

Northwest Marine Technology



# Elastomer Tag Air Driven Injection System



Visible Implant Elastomer in Salmonid



Visible Implant Elastomer in Shrimp

Corporate Office: PO Box 427, Shaw Island, WA 98286  
Tel: (360) 468 - 3375 Fax (360) 468 - 3844  
Email: [office@nmt.us](mailto:office@nmt.us) or [techsupport@nmt.us](mailto:techsupport@nmt.us)  
Web Site: [www.nmt.us](http://www.nmt.us)

Biological Services Staff:  
Tel: (360) 596 - 9400  
Email: [biology@nmt.us](mailto:biology@nmt.us)

European Office: Dr. David Solomon, Foundry Farm, Kiln Lane, Redlynch  
Salisbury, Wilts SP5 2HT, Great Britain  
Tel: +011 - 44 - 1725 - 512523 Fax: +011 - 44 - 1725 - 512964  
Email: [david.solomon@nmt.us](mailto:david.solomon@nmt.us)

Asian Representative: Mr. Yong Huang, Tanaka Sanjiro Ltd.  
Tel: (360) 455 - 4731 Fax: (360) 455 - 4814  
Email: [yong.huang@nmt.us](mailto:yong.huang@nmt.us)

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## Introduction

The Visible Implant Fluorescent Elastomer Tagging system was developed to provide externally visible, internal tags for aquatic animals that are too small for other methods or where the need for unique codes is relatively limited. The Elastomer system utilizes a specially developed, medical grade, two part Elastomer material. This material is manufactured in several colors, some of which contains fluorescent coloring. The Elastomer is a liquid, which can be injected into tissue with a hypodermic needle. Within hours, this material cures into a pliable solid. The Elastomer functions to hold the pigments in a cohesive, well defined, biocompatible mark. This technology greatly improves on previous use of fluorescence and dyes.

Four colors of fluorescent materials are currently available; red, orange, green and yellow. Several non-fluorescent colors are also available including; blue, black, purple, brown and white.

The equipment used in the air driven Elastomer injector system was designed for production tagging for rates of up to 300-600 animals per hour.

### Contents of the Air Driven Injection System

The following materials are included when you purchase the Air Driven Injection system, materials for tags (also called marks) are sold separately:

- ◆ Instruction Manual.
- ◆ Injection Power Supply, Handpiece and all associated air hoses.
- ◆ 0.5 cc injecting syringes, aluminum plunger, hex wrench, and extra parts.
- ◆ A waterproof, blue light 7-LED flashlight.
- ◆ A pair of Amber glasses for use with flashlight and safety glasses.
- ◆ The number of tags that can be injected by the injector is controlled by a token. Tokens are supplied with tags purchased separately from the injector machine. Extra cycles are programmed on each token to allow for ordinary set up and waste.

**Shelf life: The unmixed Elastomer has a shelf life of at least 6 months at room temperature. This can be extended if the material is stored in a freezer or refrigerator**

**SAFETY WARNING:** The Air Driven Injection System is operated with compressed air. As with any air driven machinery, appropriate eye protection equipment, such as safety glasses, must be worn when operating this tagging equipment. A water separator/air filter must be used with the air compressor.

## Elastomer Connections:



## Connecting the Injector

The injector (Fig.1) as supplied is ready for immediate use. Assemble the injector as follows:

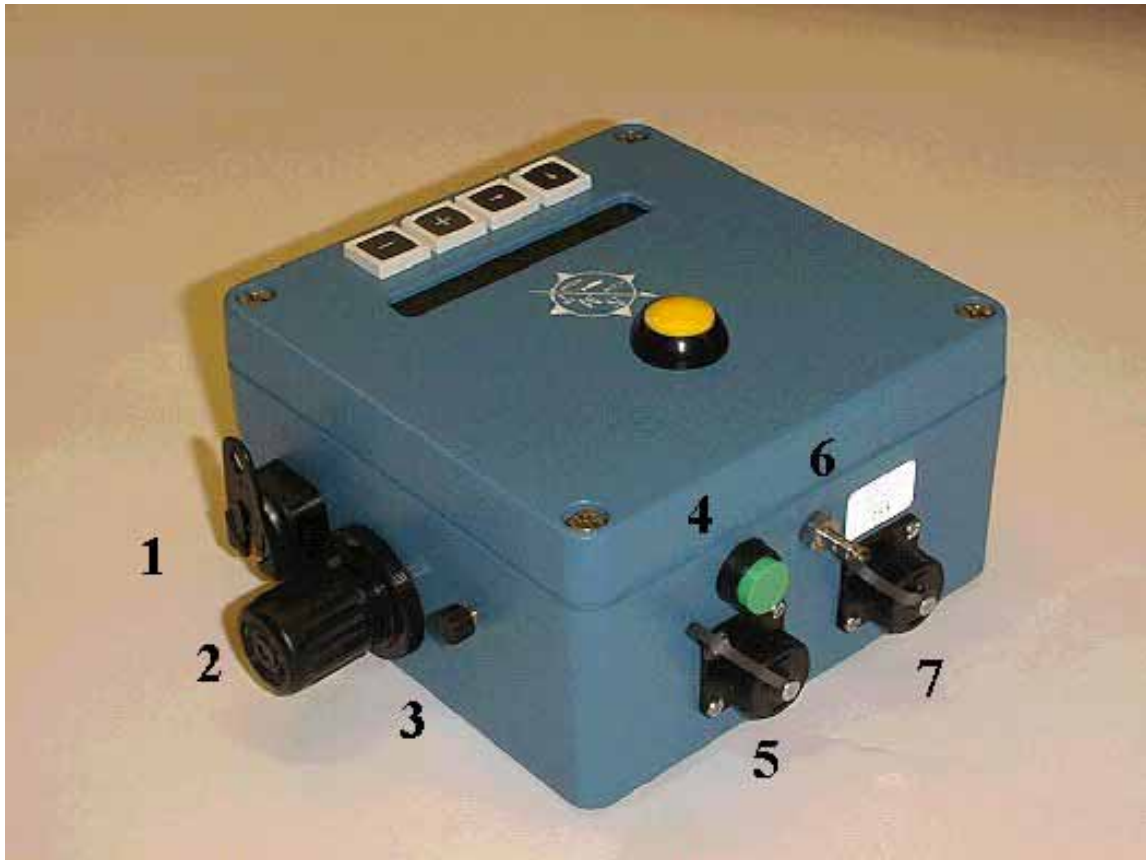
1. Plug the wall mounted low voltage power supply directly into a grounded 120 VAC power outlet and attach the black circular connector at the end of the power supply cord to the appropriate mating connector the injector (Fig. 1, #5)
2. Turn the air pressure regulator knob all the way counter clockwise. Plug the compressed air male quick connect fitting of the 10 ft. black rubber hose into the mating female connector installed on the air compressor, or into the multiport hose. If you are using your own compressor, it is recommended that it be equipped with at least a 2 gallon air tank with air delivery of 1.9 CFM @100 PSI and have a Hansen Series 3000 female quick connect fitting (contact NMT for specific connector details). Plug in the other end of the 10 foot hose (smaller diameter female quick connect fitting) into the male air input quick connector located in the center of the back panel of the injector box. **A water separator/air filter (Fig.1) must be used with this equipment.**

**SAFETY WARNING:** Always turn off the air injector box with the green ON/OFF button before assembling/disassembling the handpiece. It is possible to cause injury if you don't follow this safety warnings.

3. The loaded and completely assembled handpiece should be connected to the injector with the power OFF (directions for loading and assembling the handpiece follow). For initial familiarization with the injector, use an empty syringe (the handpiece should arrive with an empty syringe). Attach the circular black electrical connector on the end of the black cord from the handpiece to the finger switch connector on the injector (Fig.1, #7). Connect the male quick connect fitting on the end of the clear air hose from the hand piece to the female air quick connect fitting located on the front of the injector (Fig.2, #4).
4. Turn the machine ON by pressing the green ON/OFF button located on the back panel of injector (Fig.1, #4).

## FIGURE 1 : INJECTOR

1. Token port
2. Air pressure regulator knob
3. Drip control knob
4. On /off Button
5. Power connector
6. Air input quick connector
7. Finger switch connector



You are now ready to operate the machine. Each time the Activation button in the handpiece (Fig. 3, #5) is depressed a burst of air is supplied to the handpiece to inject Elastomer. The way to control this burst of air is explained in the following section.

## Operating the Injector

The control panel of the Elastomer injector is shown in Figure 2. The LED display comes on when the injector is turned on. It will initially display the **version** and **serial numbers** of the injector.

At the bottom of the control panel are four square buttons used to control the injector. The leftmost button, marked by an upward pointing arrow (↑), is the **scroll button** used to change to the next display in sequence. The others are used to set numerical values as described below.

### Batch

When you press the **scroll button** or cycle the injector, the display changes to show the count of injector cycles that have occurred so far in the present tagging run. The display looks like:

**Batch 14,332**

When the batch count is displayed, you can clear that count any time by pressing the + and - buttons simultaneously. You can decrement the batch count by one count by pressing the count debit button on the top of the injector.

### Credit

When you press the scroll button (↑) again, the display will change to show the amount of credit in the machine and in the token, provided one is mounted in its socket on the right hand panel of the machine. With a token in the machine a typical credit display might look like:

**(9,300) CR 156**

This indicates that the token holds 9,300 cycles of credit, and that there are 156 in the machine itself. In normal tagging, with a token inserted in its socket, the machine automatically draws 100 cycles of credit from the token whenever its own balance goes below 100. If there is no token in the socket for it to draw from, or if the token is exhausted, the display will begin to flash when its credit goes below 90, and it will stop operating when the credit goes to zero. Inserting a charged token will get it going again.

When purchasing Elastomer tags, you will receive enough Elastomer and a token carrying enough credits to cover the number of tags purchased, plus an allowance for setup and waste.

If you want to share the credit from one token among several machines, you can press the + button to transfer credit to the machine from the token in units of 100 for each press. Similarly, the – button transfers credit from the machine to the token. Holding either button down causes a continuous transfer. Once you have the desired amount of credit in the machine, you can remove the token and use it elsewhere.

For instance, if you were to transfer another 2000 cycles of credit to the machine the display would show:

**(7,300) CR 2,156**

To remove the token from the machine, grasp the black plastic tab of the token and pull up; disengaging it from under the spring clip. The display will change to show only the credit held in the injector. For example:

**Credit 2,156**

## **Pressure**

Pressing the scroll button next calls up a display of the pressure setting of the regulator, such as:

**Pressure 55**

This indicates that the pressure is 55 psi.

You can adjust the pressure by turning the large black knob on the right side of the case (Fig1). The pressure regulator is locked when pushed in. To unlock, pull out and rotate to adjust the pressure as desired. For most applications, 45-60 psi is recommended. This air pressure setting and the injection time together determine the amount of material injected.

## **Timer**

Pressing the scroll button again produces a display like:

**Timed: Yes .247**

This indicates that the injector is in the timed mode and set for .247 seconds. You can press the – button to turn the timed mode off and change the “Yes .247” to “No”. The + button would then turn it on again. When in timed mode, the air pressure goes on in a pulse of definite length with each press of the finger switch. When timed mode is off, the pressure remains on for however long you chose to depress the finger switch. **Note:** If the display reads “Timed: Yes 0”, the red LED will light, but no air will be delivered.

To change the time setting, press the digit-select button, which is marked with an arrow pointing left. The right most digit will begin to blink, indicating that it is ready to change, and you can increase or decrease it using the + and – buttons. Press ← again to blink and adjust the next digit, and so on. Although typical injection times are less than a second, four digits are available, allowing a maximum of 9.999 seconds. To go back and readjust a digit, press ← repeatedly until the desired digit blinks again.

The next display in the scrolling sequence is the total number of times the machine has cycled since it was built for instance:

**Total 1,247,843**

This display is of most interest to NMT when a machine comes in for service or repair.

## **Token**

If there is a token in the machine, then there is one final display in the scroll sequence that shows the token identification number. For example:

**Token 247**

Another press of the scroll button brings back the display of Batch count.

The scroll key steps through the entire set of displays as described above only if no other key is pressed. If you instead scroll to a display and then press one of the ←, + or – keys, the next press on the scroll button will skip the rest of the sequence and take you back to the display of **Batch** count.

You will not again see the initial display, version and serial number, until you next turn on the power.

## **Error Messages**

In addition to the normal messages, there are several more which may appear in response to error conditions. Among them are:

**? Credit Lost ?**

which indicates that the unit lost contact with the token in the middle of a credit transaction, and 100 units of credit may have been lost. To avoid the possible loss of credit, let the machine rest for at least a second before removing the token.

Another possible error message:

**Power Down**

This indicates that the power supply became weak or was briefly interrupted, but did not go completely off for long enough to reset the machine. This message will clear itself and the machine will return to service after several seconds. Turning the power off and then on will also clear this message.

The injector has a special memory unit, which preserves its settings and records when the power is off. These memories age slowly, and may eventually fail.

The message:

### **Memory Weak**

Indicates that the memory in the unit has given that early warning, but is still operating correctly. The message may not thereafter always appear when you turn on the machine, but once you have seen this message you should immediately contact NMT technicians on Shaw Island.

If the machine does not come back for service soon enough the memory may actually fail, and the machine will not operate.  
The message:

### **Memory Failed**

Indicates that this has happened and the machine will need repair.

## **Debit Button**

In addition to the four square buttons on the control panel, there is also a round yellow button (Fig.1, #3). This is used to decrement the total number of batch counts by one each time it is pressed. This function is a convenient way for the machine operator to maintain an accurate count of the actual number of animals tagged, should it be necessary to re-tag an animal for some reason.

## **Front Panel LED**

The red LED on the front of the machine turns on each time the machine is activated using the finger switch. It stays on a minimum of ¼ second, but will stay on as long as air is moving through the injector.

## **Drip Control Knob**

For low viscosity Elastomer, it is possible to minimize between cycle dripping at the needle by providing a slight vacuum to the handpiece between injection cycles. The knob for controlling this vacuum is located at the right side (Fig.1,#3) panel of the injector near the back. The vacuum is turned off when the knob is turned fully clockwise. When the knob is turned counter clockwise vacuum is increased. This is easily confirmed by a continuous air hissing sound associated with this function.

## **Blow Out Plugs**

On the bottom of the injector are two white plugs. These plugs allow the injector to breathe and also prevent the injector box from building up pressure should an internal component fail. When properly installed, both plugs should be flush with the bottom of the injector case. If either plug is blown out of its hole, water can enter the case and damage the electronics. Please inspect from time to time and if anything unusual is noted, please call NMT technicians for instructions.

## Figure2: Control and front panel

### Control panel

1. Count debit button
2. Display window
3. Operation control buttons

### Front panel

4. Handpiece air quick connect



## Disinfection

The possibility of spreading animal diseases between culture facilities and watersheds is of concern to both the customer and Northwest Marine Technology. Although NMT is unaware of a case of this tagging equipment, moved between locations, serving as a “vector” in spreading a disease, the consequences of such occurrences call for stringent preventative measures. Disinfecting procedures should also be implemented between groups of animals, within a facility. **Tagging should not be conducted during a severe outbreak of disease.**

**Prior to the use of any disinfectant, read and understand the Material Safety Data Sheets (MSDS) for each product.** Chlorine solutions are recommended for use as disinfectants on the Air Driven Injector System. Commonly used sources of chlorine are calcium hypochlorite (HTT) and solutions of sodium hypochlorite (‘bleach’). Household bleach comes in a concentration of about 5% so that to achieve the desired concentration one would dilute an ounce of bleach in each two gallons of water (a ratio of 1:250). Stronger solutions may be available at animal rearing facilities so that a lesser proportion of material would be required to achieve the desired concentration (200ppm) of active ingredient. A promising alternative is a solution of chlorine dioxide (sold under a variety of trade names including *Oxine* [CH20 International]). This material appears to be far less corrosive and less hazardous than the previously mentioned chlorine solutions.

Calcium hypochlorite and sodium hypochlorite solutions are highly toxic to animals but can be neutralized by adding sodium thiosulfate or sodium sulfite to the solution. As a “rule of thumb”, if a five percent solution of these chlorine compounds is used as a disinfectant, they can be neutralized by adding an equal weight of either chemical. For example, one ounce of 5% bleach added to two gallons of water would be neutralized by one ounce (dry weight) of either neutralizing agent. As an added precaution, “neutralized” disinfectant should not be poured directly into water containing animals.

**Before using any disinfectant, be sure you have and use the proper safety equipment as prescribed by the MSDS.**

To disinfect the Air Driven Injector System simply spray or wipe all surfaces (including air hoses and the disassembled handpiece) thoroughly with the disinfectant. Let sit for 15 minutes (not longer), spray or wipe down with the neutralizing agent, and then carefully wipe down with tap water. Spray with isopropyl alcohol and wipe dry.

# Tagging the Animals

The air driven injection system is quite simple to use requiring 2 basic steps:

- 1.) mixing, dispensing and loading of the two part Elastomer
- 2.) injecting the mixture into the animal to form the tag.

## Mixing/Loading

Remove the jar of curing agent from the package and let it sit upright for a minimum of 5 minutes to allow all the material to flow to the bottom of the jar. Remove the cap from the curing agent and slowly and carefully dispense all the colored Elastomer from the 6cc syringe into the jar. Mix thoroughly with the stir stick. Stir and scrape the jar walls and bottom for one full minute to ensure complete mixing. Remove the plunger from the 10cc syringe and carefully pour the Elastomer into the syringe and replace the plunger.

Carefully remove the white and orange caps from a 0.5cc injecting syringe. The tip of the 10cc syringe will fit tightly into the opening in the injecting syringe. Hold the injecting syringe almost horizontal and load the syringe as close to the opening (opposite the needle end) as possible to facilitate removal of air. Fill the injecting syringe about one half full. Fill as many injecting syringes as you will use in the amount of time you have before the material starts to cure (at room temperature, the Elastomer should have 2 hours working time). Working time is slightly longer when cooler and shorter when warmer. More than one series of injecting syringes can be filled from a single mixing if the mixed material is kept on ice or refrigerated in the 10cc syringe. NOTE: Do not store material in either the injecting or the 10cc syringes for more than 48 hours as they will become contaminated and the material will not cure.

The loaded injection syringe is now ready to be loaded into the handpiece.

## Disassembling/Assembling the Handpiece

**SAFETY WARNING:** Always turn off the power to the injector when working with the handpiece. It is easy to trigger the air pressure accidentally during loading, and if the needle is loose, it may fly off like a dart. Once the syringe is firmly and correctly installed in the handpiece it can not come loose.

The handpiece (Fig. 3) comes assembled and loaded with an empty 0.5cc syringe. Disassemble the handpiece by loosening (do not remove) the set screw in the finger switch body and using the hex wrench provided. Slide the aluminum sleeve out from the finger switch body and slide the black retainer and syringe from the aluminum sleeve. The black retainer splits into two pieces and the syringe can be removed and replaced with a freshly filled injection syringe. Be sure to remove the aluminum plunger from the old syringe, clean, and insert into the new syringe. When loading the plunger into the injection syringe gently push all the Elastomer material to the tip of the needle being careful to remove all excess air.

When reassembling the handpiece the bevel of the needle can be oriented to a position that the user finds most suitable for their particular style or type of tagging. Fit the black retainer pieces around the injection syringe and slide into the aluminum sleeve. Make sure the set screw relief in the black retainer is aligned with the set screw hole in the aluminum sleeve. Insert the aluminum sleeve into the finger switch body, again making sure that set screw hole aligns with the set screw (use line on the aluminum sleeve as a guide). Tighten the set screw (do not over tighten). Attach the quick connect fitting on the clear air hose from the handpiece to the female fitting on the front of the injector, and the circular black electrical connector from the handpiece to the matching connector on the injector (Fig.1, #7). Turn on the injector and dial the air pressure to 20 psi and touch the finger switch several times to make the aluminum plunger set properly. Adjust the pressure to your normal tagging pressure (45-60psi).

You are now ready to inject Elastomer into animals. Each time the activation button is pushed, Elastomer will be dispensed under pressure from the tip of the hypodermic needle in a manner set by the control settings.

## **Injection**

The size of the tag can vary with the size of the animal, the location of the tag, and the visibility desired. The system was designed to achieve a mark similar in volume to the Northwest Marine Technology's micro coded wire tags (.05microliter).

Experimentation should be done with your specimens to determine the best target for the mark. Almost any clear or semitransparent tissue is suitable providing there are no vessels or pores through which the tag might be lost. The adipose eyelid of salmonids and other fishes is one suitable target, as are the spaces between soft fin rays of various fishes. The fin ray spaces could also provide a coding system with each space denoting a code number. Other possible target areas are along fin margins of flatfish, and the abdominal area of shrimps.

Once the material has cured and the injection hole has healed, it is expected that the tags will be retained for the life of the animal. However, if the specimens are vigorously handled too soon after tagging, before the material cures or before the injection hole heals, the material can be forced back out the injection hole. Animals that are being marked in the wild can be released as soon as practical.

*Care should be taken to avoid the material trailing from the injection hole and curing outside. This could cause a thread of material to extend through the skin, preventing healing and loss of part or all of the tag. This problem is avoided by ending the flow of material before withdrawing the needle and lightly wiping the tagging hole.*

### Figure 3: Handpiece

- |                      |                       |
|----------------------|-----------------------|
| 1. Aluminum Plunger  | 5. Activation Button  |
| 2. Black Retainer    | 6. Finger Switch Body |
| 3. Injection Syringe | 7. Setscrew           |
| 4. Black Retainer    | 8. Aluminum Sleeve    |



Long term retention of the Elastomer tag should be ninety-percent or better if done properly.

Once the unused Elastomer begins to cure in the syringe, it should be replaced with a fresh mixture in a new injection syringe. Please dispose of the used materials properly. Particular attention should be paid to the disposal of needles to prevent a needle stick injury. A needle safe container is provided with the purchase of an Air Injection System.

## Tag Recovery

Although the Elastomer tags can usually be easily seen with the naked eye with normal daylight or interior lighting, their visibility can be greatly enhanced with special illumination and viewing conditions. Tags can be illuminated with bright blue light and viewed through a filter that allows only the green, yellow, orange or red fluorescence to reach your eyes. This will maximize the intensity of tag fluorescence while minimizing the intensity of light reflected from everything else, making the greatest contrast between tag material and surrounding tissue. The waterproof flashlight and yellow glasses are provided for this purpose.

**Caution:** The systems developed and sold prior to the year 2001 included a dive light that was fitted with a blue filter lens. Systems sold after 2001 include a 7-LED flashlight. If your system has the older style light it is important that you read the following. As these flashlight batteries wear down, the portion of the spectrum needed for fluorescence is reduced. This can give the tags the appearance of fading. When the batteries are significantly discharged, the blue light can appear to be bright but its ability to fluoresce can be less than 50% of the effectiveness at full power. This causes reduced detection particularly when tags are obscured by pigment. Generally, batteries should be replaced after about one hour's use. When replacing the batteries or bulb in the flashlight, be careful not to damage the blue filter lens and *do not tighten the cap too tightly*. To tighten the cap, turn the light switch on, screw the cap on until the light goes on and then tighten an additional 1/8<sup>th</sup> turn (45 degrees) and no more. These older style dive type flashlights are now discontinued. Spare parts are still available.

Another approach is to measure detectability using the silicon "reference" fish included in your kit. The color spots in the reference fish are easily seen on the surface of the fish. When the fish is turned over, the spots are quite obscure, similar to elastomer located under considerable pigment. If you put on the amber filter glasses, and shine the flashlight at the obscured side of the reference fish the spots should be visible. If they are not readily visible this is an indication that the batteries should be replaced. The new 7-LED flashlight should not have the same limitations as the older style light. The LED technology makes this a superior light source.

**NOTE:** NMT will exchange your old dive light for a new LED light without charge. Please call for details of this offer.

The filtering system of blue light, when used with the amber glasses can be adapted to different tag recovery regimes. NMT can provide amber filter material for scuba goggles, blue filtering material for hatcheries and supply information about how to obtain other types of lights for fluorescing tags.

Regular ultra violet light will fluoresce these lights under most circumstances, but it is considerably less efficient than the blue light and amber glasses where tags are obscured.

Please save the shipping carton that your air injector was received in for reshipping back to NMT.

The air driven injector system, as supplied, should give many hours of trouble free operation. Should you have any problems or suggestions for improved performance, please contact Northwest Marine Technology. Comments are always sought and appreciated.

# MATERIAL SAFETY DATA SHEET

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NMT ELASTOMER SYSTEM  
MANUFACTURER: NORTHWEST MARINE TECHNOLOGY, INC. SHAW ISLAND, WA. 98286  
EMERGENCY TELEPHONE NUMBER (360) 468-3375 FAX: (360) 468-3844  
DATE PREPARED: OCTOBER 01, 1992  
DATE REVISED JUNE 15, 1998

HAZARDOUS RATING: HEALTH 1, FIRE 1, REACTIVITY 0

## SECTION 1-- PRODUCT IDENTIFICATION

TRADENAME: NMT ELASTOMER SYSTEM  
OTHER PRODUCT INFORMATION: THIS INFORMATION APPLIES TO THE CURING AGENT OF THE TWO-PART KIT. HANDLE FRESHLY MIXED ELASTOMER MATERIAL AS RECOMMENDED FOR THE CURING AGENT. AFTER CURING, THE PRODUCT IS NOT HAZARDOUS. ELASTOMER MATERIAL IS AVAILABLE IN VARIOUS COLORS. ALL COLORS ARE EQUALLY NON HAZARDOUS

## SECTION 2-- HAZARDOUS INGREDIANTS

INGREDIENTS:	WEIGHT:	CAS NO
DIMETHYL, METHYL HYDROGEN POLYSILOXOINE COPOLYMER	20% OR LESS	068037592

## SECTION 3-- PHYSICAL PROPERTIES

SPECIFIC GRAVITY (AT 77 DEG F) 0.972  
VAPOR PRESSURE: LESS THAN 5 HH  
PERCENT VOLATILE BY WEIGHT (%): LESS THAN 5  
SOLUBILITY IN WATER (%): LESS THAN 0.1  
ODOR, APPEARANCE, COLOR: LITTLE ODOR, LIQUID, SOME COLOR

## SECTION 4-- FIRE & EXPLOSION HAZARDS

USUAL FIRE AND EXPLOSION HAZARDS: NONE KNOWN  
EXTINGUISHING MEDIA: WATER NO, WATER FOG YES, CO2 YES, DRY CHEMICAL YES, FOAM YES, OTHER NO  
SPECIAL FIRE FIGHTING PROCEDURE: SELF CONTAINED BREATHING APARATUS AND PROTECTIVE CLOTHING SHOULD BE WORN IN FIGHTING FIRES INVOLVING CHEMICALS

## SECTION 5-- EMERGENCY & FIRST AID PROCEDURES

EYES: FLUSH WITH WATER.  
SKIN: WIPE OFF AND FLUSH WITH WATER  
INHALATION: NO FIRST AID SHOULD BE NEEDED  
ORAL: NO FIRST AID SHOULD BE NEEDED.

## SECTION 6-- SYMPTOMS OF ACUTE OVEREXPOSURE

EYE: DIRECT CONTACT MAY CAUSE TEMPORARY DISCOMFORT WITH MILD REDNESS AND DRYNESS SIMILAR TO WINDBURN.  
SKIN: A SINGLE PROLONGED EXPOSURE ( 24 TO 48 HOURS) CAUSES NO KNOWN ADVERSE EFFECT.  
INHALATION: NO IRRITATION TO EYES AND RESPIRATORY PASSAGES. NO INJURY IS LIKELY FROM RELATIVELY SHORT EXPOSURE OF LESS THAN 8 HOURS.  
ORAL: SMALL AMOUNTS TRANSFERRED TO THE MOUTH BY FINGERS DURING USE, ETC., SHOULD NOT INJURE. SWALLOWING LARGE AMOUNTS MAY CAUSE DIGESTIVE DISCOMFORT.

# MATERIAL SAFETY DATA SHEET

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## **SECTION 7-- REACTIVE DATA**

STABILITY: STABLE

INCOMPATIBILITY: OXIDIZING MATERIAL CAN CAUSE A REACTION.

CONDITIONS TO AVOID: ALCOHOLS, ACIDIC OR BASIC MATERIALS, AND MANY METALS OR METALIC COMPOUNDS, WHEN IN CONTACT WITH PRODUCT, LIBERATE FLAMABLE HYDROGEN GAS, WHICH CAN FORM EXPLOSIVE MIXTURES IN AIR.

HAZARDOUS DECOMPOSITION PRODUCTS: SILICON DIOXIDE, CARBON DIOXIDE, AND TRACES OF INCOMPLETELY BURNED CARBON PRODUCTS.

## **SECTION 8-- ROUTINE HANDLING PRECAUTIONS**

PROTECTIVE EQUIPMENT:

EYES: USE PROPER PROTECTION---SAFETY GLASSES, AS A MINIMUM.

SKIN: WASHING AT MEALTIME AND END OF SHIFT IS ADEQUATE.

INHALATION: NO RESPIRATORY PROTECTION SHOULD BE NEEDED.

VENTILATION LOCAL EXHAUST: NONE SHOULD BE NEEDED.

VENTILATION MECHANICAL (GENERAL): RECOMMENDED.

STORING: STORE BELOW 90F/32C.

## **SECTION 9-- SPILL, LEAK, DISPOSAL PROCEDURES**

USE ABSORBENT MATERIAL TO COLLECT AND CONTAIN FOR SALVAGE DISPOSAL.

EYES: USE PROPER PROTECTION---SAFETY GLASSES, AS A MINIMUM.

SKIN: WASHING AT MEALTIME AND END OF SHIFT IS ADEQUATE.

INHALATION: NO RESPIRATORY PROTECTION SHOULD BE NEEDED.

WASTE DISPOSAL METHOD: ALL LOCAL, STATE AND FEDERAL REGULATIONS CONCERNING HEALTH AND POLLUTION SHOULD BE REVIEWED TO DETERMINE APPROVED DISPOSAL PROCEDURES.

REPORTING: PRODUCT CONTAINS NO INGREDIENT SUBJECT TO D.O.T. OR E.P.A. CERCLA/SARA ENVIRONMENTAL RELEASE REPORTING REGULATIONS. PRODUCT IS AN OIL IN THE CONTEXT OF THE U.S. CLEAN WATER ACT.

SPILLS TO U.S. SURFACE WATERS, OR TO WATERCOURSE OR SEWER LEADING TO U.S. SURFACE WATERS THAT CAUSE A VISABLE SHEEN, MUST BE REPORTED TO THE NATIONAL RESPONSE CENTER.

## **SECTION 10—COMMENTS**

THESE DATA ARE OFFERED IN GOOD FAITH AS TYPICAL VALUES AND NOT AS A PRODUCT SPECIFICATION. NO WARRANTY, EITHER EXPRESSED OR IMPLIED, IS HEREBY MADE. THE RECOMMENDED INDUSTRIAL HYGENE AND SAFE HANDLING PROCEDURES ARE BELIEVED TO BE GENERALLY APPLICABLE IN THE CONTEXT OF THE INTENDED USE.