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CLEANING TIPS FOR THE FULL FACE MASK

by John Hott

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Cleaning of Full Face Masks

John P. Hott

The following is a discussion of routine cleaning of dive equipment, specifically full face masks that have been exposed to contaminants that may be found during routine diving and the need for sharing equipment between healthy or assumed healthy divers. This is not a discussion of "hazmat" or extreme contaminated water diving. If you are required to share equipment in a department, whether professional or volunteer, it's recommended that you follow a minimum standard set by OSHA for cleaning of breathing apparatus established in **1910.134 App B-2** found at:

http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9782

If the diving conditions are considered any level of Hazmat, this is **NOT** the appropriate equipment and these are not the proper procedures.

Some time ago, I had an epiphany, well, for my simple mind it was. I had always subscribed to the dunk and swish method of cleaning dive gear. Freshwater normally, soapy water solution when required. We had been diving in the desert here in Southern California, in the aqueduct system. The water was murky, mostly from the algae bloom that results from the exposure to the bright desert sun. It wasn't the water that was the problem in this case though; it was what happened after getting out of the water. The wind picked up and in the trip from the aqueduct, to the truck, we became covered with dust, which turned to mud upon contact.

It covered and penetrated all of our wet dive gear and camera housings.

When I arrived in the driveway at home I set up my rinse station consisting of two big Rubbermaid buckets, one with fresh water and the other with a solution of Dawn dishwashing liquid, I did my normal dunk and swish followed with a through rinse. Upon removing the gear, I found a fine grit remaining on the masks and other gear. I'm generally not too concerned with some residual dirt, knowing that this wasn't particularly dangerous dirt from a contaminate standpoint, however, this grit would be especially damaging to the polycarbonate lenses of the full face masks. The solution that dawned on me, pardon the pun, was to grab a soft dish cloth and gently wash the masks as I would do the dishes... IF I were to ever do the dishes, my wife would say. The gentle cleaning and the soap solution did the job to remove the grit and remaining dirt. Now, I'm washing my FFM as if it were the dishes, but gently to insure I don't scratch the visor.

Now, this is great if you're dealing with dirt and fine sand/grit. What about contamination and pathogens as well as the dreaded Gonosyphilherpelaidstitus? In a conversation with a surgeon that was attending an AGA class, maybe eight years ago, I asked what he recommended for a good anti-bacterial/viral cleaning agent, his response was "soap". For the most part, all soap is anti-bacterial although they can charge more if they put it on the label.

The Cleaning Process.

Take into consideration what you are cleaning and consider the contaminate, not the equipment. If you are sharing masks, then an anti-viral/bacterial solution is appropriate. I'm of the school that a dunking is much more effective than a spray or a wipe. The cleaners listed in the NEDU file are all effective for this application.

Here at OTS we use Sanizide Plus. Follow the instructions in the file. Be careful not to use any harsh solutions that can damage any of the materials in the mask/regulator. The products mentioned have been used with no adverse effects on the components*. Spraying or wiping is, for the most part, superficial in exposing contaminate to the cleaning agent. With spraying, a total soaking is required to penetrate the smallest of recesses in the interior of the FFM. With "washing", removing equalizing pad and oral/nasal check valves manipulating them and the interior of the mask in the cleaning solution is a minimum requirement for basic cleaning of the mask. Physically wiping the components with a soft cloth in the solution removes debris and contaminates. Follow this with a thorough rinse in clean fresh water and draining and drying of the mask and it should be ready to go for the next dive.

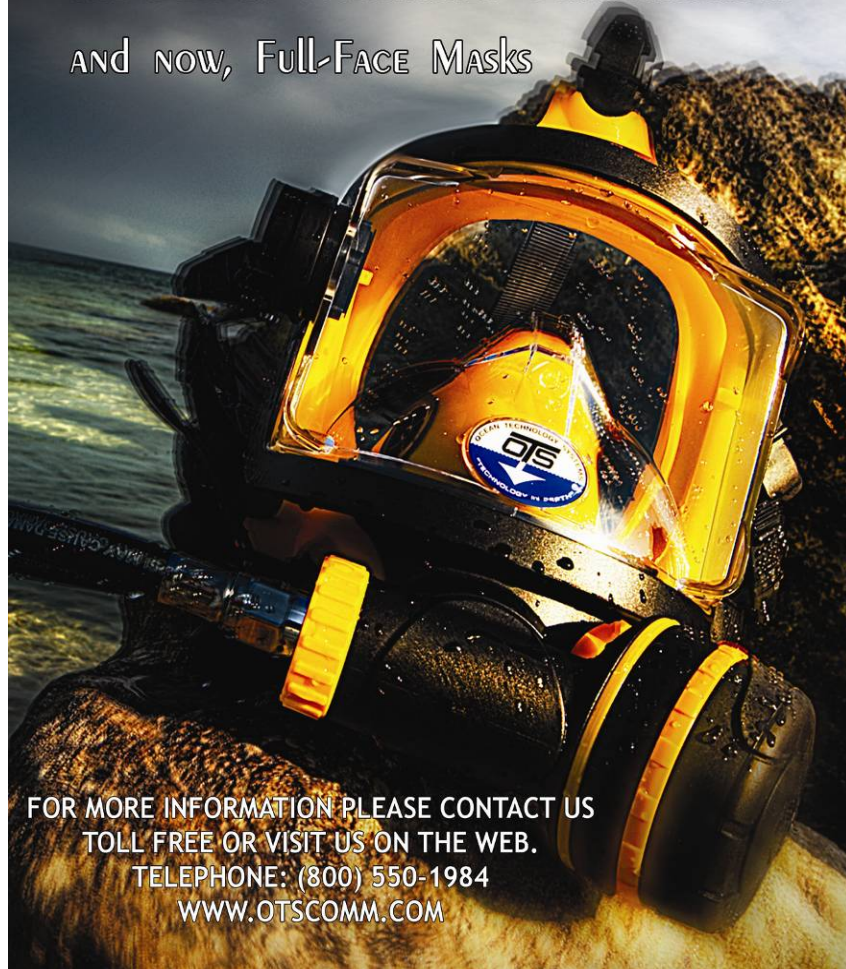
Any communications equipment should be cleaned in this manner as well. ***Do not soak the OTS ME-16R "HotMic" for more than ten minutes or subject it to direct blasts of high pressure water.***

Tailor the cleaning to the contaminate(s). If the mask has been exposed to petrochemicals such as fuels or oils, then a detergent would be most appropriate for the task. Simple Green or Dawn works well for this task. If the mask has been exposed to biohazards, anti-bacterial/viral solutions as previously discussed are required. Many of the detergents and soaps will do much of this. If concerned, use the more aggressive agents. If a mask is significantly contaminated, it may require disassembly and scrubbing. This is usually a technician level task.

Once the mask is cleaned, proper drying is the next step. Wiping the mask with an absorbent, lint free towel is a start. Hold the mask upside-down and shake as much water from the mask. Allow the water to pool in the seals and wipe this out and carefully dry the visor, making sure not to scratch the polycarbonate. Hang and allow to air dry. I can't tell you how many times I've opened a box of returned rental or consigned masks to find them stuffed wet in a plastic bag and reeking of mildew and mold. If this happens, it takes significant cleaning including some disassembly and sanitizing.

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Keep in mind that any equipment with o-ring seals should not be exposed to detergents. This can breakdown any lubricants used on the seals. If you need to clean any of these components, then the o-rings should be serviced prior to the next use.

Keeping the inside of the mask clean in the first place is a good idea. Aside from the contamination that sources from the face that is stuck in the mask, the water is the other concern. One of the main reasons that we dive full face masks is to protect us from the environment we're diving in. I can't tell you how many times I've been on dive operations and observed a diver standing waste deep in water with their mask off and it soaking in the water next to them. If the water is even slight contaminated, the mask should be taken out of service until it's been cleaned. When contaminants have been introduced into the mask in this manner, they have been rendered as dangerous as they have the potential of being. In essence, these contaminants have been weaponized. They will now be atomized into small droplets and introduced into every mucus membrane between your chin and eyebrows. As a personal rule, the mask goes on on the boat and comes off on the boat. I practice doff and don exercises only in water that I'm comfortable swimming in.

In conclusion, the masks are another tool in the tool box to help you complete your mission or the task at hand. Your equipment is only as good as the

maintenance performed on it. Take care of your equipment and it will take care of you.

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*Betadine can stain lighter colored materials such as yellow or blue mask skirts

US Navy Experimental Diving Unit (NEDU) on cleaning of diving related equipment including the MK20 and MK24 full face masks. Although somewhat dated the information is still appropriate.

From: Commanding Officer,
Navy Experimental Diving Unit
To: Commander, Naval Sea
Systems Command (00C3)

Subj: RECOMMENDATION FOR REPLACEMENT OF
WESCODYNE AS A SANITIZING AGENT FOR
USN DIVING EQUIPMENT

Ref: (a) ISEA report on sanitizing agents dtd 13 Apr 00
(b) NAVSEA Task 98-010

Encl: (1) Recommended disinfecting agents
(2) Cleaning procedures for US Navy Diving and Recompression equipment.

1. Navy Experimental Diving Unit received an ISEA report on Sanitizing agents dated 13 April 2000 reference (a). This report identified several concerns regarding the use of Wescodyne cleaning solution. The most pressing problem for units of the Pacific Fleet is the lapse of Wescodyne's California Environmental Protection Agency registration in 1988. In response to this situation, and in accordance with reference (b) NEDU is identifying replacement sanitizing agents and cleaning procedures for use on U.S. Navy diving equipment.

2. A search of the market and contact with several manufactures of cleaning, disinfecting, and sanitizing solutions, respiratory therapy departments, both in and outside the Navy, DAN, and other groups has resulted in the identification and recommendation the four following agents (Enclosure (1)):
1) SaniZide Plus 2) Advance TB 3) Bi-Arrest 2 4) Confidence Plus

3. The agents were used as directed by the manufacture to clean and sanitize various pieces of diving gear. The gear was off-gas tested at the Navy Underwater Equipment Lab and found to be safe for hyperbaric use. A recommended procedure for sanitizing diving equipment with these agents has been developed (Enclosure (2)) as an interim procedure until changes can be made in the Navy PMS system and Maintenance manuals.

4. NEDU will continue to query the market and the concerned groups mentioned above to insure these agents and procedures are the most current, effective and safe agents available. My NEDU point of contact is HM1/SCW/DV D. Stanga at (850) 230-3100.

J.R O'ROURKE By direction

SaniZide Plus

Sanizide plus is a germicidal solution that is effective against a broad range of bacteria, viruses, and many fungi. The solution is provided in several sizes ranging from 1 gallon bottles to 16 oz. trigger sprayers. Sanizide is delivered ready for use and requires no mixing. The quaternary ammonium compound is non-corrosive and will not damage lens, plastics, rubber, or metal surfaces. Manufactured by Safetec 1-800-456-7077, the cost is approximately \$1.60 per 2 oz. Spray bottle or \$6.00 per 32 oz. Spray bottle. Safetec is a GSA contract company.

Effectiveness in 30 second contact time kills:

- HIV
- Influenza A2/HK
- Herpes simplex II 3 minute contact time kills:
- Polio I virus
- Rhinovirus 5 minute contact time kills:
- Staphylococcus aureus
- Salmonella choleraesuis
- Pseudomonas Aeruginosa
- Klebsiella Pneumoniae
- Candida Albicans 10 minute contact time kills:
- Mycobacterium Bovis BCG (**Tuberculosis**)

Advance TBE

Advance TBE is a germicidal compound, containing the same quaternary ammonium compound found in SaniZide. The solution has the same disinfective characteristics and requires the same contact time as SaniZide. The Advance TBE is provided ready to use in 16 oz. spray bottle or 1 gallon bottle. Manufactured by Infection Control Technology 1-800-551-0735, the cost is approximately \$7.00 per 16 oz. bottle or \$12.00 per gallon.

Specific Germicide Activity 10 Minute Contact time

- HIV-1
- Hepatitis A, B
- Escherichia coli
- Herpes Simplex
- Influenza
- Mycobacterium tuberculosis
- Pseudomonas aeruginosa
- Salmonella choleraesuis
- Staphylococcus aureus
- Trichophyton mentagrophytes
- Aspergillus niger

Bi-Arrest 2

Bi-Arrest 2 is a non-alkaline germicidal cleaner that offers a broad spectrum of effectiveness against many bacteria, viruses, and fungi. Its germicidal activity is not diminished by hard water and is non-corrosive. The solution is provided in a 4oz. concentrate bottle with a pump attached. Mixing directions are: Mix 2 pumps of the concentrate in a 16-oz spray bottle of water. Spray bottle is provided with the concentrate. Manufactured by Infection Control Technology (MSA), 1-800-551-0735, the cost is approximately \$3.00 per gallon. MSA is a GSA contract company.

- Mycobacterium tuberculosis
- Pseudomonas aeruginosa
- Staphylococcus aureus
- Herpes simplex
- Salmonella choleraesuis
- Streptococcus hemolyticus
- Diplococcus pneumoniae
- Salmonella typhosa
- Escherichia coli
- Proteus vulgaris
- Trichophyton interdigitale
- Aspergillus
- Influenza

Confidence Plus

Confidence Plus is a germicidal solution that is effective against a broad range of bacteria, viruses, and many fungi. The active chemical compounds are closely related to those found in Advance TB_E, and Sanizide Plus. It requires the same contact time, and has similar disinfecting actions. The solution is provided in a 32 oz. bottle of concentrate with a graduated measuring cup built into the top of the container. Mixing directions are 1 oz per gallon of water.

Manufactured by Mine Safety Appliances Company, 1-800-672-2222, the cost is \$12.97 per 32 oz. bottle of concentrate.

Specific Germicide Activity 10 Minute Contact time

- Salmonella choleraesuis
- Staphylococcus aureus
- Streptococcus pyogenes
- Escherichia coli
- Enterobacter aerogenes
- Shigella sonnei
- Candida albicans
- HIV-1

Cleaning procedures:

SCUBA regulators

- With scrub brush and a non-ionic detergent solution, remove any gross contamination from the regulator.
- Rinse thoroughly with fresh water
- Spray a liberal coat of solution on and into the mouthpiece and all second stage parts until all surfaces are wet.
- Let stand for 10 minutes. If solution appears to be drying, apply more solution to keep it wet for the full 10 minutes.
- After 10 minutes, rinse the entire second stage in a container of clean fresh water, or rinse under running potable water.

BIBS masks

- Remove BIBS mask from hose
- Spray a liberal coat of solution to all surfaces including straps.
- Let stand for 10 minutes. If the solution appears to be drying, apply more solution to keep it wet for the full 10 minutes
- After 10 minutes, rinse the entire mask in a container of clean fresh water, or rinse under running potable water.
- Allow to air dry before placing back in the chamber.

MK 20 Diving Mask

- With scrub brush and a non-ionic detergent solution, remove any gross contamination from the mask.
- Rinse thoroughly with fresh water
- Spray entire oral-nasal mask interior and nose-clearing device with solution until all surfaces are wet.
- Let stand for 10 minutes. If the solution appears to be drying, apply more solution to keep it wet for the full 10 minutes
- After 10 minutes, rinse the entire mask in a container of clean fresh water, or rinse under running potable water.

MK 21 Diving Helmet and MK 24 Full Face Mask

- With scrub brush, and a non-ionic detergent solution, remove any gross contamination from the mask and helmet.
- **Rinse thoroughly with fresh water**
- Remove nose-clearing device and oral-nasal mask from helmet.
- Spray entire oral-nasal mask and nose-clearing device with solution until all surfaces are wet.
- Let stand for 10 minutes. If the solution appears to be drying, apply more solution to keep it wet for the full 10 minutes
- After 10 minutes, rinse the entire mask in a container of clean fresh water, or rinse under running potable water.
- Reinstall mask and nose-clearing device in helmet