

WSF Freediver - Management



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THE 4 FREEDIVING ELEMENTS

1. Conserving Oxygen 
2. Equalisation 
3. Flexibility 
4. Safety 

The 5th Element that is key to success is you, the freediver!

EQUALISATION

Objectives:

1. State 2 processes of equalisation for the eustachian tubes
2. Demonstrate the 5 steps of the Frenzel manoeuvre
3. State the main difference between the Valsalva and Frenzel manoeuvres
4. State the 2 main airspaces that need to be equalised on descent

Value: By learning the correct equalisation skills and knowledge, you will be able to descend deeper and with greater safety and confidence while freediving.

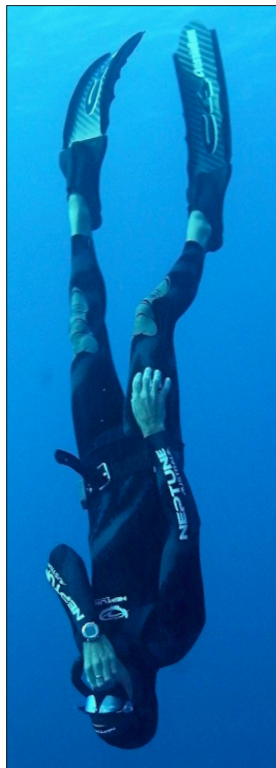
Now equipped with knowledge of Boyle's Law and the compressibility of air spaces in relation to pressure, it's high time to learn the skills of equalisation. There are many ways to compensate this pressure for freedivers. We descend many times during a freediving session so it is paramount to have mastered the art of equalisation early in your freediving career.

Let's take a practical look at some of the ways to equalise pressure within the mask and ears on descent.

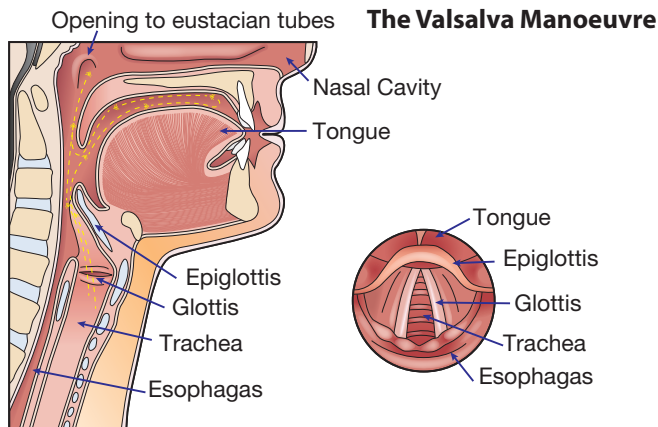
There are only 2 main airspaces we need to equalise as freedivers, the mask and the middle ear airspace. The sinus will automatically equalise as we compensate for the eustachian tubes.

The freedivers mask can be equalised very easily. While descending, make sure to puff small amounts of air through the nose into the mask regularly - this will keep the airspace in the mask equalised and stop it from creating negative pressure (which can create a squeeze if left unchecked).

Methods for equalising the middle ear airspace can vary.



The Valsalva Manoeuvre: This is also known as ‘pinch and blow’ and is achieved by simply pinching the nose closed and then blowing air against the (now closed) nasal passage. This creates a pressurisation of the air spaces within the sinus/eustachian tube that creates the familiar clicking sound as a cushion of air inflates the middle ear air space.



Toynbee Method: Pinch your nose closed and swallow. The swallowing action draws the musculature around the Eustachian tube to open the passage and the epiglottis closes to divert the swallowing action toward the stomach, creating a pressurisation that should be accentuated by the familiar clicking sound of air within the middle ear.

Voluntary Tubal Opening (VTO): Some people are able to equalise without pinching the nose - “hands-free”. These individuals are seemingly born with this skill and perform it naturally. It has its benefits to underwater photographers and to people who enjoy unassisted freediving without fins as it keeps the hands free. Keep in mind though, it is very difficult to learn successfully and your freediving practice and training may benefit more elsewhere as most freedivers who use VTO will end up wearing a nose clip, or pinching the nose as they venture deeper in their freediving.

Frenzel Manoeuvre: The preferred method for freediving is the Frenzel Manoeuvre, however, this may take more practice time to master, but the rewards are well worth the efforts.

The Frenzel Manoeuvre makes equalisation possible without using the diaphragm or chest muscles. By only using the air in the mouth to create a pressurisation strategy, we save energy and oxygen and reduce the risk of failing with equalisation. As we have learned, when we descend our lung volume decreases rapidly.

This shrinking airspace makes equalisation methods that require the diaphragm very difficult and dangerous (the Valsalva Method is even more difficult to perform when descending vertically) (see Failure Depth Diagram).

Surface	TLC 8 pints /4 L	TLC 13 pints /6 L	TLC 19 pints /9 L	TLC 23 pints /11 L
33ft / 10m (2 Atm)	4 pints / 2 L	6 pints / 3 L	8 pints / 4 L	11 pints / 5 L
66ft / 20m (3 Atm)	2.81 pints / 1.33 L	4 pints / 2 L	6 pints / 3 L	7.74 pints / 3.66 L
99ft / 30m (4 Atm)	2.11 pints / 1 L	3.2 pints / 1.5 L	4.76 pints / 2.25 L	5.81 pints / 2.75 L

In all examples above “Residual Volume” is reached at 99 ft / 30m, 25% of TLC.

Let's re-calculate considering we have reduced our Residual volume to 20% of our TLC by training or stretching for Freediving.

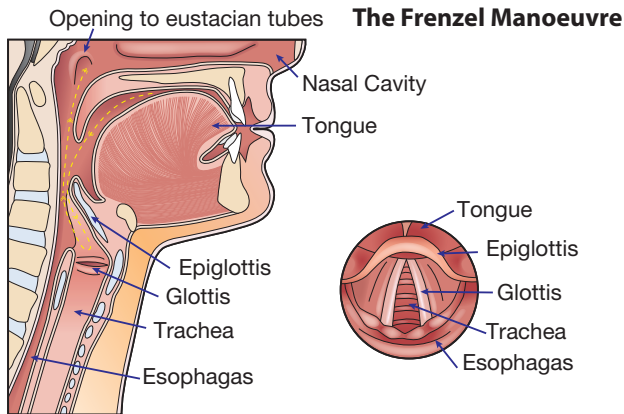
Surface	TLC 8 pints /4 L	TLC 13 pints /6 L	TLC 19 pints /9 L	TLC 23 pints /11 L
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99ft / 30m (4 Atm)	2.11 pints / 1 L	3.2 pints / 1.5 L	4.76 pints / 2.25 L	5.81 pints / 2.75 L
131ft / 40m (5 Atm)	1.7 pints /0.8 L	2.56 pints /1.21 L	3.83 pints /1.81 L	4.65 pints /2.2 L

In all examples above “Residual Volume” is reached at 131ft / 40m, 20% of TLC.

Let's learn the practical steps to perform the Frenzel technique properly.

The 5 simple steps below describe the simple process of Frenzel equalisation. Keep in mind that some people may need more practice and exercise in mastering the complete sequence. Your WSF professional instructor will guide you in great detail.

1. Close your glottis
2. Perform the tongue block
3. Keep your soft palette passive (neutral)
4. Pinch your nostrils closed
5. Use the tongue/cheeks as a pressurisation method (Move air upward toward the back of the throat/through the soft palate)



Step 1. First we must control the glottis.

The area surrounding the voice box/vocal chords is referred to as the glottis. It is possible to restrict, and even block, the glottal opening by using our laryngeal muscles. Try singing a note with the mouth open and stopping it momentarily, then continue singing the note again – this silent gap is your laryngeal muscles constricting the glottis (closing the glottis).

This exercise can also be rehearsed by simply taking an inhalation then holding your breath with your mouth open – it is the closed glottis that is trapping the air back within the lungs.



WSF Pro Tip: When holding the glottis closed, always have your diaphragm/belly area relaxed and passive.

Step 2. Perform the tongue block.

Pinch your nostrils closed with your glottis already closed. Then make the sound of the letters “TH” as if to say “THE” without the “E”. Slowly, this creates a momentary tongue block, where the tip of the tongue will lay behind the top row of teeth, creating a pocket of air and forming a seal.



WSF Pro Tip: When making the tongue block seal properly, try not to use any movement from the diaphragm/belly.

Step 3. Keep the soft palate passive.

To understand how the soft palate affects airflow to the sinus/Eustachian tube area, we can perform a simple exercise: take a breath in and very slowly start to exhale the air through the mouth, then, switch to exhaling very slowly through the nose. Alternate many times until you can perform this switching easily. Afterwards, try and exhale through both the mouth and nose simultaneously – this is where the soft palate is at its passive/neutral position.

While doing these exercises you can feel the activation of the soft palate diverting air toward the chosen destination. Note: Keep in mind that during the Frenzel method, we will not be exhaling, but using the tongue/cheeks as the pressurisation method.



WSF Pro Tip: You can practice coordinating your soft palette by using an inflated balloon, your WSF Professional Instructor will show you the techniques.

Step 4. Pinch the nostrils closed.

Simply grasping the nostrils closed where air can normally be exhaled creates pressurisation – the pressurised air cannot escape. This pressurised environment within the sinus diverts the pressure to the Eustachian tube which creates the equalisation process.

Step 5. Pressurisation.

While performing the tongue block, air can now be pressurised by pushing the base of your tongue upwards (making the “K” sound). This should actuate the familiar clicking/full feeling within your ears of pressurisation.

Alternatively, you can use the cheeks as the pressurisation strategy. The cheek muscles can be very effective for moving air around within the mouth and diverting pressure up through the soft palate to achieve Frenzel equalisation.



Workshop: pretending that your mouth is full of water (using air), slowly spit the imaginary water forward and out of your mouth until empty – remember to not use your chest or stomach muscles but only the cheek muscles to empty the air. Once this is mastered, divert the air through the nose using the same strategy using the cheek muscles as a pressurisation method. It is very possible to use a combination of tongue and cheek movements to perform the Frenzel method effectively. Experiment and find what works best for you,



WSF Pro Tip: Practice Frenzel equalisation techniques after exhaling. This will stop you from using air in your otherwise full lungs to pressurise with. While seated on the floor comfortably, take a deep breath in then proceed to exhale all of your air. Then practice the above techniques. This tip will help you to use your tongue and cheeks as the main pressurisation method.

Your WSF freediving professional will run a Frenzel workshop explaining all techniques.

BREATHING FOR FREEDIVING

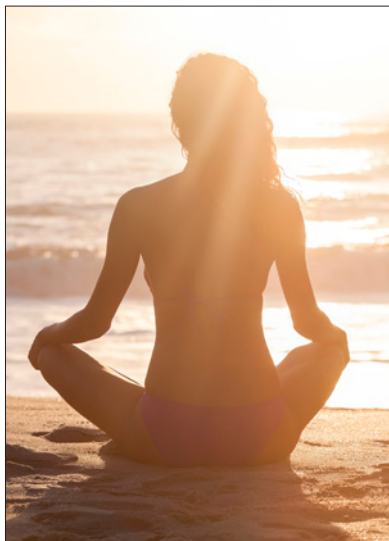
Objectives:

1. State 2 benefits of proper breathing
2. Demonstrate a proper breathe up for freediving

Value: By performing proper breathing for freediving, you will conserve oxygen through greater relaxation and enjoy freediving more and reduce risk of BO, Hypoxic Fit, and SWB which can be caused by improper breathing techniques.

Proper breathing for freediving is an important and valuable skill. The “breathe up” is great preparation for freediving where we take time to relax and calm our minds before we explore underwater. This passive approach to freediving affords us more time underwater and a more successful experience.

Let’s think of our breathing for freediving as relaxation breathing. In most modern sports, many people will use breathing to prepare themselves. Breathing helps people manage stress, achieve greater focus and calm the mind and body. Proper breathing will also maintain superior oxygenation of the body.



Our breathing for Freediving can be broken into 3 stages.

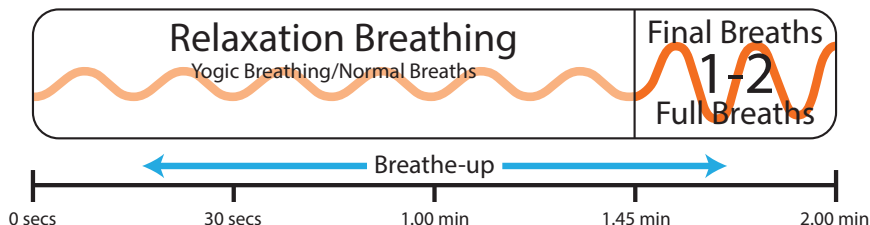
1. Relaxation breathing
2. Final breaths
3. Recovery breathing

Relaxation breathing: A good breathe up routine will be based on relaxation. In freediving, we use a technique first used in Yoga where we initiate the inhale phase by first filling the lower belly (diaphragm), afterwards filling the upper chest area.

The total inhale phase should be relaxed and quite passive. As an example, the inhale should take around 3-4 seconds (this can depend on your lung size/volume):

- 2 seconds for the lower belly.
- 2 seconds for the upper chest.

The exhale phase should be passive and longer than the inhale phase (for example, 6-8 seconds). We can control this exhale airflow by pursing the lips or pushing the tongue forward in the mouth, making an S sound. This longer exhale will maximise relaxation and lower heart rate. By doubling the exhale phase time, we help to avoid over breathing (hyperventilation).



Continue this style of breathing using your natural breathing rhythm. Try to avoid taking too large breaths; keep things passive and relaxed. A good time-frame for relaxation breathing is around 2 minutes.

Final breaths: These are the breaths we take right before we descend underwater. Final breaths are carried out with the same techniques as the relaxation breathing, with the exception that the final breath should be full (vital capacity [VC]). We recommend a maximum of 2 final breaths to make sure to avoid over breathing.



If you feel very good on your first final breath then you are ready to descend/dive. If, however, you feel you need another breath, complete the same passive exhale technique take another final breath, filling your belly and upper chest. Now you are ready to descend!

RECOVERY BREATHING O₂

After your freedive, you will surface. Upon surfacing, your body will be low on oxygen and high on CO₂. It is oxygen which is most important – we should recover these precious O₂ stores quickly and can achieve this by using recovery breathing techniques. Upon surfacing, focus on breathing in using full, quicker, deep inhalation breaths. Hold the air momentarily, then let the air out passively (without pushing). Take another recovery breath and repeat. Take at least 4 recovery breaths, or until you feel fully recovered.

Your WSF Professional Instructor Will guide you through a complete breathing session for freediving.

Hyperventilation: Over-breathing in freediving can reduce our freediving ability and put us at risk of BO/Hypoxic Fit/SWB. Hyperventilation has many ill effects for freedivers. Hyperventilating is exactly that, taking too many rapid breaths, or breathing up for far too long.

Disadvantages of hyperventilating:

1. Lowering our CO₂ by over-breathing, we decrease our DR
2. Raise the heart rate considerably and use excess oxygen
3. Cause vasoconstriction of the brain (dizziness) – this can cause blackout
4. Cause the Bohr Effect where the blood pH can become alkaline, thus creating a stronger bond for O₂ haemoglobin. This robs the tissues of the oxygen it needs and can cause BO/Hypoxic Fit/SWB.

As you can see, over-breathing can be detrimental to the freediver.



WSF Pro Tip: Remember that breathing for freediving is all about relaxation. A gentle breathe up should become part of your normal routine and will benefit your success in freediving. Avoid over-breathing/rapid breathing and aggressive, dangerous and unnecessary packing techniques as these will sacrifice your precious O₂ stores.

FREEDIVING TECHNIQUES

Objectives:

1. List 3 benefits of proper technique for freediving
2. List the 5 parts of the head first duck dive

Value: By performing proper techniques for freediving, you will conserve oxygen and afford yourself greater times underwater.

The duck dive/head first dive:

Descending from the water's surface can have its challenges. With proper technique, we can easily overcome our buoyancy and descend peacefully into the blue water below.

The duck dive is a big part of every freedivers skill set. By perfecting a streamlined duck dive, you conserve oxygen, maximise relaxation and set yourself up for a great underwater experience.



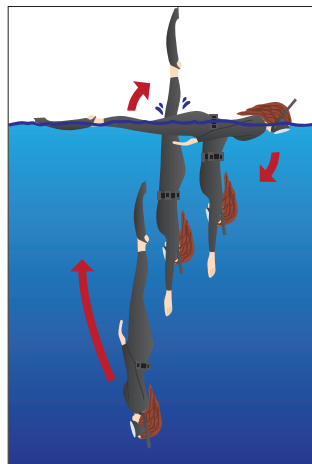


WSF Pro Tip: Whenever we are underwater, the snorkel should be kept out of the mouth. This stops the mouth from filling with water and becoming a risk of water inhalation. After your final breath, simply remove the snorkel from your mouth either by using your hand or calmly spitting the snorkel out.

It is recommended to pre-equalise the Eustachian tubes before descent as this provides a cushion of air that can help with equalisation as we perform the duck dive. A good head-first duck dive can send us to 3-4m depth with little effort, so the ears need to be ready for equalisation, and equalised regularly.

5 Steps to duck dive success:

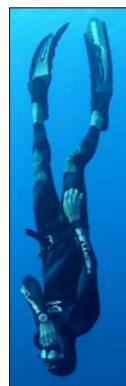
1. Surface momentum: 1-2 fin kicks will create a forward momentum on the surface, initiating your duck dive.
2. Point the arms downward at your intended trajectory.
3. Bend at the hips and match your body position to where your arm position was pointing.
4. Lift both legs together vertically as this will create a downward gravity effect and the weight of your legs will help you descend underwater.
5. Pull downward with your arms and start equalising and finning. Keep your non-equalising arm streamlined beside your body.



WSF Pro Tip: Remember just before the duck dive to pre-equalize your ears and once you have started your finning, you should equalise the ears and mask regularly.

Streamlining and body position: Correct streamlining will conserve precious oxygen. Having the right body position will keep your freediving optimally hydrodynamic which will reduce oxygen usage and give you more time underwater.

You can create less drag and improve hydrodynamics when using Bi-Fins by keeping your body streamlined, achieved by having the extremities kept in close to the body. You should have your equalising arm streamlined down the front of your body (as pictured), your non-equalising arm can be left relaxed beside your body and the head position kept relaxed and in line with your spine. Gliding through the water with minimal effort is the goal.





WSF Pro Tip: Your freediving equipment should also be very streamlined, with a form fitting wetsuit, low volume freediving mask and long bladed fins for ease of propulsion.

Finning:

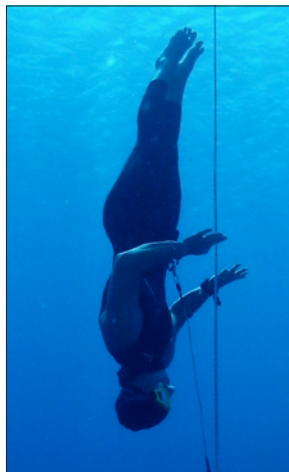
Using the bi-fins – Fin from the hips and keep the ankles straight but also slightly relaxed with your toes pointed. Finning should be relaxed but direct. When using the flutter kick correctly, you must have one fin forward kicking as the other fin is back kicking, creating an almost scissor effect. A perfect technique that creates greater thrust with less effort is optimum. When finning correctly from the hips, it is common to have your shoulders slightly roll from side to side as part of the finning action. All finning and propulsion techniques can be practiced in the pool sessions with your WSF Professional Instructor.

The Dolphin Kick can be used to great effect, especially if you are interested in using a monofin. The movement begins with an undulation from the shoulders that rolls down through the body before delivering its force to the fins/fin. Just like a dolphin's tail, the feet are kept together side by side. Your WSF Professional will guide you through techniques during your pool sessions.



No Fins:

Freediving – It is very easy to effectively move around and achieve great propulsion underwater without use of the fins. Having the skill to do this is paramount to your freediving success. Achieving greater propulsion with minimal effort using just the arms/legs has many benefits – these include moving from reefs underwater, to ascending in case of leg cramps (arms only). The arms have a big role in your freediving technique. Using an over-the-head starting point similar to the breast stroke swimming style, we grasp the water with open cupped palms, then pull downward, bringing the arms into position beside our body.



This momentum will allow us to glide for a short period, after which we start the leg kick phase (frog kick). We then continue to bring the arms back overhead using streamlining, and repeat this process. Your WSF professional Instructor will guide you through the freediving skills and techniques in the pool session.

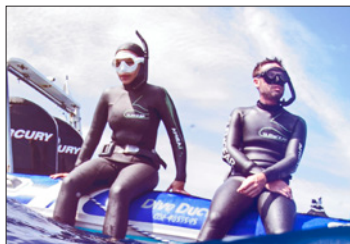
FREEDIVING BUDDY SYSTEM SFE

Objectives:

1. List 3 benefits of buddy system for freediving

Value: By performing proper buddy system techniques for freediving, you will be safer and maximise your own and your buddy's safety.

It is important that we freedive with a buddy to maximise safety and enjoyment. Freediving is far too much fun and adventure to experience alone – with a competent buddy, or buddies, by our side, we have little to worry about and can experience a greater amount of relaxation and safety.



There are many benefits to having a buddy:

1. They provide help in all phases of your freediving.
2. They provide physical support and make you feel safer.
3. They provide total safety during your freedives, both on the surface and at depth.
4. They allow more fun and enjoyment during sessions.



WSF Pro Tip: Ideally, your buddy should be at a similar or greater level of freediving than you. You and your buddy should use communication before and during your sessions, express your concerns and requirements before you get in the water, make a schedule together and discuss emergency plans and possible dangers prior to sessions. In the process of freediving and developing together, you will create a great buddy team where you respect and rely on each other, of which your freediving experiences will benefit.

While planning for freediving, it is a good idea to discuss certain environmental and freediving concerns such as:

1. Freediving depth
2. Location
3. Distance from shore
4. Wind, swell, tides, currents
5. Emergency plans

6. Length of session in water
7. Necessary equipment

Our freediving buddy can help us while we breathe up, help with equipment donning and removal, and provide our safety at both the surface and depth by monitoring lanyards, clips, time and depth, watching visually, and checking the physical movement of the freediving rope. We should ideally meet our buddy on ascent from at least a minimum depth of 10m (depth depending).

When meeting our buddy on ascent, it allows us to react within seconds should a shallow water blackout (SWB) occur.



WSF Pro Tip: During deeper freediving sessions it is a recommended to have a second safety diver/buddy as this maximises safety and enjoyment. You can never have too many freediving buddies.

How to perform safety for depth – As the buddy, you should know the freediver's intended depth/dive time. With this knowledge, there are three ways to monitor our buddy:

1. Visually – Watching them descend and ascend.
2. Using the rope – Feeling the rope for pulling which signals a possible turn, and/or feeling the free falling of the lanyard against the rope.
3. Timing – by timing the dive with a gauge, we can estimate the halfway point, when the turn may happen and when they will surface.

It is recommended that you use a safety lanyard in poor visibility, depths greater than 25m, or when the bottom structure depth is significantly greater than the bottom plate depth.

Armed with this knowledge, we can plan to meet them on ascent.

For example, you know your buddy will dive to 20m and will take 1:00min dive time. In bad visibility, you can watch your gauge and feel the rope as they duck dive (NOTE: a properly weighted freediver will generally take around 1m per second for descent and ascent; add 5-10 seconds for turns and duck dives). We can then calculate the halfway point and plan to dive at either the 20-25 second mark, or when we feel the turn on the rope. We will then find that we meet them at around 10m on ascent. If visibility is good, we can just watch them turn and visually meet them at around 10m. Keep in mind, however, that it is recommended to meet your buddy deeper the deeper they dive.



Within the pool, buddy DYN events by following your buddy on the surface watching for safety, and during static being beside your buddy and watching and using hand signals or a tapping system for safety. Your WSF Professional will guide you through safety sessions during your course.

Using the 'okay' sign to communicate with your buddy after surfacing is a great way to become used to the surface procedure for WSF competitions. Upon surfacing and after recovery breathing, you can remove your mask/facial equipment and give the 'okay' sign to signal that you are okay to your buddy.

A key point to freediving safety and success is to never freedive alone. Find yourself a buddy and/or group of buddies to maximise your safety and enjoyment. During your WSF freediving course is a great time to start forming possible lifelong freediving friendships with other participants. Ask your WSF freediving professional about social freediving trips and/or tours where you can meet other freedivers.

Armed with knowledge of streamlining techniques and buddy systems, we can visualise a freedive. From our relaxing breathe up, to the head first duck dive underwater. We streamline our bodies, maximising propulsion and minimising effort to create underwater movement. We can explore the sea in a relaxed, enjoyable way. Then, as our body uses oxygen, it will produce CO₂ which will initiate our urge to breathe. We surface in a relaxed manner and use recovery breathing, then give the 'okay' sign to our freediving buddy and watch them enjoy their time underwater. Freediving is a great year-round activity.



PROPER BUOYANCY FOR DEPTH FREEDIVING O₂

Objectives:

1. List the 3 stages of buoyancy in freediving
2. List 2 benefits of proper buoyancy for freediving

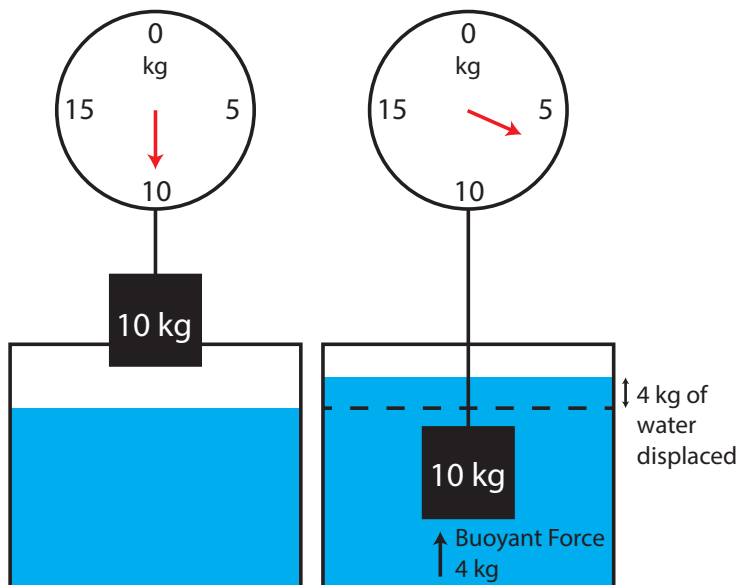
Value: By being correctly weighted, you will maximise your time underwater and be able to breathe up with total relaxation, saving precious oxygen on ascent.



WSF Pro Tip - Different people will have different natural buoyancy, the amount of body fat and the natural bone density of a person can influence this factor to either be positively buoyant or negative.

How much weight/ballast we use as freedivers will determine our buoyancy. As we freedive through our careers, we will naturally start to freedive deeper. Our buoyancy will change proportionally with depth – as we go deeper, the less weight we use to offset the upward buoyant force. The one consistency is that we will always be weighted to be positively buoyant on the surface; that is, when we are breathing up we have positive buoyancy so as not to sink while breathing. Archimedes' Principal: An object partially or fully immersed in a fluid will be buoyed up by the force equal to the weight of the fluid displaced by the object. In this case, the object is the freediver.

Archimedes discovered there was a buoyant force acting within fluids. You can experience this yourself very easily the next time you jump in the water: when underwater, do some flips and twists and push yourself off the bottom using only your finger strength. Notice how easy it is to move your whole body weight around?



Now try the same out the water and feel how much more difficult or impossible it is. This in-water marvel is due to the buoyant force that is pushing you upward, directly proportional to the water displaced by your body. We already know that pressure increases with depth so when an object is submersed, the pressure is greater on the bottom of the object than it is on the top. The volume amount of water you displace is equal to the buoyant force acting on you within the fluid.

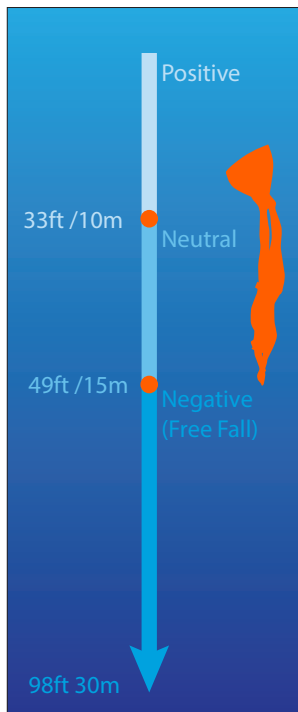
Keep in mind the buoyant force is equal to the weight of this displaced fluid, NOT the weight of the freediver.

The human body is made up of many different tissues: some float and others sink. Any airspace will add positive buoyancy. Fat adds buoyancy, soft tissues are mostly water so neither float nor sink, and bones have varying density but commonly sink.

A freediver's body acts similar to that of a balloon in relation to buoyancy. Our volume will decrease as we descend due to Boyle's Law (our lungs and exposure suit compress), creating a lesser volume of displacement as we descend. This means that we can achieve the three phases of buoyancy during one freedive. We go from positive to neutral to negative, and then on ascent the reverse occurs (we go from negative to neutral to positive).

- Positive - if the weight of the freediver is less than the buoyant force (the weight of the displaced fluid) then the freediver will float.
- Neutral - if the weight of the submerged freediver is equal to the buoyant force (the weight of the displaced fluid), then the Freediver will neither sink nor float.
- Negative - if the weight of the Freediver is greater than the buoyant force (the weight of the displaced fluid), then the Freediver will sink.

Let's visualise a dive: as the freediver takes the final breath, the lungs are fully inflated and the freediver is at their most buoyant on the surface. The freediver now uses the head first duck dive and finning techniques to overcome the upward buoyant force and starts to descend. On descent, the lungs and suit of the freediver compress and the freediver ultimately takes up less volume. As a result, the weight of the displaced fluid now matches the buoyant force and the freediver achieves neutral buoyancy. As the freediver descends further, the volume they displace lessens in proportion to the increasing pressure. Eventually, the freediver's weight is greater than that of the buoyant force so they become negatively buoyant and sink (free fall). It is this free fall that will save huge amounts of oxygen during our freedive. By remaining still and relaxed while we free fall, we use minimal energy/oxygen, thus conserving our precious stores of O₂.



Maintaining perfect buoyancy is an integral part of freediving success.

When pool freediving we will weight ourselves to be perfectly neutrally buoyant when we take our final breath, we will neither sink nor float.

The freediver should weight themselves according to the planned depth, so it is a great idea to keep a log book of your dives with data on your style of suit, amount of weight, depths, salt vs. fresh water, etc.

Another interesting fact is that salt water weighs more than fresh water. Most of our salty seas and oceans contain around 3% salt, making it far denser than fresh water. What does this mean to a Freediver?

- Salt water weighs more than fresh water
- Salt water exerts a greater upward buoyant force on a submerged freediver
- A freediver will be more buoyant in salt water



WSF Pro Tip: Keep your weighting/buoyancy in your log book updated if you frequently change between fresh and salt water freediving locations (the same applies to warm and cold water locations) as you will need to compensate for the differences in the thicker or thinner exposure suits.

We know we should always be positively buoyant on the surface, so we aim to set weighting to match our neutral buoyancy between a minimum of 10m and a maximum of 25m (depth dependant). If we are over-weighted, the ascent will be very difficult and waste precious oxygen stores. If we are under weighted the descent will be very difficult and waste precious oxygen stores. As you can see, it is a delicate balance to find the correct weighting match for the conditions. Your WSF Professional Instructor will advise you on correct weighting and perfect it during your practical training.



ADVENTURE FREEDIVING & COMPETITION

FREEDIVING **SFE**

Objectives:

1. List 2 adventure freediving activities.
2. List 3 pool and 3 depth competition events.
3. State the main difference between adventure freediving and competition freediving activities.
4. List 2 safety factors for an adventure freediving activity.

Value: Having a good understanding of all the different activities available when freediving can maximise your fun, enjoyment and safety.

There are many great ways to utilise your amazing freediving skills. The oceans, seas, rivers, lakes and springs of the world all contain adventure and discovery. As a freediver, you need only your freediving equipment and your buddy/buddies to participate in the excitement.

Adventure freediving is the activity of freediving to explore and discover. The waterways of the world are filled with an array of underwater playgrounds – containing coral reefs, ship wrecks, drop offs, dolphins, manta rays, whale sharks and thousands of beautiful schooling fish just to name a few. From the shallow reef fringes to the deep wall drop offs and beyond, there are literally thousands of miles of coastlines just waiting for adventure volunteers.

When we are freediving for adventure, there are some key points to keep in mind. We need to take more care in the planning of our freediving sessions as, sometimes when exploring a reef or a wall or wreck, we may not have a freediving rope to guide us.



We therefore need to be mindful of depths, dive times, currents and visibility. Keep in mind that it is always better to have a guide rope when possible as this gives a direct reference of where to descend and where to ascend, making it much safer for the buddy system. However, in many cases of adventure freediving, it is simply not practical to have a guide rope. During this time we must take more care and be conservative with the depth/time and environmental conditions.



Even if we cannot use a guide rope, we must still use a surface maker/freediving buoy with the appropriate diver down flag. This enables other water craft users on the surface to see us, such as boats. It is also a great place to breathe up, surface onto and use for support.

Do not venture into wrecks, caverns or caves upon discovery. Stay within the entrance area and treat them with respect. These areas have overhead environments and are prone to silting up if you disturb the water inside, which can cause a silt out. This impairs vision so you may be unable to see the exit and could potentially become trapped if unaware.

It is much safer to adventure freedive in excellent visibility as the buddy can watch the entire descent and ascent from the surface with ease. When visibility is too low (under 10m), it becomes more difficult for the buddy system to operate perfectly. Without good visibility or a guide rope, it is difficult for the buddy to predict where the freediver will surface, or when to safety dive for them when meeting on ascent.

When adventure freediving in these conditions, the freediver can improve safety by being conservative with depths and dive times. You can maximise safety for these sessions by using some common sense and conservative measures. For instance, when starting the ascent to surface, it is possible to look up and try to find the silhouette of your buddy on the surface. This makes it possible for the freediver to surface under or very near their buddy, making it safer for everyone. Keep these extra safety tips in mind when adventure freediving in such conditions.

Some key safety factors for adventure freediving:

- Always have a surface buoy/marker and diver down flag.
- Use a guide rope when possible (otherwise be conservative).
- In low visibility, be conservative with depths and times.
- In low visibility without a guide rope, surface under or near buddy.
- Do not venture into caverns, caves or wrecks (remain at entrance area only).

Competition Freediving

World Series Freediving have competition events available for everyone – whether you wish to compete with your friends, challenge yourself, or set national and world records.

Competition freediving involves far more controlled conditions than adventure freediving with its own dedicated guide ropes, bottom plates, lanyards, safety divers, judges, warm up and competition areas, and many people who watch and monitor your dives, including spectators on the surface and in the water.

Entering a freediving competition is made as easy as possible for you, the competitor. The WSF competition organiser, judges and safety freedivers do all the work, so all you have to do is get yourself prepared with appropriate training, then join in and have fun!

You can take part in a WSF 'Competition Freediver Course' or an 'International Judges Course' and become an international WSF freediver or judge (so you also have the option to judge at WSF freediving competitions). Talk to your WSF Professional Instructor about joining the next judge or competition freediver specialty course.

There are 8 WSF competition Events:

- 4 Pool Events
- 4 Depth Events

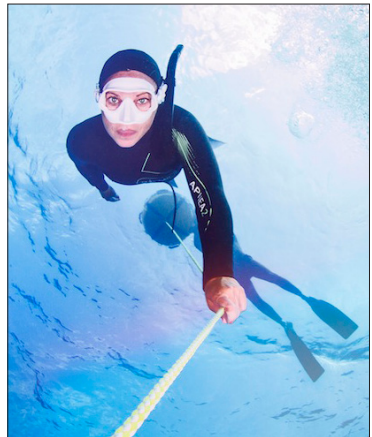


Pool Events

1. Static apnea - Performing a breath-hold/apnea for a measure of time while face down/airways underwater, floating in confined water.
2. Monofin DYN - Breath-holding while swimming an underwater distance, using a monofin as propulsion.
3. Bi-Fin DYN - Breath-holding while swimming an underwater distance, using bi-fins as propulsion.
4. No-Fins DYN - Breath-holding while swimming an underwater distance, using only the arms and legs as propulsion (unassisted by pulling or fins).

Depth Events

1. Monofin - Achieving depth with propulsion from a monofin while maintaining constant weight/ballast.
2. Bi-Fin - Achieving depth with propulsion from bi-fins while maintaining constant weight/ballast
3. No Fins - Achieving depth with propulsion from the arms and legs only (unassisted by any fins) while maintaining constant weight/ballast.
4. Free immersion FIM - Achieving depth with propulsion from pulling on the rope without use of any fins, while maintaining constant weight/ballast.



NOTE: All depth events are constant weight (the same weight used on descent is carried on ascent at all times during the dive).

During freediving competitions, you will be expected to announce your desired performance before completing it. Knowledge of the times, distances and depths gives the judges and safety divers information to ensure maximum safety for all competitors.

During pool events, it is possible to exceed your announcement. You must announce a minimum time/distance and then match or exceed it, otherwise you will attract penalty points. For example, if you announce 2:00 min static apnea and only achieve 1:45 mins, you will receive a penalty. Announce conservatively, but close to your desired performance, so as not to put great pressure on yourself. Keep in mind that the time or distance you nominate may play a role in your position in the line-up. In some competitions you may be first to participate on competition day if you have announced the smallest time or distance.

During depth events, your announcement must be exact. You will announce your desired depth based on your respective experience and will then have to match it during the event. If you fall short you will attract a penalty. The competition judge will set the bottom plate at your announced depth where you will be expected to collect a tag and bring it with you back to the surface.

To maximise your safety, enjoyment and success you should announce honestly and conservatively. If you announce beyond your personal bests during competition you place unnecessary pressure on yourself. On top of nerves and spectators and judges, you will have to deal with your own expectations, and if it is beyond your skill set you may find failure, or worse, run into injury. Be conservative and always announce lower than you have achieved in training.



During all WSF events, you will be assigned your very own trained WSF competition safety freedivers. They will follow you during all DYN events, watch over you during static, and meet you on ascent during all depth events. You can take the WSF Safety Freediver Specialty Course. Freediving safety is a very important part of the WSF competitions and the subsequent specialty course is a rewarding experience.

TRAINING FOR FREEDIVING O₂

Objectives:

1. Describe a CO₂ training table
2. List the key safety point for training in pools for freediving

Value: By gaining knowledge of training techniques, you can maximise your DR. Pool training also gives you the opportunity to freedive regardless of the weather outside.

In combination with basic fitness, streamlining and flexibility. The best training for freediving is freediving! There are, however, other great methods and techniques of training our DR to be strong and quick. This will maximise our freediving potential. The human body will make the necessary adaptations to operate on low oxygen and higher CO₂ and, with regular training sessions, the DR will become very strong.

One of the best methods to train the DR and the reaction of the freediver's body to CO₂/urge to breathe, is to utilise the CO₂.

By training using the CO2 table in both DYN/static events, we notice great results in as little as a few sessions.

Pool training sessions are usually conducted within the pool or confined water. They can be great social events as you have fun and meet other like-minded people. The more training you do, the more freediving buddies you will meet and the stronger and quicker your DR will kick in.

The higher the CO2 the larger the urge to breathe becomes. This will dictate the level of difficulty for the freediver, based on their individual reaction to that urge to breathe.

The more you train, the more you learn to understand how your body is reacting to the urge to breathe. You will find that as you learn to work with the signals your body is giving you while freediving, tasks that were once difficult become much easier.

The key safety point for pool training is “Never Freedive Alone”. Although a pool is shallow and very controlled, you must always have a freediving buddy watching your entire dive, including surfacing and surface procedure.

Surface procedure

After surfacing, the freediver should recovery breathe, then remove any facial equipment/mask and give the ‘okay’ signal to establish they are in fact okay.



WSF Pro Tip: The safety diver should continue to monitor the freediver for at least 30 seconds after surfacing.

A great example of a freediving CO2 Table for DYN and static is pictured below.

(Within a CO2 table, the time and distance remains the same; it is the breathe up in between that is lowered in stages. This style of training levels the freediver with smaller recovered periods, thus remaining higher CO2 and ultimately more urge to breathe during the training cycle)

CO2 tables should be difficult but achievable sessions.

The DYN CO2 table is a great anaerobic workout and will develop higher CO2 resistance. Combined with contractions of the diaphragm, urge to breathe and lactic acid build up within the tissues, the body will react by triggering a strong DR which will lower the heart rate. The body will make the necessary physical adaptations to deal with these conditions and, eventually, you will possess greater freediving skills.

CO2 Table DYN (Bi-Fins/ MonoFin)	
50m	1.30 min breathe
50m	1.15 breathe
50m	1.00 breathe
50m	0.45 breathe
50m	0.30 breathe
50m	0.15 breathe
50m	0.10 breathe



WSF Pro Tip: If the table is too difficult, make it more achievable by simply adjusting the distance or breathe up time. In the same respect, if the table is not difficult enough, then make it more difficult by simply adjusting the distance or breathe up time to be more strenuous.

CO2 Table - Static Apnea	
2.30 mins	2.00 min breathe
2.30 mins	1.30 min breathe
2.30 mins	1.15 min breathe
2.30 mins	1.00 min breathe
2.30 mins	0.45 min breathe
2.30 mins	0.30 min breathe
2.30 mins	0.10 min breathe



WSF Pro Tip: If the table is too difficult, make it more achievable by simply adjusting the distance or breathe up time. In the same respect, if the table is not difficult enough, then make it more difficult by simply adjusting the distance or breathe up time to be more strenuous.

Complete your training table at least twice and give yourself a break of at least 15 mins between tables.

Remember the pool training sessions are a great time to focus on your streamlining and propulsion techniques. These sessions also provide a great opportunity to become familiar with any new equipment before taking it into open water. Enjoy your training sessions regularly and always freedive with a buddy.

Ask your WSF Freediving Professional Instructor about the Pool Freediving Specialty Training Course available within WSF.

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