AQUANEWS

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Is Your Gear Safe with Nitrox…..Revisited

at what oxygen content is ignition possible?

While Nitrox rapidly continues to gain popularity in the U.S. and abroad, there's a simmering debate within the industry about the maintenance of Nitrox compressors and scuba equipment. The problem is that at some increased level of oxygen in Nitrox, standard compressors and regulators can become flammable. So, the industry requires an "oxygen clean protocol," which specifies components and lubricants that are not flammable and are therefore safe. Yet, some experts believe that the oxygen level currently recommended or cleaning may be too liberal to be safe.

Traditional American compressors and scuba gear are set up for compressed air, which contains tiny amounts of condensed hydrocarbons. The slurry visible in the condensation traps of standard oil lubricated compressors shows how much oil exists in the compression chambers and thus the output. Only proper filtration removes this oil from the breathing gas. The Compressed Gas Association, a trade organization that develops standards for compressed gas practices, has a safe standard for scuba air (called "Grade-E"): no more than five milligrams of hydrocarbons per cubic meter. A greater percentage of oxygen increases the risk of oxidation in compressors, scuba tanks and regulators. Oxidation can result in fires or even explosions. Rapid pressurization, such as when a tank is being filled or when a cylinder valve rapidly pressurizes a regulator's first stage, heats the gas. As a result, fires have occurred in fill stations and scuba gear.

Bill High, president of Professional Scuba Inspectors, recounted the case of a San Diego diver whose titanium Atomic regulator caught fire while he was breathing a decompression mix of 78.4 percent oxygen on the beach.

Charlie Johnson, vice president of American Nitrox Divers International (ANDI), said the fire melted the diver's wet suit to his body, burning him badly enough to require plastic surgery. Johnson says that Atomic recommends that the titanium regulator in question only be used with mixes of 40 percent oxygen or less. Elliott Forsyth, technical consultant for Oxygen Safety Consultants, Inc. notes that "Construction materials need to be compatible from a flammability standpoint," he states, "and the regulator needs to be tolerant of potential ignition mechanisms." Cleaning alone is not enough. While oxygen makes up 21 percent of the air we breathe, the most common Enriched Air Nitrox (EAN) mixes have 32 percent oxygen (EAN/32) and 36 percent oxygen (EAN/36). Some tech divers use mixes containing 50 percent oxygen. Decompression cylinders such as the one in the San Diego tragedy often contain far higher percentages. Bill High notes that some gas mixing processes introduce 100 percent oxygen into the cylinder, then adding the remaining gas to create the desired percentage. Despite the risk, the benefits of Nitrox (longer bottom times, less deco time, decreased narcosis, and, some divers report, warmer and less tiring dives) have created a spiraling consumer demand that has industry scrambling to adopt standards to allow dive shops and divers to use Nitrox without causing everyone to

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AquaNews

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SALT vs FRESH WATER WEIGHT ADJUSTMENT
By Lada Simek

OK- you did your pool training and now it is time for the ocean. Your instructor probably told you to add a few pounds to your weight belt, but I bet he was not specific. One hears of "10% of your weight plus five", but that is not acceptable to me. I want the EXACT number! In this article I will show you how to get it.

First of all even being two pounds overweighed means that two pints of air must be added to your BC to offset it. That is one quart, folks. And all this does nothing for you except create drag and cause major buoyancy changes with depth. In my opinion, perfect weight belt is the minimum that allows you to hover at 15 feet with a nearly empty tank.

Situation: You weigh 180 lbs and need a 20 lb belt in a pool. How much should you need in salt water?

First some facts. A cubic foot of fresh water weighs 62.4 lbs
A cubic foot of salt water weighs 64.0 lbs

Density is weight divided by volume. Or,
The volume is your total weight divided by the density.

First we will calculate your volume. Since you are neutral with a 20 pound weigh belt, your volume in cubic feet must be 180 + 20 divided by 62.4 or 3.2 cubic feet. That volume will be the same in salt water, which has a density of 64 lbs per cubic foot.

Using the same relationship above, the total weight is your volume multiplied by the density, or, 3.2 x 64.0 which equals 205 lbs.

That is your total weight. Since you weigh 180, obviously you need a 25 pound belt in sea water.

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Rockland Aquanauts Organization Inc.
Mission Statement:

To provide, promote, and advance environmental protection, care, and voluntary clean-up of waterways by any and all lawful means; to promote the importance and care in every manner possible by environmental awareness and otherwise; to purchase, print, publish, and circulate literature to promote the importance and care of the waterways and the work of the Corporation. To perform all acts the Corporation may deem appropriate or advisable in such operation; to establish, provide, and voluntary clean-up waterways, to encourage, support and subsidize the cleaning and protection from pollution.

Nitrox

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retool completely. It has become necessary for Nitrox divers and stations to use Nitrox-compatible materials (that is material with a higher heat tolerance), including o-rings and lubricants. But the next step is to define the level at which Nitrox requires special cleaning of equipment to remove flammable lubricants and thus reduce the danger of hydrocarbon combustion in oxygen-rich environments. To Nitrox clean a regulator, it must be fully disassembled, and the o-rings and filter must be replaced with Nitrox compatible parts. A degreasing solution such as Blue Gold is used to remove old grease and hydrocarbons, and Nitrox compatible grease is applied. The entire process should add about $15 to the cost of a standard annual regulator service. Two factions with divergent opinions have debated the question. ANDI, a Nitrox training agency, proposed that the scuba industry follow Compressed Gas Association guidelines: scuba gear and compressors using EAN with greater than 23.5 percent oxygen should require special treatment. One source of contamination would be simply the CGA Grade-E Air, the industry standard for normal scuba air; the allowable condensed hydrocarbon content is too high. Such a standard, however, would require any diver who planned to switch between Nitrox and compressed air to maintain separate scuba systems for each. That's too much to ask your average recreational diver to swallow. Most other agencies that certify fill stations and technicians lined up behind a cleaning threshold of 40 percent oxygen, meaning that systems using compressed air or EAN up to 4 percent did not need to be especially oxygen-clean. That would allow recreational divers using the common Nitrox mixes to use air, as well, with Nitrox-compatible regulators.

The Divers Alert Network held a workshop in to resolve this debate, engaging most training agencies, several manufacturers and outside experts. DAN published a document saying the consensus was that 40 percent oxygen was an acceptable non-cleaning threshold. Charlie Johnson says that the paper, which was not a transcription of the proceedings, left out many contrary arguments. He told *Undercurrent* that "Some experts outside the scuba industry say the 40 percent threshold is laughable. Some say it's criminally negligent. None say it's appropriate." Nevertheless, it seems to be the de facto industry standard. Apparently everyone at the DAN workshop agreed on one conclusion: Manufacturers' recommendations for product use must be followed. That puts the responsibility on the manufacturers to test their equipment and to know what environments it can tolerate. It also offers the rest of the industry some protection, because manufacturer's recommendations are used to protect equipment makers, such as Atomic, from liability when their products are misused, as in the San Diego regulator fire. You can bet those recommendations are conservative, or some lawyer isn't earning his retainer. Even ANDI has dropped its crusade to lower the threshold. "We were taking too many arrows in the back," says Johnson. Instead, ANDI, like the rest of the industry, advises trainees to follow those good old manufacturers' recommendations. So before your next Nitrox fill, check the product literature about your tank and regulator and make sure you don't exceed the recommendations. Some equipment is rated for use with air only. Others will state that the equipment as sold (without further modification) should only be used with certain levels of oxygen. And be sure the shop you buy your gear from knows what they're doing. Mistakes do happen. One Florida shop owner who prefers to remain nameless tells us that last summer she spotted Scubalux Nitrox aluminum tanks being lubricated with silicon grease before being fitted with valves in a local plant. Since silicon has a low flammability point at high pressures, it is not Nitrox compatible, so it's no wonder and probably a good thing that the plant has since been closed. Finally, if your equipment is a few years old, chances are it's not Nitrox compatible, meaning it has o-rings and lubricants with low flash points. Some regulator casings, such as those made of titanium, may not be Nitrox compatible. If you're planning to use Nitrox regularly (such as on a live-aboard trip), and you want to play it safe, take your regulator to a shop with a certified Nitrox technician and get it tuned and cleaned for Nitrox. Then be sure not to use it with air again until you're through diving Nitrox. This advice goes double for anyone planning to use Nitrox with more than 40 percent oxygen.

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What You'll Pay on Your Next Dive Trip

the latest on trip pricing and "hidden" fees

from the January, 2009 issue of ***Undercurrent***

More so than ever before, divers are scrutinizing every cost associated with dive travel. With their income and portfolios down, some are planning to dive closer to home or not at all. Those who are planning trips are not about to spend money foolishly. Today is much different from a year, even six months, ago. While you have less money in your pocket, the dollar's value is on the rise, oil prices are heading downward and the election has gained America more respect abroad - - one may not necessarily feel like the "ugly American" anymore.

Regardless, we divers are not about to cotton to unnecessary charges and hidden fees, especially when they can add up to 30 percent of the total bill. To avoid these, pay careful attention to dive trip costs - - and ask the right questions about them - - before you reach for your checkbook. In the April 2007 issue of *Undercurrent*, we covered several hidden costs of travel; that article is available online to all subscribers (go to www.undercurrent.org and click on "Back Issues.") Here are some financial aspects to consider as you plan your next trip.

Trip Prices

An impressive rise in the value of the U.S. dollar is making it more affordable for American divers to travel abroad. For example, bookings on Red Sea liveaboards that charge in Euros will be nearly 20 percent less than if you booked last year. Divers can also get more for their money in Mexico, too. You can get nearly 13 pesos for $1, compared with 10 pesos over the summer.

There are still some regions where the dollar hasn't made significant gains, like Asia, the Caribbean and Central America. But the biggest bargain is Australia, where the American dollar is worth 35 percent more than it was last summer. Now Mike Ball's seven-night "Coral Sea Safari" will only cost around $1875 instead of $2750 last year. Unfortunately, this doesn't mean dive packages will be discounted across the board. Says Ken Knezick, president of Island Dreams Travel in Houston, Texas, "Dive travel pricing is demand-based instead of economy-based." That means don't expect deluxe resorts like Tawali in Papua New Guinea and Wakatobi in Indonesia to cut their prices by much, if at all. "I'm seeing that higher-priced trips are still being purchased, so wealthy divers are still able to travel."

Knezick says that also applies to liveaboards, which typically price their trips two to three years in advance. That means 2009 trips were priced long ago, so they don't reflect the boat fleets' take on economic conditions right now. It's not a sense of eliteness keeping liveaboard prices steady or rising, it's the constantly upward increase of costs to run the boats, says Knezick. "Besides fuel, there are other expenses like manpower and food that are increasing. That's what I have to keep telling angry people calling us asking why they're not lowering prices. No dive operator is going to give its trips away. They have to evaluate what makes sense to stay in business." *Undercurrent* contacted the Peter Hughes, Aggressor and Explorer Ventures fleets to get their current take on trip pricing, but none of them responded by press time. In December, all three had a few discounts for specific boats on their Web sites, but Aggressor was unique in creating a new "5-5-5 Loyalty Program," a type of layaway plan that let any past passenger book a trip by putting down a 5 percent trip deposit and paying monthly payments of 5 percent, and receiving a 5 percent discount off the total in return. (The deal applied to all past guests until December 31, but starting in January it is only applicable for divers who book within five weeks of their most recent Explorer trip.)

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So to find the good deals and discounts, you still need to do your due diligence or work with a travel agent. For example, find a dive resort or liveaboard that charges in its own currency instead of the U.S. dollar. The American -friendly Philippines has great dive deals. For example, at Southern Leyte Divers on the island of Leyte, an air-conditioned beachfront cottage goes for $34, a two-tank dive is $50, and dinner with a beer will only set you back $5. Readers rave about Grand Komodo Tours in Indonesia, not just for their great services but their low liveaboard prices. Because they calculate prices in Indonesian rupiah, you're typically diving for $1,500 less per person than other Raja Ampat boats. 2009 prices for a double cabin on their five boats range from $190 to $285 per night.

Currency Charges

Other annoying fees come from using plastic. Currency conversion fees can add up, as Phil Hampton (Orlando, FL) found out last summer aboard the *Belize Aggressor*. "I put my payment for fuel surcharge, port charge and tip on my Citicard. My charge was $820. Aggressor converted that to $1,640 Belize. Citicard uses a different conversion than Interbank and converted it back to $837, a $17 overcharge. It then added a 3 percent foreign-transaction fee, which was $25. Thus it cost me an extra $42 to pay by credit card. The Aggressor states that most credit-card companies will remove these superfluous charges with a phone call, but that was not true for Citicard. Next trip I'll take cash, unless the dive operator accepts Discover."

Indeed, Discover and Capital One are the only cards that don't charge a dime in currency-exchange fees; Capital One doesn't even pass on the 1 percent fee charged by Visa and MasterCard. Neither do credit unions nor most community banks. American Express doesn't charge a foreign-transaction fee but it does carry a 2 percent currency-conversion fee. Besides Citibank, those that charge 3 percent include Bank of America, Chase and Wells Fargo. Don't think you can get away from fees by using your debit card - - fees of 2 to 3 percent are the norm.

Resort Fees

Unless you have asked a lot of questions and read the fine print, you may not learn of extra fees until you receive your bill, as reader Allan Ripple (West Bend, WI) found out when booking at the Wyndham Hotel in Nassau. "We contacted the Wyndham's corporate sales department and were quoted a very attractive room rate. But at check-in, not only were we not given that quoted rate, we were also charged a resort fee of $15 per day, per person, $105 a week." The resort "fee" is sneaky. And it's an addition to the often unmentioned resort taxes, which can run up to 15 percent. Also watch out for added airport transfer fees.

Regarding the diving expenses, two add-ons to watch for are marine park fees and special dive trips. When doing a day trip at Belize's Blue Hole, Adam Feinstein (Sterling Heights, MI) didn't know about the US$40 park fee to enter. "I had $100 to give to the crew as tip and 80 ended going for the park fees." Randy Brook (Seattle, WA) went to Belize's Isla Marisol resort for its whale shark dives but, he says, "you have to go deep on its website to find that there is an extra charge. A two-dive trip in the whale shark area cost an additional $175 per person. When I arrived at the resort, the chalkboard announcing whale shark trips made no mention of the extra charge. A family of four divers was shocked when they found $700 was added to their bill at checkout, because they thought the whale shark dive was just part of the package."

Most travel agents will charge you the total price with fees included, or at least break them down and put them in writing for you. But if you're booking it yourself, Knezick says it's important that you ask the resort lots of questions directly. "Is tax included? What transfers are included, and what cost extra? Are there boat fuel charges involved and what's the amount? Are there chamber and marine park fees to pay? What is the cost of Nitrox? What beverages are and aren't included? Credible travel suppliers will be very transparent and as clear as possible about their pricing."

Is That Welding Oxygen in Your Nitrox Tank?

In most countries there are no universal standards for handling Nitrox, so regulations and practices vary from location to location. In fact, operations in countries such as St. Eustatius, Belize, Fiji, Papua New Guinea and nearly all distant dive venues use industrial grade (i.e., welding) oxygen in their mixes. Medical grade oxygen is either unavailable or prohibitively expensive, they say.

While ANDI recommends that only gas rated for human consumption be used for diving, apparently the risk of contaminants in industrial grade oxygen is generally low. As PSI's Bill High told *Undercurrent*, both medical grade and industrial grade oxygen "come out of the same faucet." The difference is in how storage cylinders are handled. Industrial grade oxygen cylinders are returned for filling while still slightly pressurized. New oxygen is added on top of the old gas. Medical grade cylinders are vacuum cleaned to clear out any cross contaminants that may have slipped through the manifold when the cylinder was in use. If you're nervous about getting a Nitrox fill from a foreign dive operator, ANDI's Charlie Johnson suggests you ask to see their most recent air analysis certificates. Standards vary widely, so you'll probably need to have the operator interpret the results for you. But if there's a history of the air being tested frequently and recently (every three months), that's a good indicator that the operator is being careful. Dedicated Nitrox divers often carry their own oxygen analyzers to measure the oxygen content in their mixes. Charlie Johnson says that other kits are available that can detect gross amounts of carbon monoxide.

Florida Diver Loses Both Legs to Speedboat

While surfacing from a dive in the St. Lucie Inlet on January 9, Rob Murphy, 26, was struck by a passing boat, which severed both his legs. The boat was operated by Roger Nicosia, ironically an emergency room physician. Murphy, who lost nearly half his blood, was spared from death because his dive buddies acted quickly and applied a tourniquet before the helicopter ride to the hospital. Even though doctors couldn't save his legs, Roberts told the *Treasure Coast News* he is "trying to make a sad situation into a positive." Now he is doing physical therapy and intends to dive again one day. On January 31, volunteers at boat ramps around Florida talked to boaters and anglers about dive flag safety laws, and also carried a petition to create an official state "Dive Flag Awareness Day" that they intend to present to the governor.

ANNUAL MEMBERSHIP FEES ARE DUE

Rockland Aquanauts Organization
2009 Dues

I guess it is that time of the year again, Membership Dues are due. Last year all our members received much more than they gave out to the Organization. As usual you will be receiving a tax donation for the first $25.00. All members who attended the Annual Dinner not only received money off their own dinner but they also received money off theirs guests dinner. Everyone whom attended also received prizes, some worth many times the cost of their Dues. Don't forget the Annual Picnic as well as all the BBQ lunch's after the Lake Dives.

So please send in your $42 dues early to;

Rockland Aquanauts Organization
c/o
Paul Galeazzi Jr.
4 Greensward Drive.
Valley Cottage New York 10989

BBQ Help Needed

We have BBQs after every Hessian Lake dive, but next year, we don't want the chef tasks to fall on the same people all the time, so we are asking for your help. If you plan on coming to the Hessian Lake dives, please consider offering to set up, cook, or break down the BBQ gear.

Setting up might mean you set up before diving, get out of the water first, or forego diving that day. **Cooking** means you cook for everyone who shows up, not just yourself & your friends. **Breaking down the BBQ gear** means you stay until everyone has eaten and the grill is cool enough to put into your car to store until the next dive.

You don't have to be a Board Member to help. Everyone can pitch in. Any expenses, like buying food, are reimbursable. So please look at the dive dates and let us know when you can help out.

Thank you

Don't Forget to Visit EmbroidMe for your Rockland Aquanauts Apparel

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March 2009

Is Your Gear Nitrox Safe?, Salt Water vs Fresh Water, How Much for Next Dive Trip?, EmbriodMe, Dues

**There Will be NO March Meeting **