Answering Your Gear Questions

By Ocean Eye, Inc.'s Chris Gabel

This time around, I thought I would comment on some questions that seem to repeatedly come up in conversation around the shop and in the field. These have come up often enough that I thought it would be a worthwhile idea to share them with you.

I want to repair my own drysuit seals. Does it matter what glue that I use?

Let's face it, we live in a do it yourself (DIY) world. More people want to be able to build and repair things themselves. The challenge is getting all of the facts in one place so that the consumer is fully informed on the process. This is one of those cases.

The answer is a resounding YES. The material you are trying to bond together is going to require an adhesive that was designed for that purpose. Elmer's Glue will not bond vulcanized rubber. It may taste great, but it won't seal that drysuit ring system in place. I'm going to cover this in more detail in a future article here in UW, but I think it's also important to note here.

There are a lot of variables to consider. For instance, if you use standard Viking glue on an HDS suit and want to dive in contaminated water, you just turned your HDS suit in to a Viking Pro 1000/1500 (depending on the material thickness).

What do I mean? Well, the components are only as good as the adhesive. If you don't use the glue that was designed to conform to the materials and/or environments that you are going to use the equipment in, it's not going to perform as designed.

I'm using the glue that was recommended but my seals won't stick, why?

Okay, this is a two-parter. The first part is material preparation. For instance, did you appropriately prepare both the sleeve and the cuff so that the adhesive will adhere itself to both materials?

If at this point you ask yourself "What in the @#$% is he talking about, preparation?" Please put it in a box and send it to a trained authorized repair facility. If you don't, at best you will be cursing like a sailor for days. Or worse, you'll have a substandard repair that will come apart when you least want it to (like at 50 feet in cold contaminated water).

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thoroughly clean the area you're working on with an appropriate cleaning agent.

Here is the second part, if you know how to do the repair and have done it before successfully. You did the preparation as you did before. You are using the right glue and still everything has gone sideways.

This is when bad things happen to good people, right? I ran into this situation a few times myself. Often, the culprit is what is on the suit. What do I mean? Well, I've had issues with people doing things like using ArmorAll on their drysuit. The issue may not be that overt.

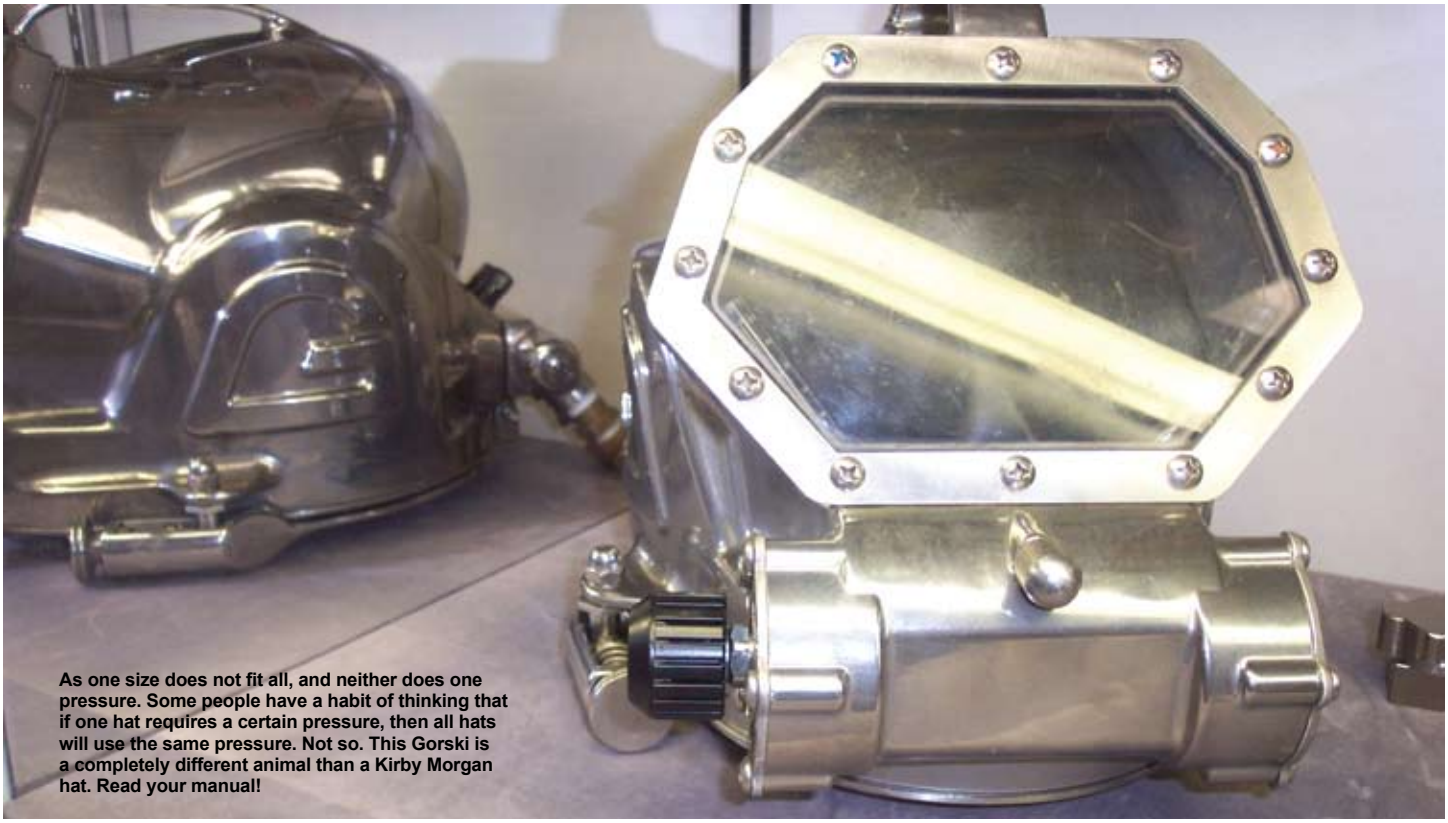
It also depends on what the diver was submerged in – especially when it comes to petroleum. The resolution to this issue is to thoroughly clean the area you're working on with an appropriate cleaning agent. For instance, Heptane on a Viking Pro 1000.

Why is my Gorski helmet breathing harder than it should?

As one size does not fit all, neither does one pressure. Some people have a habit of thinking that if one hat requires a certain pressure, then all hats will use the same pressure.

For instance, in the past, the Kirby Morgan Dive Systems 17B helmet had a pressure requirement of at least 90 PSI over bottom pressure for anything from zero to 60 feet (18m) of salt water. (There have been some revisions to these calculations. For a more complete explanation, see: *Surface Supply Breathing Requirements and Recommendations for Kirby Morgan Helmets and Band Masks*, written by Mike Ward of Dive Lab).

Perfectly valid. That said, it's not valid for the Gorski. That manual dictates that the minimum over bottom pressure for the second stage regulator is 130 to 160 PSI over bottom pressure (more than 160 PSI over bottom pressure could cause the regulator to free flow). Since it uses a balanced Poseidon Cyklon 5000 second stage, the requirement is the same as if you mated



As one size does not fit all, and neither does one pressure. Some people have a habit of thinking that if one hat requires a certain pressure, then all hats will use the same pressure. Not so. This Gorski is a completely different animal than a Kirby Morgan hat. Read your manual!

the Poseidon Cyklon second stage with an appropriate scuba first stage. The intermediate pressure needs to be at least 130 PSI.

I've seen people using smaller compressors that only put out 110 PSI on the surface and trying to throw on a Gorski hat and dive it to 20 or 30 feet. Basically, at 20 feet (6m), you have a pressure to the hat of about 90 PSI. That's at least 40 PSI less than what the minimum requirement is.

All of this is covered in the manual. You can actually download a full copy at www.GorskiHat.com. Manuals for any of the Kirby Morgan product line can be downloaded and viewed at www.KMDSI.com.

I'm doing shallow dive. Why should I be bothered buying and maintaining an EGS bottle with my demand hat?

Frighteningly enough, I've had this discussion more than once. The scenario is this: the diver/company is only doing shallow work, perhaps a bone crushing eight or ten feet. The normal comment is that they can swim to the surface in an out-of-air emergency. Why bother with the additional equipment and hassle?

Here is my answer. If you're wearing enough weight to nail you to the bottom, 10 feet (3m) might as well be 100 feet (30m) when you're trying to get to the surface.

Although OSHA talks about the following four items requiring the use of a "diver-carried reserve breathing-gas supply," it's an extremely rare exception that safety would be compromised where a diver above 100 feet (30m) should not carry one (for instance, confined spaces). The applicable OSHA notes are:

• 29 CFR 1910.425(c)(4)(i), (c)(4)(ii), and (c)(4)(iii). For dives deeper than 100 fsw or outside the no-decompression limits, each diver must: be tended by a separate dive-team member; have a standby diver available at the dive location while the diver is in the water; and have a diver-carried

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reserve breathing-gas supply, except when heavy gear is worn.

• 29 CFR 1910.425(c)(4)(iv). A reserve breathing-gas supply is required at the dive location for dives deeper than 100 fsw or outside the no-decompression limits.

• 29 CFR 1910.425(c)(5)(i) and (c)(5)(ii). For surface-supplied air diving with heavy gear, deeper than 100 fsw, or outside the no-decompression limits, an extra breathing-gas hose must be available to the standby diver, and the hose must be capable of supplying breathing gas to the diver in an emergency. Also, an inwater stage must be provided for the diver(s) in the water.

• 29 CFR 1910.425(c)(6). A diver-carried reserve breathing-gas supply must be provided to a diver in the water when the diver is prevented by the configuration of the dive area from ascending directly to the surface (i.e., when the diver does not have "free access to the surface"), except when the diver wears heavy gear or when the physical space does not permit the use of such a breathing-gas supply. The diver-carried reserve must be sufficient under operating conditions to allow the diver to reach the surface, or another source of breathing gas, or to be reached by a standby diver. Heavy-gear diving is exempted from these provisions because the gear carries its own reserve.

So the bottom line is that a bottle, first stage regulator, pressure gauge, overpressure relief valve, and a low pressure whip are cheap insurance. Maintaining this additional gear is simple and minimally invasive to your annual budget.

Okay? Simply put, just use it.

(I do need to note here that this does not count for heavy gear. I included 29 CFR 1910.425(c)(5)(i) and (c)(5)(ii) to cover part of this. The rest is a different story.)

Until Next Time

From time to time in future issues, I would like to continue addressing your questions. Send in the diving equipment maintenance or repair questions that you want to have answered. You're the reason that these articles are written, so I want to work on subject matter that you are interested in. Email your questions to me at CGabel@Ocean-Eye.net or snail mail them to me at:

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Let me know if it's alright to add your name and company name on the credit for the question when we use it in UW. If your question is chosen, we'll send you a $5 gift card to Starbucks so that you can get properly caffeinated. Dive safe. **UW**

University of Central Florida Students Win at AUVSI

A team from the University of Central Florida Robotics Laboratory took first prize at AUVSI and the U.S. Office of Naval Research's First International Autonomous Surface Vehicle Competition (ASVC), held Aug. 7-9 in San Diego, Calif. The first competition of its kind brought together students teams from the U.S. and Canada. Six undergraduate student teams competed for three days at the U.S. Space and Naval Warfare Systems Center's TRANSDEC Facility, where they were challenged to navigate a surface-water course with autonomous vehicles built with off-the-shelf components. The ASVC is a student competition based on unmanned boats operating under rules of the waterway including littoral area navigation, channel following and autonomous docking. This is typically done with computer vision, multi-sensor fusion techniques, proactive and reactive path planning, and machine learning approaches. **UW**