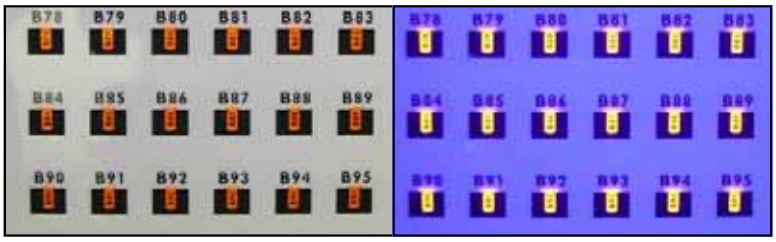
Instructions for NMT's New Visible Implant Alpha Tags

Visible Implant Alpha (VI Alpha) Tags are implanted beneath transparent or translucent tissues but remain externally visible. They are used for individual identification of fish, crustaceans, reptiles, and amphibians.

Northwest Marine Technology is pleased to introduce our new VI Alpha Tag! Our new VI Alpha Tags are:

- easy to load and inject;
- stable for long-term storage;
- backed by our 1 year guarantee and expert customer service;
- less expensive than the Soft VI Alpha Tags.

The new tags are available in one size (1.2 mm x 2.7 mm) with black letters on a fluorescent red, orange, yellow, or green background. Each color has 2,500 different alphanumeric codes. The visibility of the fluorescent colors and tag readability is enhanced with NMT's VI Light.



Above: VI Alpha Tags in ambient light (left) and illuminated by the VI Light (right). Below: NMT's VI Alpha Tag Injector.

Along with the tags, we redesigned the VI Alpha Tag Injector. The new needle is sharper than the previous version and can be inexpensively replaced. Existing injectors can be retrofitted with a new needle to accommodate the new tags. Most amphibians and reptiles can be tagged directly with the new injector, rather than having to make an initial cut with a scalpel.

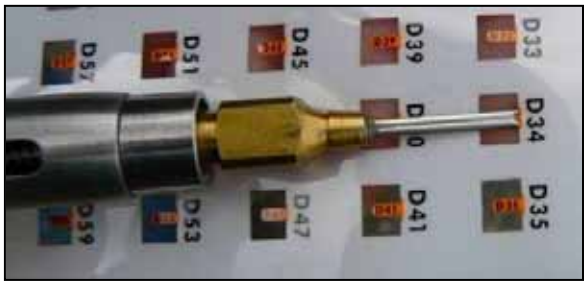
Before using VI Alpha Tags, we recommend that you review available reference material to learn about tagging sites and procedures for your species. Many references are listed on our website (www.nmt.us) and the NMT Biology staff is available to provide free tagging advice and we welcome your questions. Please contact us by email (biology@nmt.us) or telephone (360-596-9400). If references are lacking, experiments to evaluate suitable tag locations, retention rates, and tag visibility should precede application.

Clear or translucent tissue may be a suitable target, if there are no associated pores or cavities through which the tags might exit. The adipose eyelids of salmonids and some other fishes, as well as the spaces between fin rays are examples of potential targets. Other possible targets are along fin margins of flatfish, and the abdominal area of shrimps. In some cases, VI Alpha tags can be placed under pigmented skin where they are difficult to see in ambient light, but quite visible when fluoresced.

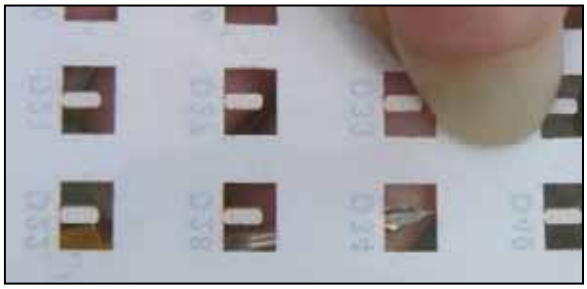
Loading New VI Alpha Tags into the Injector

We recommend the following method for loading the new VI Alpha Tags into the injector. You may find another method you prefer, but however you choose to do it, do not twist the tag off of the sheet. This will distort the tag at the end where it joins the sheet such that the tag will not fit completely into the injector and will not lay flat after injection.

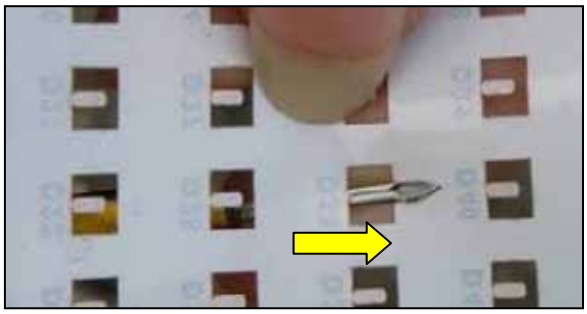
1. Wet the needle. This helps prevent the tag from sticking to the needle during injection.
2. With the bevel up, push a tag into the injector so that the injector is all the way to the top of the rectangular cutout.



3. Keeping the tag pushed all the way into the injector, fold the tag sheet back over the injector until it is flush with the injector, and the tag sheet is upside down. This bends the joint between the tag and the tag sheet.



4. Cut the tag by pushing the injector directly forward. Do not twist the injector to remove the tag! Twisting will distort the tag material at the joint with the sheet. The tag will not load completely into the injector, and will not lay flat after injection.



The tag is now ready to be injected.

Loose tags (tags that are detached from the sheet) can be difficult to load into the injector, particularly when they are wet. We recommend holding one end of the tag with tweezers and inserting it into the needle.

Injecting VI Alpha Tags

VI Alpha Tags cannot be pushed far into solid tissue without the aid of the injector needle. The sharp tip of the needle is used to cut a path for the tag.

The procedure is:

1. The needle cuts a space so the tip is slightly in front of where the far edge of the tag is desired.

2. The shim is advanced until the tag is in the desired location.

3. The tag is left in place as the needle is withdrawn, with the shim still out. Release the shim.

Tips for Successful Tagging

- Tag retention is often higher in larger animals – schedule tagging for when the study animals are as large as possible.
- Never tag animals that show signs of disease. The increased handling and stress from the tagging procedure will exacerbate the disease, increase mortality, and reduce the tag retention.
- The tagging area should be very well lit.
- When possible, set up your tagging station on land rather than in a boat. Tagging with VI Alpha requires a steady hand, and is much easier when you are still.
- The animal to be tagged should be well anesthetized or restrained; otherwise, they are likely to move when injected. This usually causes tearing and enlarging of the tag location, which will increase tag loss or preclude further tagging attempts. Many amphibians and reptiles can be restrained without anesthetic, while most fish require anesthetic.
- If you are new to tagging, we recommend practicing with animals that are not part of the study to improve tag retention. Practice first on larger specimens and work your way to smaller specimens. Sometimes, you may need to substitute taggers – not everyone is good at it.
- Implanted tags should remain just below the skin. Deep tags may become obscured, and if they penetrate into the skin, the tags are likely to be rejected.
- Whenever possible, a sample of tagged specimens should be retained for evaluation of tag loss and visibility for at least several weeks.
- Tag retention varies between species, among taggers, and with tag location. If the tagged animals are vigorously handled before the wound heals, the tags can be forced back out of the needle wound. Merely dropping the animal into water or subjecting it to heavy current could increase tag loss. Tagged animals should be handled with care for at least 10 days.
- In some instances, tag retention may be improved by using a surgical glue to close the needle wound. We recommend you consider using this only if retention is below an acceptable level without it as it does add another step to the tagging process.
- If you are tagging in the field, keep unused tags out of direct sunlight. Exposure will fade the fluorescence.
- If you are having any difficulties or have questions about tagging, contact NMT Biology (biology@nmt.us; 360-596-9400).

Tag Detection

Although VI Alpha Tags can usually be seen with the naked eye under normal daylight or interior lighting, their visibility can be enhanced with NMT's VI Light, particularly in the dark. When fluoresced, the tags can be seen (but not read) at considerable distance. Tags that are obscured by pigmentation and can't be seen in ambient light are often detected with the VI Light.

To maximize tag identification:

- Choose distinct colors for tagging.
- Tag in clear tissue whenever possible.
- Train your samplers – let them practice with the tag colors they will encounter.
- Fluoresce poor or obscured tags with the VI Light.
- Use the VI Alpha Color Standard to correctly identify colors if more than one tag color is being used.

Using the VI Alpha Color Standard

NMT's VI Alpha Color Standard presents the four VI Alpha colors on a clear card. This allows the sampler to place the color sample directly beside a tag for comparison, either under or over the tagged tissue.

Using the VI Light

Turn on the VI Light and verify that it does not need fresh batteries. The VI Light has a built in regulator to insure the beam intensity is constant throughout the life of the batteries. When the batteries are weak, the VI Light will flash to let you know it's time for a fresh set. Detailed instructions for the light are included in its package.

Shine the light directly on the area where the tag is, or is thought to be. If you are working in direct sunlight, you will need to fluoresce the tags in the shade – even the shade of your body may be enough. Very faint tags are best seen when fluoresced in darkness.

VI Alpha Injector

VI Alpha Injector parts.

Assembling the VI Alpha Injector

We recommend the injector be assembled as follows:

1. Insert the shim into the end screw with the bent end of the shim at the bottom of the screw, as shown in the picture.

2. Insert the end screw into the threaded end of the plunger and tighten it. The shim must rotate freely after tightening.

3. Slide the spring over the shim.

4. Insert the plunger with the shim and spring into the injector body. This is easiest if you first hold the plunger with the shim up, and once the end of the shim contacts the threaded end of the injector body, turn it upside down so that the shim hangs freely and slides into the guide in the end of the injector. Be gentle to avoid bending the shim. You can look through the slot in the side of the injector body to make sure the spring is properly in place.

   Put the set screw on the end of the allen wrench.

5. Rotate the plunger until the hole in the end screw aligns with the cutout in the side of the injector.

   Insert the set screw and tighten it until it is flush with the outside of the injector body.

6. Insert the shim into the round end of the needle hub. Slide the needle over the shim, being careful not to bend the shim.

   Screw the hub of the needle into the injector body.

Cleaning and Disinfecting the Injector

We recommend that you clean the injector, especially the needle and shim, at the end of each day. The most common problem with the injector is damage to the shim when it sticks in the needle because it has been stored without cleaning.

To clean the injector, disassemble all of the parts (you can follow the assembly instructions in reverse). Use freshwater and the cleaning rod to clean inside the needle (a squirt bottle is helpful for this). Gently wipe the other parts, and clean inside the injector body with a cotton swab or bottle brush. Dry all components before reassembling.

The possibility of spreading disease with tagging equipment concerns our customers and NMT. To disinfect, rinse the surfaces of the injectors with tap water to remove extraneous material. Place the equipment on a clean, disinfected surface and spray liberally with a chlorine solution, made from 1 part household bleach and 250 parts water (one ounce of bleach to 2 US gallons of water) or similar disinfecting solution. Let stand at least 10 minutes. Use water to thoroughly rinse away disinfectant. Dry all components before reassembling.

Replacing the Injector Needle and Shim

The needle can be sharpened using a knife sharpening stone. We recommend you do this under a microscope for best results. When the needle cannot be satisfactorily sharpened, replace the needle following the instructions above. The shim would usually be replaced at this time, and should be replaced any time it is bent.

Storing New VI Alpha Tags

NMT's new VI Alpha Tags have a much longer shelf life than the Soft VI Alpha Tags. To maximize shelf life, we recommend that unused VI Alpha Tags be stored in a cool, dark place. Exposure to sunlight will fade the fluorescence.

Continuing Projects

When the supplies in your kit have been exhausted, NMT offers additional tags, replacement needles, and shims for the injectors. Please see our catalog for more details.

Contents of VI Alpha Starter Kits

- 100 VI Alpha Tags
- 1 VI Alpha Tag Injector
- 1 Replacement Needle and Shim
- 1 VI Light
- 1 VI Alpha Color Standard
- Instructions

Contacts

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www.nmt.us

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