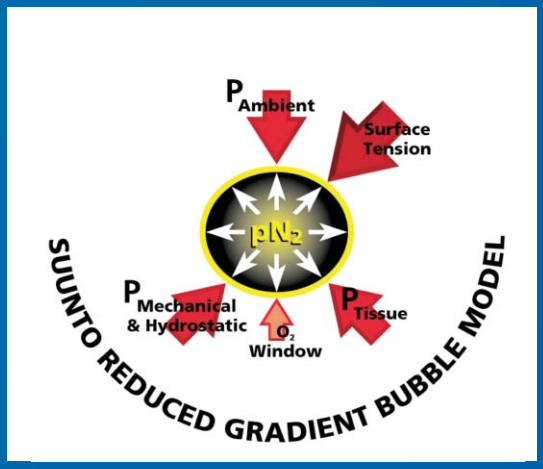
The best cure for Microbu

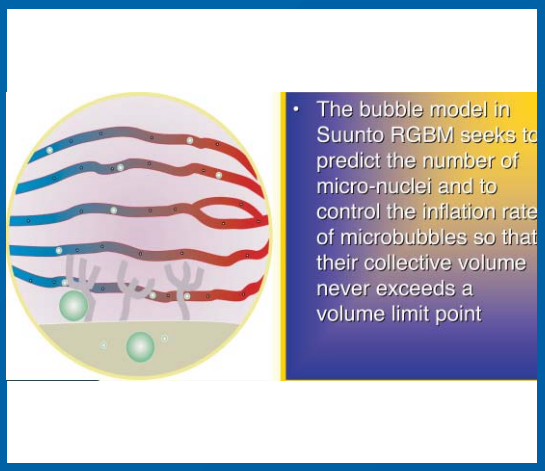


WHY TRADE YOUR DIVE COMPUTER?

Every year or so computer chips halve in size and double in power. Battery technology too is surging ahead to keep pace with the needs of computer development.

One company, Suunto, recognised that these changes made available the power to incorporate the latest research in decompression theory in a dive computer, which led to the development of the most advanced dive computers in the world today.

Updating to a new Suunto dive computer can make your diving safer, extend your bottom time, save you money (due to improved battery technology) and more convenient (due to reduced size). You can even make a fashion statement with one of Suunto's advanced computer watches.



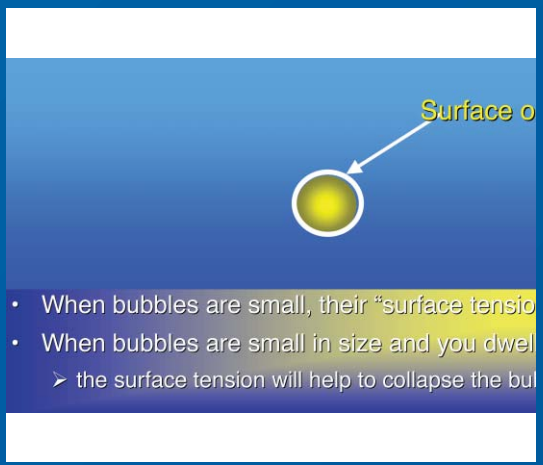
SAFETY FIRST

While there are many reasons to trade up to a Suunto computer, there is none more important than safety.

The most important difference from one dive computer to the next is its decompression algorithm. It is also the most difficult feature to explain and most costly to develop. As a result more obvious but less important benefits are often used as the key selling feature, which leads many manufacturers to place less emphasis on this critical safety factor.

Most divers are lucky enough to never have a problem with decompression illness, however each year thousands of divers throughout the world do. More importantly research over the last decade has shown that long term damage to soft tissue (the brain, spinal tissues and the retina) are far less likely if you use a dive computer incorporating the latest research on prevention of micro bubble build up. Divers who dive very regularly, like instructors and professional divers are most susceptible to the long term affects of micro bubbles, but any diver that does multi day diving, for example on a vacation, will be affected by micro bubble build up.

Therefore, understanding what the Suunto Reduced Gradient Bubble Model (RGBM) can do to make your diving safer is critical to most divers.

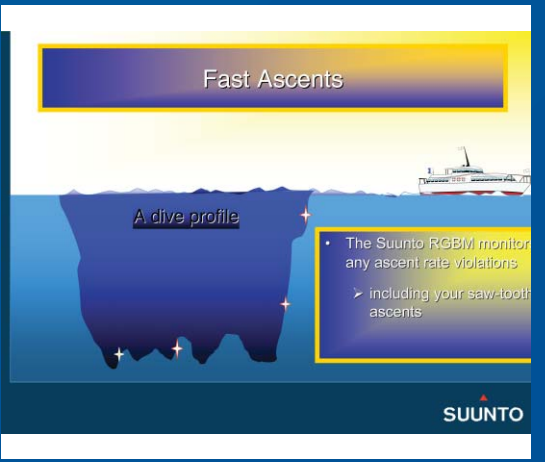


The Suunto RGBM is a modern algorithm for predicting both dissolved and free gas in the tissues of divers performing a wide variety of maneuvers. It was developed in co-operation with SUUNTO and Bruce R Wienke (BS, MS and PhD) and is based both on laboratory experiments using highly advanced Doppler Bubble detection devises and is supported by Divers Alert Network's (DAN) dive data, folding both in coupled synthesis for safety.

ubbles is prevention

The Suunto RGBM is a significant advance on the classical Haldane models, which do not predict free gas (micro bubbles). It incorporates consistency with real physical laws for gas kinetics. The Suunto RGBM can address a number of circumstances outside the range of just dissolved gas models by :

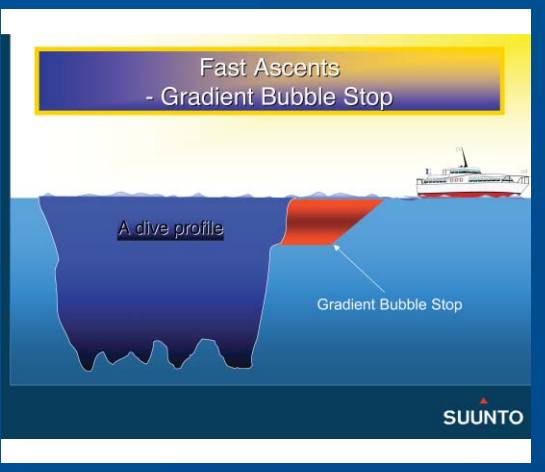
* Monitoring continuous multiday diving
* Computing closely spaced repetitive diving
* Accounting for diving deeper than previous dive
* Regulating rapid ascents with high degrees of Doppler bubble formation



Is Suunto the only company to have the RGBM feature?

Yes. Only one competitor claims publicly to even understand micro bubble theory. Suunto is the only company to use a Reduced Gradient Bubble Model. Suunto were the first company to take into consideration the affects of micro bubbles on decompression illness and understand the pitfalls of other models, which try to deal with this issue.

The Suunto RGBM is a far more advanced program because rather than being an "add on" to a Haldane model Suunto integrate the latest research on micro bubble formation with a Hadanean model into a fully automated algorithm. The Suunto RGBM actually models how and when micro bubbles arise (dependent on factors relating to depth, repetitive diving, and multi day factors) and adjusts the decompression model in real time according to these factors.



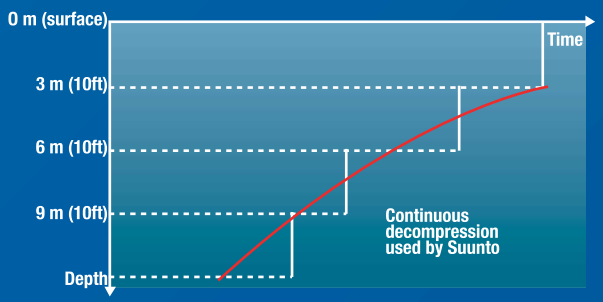
In other words Suunto is inherently protective because it uses a highly sophisticated algorithm to minimise the build up of micro bubbles automatically before they occur rather than try to suppress the bubbles through complex stops after they have occurred. Suunto automatically calculates the safest dive profile based on actual dive data rather than relying on the diver to make a complex choice without any guidance on how the level of protection should be selected.

CONCLUSION

Technology, which can reduce the risk of decompression sickness and possible long-term damage to soft tissue such as the brain, spinal cord or retina, is the very first feature to consider when buying a dive computer. Even though excess micro bubble formation is universally recognised a key safety issue, only two companies even promote micro bubble technology as a feature in their computer. Only Suunto use the highly sophisticated fully automatic RGBM algorithm which makes Suunto the logical choice for all divers . Suunto Vytec, Stinger, Cobra, Vyper and Mosquito all feature RGBM technology.

SUUNTO

CONTINUOUS DECOMPRESSION



More gradual and closer to the elimination partern chosen as the computer's working assumptions, this form of decompression is called continuous decompression. Combined with a well controlled ascent rate, it is one of the most natural decompression methods available. Since 1987, suunto has offered divers the choice between "knotted line" and "microprocessoe driven" decompression.

From the knotted line to the microprocessor

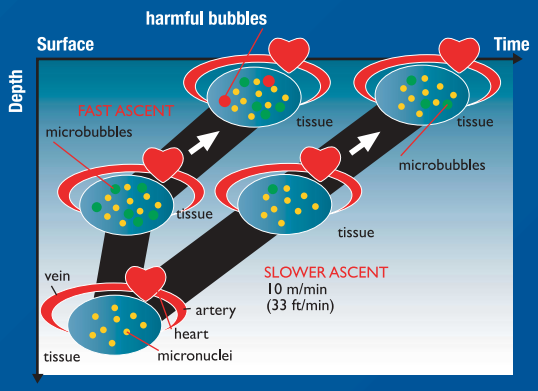
When Haldane developed the first decompression tables, he invented compulsory stops which he arbitrarily placed every ten feet (or three meters). At the time, the most practical way for divers to measure decompression stop depth was to tie a knot in a line every ten feet. Suunto full decompression dive computers also offer another alternative: continuous decompression.

Based on high performance microprocessors and advanced software, all Suunto full decompression dive computers are able to display, in real time, the calculated depth at which optimum decompression can take place. In addition, many Suunto computer models display the lower limit at which all compartments start desaturating - the decompression floor - and the upper limit - the decompression ceiling. These two limits determine the decompression range. Suunto is the only manufacturer to display these parameters.

Since the calculation is updated at very short intervals and the dive computer displays a new optimum depth as soon as conditions allow, the diver is guided to the surface in a succession of more numerous but shorter "mini-steps". This set of ideal decompression depths tends towards an exponential curve, which represents the function governing tissue nitrogen absorption and elimination.

Naturally Suunto dive computers allow also for decompression stops using ordinary ceiling depths.

ASCENT RATE

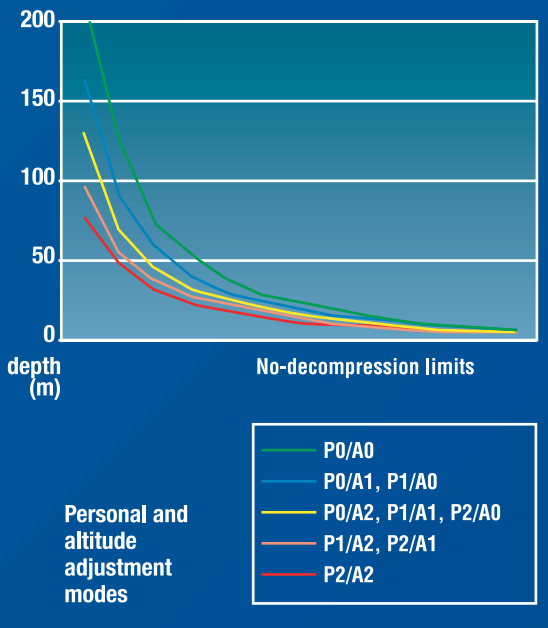


Fixed ascent rate approach

One might wonder why Suunto, having originated so many dive computer innovations, is applying the principle of a single ascent rate of 10 meters/minute. When it comes to safety, ascent rates should not be underrated. End-of-dive nitrogen elimination is no simple phenomenon and there are still many dark areas, even for the specialists. Regarding nitrogen elimination, however, one thing certain from our present state of knowledge is that a slower ascent rate also at greater depths is less dangerous. Secondly, it is easier to learn to achieve the fixed ascent rate compared to the continuously variable one. Also most of the military tables are now applying the fixed 10m/min (33 ft/min) ascent.

A fast ascent rate provides more chances of allowing micro-nuclei to grow and turn into actual bubbles. Once initiated, bubbles expand with ascent according to Boyle's law. When they reach a certain size, they can become trapped in various parts of the body and induce physiological disorders that have serious and sometimes life threatening consequences. If this stage of the process is reached, decompression sickness is imminent and will not be reversed by a few extra minutes of decompression. If a slower ascent rate is chosen, there is both a greater chance of eliminating micro-nuclei through normal exchange in the lungs and less chance of their reaching a damaging size.

ADDITIONAL SAFETY ADJUSTMENT



MANY OF THE PRECEDING FACTORS MAY NOT HAVE BEEN CONSIDERED IF YOU PURCHASED A COMPUTER SOME TIME AGO. MOST MAUFACTUERS DON"T EVEN CONSIDER THEM TODAY. SO IF YOU VALUE SAFE DIVING THERE HAS NEVER BEEN A BETTER TIME TO TRADE UP TO A SUUNTO DIVE COMPUTER.

Choosing your own safety level

There are certain decompression factors that are far safer performed by the computer automatically. Like the prediction of micro bubble formation based on the following dive variables:

- Monitoring continuous multiday diving
- Computing closely spaced repetitive diving
- Accounting for diving deeper than previous dive
- Regulating rapid ascents with high degrees of Doppler bubble formation

Equally there are factors dive computers do not have the information on which to base a logical calculation. For example it is impossible for a dive computer to calculate body core temperature without sticking a probe into the diver (which I am sure they would not appreciate). The computer can tell how cold it is, but cannot tell whether the diver is wearing a short suit or dry suit- so this evaluation is far better left to the diver.

While a dive computer can predict air consumption, it is the pressure of air that dictates absorption levels into the blood stream, not the rate at which air is exchanged in the lungs. While exertion is a factor, breathing rate can be affected by a number of things so to include this in the decompression algorithm would make no sense. Again this a decision best left to the diver.

In fact some decisions can only be made by the diver themselves. Which is why Suunto incorporates a unique personal adjustment in all their computers for the diver to choose based on the following:

- If the diver feels cold
- If the diver is below average fitness
- If the diver is fatigued
- If the diver is dehydrated
- If the diver is under stress
- If the diver is overweight
- If the diver has a known history or susceptibility to DCI

The diver can assess these factors and make a logical choice of one of three personal adjustment levels based on a simple guide in the computer manual to make their dive computer as conservative as their personal circumstance indicates.

SUUNTO