

Drysuit Diving and Suit maintenance

INTRODUCTION

There are two basic types of drysuit, Membrane and Neoprene. Both, unlike a wetsuit, are active pieces of equipment which may cause problems if not used correctly.



Membrane



Membrane



Neoprene

EFFECTS ON A DRYSUIT DIVER

A drysuit provides both insulation and buoyancy by surrounding the diver with air. However this air space will be subject to Boyles Law and will contract with depth and expand on ascent. Thus there is a need to be able to control the air within the suit and this is achieved using air from the cylinder via the suit inflate valve and loss of air via the dump valve.



Top: Inlet valves

Bottom: Cuff dump

Auto dump

During descent the suit will be squeezed against the diver's body and may pinch the skin. This is known as suit squeeze and is characterised by wheals on the skin. This is prevented by admitting air to the suit during descent.

Air movement within the suit is termed migration and it will always travel to the highest point (which may not necessarily be the shoulder).

Thus air dumps are often situated at the shoulder or cuff and may be of an automatic or open nature.

Should a drysuit become filled with water it could hold up to a cubic metre or 1 metric ton of water. Thus if there is ever a possibility of falling into water the suit zip should always be firmly fastened. Exiting from water with such a load is extremely difficult.

TYPE OF DRYSUITS

There are major differences between the two main types of suit.

Membrane suits, having no real gas spaces within the material of the suit, are not buoyant and require an undergarment for warmth and protection. However the suit material experiences no change in its buoyancy with increasing depth.

The much thicker Neoprene suits do offer a degree of warmth and protection, but being filled with gas bubbles which compress with increasing depth, they do lose buoyancy.

There are a range of one or two piece undergarments available for both suit types which offer differing degrees of thermal protection. Give consideration to the type of diving before purchase. Extremes of temperature will require undersuits with varied characteristics.



Different suit manufacturers produce different styles with varied zip positions from across the shoulder to front entry.

All zips need regular cleaning and lubricating. Seals at the neck and wrist may be of neoprene or latex and care should be taken with initial sizes as over tight or over slack seals will cause discomfort.

Latex neck and wrist seals may be trimmed to size and comfort BUT trim cautiously.

Slack wrist seals may be waterproofed using external extra bands.

Hoods are generally supplied separately.



SUIT CONTROLS

The importance of the control of admission and venting of air into a drysuit has already been demonstrated. Thus it is essential that the user is fully conversant with these controls and their positioning.

The inflate valve on most suits is sited in the chest region but care must be taken to ensure that it will not be impeded by straps or attachments of the wearer's STAB jacket. The deflate valve may be of two distinct types. The simplest of these is a one way valve usually mounted on the inside of a suit cuff. Thought should be given as to which cuff as for example a right handed person passing a weight belt into a boat will lose suit air and buoyancy if the valve is on the right arm. However if the valve is placed on the left arm this is generally the hand used to hold an SMB reel during ascent and it may be inconvenient to keep raising the arm to vent.

The second type of valve is the auto dump which is generally mounted on the left upper arm. This may be dictated by seam positioning on membrane suits.

Auto dumps do require practice in use as they have been designed for the diver to set the level of air/ buoyancy in the suit by adjusting the spring tension of the valve. The valve will then maintain that air/ buoyancy throughout an ascent without further adjustment.

USE OF BUOYANCY COMPENSATOR WITH DRYSUITS

A drysuit may contain air but it is not a lifejacket and a diver will soon realise that whilst a drysuit may offer buoyancy, it also has a tendency to position the diver face down in the water.

For this reason a lifejacket should be worn when aboard small boats and a Stab jacket utilised for simple Scuba. In certain instances Stab jackets are not provided for some types commercial diving.

The Stab jacket also provides a source of surface buoyancy in an emergency.

Stab jackets may be supplied with an independent air source.

The Stab jacket may offer some assistance in correcting inversion problems.

ESCAPE FROM INVERSION (AT THE SURFACE)

Air migration to the feet at the surface can generally be easily corrected by inflation of the Stab jacket accompanied by gentle movement of the body to assist with air migration away from the legs. Some divers find a greater stability above and below water by using ankle weights.

Surface inversion would suggest either too much air in the suit or too much weight on the weight belt. It may also occur if the suit is incorrectly sized.

Correct weight positioning and buoyancy adjustment is essential for diver comfort underwater. Should the diver be incorrectly weighted it will greatly affect air consumption.

ESCAPE FROM INVERSION (UNDERWATER)

There are several options to escape from underwater inversion and these must all be demonstrated and practiced until the diver is confident in their own ability.

Options include jack-knifing the legs or completing a forward roll.

The use of ankle weights may offer some assistance.

SELECTION, CARE AND MAINTENANCE

The selection of a drysuit will be dependent upon personal insulation factors (bigger bodies need less insulation than smaller ones) and personal preference.

Neoprene requires thinner/ fewer undergarments but greater weighting on the weight belt.

Membrane suits need thicker undergarments but often less weighting.

Total costs are very similar for both.

Seek advice from existing users and from the suit manufacturers.

Care and Maintenance

A drysuit represents a considerable investment for a diver and it is important to maintain the suit on a regular basis.

Donning and removal of the drysuit should be performed with care, lubricating neck and wrist seals prior to fitting and taking care during their removal. Rings can easily rip both latex and neoprene seals and facial jewellery can damage the neck seal.

It should be thoroughly washed in fresh water following a sea dive and allow to dry naturally. Avoid drying the suit in direct sunlight or using excessive heat.

Check and clean the zip and lubricate regularly. Replacing a zip is a very expensive process.

Avoid allowing talc to enter dump valves as this will lead to clogging and possible valve failure.

Periodically the inlet and vent valves should be stripped and cleaned. Depending upon the suit this may need to be serviced professionally.

All drysuits used within the University of Plymouth require proof of annual service conducted by a competent person.

Storage

Prior to storage a suit should be thoroughly dried with all seals covered with Talc.

The suit may be stored by hanging by the shoulders on a padded hanger taking care not to place strain on the neck seal.

It may also be hung inverted by the heels from a purpose designed hanger

If storage space is a problem the suit may be stored loosely rolled with the zip fastened.

The suit should be rolled from the feet upward to lessen the strain placed on the zip.