

Mud wrestling over Nitrox

Dive industry politics fascinates me. It was especially juicy around the issue of Nitrox. I rediscovered a piece I wrote seven plus years ago — when industry moguls did just about everything they could to prevent sport divers from using Nitrox. My, the ends they went to ...

Who'd a thunk that the notion that divers can dive more safely by using Nitrox — a gas with 32 percent oxygen and 68 percent nitrogen — would have started a mud wrestling match in the diving industry that's on the verge of busting into a bare-knuckled fist fight.

In this corner, we have *Skin Diver* magazine, the Cayman Dive Operators Association, and PADI, among others. They argue that Nitrox is not safe — that it leads to deeper and more risky diving. The motive for the promotion of Nitrox, they believe, is the almighty buck, since it's being promoted by those who expect to make money from the training, sales of equipment and Nitrox, itself. This economic interest is grounds enough to cast suspicion upon those training or providing the gas.

In the other corner are 100 Nitrox stations, two Nitrox training agencies, NAUI and NASDS and a bunch of technical divers who argue that the safety record of Nitrox is nearly perfect and that the conservative, knee jerk reaction by the opposition is designed to protect their own turf.

Letters, faxes and editorials are flying about, and claims from both sides suffer from hyperbole. One claim is that Nitrox has been banned in the Caribbean, which isn't true. The Cayman Dive Operators Association has banned Nitrox — which means you're not going to use it on a Bob Soto boat (God forbid you should be able to extend your bottom time by 30 minutes). But, it is available to Nitrox trained divers from a Cayman gas supply house.

The Cayman Association, speaking through the voice of the Cayman hyperbaric chamber, has stated that they would not treat a diver who was using Nitrox when he was bent. That's pretty ridiculous. No reputable or ethical medical facility could refuse treatment. Dr. Bill Hamilton, president of Hamilton Research and noted physiologist, told us, "I hate lawsuits but if treatment is refused to any injured diver using Nitrox, I'll be an expert witness if asked."

Nitrox, like compressed air, requires training in its use. And, the gas needs to be analyzed to determine the correct mixture. Neither compressed air nor Nitrox is a perfect diving gas. It is possible to be bent on both. It is possible to embolise on both. In July (1992) alone, eleven American divers died. Eight were using air. Three were using a mixed gas of some sort, but only one was trained and certified in its use. With compressed air, narcosis is a problem. Using Nitrox, oxygen toxicity is a problem, so depths must be limited to 130 fsw. Nitrox, however, within constraints, is safer than compressed air because it reduces the amount of nitrogen absorbed into the diver's body.

While the debate continues, Nitrox diving will expand, computers will be sold, and more and more people will get into it. We can wrestle in the mud to fight progress. We can't stop it.

- Ben Davison, *Undercurrent*, January 1993

what the latest stats show

Anyone certified in the past ten years might presume that Nitrox has been a favorite of sport divers forever. Not so. Nitrox has been available to sport divers for 22 years, but politics and controversy about its use raged through the dive industry for nearly half that time.

Nitrox was introduced to recreational divers in 1985 by Dick Rutkowski, a NOAA Deputy Diving Officer, but it took more than a decade for the entire dive industry to embrace it. DEMA, PADI, *Skin Diver* magazine and many dive operators were against it well into the 1990s. They argued that Nitrox was patently unsafe and led to deeper, more risky diving. They believed that Nitrox was

They wouldn't treat Nitrox divers who got the bends

rashly being promoted by businesses just wanting to make money from Nitrox training and equipment sales. The Diving Equipment and Marketing Association went so far as to prevent any mention of Nitrox at their annual conventions. The Cayman Dive Operators Association said they wouldn't treat Nitrox-using divers who got the bends. *Undercurrent* editorialized frequently about the foolishness of these arguments.

The major defenders included NAUI and NASDS, arguing that the safety record of Nitrox was nearly perfect and that opposers were just trying to protect their own turf. Regardless of the controversy, divers took to it like water—234,000 divers became Nitrox-certified between 1987 and 2000. A major milestone occurred in 1996, when PADI finally accepted Nitrox. Now the gas can be found in nearly every dive school, shop and liveaboard, and the word "Nitrox" is displayed at hundreds of booths at DEMA's annual show.

Better than compressed air?

Nitrox, of course, allows greater bottom times for no-stop dives and shorter stops during decompression dives than compressed air. Over the years, researchers have studied Nitrox's effect on divers' fatigue, gas consumption, decompression stress and other symptoms. While divers make all sorts of claims for Nitrox, so far researchers have found no significant differences between Nitrox and compressed air. A study published in *Undersea Hyperbaric Medicine* in 2003 tested 11 divers breathing either Nitrox or compressed air for 40-minute bottom times at 55 feet. Divers were assessed before and after their dives, and no group measured differently in fatigue, attention levels or ability to concentrate.

A DAN workshop in 2000 focusing on Nitrox found no evidence that Nitrox increased the risk for decompression sickness. It also found no evidence of an unreasonable risk of fire or ignition for divers with standard dive equipment using up to 40 percent Nitrox. Last year, Michael Lang, director of the Smithsonian Scientific Diving Program, took a look at DAN data on mixed-gas diving fatalities and injuries since the 1990s. In an article for *Diving and Hyperbaric Medicine* last summer, he published his findings:

- A higher proportion of safe divers used Nitrox than of divers who were injured on dives
- Nitrox divers were typically older than air divers, and 60 percent of them had specialty training
- Safe Nitrox diving was most common aboard charter boats, and there were no air or Nitrox fatalities from liveaboards
- Nitrox divers dived deeper than air divers, but they did fewer dives over more days
- Injured divers and diving fatalities had higher proportions of rapid ascent and running out of gas, but the use of Nitrox or air was not a significant factor

He also found that in the past six years, the certification numbers of Nitrox instructors and divers has approximately doubled, but there is no comparative increase of DCS rates in Nitrox divers. One million more Nitrox dives were done in the last six years than in its entire history of use. Liveaboards report that most of their divers are exclusively Nitrox users, but Lang says the fact that they are not reporting higher DCS rates shows the gas isn't causing any more safety hazards than air does.

"There're really two things to be cognizant of as a Nitrox diver—the amount of oxygen in your Nitrox mix and your maximum depth," Lang told *Undercurrent*. "There's no higher risk of narcosis or fatigue. You wouldn't even know you were breathing Nitrox unless you saw the mark on your tank. You don't even need to be an experienced diver anymore; dive schools will teach novices how to breathe Nitrox from day one."