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APPLYING ANTIFOULING PAINT TO PAT TAGS

Micron is a copper-based, ablative antifouling paint that kills biofouling on contact. Because of its toxicity, you must be careful to avoid skin contact—on the animal and the painter.

Micron antifouling paint has been successfully used for decades to limit biofouling on sea turtle satellite tracking tags, however, Micron can be used on all Wildlife Computers tags including PAT (Pop-up Archival Transmitting) tags (MiniPAT, microPAT, mrPAT, Benthic sPAT, or sPAT). Micron paint adds additional weight to the tags. Please see [Considerations for PAT Tags](#) for tether and testing information.



Be careful not to paint any surface that will be in permanent contact with the skin of sharks or other species.

Wildlife Computers has seen deployments of over two years on properly painted tags. However, Micron's effectiveness can be compromised if the paint is hastily applied or critical parts of the tag are left unpainted.



Argos whip antennas and Fastloc® GPS antennas MUST be painted.

The following instructions are based on recommendations from the technical department of International Paints, the manufacturer of Micron paint. The process involves one coat of [InterProtect 2000 E primer](#) and two coats of Micron for MiniPAT, sPAT and Benthic sPAT, microPAT, and mrPAT tags. We recommend Micron66* (if available) although proven choices are Micron77, 99, CSC, and Extra SPC, although other Micron paints will function well if applied properly. Wildlife Computers does not apply Micron antifouling paint. If Micron paint is unavailable in your area, try to find an alternative copper-based ablative antifouling paint with a suitable primer.

**Micron66 has been discontinued but can still be found in some stores. Wildlife Computers has been testing Micron CSC and Micron Extra SPC as a replacement. MiniPAT, sPAT, Benthic sPAT, mrPAT, and microPAT pop-up tags will float with one coat of primer and two coats of Micron CSC. Micron Extra SPC is heavier, restricting its application on pop-up tags until further testing can be done. SPLASH and SPOT tags on other species such as sea turtles and sharks should be painted with one coat of primer and three coats of any Micron paint. Once antifouling paints and tethers are applied, Wildlife Computers recommends performing a float test.*



Micron66 is not suitable for use in fresh water. Other Micron paints are available for freshwater use.

PAT TAG ANTIFOULING PROTOCOL – CONTINUED

Safety Information

Safety guidelines must be followed and the correct personal protective equipment be worn for the application of both the primer and Micron paint. Once painted, tags should only be handled with gloves due to the copper and biocide in the antifouling paint. They can be stored in a Ziploc® bag. The following link will provide access to the safety datasheets for both the InterProtect primer and Micron66 antifouling paint: <https://www.interlux.com/en/us/boat-paint/antifouling/micron-66>. Check your paint can for the MSDS version number. For example, E5 for Micron66 Black.

Process Tips

- The entire process requires up to 48 hours to complete prior to the tags being attached to the animal.
- Mix the Micron with a battery drill and paint mixer tool—you must dislodge the copper off the bottom of the can. If you can't use a drill, mix it thoroughly with a wide paddle to ensure all the copper is mixed into the paint.
- After masking off the wet/dry sensors, communications port, temperature, light (**MiniPATs have two**), and pressure sensor(s), Wildlife Computers return label and serial number, release pin, ground plate, nose cone, and LED viewing port, prime the entire tag **including the Argos whip antennas**.*
- Only prime 2-3 tags at a time. You want to paint the Micron on while the primer is tacky and not dry (if the primer has hardened, apply another coat of primer and paint when tacky).
- Apply one coat of Micron**—paint the entire tag **including the Argos whip antennas. Once the first coat dries, you may paint an additional coat.** Micron will add more weight compared to other coatings (~.7 grams per coat on average) because it is a metal-based paint. One coat minimum is recommended. If adding more than one, see [Considerations for PAT Tags](#) below for testing information.
- Remove the masking tape from all the areas once the last coat is dry.

* Sensors, antennas, and ports vary by tag. Please refer to your tag's user manual.

**Please refer to the Micron Antifouling Protocol for SPOT and SPLASH tags.

Application Requirements

Equipment Required

- [InterProtect 2000E Primer](#)
- [Micron Antifouling Paint](#)
- Six paint mixing cups or bowls
- Battery-powered drill and mixing tool or strong mixing sticks (for the paint)
- Six mixing sticks (for the primer)
- Two 50 ml syringes or 100 ml cups for measuring the primer, paint, and hardener
- Six small disposable paint brushes
- One sheet of 80-100 grit sandpaper
- 500 ml of isopropyl alcohol or acetone
- Three clean rags
- 10 pairs of disposable gloves
- One roll of masking tape and scissors
- Appropriate respirator, fume cabinet, or well-ventilated work area
- Optional: 3/8" (10 mm) and 1/4" (6 mm) hollow punches, hammer, and wooden/nylon board to punch out masking tape discs

PAT TAG ANTIFOULING PROTOCOL – CONTINUED

Application Preparation

The process for applying antifouling paint is similar between sea turtle tags and PAT tags. You can view the step-by-step video for sea turtle tags: <https://wildlifecomputers.com/turtle-tagging/>



The entire process requires up to 48 hours to complete prior to deployment.

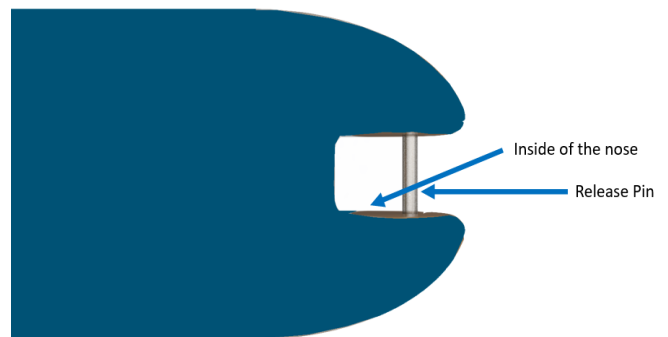
Work Area Preparation

Lay out all the required equipment in a well-ventilated area. You will want to hang up the tags once painted to not disturb the paint. Bend a paper clip into an “S” shape. Hook one end onto the release pin of the tag and one end to a rack and let it hang until dry.

Tag Preparation

1. Wipe the tag with isopropyl alcohol or acetone using a clean rag.
2. Cover all critical areas of your tag with a non-soluble tape, such as masking tape. Painting over these areas will hinder the tag's operation and greatly impede its performance. Use a hammer and suitable hollow punch on a nylon board to punch out discs of masking tape.

- Critical areas include the wet/dry sensors, communications port, temperature, light (**MiniPATs have two**) and pressure sensor(s), Wildlife Computers return label and serial number, release pin, ground plate, nose cone, and LED viewing port.*



Do not paint the release pin or inside the nose on any PAT tag!

3. Insert the communication connector plug and cover it with a piece of masking tape.
4. Cut or punch a 6 mm (1/4”) circle of masking tape and place this over the LED area to enable viewing once the tag is painted (swipe a magnet over the communications port to determine the LED position).
5. Sand the tag—except the taped-over areas—and antennas thoroughly to roughen the surface to help ensure the paint sticks. Be careful not to damage any external sensors such as the temperature sensor probe, if applicable.
6. Clean the tag thoroughly with isopropyl alcohol or acetone, avoiding the masking tape. Do not handle the tag without gloves once cleaned.

**Sensors, antennas, and ports vary by tag. Please refer to your tag's user manual.*

PAT TAG ANTIFOULING PROTOCOL – CONTINUED

Application Procedure

Primer Application and Drying Time

1. Stir or shake each can of base and hardener thoroughly.
2. Measure three-parts by volume of 2000E base and one-part per volume of 2001E hardener and mix completely.
3. Stir and allow it to rest for 20 minutes to pre-cure and to allow the bubbles to disperse.
4. Apply to the tag with a brush, painting all surfaces and antennas evenly—avoid drips and wet areas that will dry at different rates.

Drying times vary with temperature and humidity; however, 10 minutes is typical in warmer climates. It is critically important that the first coat of Micron be applied while the primer is still tacky. This is determined using a “thumb-print test.” After the primer has dried for 10 minutes, use a gloved hand to touch the tag’s surface to see if it leaves a print on the paint. If paint sticks to the glove, it needs to dry longer. If the primer feels tacky and leaves a mark without getting paint on the finger, then it is ready to overcoat with Micron. If the primer is left too long and has cured hard, then another coat of primer will need to be applied and the process repeated for a tacky base.



It is critically important that the Micron be applied when the primer is still tacky.

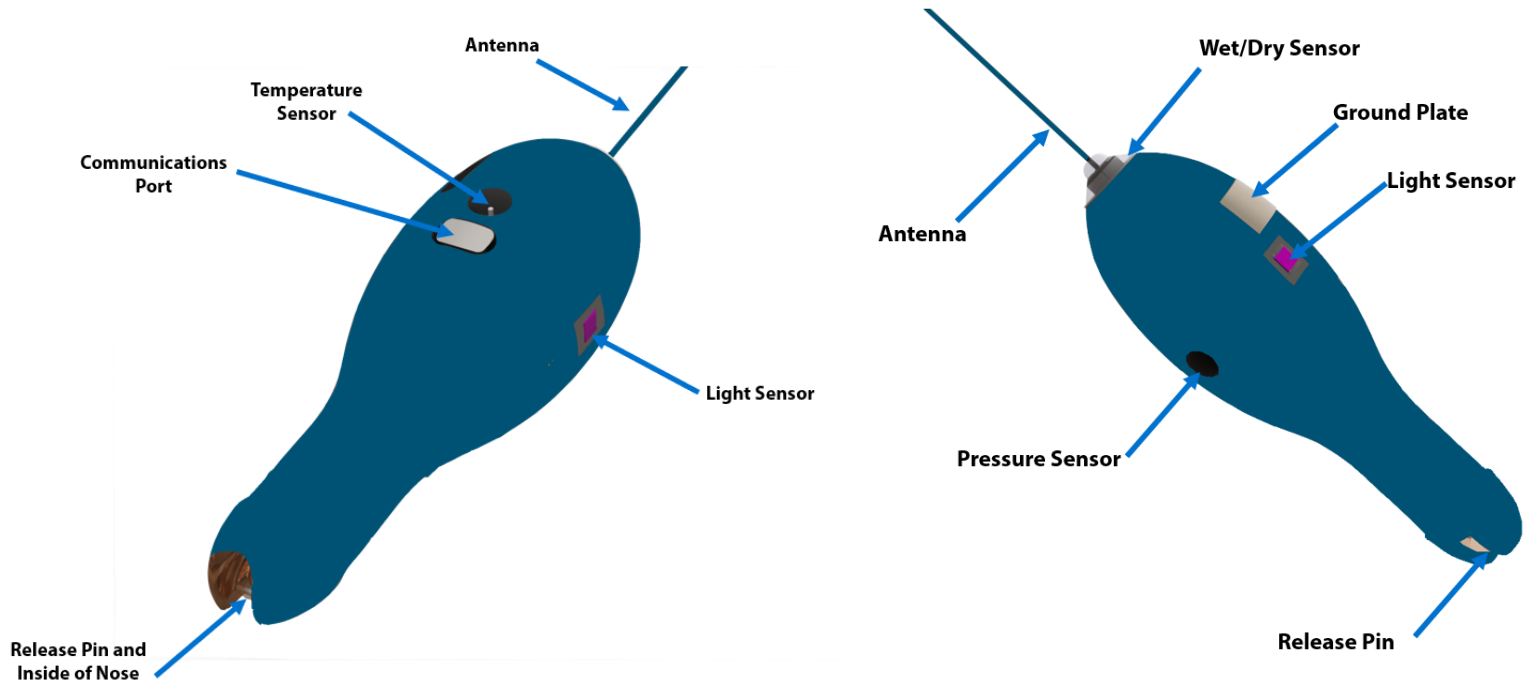
Micron Application and Drying Time

1. While the primer is drying, mix the can of Micron well using a drill with an attached paint stirrer or strong mixing stick. Shaking the can is not effective as the copper settles to the bottom of the can. Since Micron is a copper-based paint, ensure it is mixed properly.
2. Immediately brush a coat of Micron antifouling paint onto the entire tag and all antennas once the primer is tacky (“thumb-print test”).
3. The ideal drying time between coats of Micron is four hours at 35° Celsius (95° Fahrenheit), six hours at 23° Celsius (73° Fahrenheit), and eight hours at 10° Celsius (50° Fahrenheit). It is ideal to leave the tag overnight.



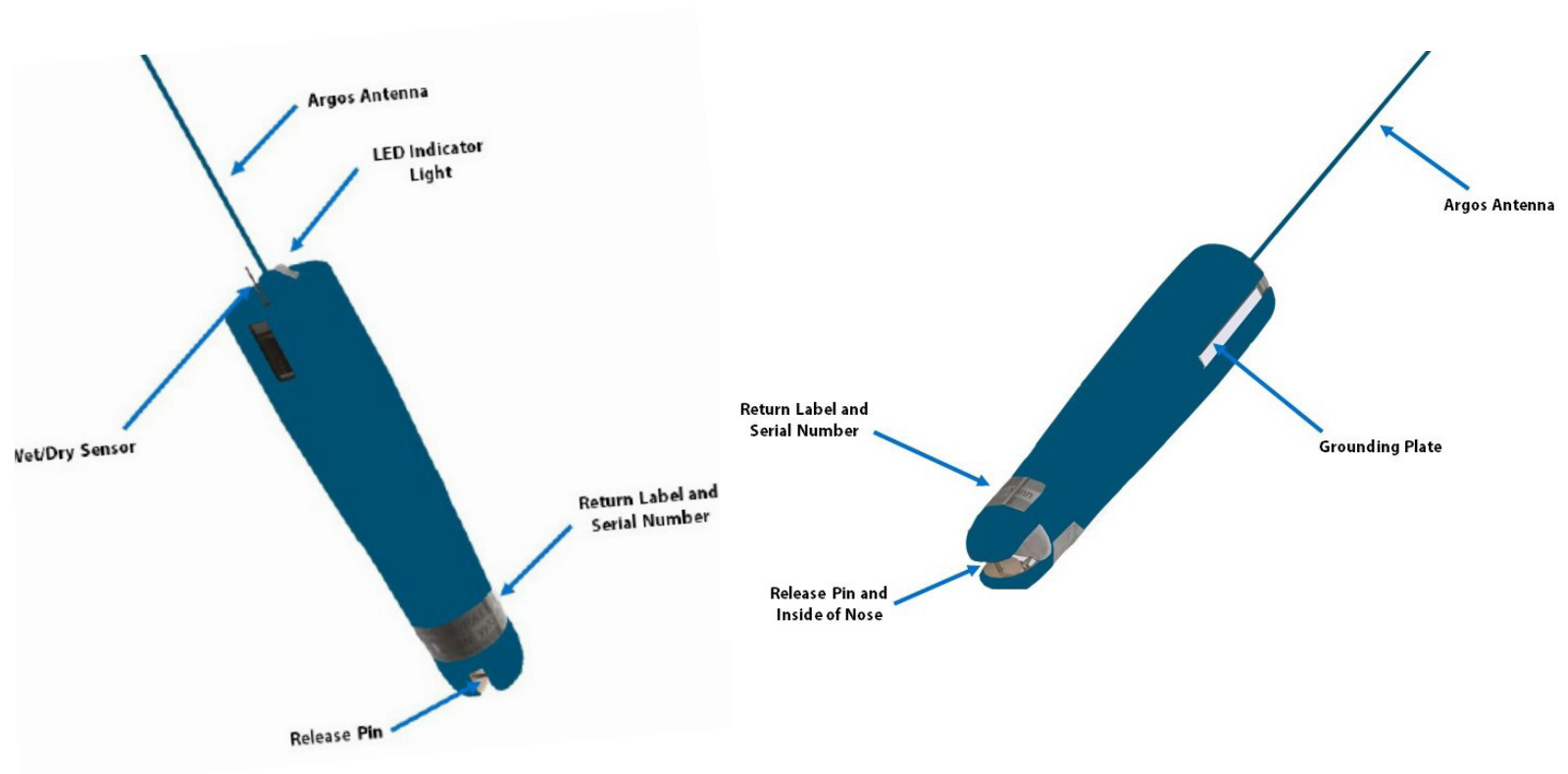
We recommend at least one coat of Micron. Micron adds weight so ensure it floats before deploying.

PAT TAG ANTIFOULING PROTOCOL – CONTINUED



mrPAT Example

Note: A Benthic sPAT is similar in shape to a MiniPAT but does not have a depth sensor.



PAT TAG ANTIFOULING PROTOCOL – CONTINUED

Masking Tape Removal

After the final coat is dry, put on a pair of disposable gloves and remove the masking tape from any temperature, light, wet/dry, and pressure sensors, communications port, LED light, and ground plate.*

Tag Handling

Once dry, tags can be handled using disposable gloves. They should be stored in a resealable plastic bag like a Ziploc® as Micron emits a strong odor. Store the tags in a cool place. A refrigerator is good but tags should not be stored with food.



Tags must be handled with gloves as Micron contains copper and biocides.

Tag Deployment

Once dried, the tag can be attached or tethered and deployed immediately. If you are not deploying right away, tags can be stored; however, if more than 30 days have elapsed since the last coat of Micron was applied, use a soft, nylon brush to lightly wash and reactivate the top layer.

Considerations for PAT Tags

Tethering

Once a tether is added to an antifouled PAT tag, it is much heavier than you may realize (one coat of primer + two coats of Micron + tether). You must test the buoyance of the tag. If, after testing, you find that the tag sinks, you may need to shorten the tether.

Testing

Once the coating and tether are applied to the PAT tag, you can perform a simple float test. All Wildlife Computers PAT tags are positively buoyant, so when the pin burns, the tag floats to the surface and Argos transmissions are initiated once a dry environment is recognized. Micron will add more weight compared to other coatings (~.7 grams per coat on average) because it is a metal-based paint. To perform a float test, fill a bucket or sink with water, add the tags with their tethers, and make sure they remain positively buoyant.

PAT TAG ANTIFOULING PROTOCOL – CONTINUED

Resources

International Paints Primer



Wildlife Computers recommends InterProtect 2000E primer. This primer is a two-part epoxy coating formulated to create an overlapping water barrier. This primer provides excellent adhesion to fiberglass, composite, metal, and wood. InterProtect 2000E is available in one-gallon or three-gallon sizes. If InterProtect primer is not available then “Primocon” or “Gelshield” primers can be used but they are not as effective.

Learn more: <https://www.interlux.com/en/us/boat-paint/primer/interprotect-2000e>

International Paints Micron Antifouling Paint

Micron is available in the USA and Asia-Pacific regions from International® paint dealers and ship handlers. Micron is not available in all countries. Similar Micron products such as Micron Extra, Micron Extra SPC, MicronCSC, Micron77, and Micron99 are alternative solutions although Micron66, Micron77 and Micron99 are the most effective. Micron77 may only be available from licensed applicators. Micron66 is for use in salt or brackish water and is only available in 1-gallon and 5-gallon cans.

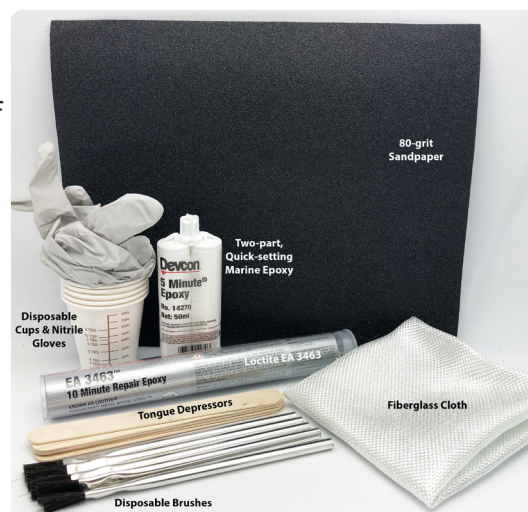


Learn more: <https://www.interlux.com/en/us/boat-paint/antifouling>

Store Locator: <https://www.interlux.com/en/us/paint-shops/stores-near-me#1,0,retailer,0,0,0,grid>

Wildlife Computers AZ-ATTCHKIT-000

Wildlife Computers AZ-ATTCHKIT-000 takes the guesswork out of gathering your turtle tagging supplies.



PAT TAG ANTIFOULING PROTOCOL – CONTINUED

Appendix 1



We know companies change formulations so in November 2019 we initiated another round of antifouling testing. We looked at Micron66, Lightspeed, Propspeed, an unnamed competitive product, and a placebo. We painted the tags according to the manufacturer's recommendations and secured it to a floating wharf in Northland, New Zealand.

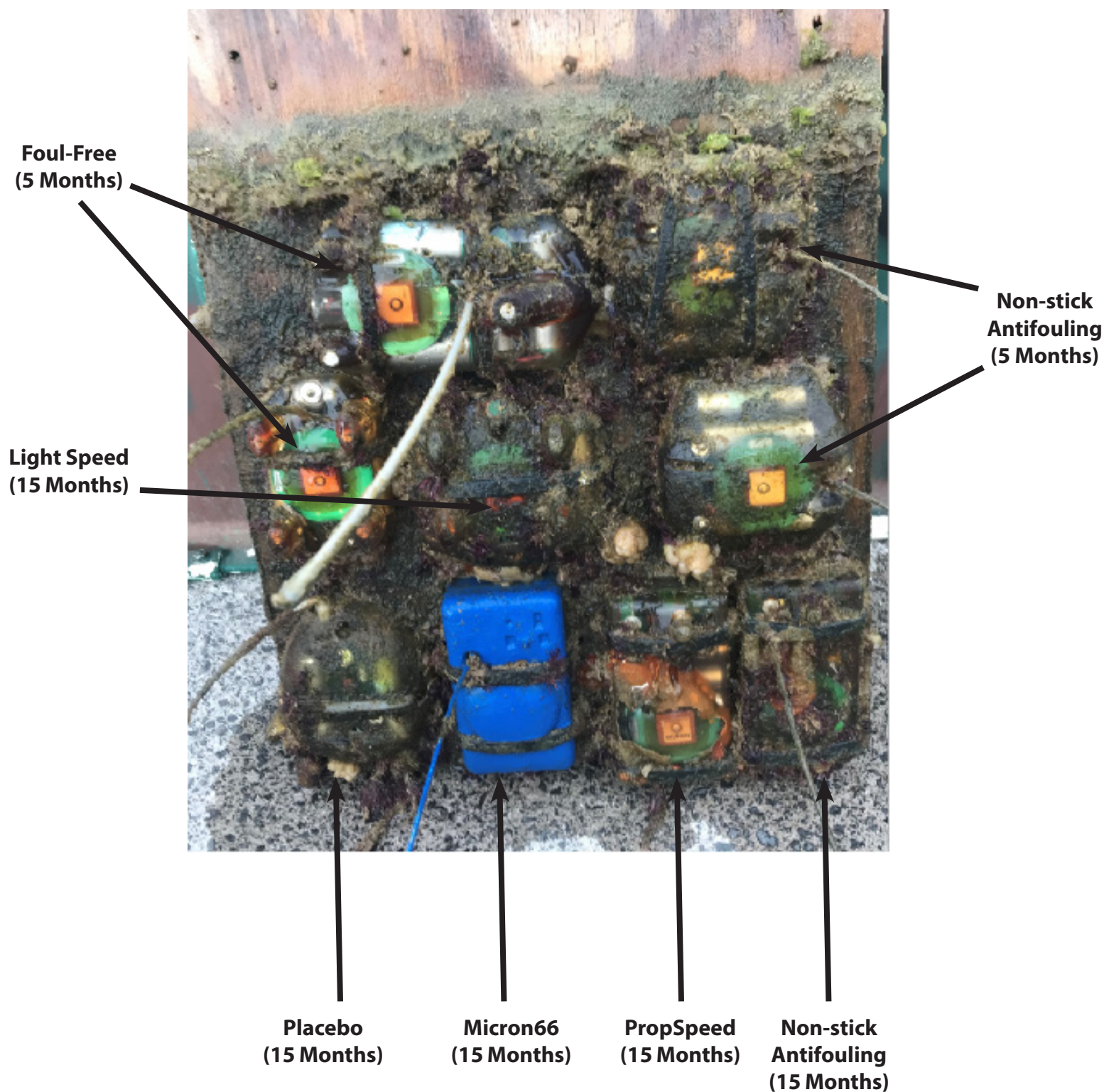
After 4.5 months, the blue tag, painted with Micron66, showed no evidence of fouling, with Propspeed coming in second. Micron66 has been used successfully for over two decades to limit biofouling on sea turtle satellite tracking tags.



PAT TAG ANTIFOULING PROTOCOL – CONTINUED

Appendix 1—Continued

In August 2020, we added four additional tags. The tags were attached to the floating dock in a tidal channel in Whangaroa Harbour, New Zealand. The image was taken after a light hose wash to remove mud.



PAT TAG ANTIFOULING PROTOCOL – CONTINUED

Contacting Wildlife Computers

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Members of the Wildlife Computers technical sales and support team are located in Redmond, WA, USA, and Havelock North, New Zealand, allowing us to cover promptly a wide range of time zones.

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For Asian Clients

While we welcome your direct correspondence, we recommend that you contact our colleague, Yong Huang, for assistance. Mr. Huang understands the special purchase processes for your countries, and will provide you with the best service for the best price. He also is fluent in Japanese, Chinese, and English.

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