Seams
The seams joining the panels of all Northern Diver wetsuits, which are 3mm or thicker, are blind stitched and waterproofed using glues and other substances that stop water from passing through the seams.

Wetsuit fit
Wetsuits are designed to fit closely against the body of the diver; nevertheless the wetsuit must not be overly tight, impair movement or breathing or be restrictive in any area. At the crotch area the wetsuit must not constrict nor be too loose.

Ensuring a correct fit
Simulate a deep inhalation to make sure that the wetsuit does not impair the expansion of your rib cage. Make sure you are able to join your hands above your head, touch your toes, squat and kneel on your knees without restriction. Please refer to the Wetsuit Size Chart to determine the best match of your measurements in relation to Northern Diver standard sizes. Size charts can be found online.

Donning your wetsuit
Lay the suit out flat and do a quick overall inspection to ensure it is in good condition.

Remove all jewellery – sharp edges can damage the seals at the neck, ankles and wrists.

Sit down if possible and insert the foot first into the suit.

Fold the neoprene of the ankle gusset (if present) away from the inner seals.

Grasp the suit material at calf level and gently ease the foot through the lower opening. Pull the suit up over the leg.

Repeat with the other leg.

Grasp the torso and ease the suit up, making sure that the crotch of the suit is in the correct position.

Fold the neoprene of wrist gusset (if present) away from the inner seals.

Insert the first arm all the way, taking care not to damage the seal when pushing the hand through the opening.

Repeat with the second arm. During this process make sure that the inner zip flap is not folded inside the suit.

If your suit is equipped with an across-shoulders zip, grasp the upper part of the neck with both hands, with fingers on the inside and thumbs on the outside. Slightly stretch open the neck area to help in passing your head through, then adjust the neck seal in the most comfortable position. Ask your diving buddy to draw the zip closed, moving the slider left to right, keeping one finger in front of the slider to avoid clothing and foreign objects from being trapped between the zip teeth. Make sure the slider is drawn up tight against the right side stop.

Wetsuit usage
All Northern Diver wetsuit models are manufactured using top quality materials according to the highest manufacturing standards, however the suits must be used within reasonable limits.

Do not:
Exceed the maximum depth you are qualified for by your certification level.

Use the wetsuit in contaminated or heavily polluted environments, nor in toxic or hydrocarbon-rich waters.

Use the wetsuit as a safety/buoyancy device.

Use the wetsuit with a weight harness or other weight system not equipped with a quick-release system.

Pre-dive checks
Before EVERY dive make sure that the wetsuit is in good condition by checking seams, visible damage to materials or components, tears and holes. Ensure that the zip is working and not damaged or prone to blocking.

Post-dive checks
After EVERY dive, repeat the pre-dive checks and inspect the suit for possible new damage that might have occurred during the dive. If you detect any kind of damage, repair it as soon as possible or take the suit to Northern Diver.

Assessment of risks
Diving with a wetsuit carries an inherent amount of risk, just as any other SCUBA diving activity. These risks include:

Hypothermia – Hyperthermia
Wetsuits are used in varying temperature conditions, where there may be combinations of cold at the surface and in the water or warm/hot surface

conditions and cold water. It is important to be aware of your own thermal comfort range, so as to be able to prevent overheating or chilling.

A wetsuit provides excellent thermal protection but it does have limits and your safety and fun will depend on the combined action of water temperature, workload and your own body type.

If the body loses too much heat and the body temperature reaches unsafe levels, we are in a condition known as hypothermia. Hyperthermia takes place when the body temperature rises beyond the normal range.

While using a wetsuit hyperthermia can be experienced during surface intervals in warm climates or while diving in warm, shallow waters when engaged in activities that require a high workload.

It is strongly advisable to always wear gloves, boots and hood together with a wetsuit anytime the water temperature may expose the diver to the risk of hypothermia. Gloves, boots and hoods can be purchased online at **www.ndiver.com**. It is important to know your own limitations and comfort range; this allows you to recognize a situation of discomfort as a danger signal. Hypothermia and/or hyperthermia are both harmful and possibly fatal conditions.

During any diving activity, constantly monitor your workload to prevent excessive gas consumption, fatigue, stress, overheating and other risks.

Buoyancy change at depth
All neoprene products used in SCUBA diving incorporate a closed-cell foam to provide thermal protection. As the diver descends, the pressure increase causes these bubbles to shrink in volume, resulting in a reduction of buoyancy at depth.

NOTE: Learning how to compensate for this loss of buoyancy is one of the vital skills that must be learned in the proper use of a wetsuit.

Thermal protection loss at depth
When neoprene thins under pressure (see above) the thermal performance of the material is reduced. Divers planning to spend time at greater depths must account for the diminished thermal protection at depth by wearing additional protection under the suit or using thicker suits.

Wetsuit ergonomics
It is very important that the wetsuit correctly fits the body of the diver. A loose

wetsuit will allow water to move inside the suit and to flow in and out. Water exchange between the inside and the outside of the suit will result in a much higher thermal loss than that taking place through the wetsuit material during normal usage.

The correct wetsuit size must be chosen to prevent the formation of folds or “pockets” caused by excess material. During the dive these folds will tend to pump water in and out of the suit.

Neck, ankle and wrist seals must be able to reduce the flow of water, but not be so tight as to restrict circulation to the hands, feet and head. A restriction of blood flow to the extremities can result in a loss of feeling, nitrogen build up, or lack of oxygen to the brain with the risk of a loss of consciousness while underwater.

Allergies
A small percentage of the population is known to experience allergic reactions to neoprene, polyester and nylon. Make sure you do not suffer from allergies to these materials before purchasing or using any wetsuit containing them.

Cleaning and disinfection
After **EVERY** use of your wetsuit:
Rinse the inside and outside of your suit with clean fresh water.
Hang the suit in a position that allows the water to flow away from the suit.
Allow sufficient time for the suit to dry both internally and externally.
From time to time perform an accurate cleaning of the wetsuit (in a washing machine set on the “delicate fabrics” program).

Storage and transport
Wetsuits are best stored on the Northern Diver Wetsuit Hanger (available to purchase at www.ndiver.com) that can hold all wetsuit components. Keep the wetsuit in a dry, cool place and away from direct sunlight. Other component-specific advice may be found in previous sections of this manual.

Transport wetsuits in bags designed for SCUBA gear to avoid folding the suit in several places and prevent excessive neoprene compression. Clean excess dirt and sand from the suit before storing it in a bag.

Disposal
When you will need to dispose of the suit, please make sure to do so according to local regulations and prescriptions.

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www.ndiver.com

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