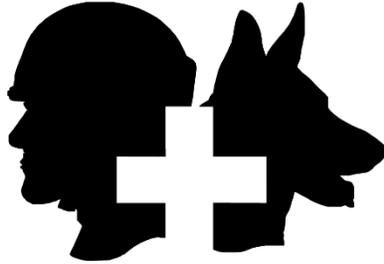


TRAUMA F/X[®]

Improving Survivability



K9 DIESEL ADVANCED CANINE MEDICAL TRAINER

K9 Diesel: Advanced Canine Medical Trainer User Guide

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TRAUMA F/X[®]

Improving Survivability

TraumaFX®

K9 Diesel: Advanced Canine Medical Trainer

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Chapter 1: Introduction

About K9 Diesel: Advanced Canine Medical Trainer

K9 Diesel is a tetherless veterinary training manikin that delivers powerfully realistic simulations of injuries commonly suffered by service canines. Jointly developed by TraumaFX Solutions and the Department of Defense (DoD) Special Operations Command (SOCOM), K9 Diesel employs state-of-the-art special effects materials and technologies to deliver incredibly realistic visual and tactile stimuli with lifelike response to treatment. K9 Diesel features removable, swappable limbs with amputation and fracture wounds. The amputations – front and rear – bleed arterially and require direct or circumferential pressure to the wound or nearby artery to stop bleeding, and there are bilateral axillary wounds requiring wound packing. Rounding out K9 Diesel’s already robust features is the ability to perform oral airway interventions and intubation, Cardiopulmonary Resuscitation (CPR), tracheostomy, bilateral cephalic vein intravenous (IV) insertion, bilateral needle decompression with air release, bilateral tibial and humeral intraosseous (I/O) infusion, gastric dilatation volvulus (GDV) training site, removable facial, abdominal, and chest wounds, bilateral femoral pulses, and extremity bandage or suture training. Extraordinary realism provides desensitization to traumatic injuries allowing Military Working Dog handlers, veterinarians, and other first responders to perform life-saving tasks more efficiently and effectively in the field, leading to significant improvement in the treatment of injuries received by Military Working Dogs (MWDs).

K9 Diesel is designed for rugged use in realistic training environments. To ensure proper operation, do not subject the K9 Diesel to unnecessarily harsh treatment. Care for K9 Diesel as you would a live canine patient. Also, careful preventive maintenance and frequent after-use inspection is essential to ensure the service life of your veterinary trainer(s). Please review **Chapter 5: After Use Care** which outlines the standard preventive maintenance required for K9 Diesel.



Item Checklist

The components listed below (Figure 1) are required to set up and operate your K9 Diesel unit and come standard with each K9 Diesel purchase. Optional components may or may not be included – check your order or packing lists to determine if any optional components were purchased.

Standard Components

K9 Diesel unit



Radio Control (RC) Transmitter x 1



One Gallon Blood Filling System x 1



1 Gallon Blood Mix Packets x 10



1 Pint Blood Paste (Coagulated)



18v Li-ion Batteries x 2



Li-ion Battery Charger for 18V Batteries x 1



INTRODUCTION

Li-ion Battery Charger for Remote Control Batteries



Li-ion RC Batteries x 2



Bleeding Tracheostomy Skin Plug Kit x 1



Single Use Tracheostomy Skin Plug x 10



Multiple Use Tracheostomy Skin Plug



Trachea x 10



Needle Thoracocentesis Skin Plug x 2



Needle Thoracocentesis Pressure Seal



Intraosseous (I/O) Bone Plug - 4 sets of 5



Cephalic Vein x 10



Blood Fill/Extraction System



Drying Rack



Left Rear Leg Amputation



Bullet Wound



Burned Leg Sock



Airway Lubricant (8oz)



Filter Wrench



Figure 1

Other standard components not shown

- Blood stir sticks x 2
- O-rings (pack of 10)
- Tibial/Humeral I/O Drain Tube
- Fur sewing repair kit
- Replacement injured paw

System Overview

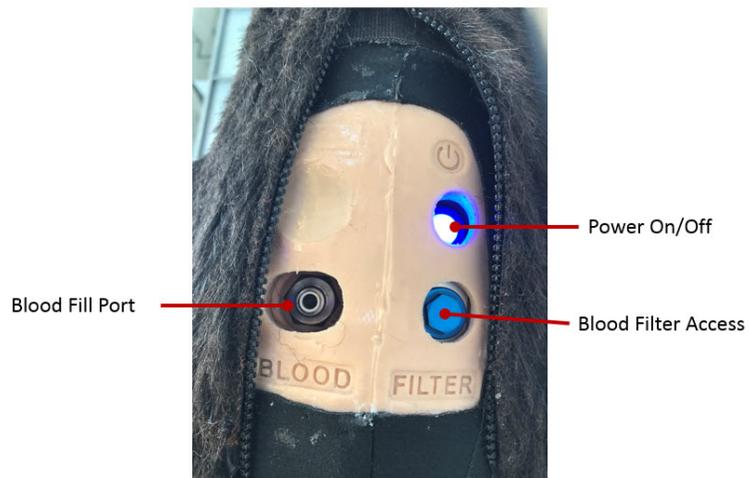
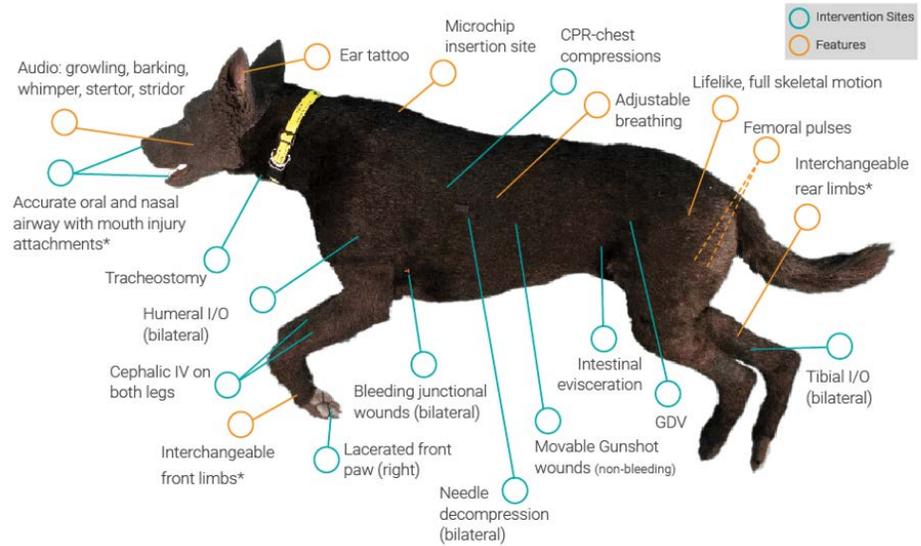


Figure 2

***Access the control panel by unzipping the fur located along K9 Diesel's spine.

Special Notes and Cautions

Read all TraumaFX® and Third-Party user instructions and manuals before attempting to assemble, install or operate K9 Diesel or accessories.



Latex Allergy Alert

The tubing used in K9 Diesel’s IV system is surgical quality and contains latex. This tubing is only exposed during the replacement of the IV tubing.

Individuals with latex allergies or sensitivities should use proper precautions before operating, treating, or attempting to repair the unit.



After Use Care

K9 Diesel is designed for rugged use in realistic training environments. To keep K9 Diesel working optimally, careful preventive maintenance and frequent after-use inspection will extend the service life of K9 Diesel, and is required under the terms of the limited warranty. Please review ***Chapter 5: After Use Care*** which details the tasks to perform at the end of every training session.



Water Resistance and Cleanup

DO NOT USE PRESSURIZED WATER OR SUBMERGE K9 DIESEL UNDER WATER. REMOVE BATTERIES BEFORE CLEAN UP TO AVOID ELECTRIC SHOCK!

K9 Diesel is not water resistant nor waterproof. Avoid direct water contact with the battery compartment. Wash K9 Diesel’s fur carefully after each use with clean water only. K9 Diesel can be washed off with a soft wet cloth or sponge; however, vigorous scrubbing of the legs will remove leg hair. Simulated blood should be washed out of clothing as soon as possible preferably within 24 hours to avoid staining; pre-treatment of stains and vigorous cleaning will usually remove stains caused by the simulated blood.



Possible Reaction to Synthetic Blood Mix

The chemical components that comprise TraumaFX’s organic dye blood mix may cause skin and eye irritation for some users. Avoid ingestion or inhalation. If eye contact occurs, check for and remove any contact lenses, immediately flush eyes with water for at least 15 minutes; cold water may be used. Get medical attention if irritation occurs. Should skin contact occur and the skin becomes irritated, wash with soap and water. Get medical attention if irritation persists. If blood powder is accidentally inhaled, remove victim to fresh air. If breathing difficulties occur, seek medical attention immediately. If blood mix is ingested (powder or liquid form), DO NOT induce vomiting unless directed to do so by a physician. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt, or waistband. Immediately get medical attention.



Do Not Over Lubricate

K9 Diesel’s throat is pre-lubricated, but additional lubrication is necessary on a regular basis as required to simulate realistic throat moisture and to reduce friction and allow for easier intubation. It also serves to extend the life of the throat. An 8 oz. bottle of silicone lubricant is provided for this purpose. Use two or three sprays only – do not over lubricate! Over lubrication will make intubation more difficult. It is recommended to also lightly spray lubricant on the ET tubes and other intubation devices for easier insertion into the throat.



Do Not Ingest Lubricant

The silicone based intubation lubricant is not for human consumption.



System Weight

K9 Diesel is designed to replicate the weight and feel of a live canine patient. To prevent injury, use caution and proper procedures when lifting or carrying the manikin or cases. To lift K9 Diesel, bend at the knees and grasp with both arms under the torso – one arm behind the forelimbs and the other in front of the hind limbs – before lifting.



Simulated Blood

Only use TraumaFX®-provided simulated blood and blood mixes in K9 Diesel.

Use of other liquids or the addition of any substance, including detergents, to the blood mix may damage internal components and will void the manufacturer’s limited warranty.

To preserve the life of the simulated blood paste, please store in a dark, cool location.



Radio Control

The Radio Control (RC) system used to operate K9 Diesel has an extended range (see technical specifications) and can be used indoors or outdoors. Note that indoor range is subject to building design and construction materials. Test system operations whenever setting up in a new location or moving to a different area of a building.



Third Party User Manuals

K9 Diesel uses third-party commercially available equipment. Where such equipment is provided, the associated user manuals and any pertinent documentation are provided as well.



Storage

The K9 Diesel unit, accessories, and fluids should be stored in a cool, dry location.



Compliance

If K9 Diesel is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Chapter 2: K9 Diesel Features

This section describes the highly realistic features of K9 Diesel that contribute to the unique training experience K9 Diesel provides. K9 Diesel contains the following features:

- Simulated nasal airway
- Simulated oral airway with teeth and tongue for intubation
- Simulated tracheostomy site
- Simulated bilateral cephalic intravenous (IV) sites with flash cue
- Simulated bilateral needle decompression sites featuring air release, with replaceable, multiple use skin plugs
- Simulated CPR site
- Simulated bilateral infusible tibial intraosseous (I/O) sites
- Simulated bilateral infusible humeral intraosseous (I/O) sites
- Removable, interchangeable limbs
- Simulated front and rear leg amputations with arterial bleeding
- Simulated front and rear leg fractures
- Simulated axillary wounds with arterial bleeding requiring wound packing
- Removable facial, abdominal and chest injuries
- Simulated gastric distension volvulus (GDV) site with replaceable, multi-use air bladder
- Simulated Femoral pulse points
- Simulated paw injury for bandage or suture training
- Ear tattoo
- Realistic head complete with movable jaw
- Realistic canine body made of lifelike, wrap-around silicone skin with self-healing intervention sites.
- Articulating front and back legs that provide full range of motion.
- Microchip-compatible

Ruggedized, Realistic Synthetic Fur

The outer fur of K9 Diesel is designed to provide the “look-and-feel” of real fur. The fur is rugged, but must be maintained regularly to ensure longevity. K9 Diesel’s simulated under skin is made of a proprietary silicone compound.

Hemostatic Wound

K9 Diesel offers a hemostatic wound, incorporating advanced sensor technology to provide the trainee with immediate feedback of their efforts. The wound at the axillary junction is a pressure-sensitive wound with sensor that identifies if the right amount of pressure is being applied to the wound. If the trainee exceeds the minimum pressure, the bleeding will occlude, and the Remote Control will signal success. However, if the pressure is not sufficient K9 Diesel will continue to bleed. This is valuable measured feedback that can be shared with the trainee.

Cautions and Care

K9 Diesel unit is water resistant, but not water proof. When washing K9 Diesel, use only water. **DO NOT USE FORCED AIR OR A HAIR DRYER** to dry the fur. Let the fur air dry. A drying rack is included with K9 Diesel.

When washing, use caution to prevent water from entering the mechanical and electrical areas of the unit around the pelvis. Always use gentle pressure and avoid vigorous scrubbing of the fur as this will cause damage.

Often in live training scenarios, K9 Diesel's simulated blood may come into contact with a user's clothes. To reduce the risk of staining, simulated blood should be treated with detergent and be washed out of clothes within 24 hours of exposure.

Materials

The internal structure of K9 Diesel is composed of a combination of rugged urethane polymers along with stainless steel and aluminum components, and layered with realistic silicone-based skin and fur. This construction results in a high-fidelity look and feel with exceptional durability that allows K9 Diesel to be carried or dragged on many surfaces such as outdoors or various flooring commonly found in buildings. Though highly ruggedized, do not subject K9 Diesel to severely damaging conditions; users must treat K9 Diesel as they would care for a canine patient. Failure to do so can void the K9 Diesel limited warranty.

K9 Diesel's fur requires cleaning with water only. This simulated fur covers the entire unit except for the head.

Bleeding System



ALLERGY WARNING: The tubing used in the K9 Diesel IV system is surgical quality and contains latex. . This tubing is only exposed during the replacement of the IV tubing. Individuals with latex allergies or sensitivities should use proper precautions before operating the unit.

K9 Diesel provides realistic physiological response to treatment. During training exercises, proper pressure applied will occlude bleeding. The operator does not need to “judge” when enough pressure is applied and manually discontinue the blood flow.

Unless stopped by the instructor, users should continue treatment until the bleeding is stopped through the use of proper technique, or the unit bleeds out.

The pumping system simulates arterial blood flow, and will exhaust the reservoir supply (bleed-out) in approximately 30 minutes (depending on how many wounds are active as well as the treatment to occlude or slow blood flow). Once the blood bladder is filled (see Gravity Filling/Refilling K9 Diesel with Blood), users activate the blood pump from the Remote Control (RC). This will cause blood to flow from the wounds.

Chapter 3

Chapter 3: Getting Started



Read all TraumaFX® and Third-Party user instructions and manuals before attempting to assemble, install or operate K9 Diesel or accessories.

Notes on General Use and Care

K9 Diesel is designed for rugged use in realistic training environments. To ensure proper operation, care for the K9 Diesel unit as you would a canine patient by not subjecting to unnecessarily harsh treatment. Also, careful preventive maintenance and frequent after-use inspection is essential to ensure the service life of your unit. Please review **Chapter 5: After Use Care**, which outlines the after use care required.



Only use TraumaFX-provided TraumaFX® simulated blood and blood mixes in your K9 Diesel unit. Use of other liquids or the addition of any substance, including detergents, to the blood mix may damage internal components and will void the limited warranty.

Charging the Batteries



K9 Diesel & RC Transmitter Batteries

Read all instructions provided in the *Operating Manual – Makita Battery Charger* and *Operating Manual – Tenergy Battery Charger* before using.

Each K9 Diesel unit utilizes one (1) 18V Makita Lithium-Ion battery for operation. Two (2) Makita batteries are provided as standard equipment. Additionally, two (2) Lithium-Ion batteries operate the Remote Control (RC). Two (2) Li-ion rechargeable batteries are provided as standard equipment. Additional batteries are available for purchase through TraumaFX®.

Only use the batteries and charger(s) provided by TraumaFX®; use of different equipment may result in damage to the batteries and/or TraumaFX equipment and can void the limited warranty. Read the instructions for the Makita battery and charger in the *Operating Manual – Makita Battery Charger* and *Operating Manual – Tenergy Battery Charger* provided.

The K9 Diesel and RC Transmitter batteries are consumable items (with a one (1) year manufacturer's warranty). As with most batteries, Li-Ion batteries have a finite shelf life. After considerable use, a 'used' battery's capacity will drop to a point that it will no longer be able to hold a charge.

K9 Diesel contains a low voltage disconnect feature that will automatically shut the unit off when battery voltage drops to a certain level. If K9 Diesel stops operating, remove and recharge the battery or replace with a fully charged battery.

Recharging K9 Diesel and RC Transmitter Batteries

Makita 18v Lithium Ion batteries

1. **Plug** the Makita quick charger (Figure 3) into a standard 110V wall outlet.
2. **Slide** the battery into the quick charger until firmly in place and the indicator light illuminates (each battery takes approximately 30-45 minutes to charge, and depending on the amount of usage, provides up to 6 hours of training support).



Figure 3

3. **Remove** the battery when readout indicates charging is complete.

NOTE: A 220V Makita charger is available for International use. This is a special-order item and available for purchase through TraumaFX®.

Remote-Controller Lithium Ion batteries

1. **Plug** the Tenergy charger (Figure 4) into a standard 110V wall outlet.
2. **Insert** the battery(s) onto the quick charger until firmly in place and the indicator light illuminates (each battery takes approximately 15-30 minutes to charge, and depending on the amount of usage, provides up to 6 hours of training support).



Figure 4

3. **Remove** the battery(s) when readout indicates charging is complete.

General Use and Care of Batteries

All batteries used in TraumaFX products were specially selected to provide optimal operational performance. However, as with all batteries, they will last longer with

proper care and maintenance. To preserve the life of the batteries, the following best practices are recommended:

1. Only use the batteries and charger(s) provided by TraumaFX®; use of different equipment may result in damage to the batteries and/or the TraumaFX unit(s).
2. Remove all batteries from K9 Diesel and the RC Transmitter at the end of each training session. Batteries should never be stored inside a unit (K9 Diesel or RC Transmitter).
3. Recharge batteries immediately after use by placing them in the Makita or Tenergy battery charger.
4. Fully recharge all batteries before each training exercise.
5. Store batteries indoors, away from extreme temperatures (not above 120°F or below 38°F).
6. Only charge TraumaFX-related batteries using the approved chargers supplied with the TraumaFX system.

Installing and Removing the Batteries

Installing K9 Diesel Battery

1. Select one (1) 100% fully charged Makita Lithium-Ion battery.
2. **Insert** the fully charged battery into the battery compartment (Figure 5) located under K9 Diesel's tail.
3. **Push** the battery into the battery compartment until it audibly 'clicks' into place.



Figure 5

Removing K9 Diesel Battery

1. Push the white button located on the front of the Makita battery to release and remove the battery from K9 Diesel (Figure 6).



Figure 6

Installing and Removing the Remote Control Transmitter Batteries

1. **Install** the batteries by inserting the batteries into the back of the RC (Figure 7).
2. **Remove** the batteries by gently pulling up on the battery to remove from the RC transmitter.



Figure 7

Simulated Bleeding

Priming the Hose and Blood System

The K9 Diesel blood fill hose is sent to you “pre-primed” with water and should not require any additional priming when first received. Results are best when water is left in the hose between uses. If cavitations (air pockets) arise, the hose can be primed again using objects such as Allen keys or pencil erasers to push in the valve of the quick-connect attachment at each end of the hose. To re-prime the hose, attach one end of the blood fill hose to the quick-connect valve on the blood fill system. Then, using a sharp object, simply push in the valve at the other end of the hose. Let water flow through the hose until the air pocket is eliminated.

Prior to the first use or after a period of non-use, it is recommended to prime the blood system with water (temperature range of 40°F – 120°F) before filling it with artificial blood to ensure optimum pump action. This process removes the air that may be trapped during shipping and handling. This process can be repeated if you notice any decrease in pumping pressure after prolonged use.

1. Fill the one (1) gallon blood bucket (with the quick connect fitting) with clean cold or warm water (temperature range of 40°F – 120°F)
2. Connect clear hose from bucket to unit via blood fitting, which can be exposed by unzipping the fur on the backside of K9 Diesel (Figure 8).
3. Elevate bucket to allow gravity to fill the blood reservoir in the unit. The reservoir holds one-half liter of blood liquid. Generally, this fill process takes between 1 and 3 minutes (the higher the fill bucket elevation, the shorter the fill time).
4. Disconnect the hose from the unit and keep the hose clear of any grit or debris that could impede or compromise the pump system
5. Turn the RC transmitter ON.



Figure 8



It is important to remember to turn off the transmitter when not in use as this will continue to drain the battery pack even if it is not in use.

6. Turn the unit switch ON. The ON/OFF switch is located on the backside of the unit which can be exposed by unzipping the fur on the backside of K9 Diesel (Figure 9).



Figure 9

Mixing the TraumaFX® Blood Powder



The blood powder and mixed blood solutions may stain fabric and porous surfaces. Do not add any other substance to the blood (including detergents) as they may damage internal components and will void the limited warranty.

Use care when transporting pre-mixed blood or open bags of blood mix powder. If a surface or fabric comes into contact with the simulated blood solution, treat with detergent as soon as possible to avoid permanent stains. Simulated Blood should be washed out of clothing as soon as possible (preferably within 24 hours) to avoid staining. Pre-treatment of stains and vigorous cleaning will usually remove simulated bloodstains. Only use detergents and cleansers recommended by the manufacturer(s)

of the affected surfaces or fabrics. If dry blood powder is spilled, avoid contact with liquids. Sweep or vacuum the affected area immediately.

To mix the blood powder, follow the instructions below:

1. **Remove** any items from inside the blood filling system, and check that bucket is clear of dirt or debris
2. **Fill** the blood fill container with the desired amount of water
3. **Open** the corresponding number of blood powder packets (1 packet per gallon) and empty the entire contents of each blood powder packet into the blood fill container
4. **Stir** the blood powder into the water until thoroughly mixed.

Gravity Filling/Refilling K9 Diesel with Blood
If K9 Diesel is completely empty, then it will likely take approximately 2-3 minutes to totally fill with blood.

1. **Connect** one end of the quick connect blood fill hose to the quick connect valve on the bottom of the bucket (Figure 10)
2. **Carefully** connect the fill hose from the fill bucket to K9 Diesel blood fitting (Figure 11), which can be exposed by unzipping the fur on the backside of K9 Diesel. When connecting and disconnecting there may be a small amount (a couple of drops) of blood left over from the connecting action. This is normal. If there is a large amount visible or there is a constant drip when connected then the black rubber 'O-ring' on the fill connector on K9 Diesel's body should be removed and replaced with an O-ring (provided) as the old one is likely damaged.



Figure 10



Figure 11

3. **Raise** the filled blood bucket above K9 Diesel so that gravity makes the blood flow into K9 Diesel. K9 Diesel is filled by gravity alone. The fill process works best if the bucket is positioned at least 3 feet above the unit (Figure 12).
4. **Disconnect** the quick connect blood fill hose from the quick connect valve on K9 Diesel.



Figure 12

Syringe Filling K9 Diesel with Simulated Blood

K9 Diesel can also be filled and drained using the supplied syringe fill system. To operate, attach the male quick disconnect fitting into the female fitting on the end of the syringe tube. Place the end of the tube into the blood bucket and pull the syringe plunger to fill the syringe. Remove the male quick disconnect fitting, and connect the female quick disconnect to the male fitting on the back of K9 Diesel. Depress the syringe to transfer blood to the internal reservoir (Figure 13). **Caution:** Do not use excessive force to fill; if there is significant resistance then either the filter needs to be cleaned or the reservoir is full. Repeat the above until the reservoir no longer accepts blood – the reservoir volume is approximately 500ml.



Figure 13

To remove blood from the system, perform the above procedure in reverse order until no more blood can be removed.

Applying Blood Paste

Blood paste can be applied to enhance the realism of K9 Diesel's wounds and various surfaces in staged training areas (Figure 14). The K9 Diesel unit comes with one (1) pint of pre-mixed blood paste. Additional quantities can be purchased by contacting TraumaFX.



Figure 14

Blood paste provides the look of coagulated blood. The paste can be rubbed onto simulated wounds using a paint brush, sponge, or fingers to enhance their realistic appearance and feel, and can be used to provide the appearance of coagulated blood on floors, walls, doors, or

other surfaces (see caution above regarding staining of surfaces with simulated blood compounds).

Skin Plug and Component Replacement

Replacing the Tongue

The tongue attaches with rare earth magnets at the back of the tongue (Figure 15). To replace the tongue, firmly pull the tongue while twisting it near the back of the throat to release it from the magnets, and replace the tongue by lining up the magnets into their proper place. An optional injured tongue can also be used in place of the standard tongue.



Figure 15

Inserting the Single Use Tracheostomy Skin Plug and Trachea

Unzip the fur at K9 Diesel's neck, remove the tracheostomy skin plug and the trachea. Insert the trachea ends around the tracheal notches in K9 Diesel's throat. Grab the mounting pins at both ends and pull snug; you will feel a click. Insert the tracheostomy skin plug around the mounting pins located at the throat (Figure 16). Adjust the skin plug edges as needed.





Figure 16

Inserting the Cephalic Veins

Lower the front leg sock to access the cephalic vein and remove the existing cephalic vein by pulling up and away from the leg and removing the tubing from the connectors. Insert the cephalic vein ends around the connectors on either side of the cephalic vein groove (Figure 17). Adjust the vein as needed, pull the leg sock back up. Adjust the fur as needed, and repeat for the other leg, if needed.



Figure 17

Inserting the Needle 'D' / Thoracocentesis Skin Plugs

Unzip the fur along the back of K9 Diesel and pull down to expose the Needle Decompression site on that side. To change the skin plugs, remove the existing skin plug by gently pulling the lower seam open to expose the two clips (Figure 18). Press both clips upwards and pull the plug out. Next, remove the pressure seal by lifting out of the recess. Replace the old pressure seal and skin plug. Repeat on the opposite side if both plugs require replacement. Pull the fur back over the side of K9 Diesel and rezip the back.



Figure 18

Inserting the Tibial Intraosseous (I/O) Bone Plugs

Pull the rear leg sock down to access the tibial I/O bone plug (Figure 19). Remove the tibial IO and replace by twisting the plug clockwise slightly and lifting the plug from the socket. Replace by placing the new plug within the socket and twisting counter-clockwise slightly to lock in place, and then pull the leg sock back up. Adjust the fur as needed, ensuring that the reinforced section of the sock lies over the bone plug to extend the life of the sock. Repeat on opposite leg if needed.



Figure 19

Inserting the Humeral Intraosseous (I/O) Bone Plugs

Open the front of the fur to access the humeral I/O bone plugs (Figure 20). Remove the humeral IO and replace by twisting the plug clockwise slightly and lifting the plug from the socket. Replace by placing the new plug within the socket and twisting counter-clockwise slightly to lock in place, and then pull the leg sock back up. Adjust the fur as needed, and repeat on opposite leg if needed.



Figure 20

Inserting the GDV Bladder

The gastric dilatation volvulus (GDV) bladder can withstand over 200 uses before replacement. If the bladder begins to leak during use, replace it by unzipping the fur along the back of the simulator and opening the Velcro attachments. Locate the GDV bladder on the right side and replace with a new one. Re-close the Velcro, and close the zipper along the back.

Removing and Attaching Limbs

Hind Limbs

To remove and swap a hind limb, unzip the fur and remove from the target limb to expose the hip joint. Unzip the 2 zippers on either side of the upper thigh, and locate the through-hole at the top of the thigh (Figure 21) Press the button located within the hole, and lift the limb straight out while holding the button in. Each limb is marked with a color-coded label matching that part of the dog.



Figure 21

To attach a limb, insert the pin on the male connector into the mating connector on the hip, and push gently until the pin locks in place (Figure 22). Re-close the zippers on either side of the hip, and replace the fur over the simulator.

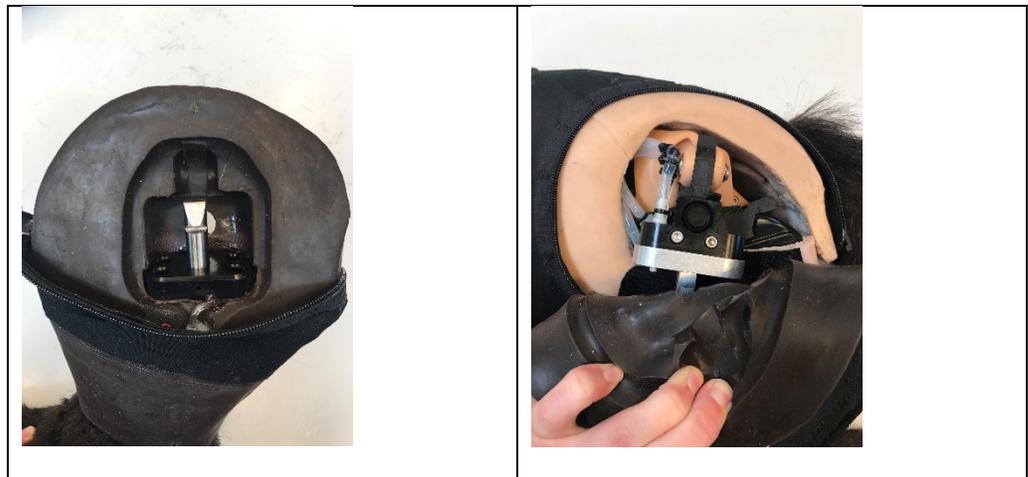


Figure 22

Front Limbs

To remove and swap a front limb, unzip the fur and remove from the target limb to expose the hip joint. Unzip the 2 zippers on either side of the upper thigh, and locate

the through-hole at the top of the thigh. Press the button located within the hole, and lift the limb straight out while holding the button in.

To attach a limb, insert the pin on the male connector into the mating connector on the hip, and push gently while holding down the release button until the pin locks in place (Figure 23). Re-close the zippers on either side of the hip, and replace the fur over the simulator.



Figure 23

Attaching the Removable Wounds

Exposing the Abdominal Wound

To expose the removable abdominal wound, locate and unzip the short zippers in the fur and skin on the left side of K9 Diesel. Below this site lies a pouch within the skin (Figure 24). Reach into the pouch and gently pull the intestines outside the body



Figure 24

Attaching the Facial Wound

The optional removable facial wound is intended to drive the student to perform a tracheostomy rather than oral intubation. Place the flexible appliance into the mouth, with the tongue fitting through the center (Figure 25). Push down over the teeth to get a secure fit; no attachment means are necessary. When done, pull the appliance off the teeth and out of the mouth. An optional injured tongue can also be installed to increase the visual impact of the injury.

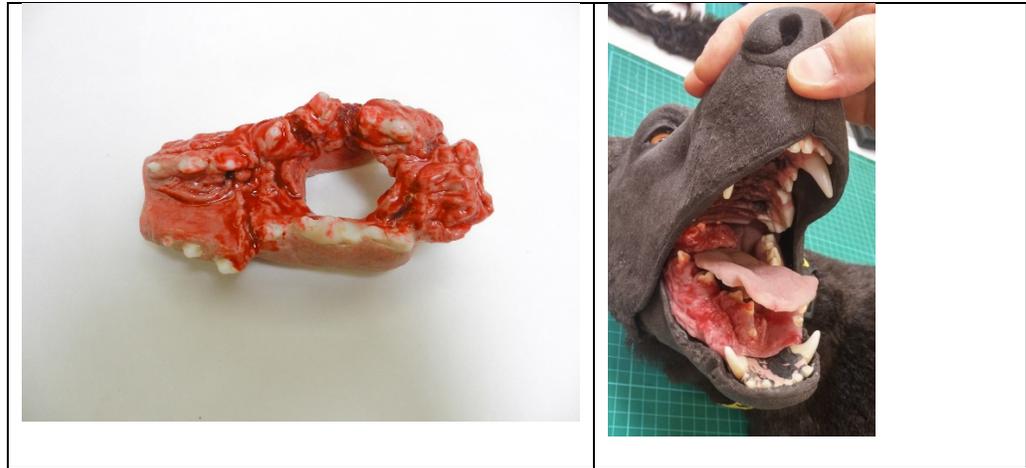


Figure 25

Attaching the Axillary Wounds

Diesel comes with two Axillary wounds, one which can be fitted to the right side and one for positioning on the left side. They simulate packable exit wounds caused by a bullet entering from the front side of the canine chest and emerging just under the humerus. Each are stand-alone wounds and stored separately in the Diesel accessory support case.

These junctional wounds can be attached to the inside of the external fur on either side of the dog's body by lining up the wound with the appropriate inside surface of the fur 'coat', locating the oval of zipper, and zipping both wound and fur together.

To line up and position the wound once attached to the fur, pull the zipper running up the backside of the front leg approximately six inches (Figure 26). This will create an opening to position the wound on the inside of the leg.

Tilt and twist selected front leg counterclockwise to expose the ribs underneath. Locate the steel male connector which is attached loosely to the rib cage and connect that with the steel female connector running out the front side of the wound itself (Figure 26). Line up the Velcro on the leg and the Velcro on the wound and press together. This will hold the wound in proper position. When complete, it should look like the final image. Note: images are shown without fur for clarity; the wound can be installed with the fur in place.

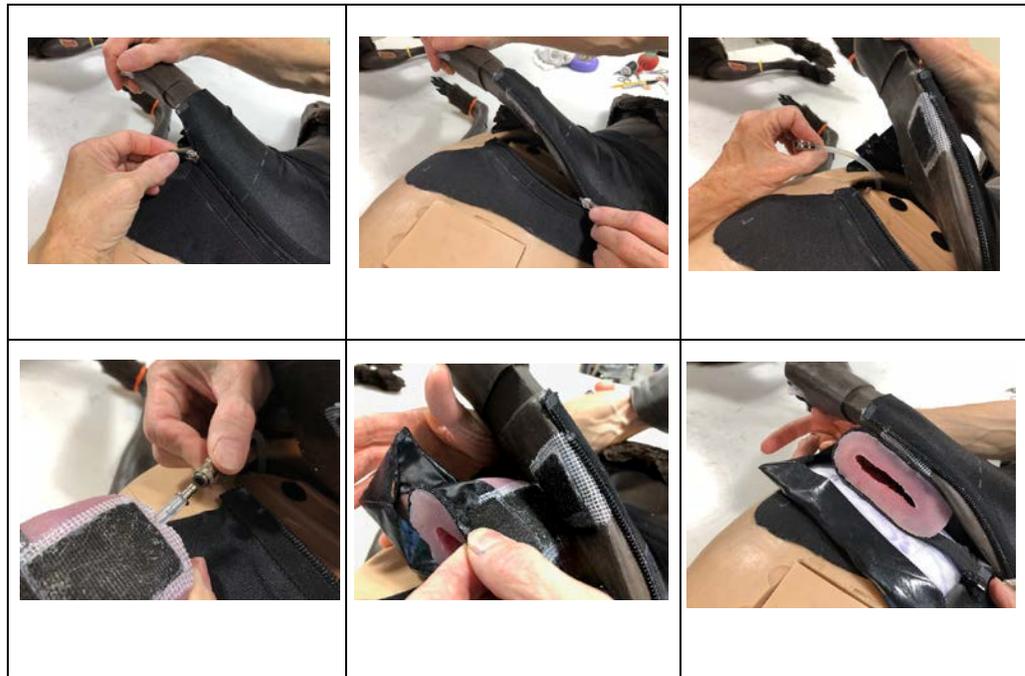


Figure 26

Only one wound (either right or left) should be connected at a time as Diesel is designed to maximize flow to one wound only. A stainless-steel connector is located on both sides to allow for connection to either right or left axillary wound. This will allow for variability of training and prevent anticipatory treatment.

The water absorbent pads provided fit into the axillary overflow pockets and their use is a necessity because they soak up overflow blood which will migrate around the body fur and pool underneath, making cleanup and fur maintenance more difficult. This blood flow may also find its way into the unit itself. These pads can hold up to 80 cc of liquid and remain outwardly dry. They can be changed once a day or as often as required. A view (outside the body, for example) of how the pad should look when inserted correctly is shown (Figure 27).



Figure 27

Attaching the Gunshot Wound

K9 Diesel has a simulated gunshot wound for Chest seal training, and can be attached anywhere on the fur. The wound attaches magnetically; separate the front and back, and place the two pieces on either side of the fur. The magnet will hold the wound in place, and the fur can be smoothed over to blend in with the main fur body (Figure 28). It is recommended that Training chest seals be used rather than standard chest seals, to limit damage to the fur. If no Training seals are available and a Standard

chest seal is used, it will be easier and less damaging to remove if it is removed promptly and is not left in a warm environment.



Figure 28

Microchipping K9 Diesel

A microchip can be installed on K9 Diesel using any standard veterinary microchip system. Insert the chip into the small pocket located between the shoulder blades (Figure 29). To better secure the chip, a small amount of Sil-Poxy or other silicone sealant can be added to close the pocket. *Note: Microchip is not provided with K9 Diesel.*

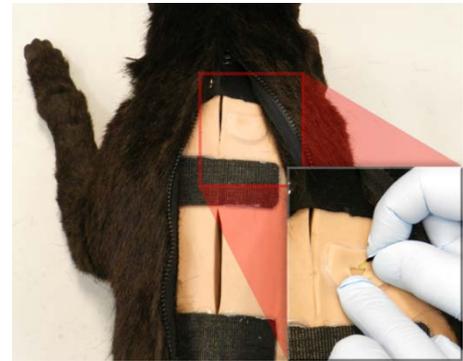


Figure 29

Chapter 4: Operating K9 Diesel

This chapter describes the operational features of K9 Diesel.

Power

Power for the K9 Diesel unit is provided by one (1) 18V Makita Lithium-Ion battery. Power for the RC transmitter is provided by two (2) Lithium-Ion batteries. All batteries are fully rechargeable and come with respective chargers and complete manufacturer's instructions and operating manuals.

Sync Check

Prior to beginning a training exercise with the K9 Diesel unit, performing a quick sync check between the RC transmitter and K9 Diesel is highly recommended. The Remote Control will automatically pair with K9 Diesel, and is indicated on the Remote Control LCD.

Operating the K9 Diesel RC Transmitter

The custom RC Transmitter {xe “transmitter”} for K9 Diesel has 2 bleeding buttons, 2 Selector knobs, 4 sound buttons, with a 8 line LCD display (Figure 30). To turn on the RC Transmitter, press the power button on the top to turn the display on. While multiple bleeding wounds can be connected to K9 Diesel, up to 2 locations can be set to bleed at any time.

After powering on the RC Transmitter, it will attempt to pair with its assigned K9 Diesel if it is also powered on. Once paired, the *Status Screen* will be displayed. This screen will show the current settings for Pulse Rate, Pulse Feel, Breathing Rate, GDV setting, Tension Pneumothorax setting, and the Active Bleeds setting (Figure 31).



Figure 30

The 2 selector knobs on the RC are used to navigate the menus and make selections. Pressing the *Select* button from the *Status Screen* will take you to the *Menu* screen.

- Turn the Selector knob to move up and down the Menu list. There are 2 pages of Menu items; selecting the More Options item from the bottom of the page will take you to the second page. Items available on the Menu page are:

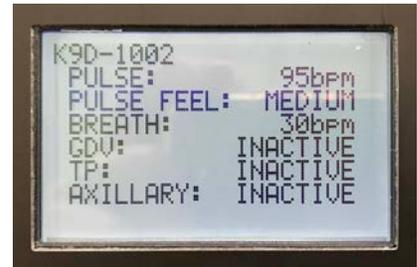


Figure 31

- Pulses: Allows the user to set both the rate and the feel of the femoral pulses. Pulse range is from 50-170, and the feel can be set to Weak, Medium, or Strong (Figure 32).
- Breath Rate: Allows the user to set the breathing rate, from 10-120.

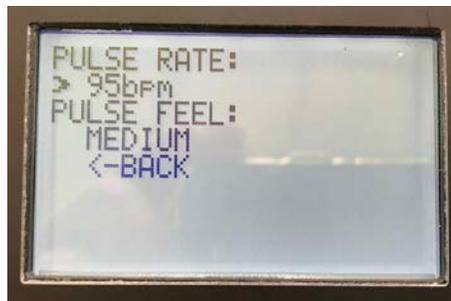


Figure 32

Additionally, the user can set the breathing rate to NONE, SLOW, NORMAL, and FAST. These are set at 0, 10, 30, and 120 breaths per minute, respectively (Figure 33).



Figure 33

- GDV and TP: Turns the Gastric Distension Volvulus (GDV) site and the Tension Pneumothorax site (TP) on and off. These can be turned on and off multiple times during a session (Figure 34).

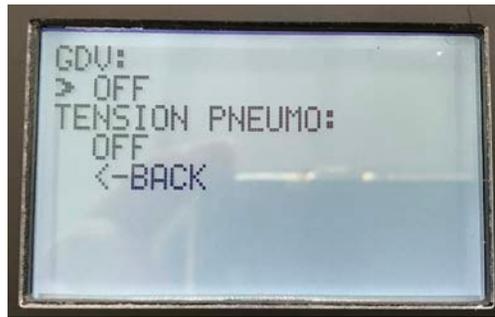


Figure 34

- Scenario Setup: Takes the user to a drop-down menu that allow a specific scenario to be programmed, with control of the breathing, pulse, bleeding, GDV, and TP (Figure 35).



Figure 35

- Scenario Toggle: Turn the programmed scenario on and off (Figure 36).



Figure 36

- Dead or Alive: The user can set K9 Diesel to either Dead or Alive. This can be done during a session to indicate the need for CPR or to indicate that the student has not done enough to keep the patient alive (Figure 37).



Figure 37

- Flush: Turn the pump on and off to flush the blood system.
- Backlight: Adjusts the RC backlight on a scale between 0 and 31 (Figure 38).



Figure 38

- Volume: Adjusts the volume level of sounds coming from K9 Diesel on a scale of 0 to 100 (Figure 39).

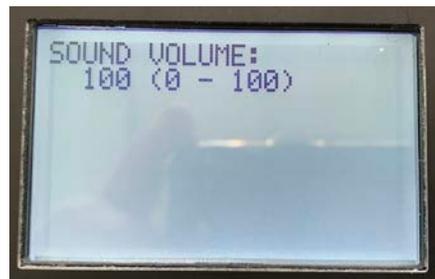


Figure 39

- Pair to Body: Allows the user to pair the RC Transmitter to any powered K9 Diesel within range (Figure 40).



Figure 40

- About: Displays the remote serial number and software version, along with the K9 Diesel software version (Figure 41).
- Configuration: Selects which wounds will be active for the session.



Figure 41

The user can select 2 from the 3 possible bleeding wounds: Front Amputation, Rear Amputation, and Axillary (Figure 42).

Sounds

The remote control transmitter can be used to generate simulated canine sounds for

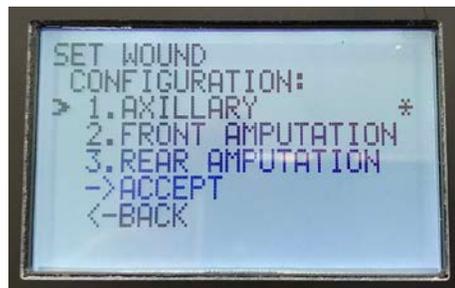


Figure 42

use during training sessions. The four (4) buttons at the bottom of the RC correspond to the different available sound types:

1. Barking
2. Growling

3. Whimpering
4. Stertor or Stridor (you can assign one of these sounds to the fourth button using the remote control)

Pressing a button briefly will play a single sound file one time; they are typically 2 to 5 seconds long. Pressing and holding a button for at least 2 seconds (only applies to barking and whimpering) will start a loop of sounds of that type, continuing until the user presses either that same button again to stop the sounds or a different sound button to switch to a different type of sound (stertor and stridor will only play when the breathing rate is set between 20 and 60 breaths per minute).

Pressure Points

K9 Diesel is designed to simulate accurate and realistic bleeding for training simulation. Properly applied hemorrhage intervention will occlude bleeding even though the blood pump is activated.

Simulated Nasal Airway

The *Simulated Nasal Airway* provides for Cardiopulmonary Resuscitation (CPR) intervention into the nostrils to facilitate forced air into the lungs (Figure 43).



Figure 43

Simulated Oral Airway

The *Simulated Oral Airway* cavity with teeth, tongue and flexible neck and jaw can be used to perform endotracheal intubation, and to facilitate opening and maintaining a clear airway for mechanical ventilation (Figure 44). This simulated airway can be used with straight or curved size 10-12mm endotracheal (ET) tubes.



Figure 44

Responsive Airway

When attempting to bag ventilate, the system will respond according to the tube placement. If it is placed correctly, both sides of the chest will inflate with ventilation. If placed in the esophagus then the abdomen will inflate.

Simulated Tracheostomy Site

The *Simulated Tracheostomy Site* is a training site that allows for the palpation of landmarks to properly identify and locate the trachea (Figure 45). Additionally, this site allows trainees to create an incision through the skin and sternohyoid muscles for airway intubation. A tracheostomy is generally required during certain life threatening conditions where oral intubation is unfeasible such as with severe head trauma, cervical spine trauma, or severe chemical inhalation injuries. This site uses replaceable, single use tracheas and either single or multiple-use skin plugs to provide the most realistic simulation of a tracheostomy.

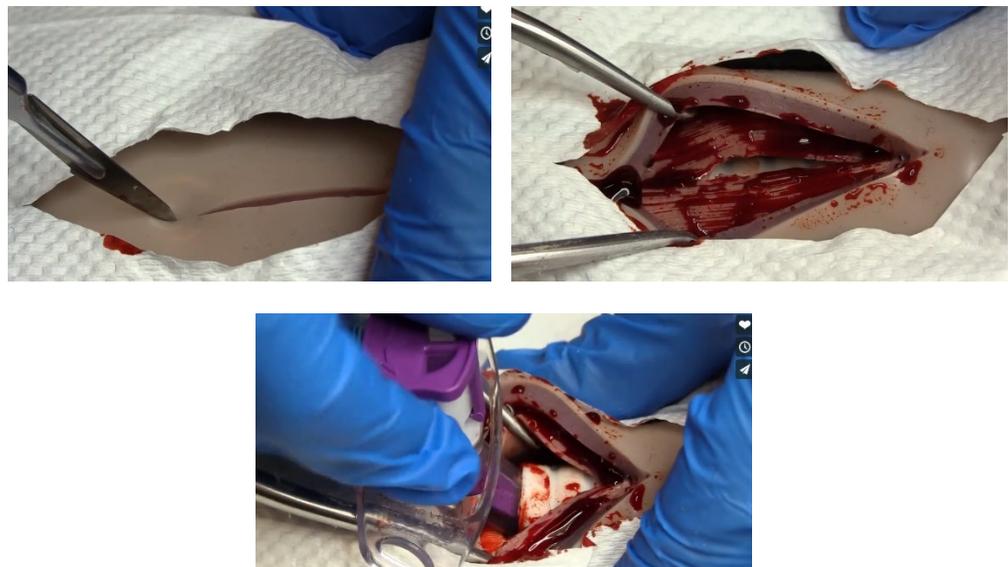


Figure 45

Filling Single Use Trachea Skin Plugs with Blood

Two sets of single use trachea skin plugs are provided; one set for use without bleeding, and one for use with the addition of simulated blood. To fill the skin plugs with blood, use the 3ml syringe with a 20g blunt fill needle; these are provided with the initial starter kit with K9 Diesel. Fill the syringe with blood from the K9 Trach Blood bottle (Figure 46), insert the tip of the blunt needle into the space between the skin and muscle, and inject 1.5ml into this space (Figure 47). Remove the needle – the silicone will self-seal. For best results, use filled skin plugs shortly after filling to prevent evaporation.



Figure 46



Figure 47

Simulated Cephalic Vein Intravenous (IV) Insertion with Flash Cue



Do Not Infuse

This site is designed to provide trainees with a practice area for IV insertion and is accompanied with flash cue (Figure 48). The starches and carbohydrates contained in products such as Hextend and Ringers Lactate could severely damage the liquid blood system components and lead to complete failure. If the unit is accidentally infused, the system must be flushed immediately with warm potable water for at least 15 minutes.

The IV insertion sites accommodate a 1.5inch 18-gauge needle and catheter. The vein can be palpated underneath the fur to locate the proper insertion point. The training site is bilateral, so either front limb can be catheterized.

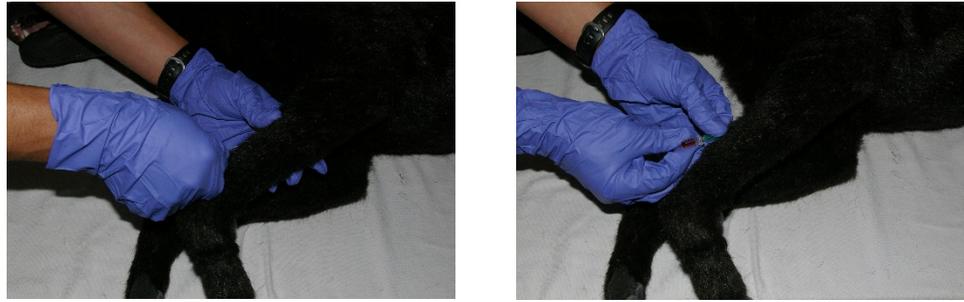


Figure 48

Simulated Needle Decompression Sites

The *Simulated Needle Decompression Sites* are multi-use training sites that provide trainees with palpable landmarks at the ribs to locate the correct needle decompression site and fully insert a 14ga decompression needle and catheter (Figure 49) to relieve pneumothorax caused by physical trauma to the chest such as a blast injury. This site uses reusable and replaceable assemblies consisting of a skin plug and a pressure seal to accommodate repeated simulations. If a tension pneumothorax is present – which can be set using the remote control transmitter – there will be a brief release of air through the needle and catheter when properly inserted, and the K9 will soon begin to breathe normally again.



Figure 49

Simulated Cardiopulmonary Resuscitation (CPR) Site

K9 Diesel is equipped with a chest compression site located perpendicular to the canine's elbow bend (Figure 50).



Figure 50

Lacerated Front Paw

The right front paw presents a deep laceration requiring a bandage (Figure 51). The wound can also be sutured, and can be reused many times before replacement.



Figure 51

Simulated Bilateral Femoral Pulse Points

K9 Diesel is equipped with palpable bilateral femoral pulse points (Figure 52). The pulse rate is variable and can be set using the Remote Control; the available rates are

between 50 and 170 bpm. The strength of the pulses can also be selected using the remote control; they can be set to weak, normal or strong.



Figure 52

Simulated Tibial (Bilateral) Intraosseous (I/O) Infusion Sites

The *Simulated Tibial Intraosseous (I/O) Infusion Sites* allow trainees to place and introduce any Intraosseous (I/O) infusion introducer (Figure 53). I/O infusion provides immediate, vascular access for fluid and medication infusion for canine victims experiencing shock and trauma, and allows trainees to rapidly, safely and reliably administer tibial I/O infusions. The I/O training sites use a multi-use, infusible skin/bone plug to accommodate repeated simulations.



Figure 53

Simulated Humeral (Bilateral) Intraosseous (I/O) Infusion Sites

The *Simulated Humeral Intraosseous (I/O) Infusion Sites* allow trainees to place and introduce any Intraosseous (I/O) infusion introducer. I/O infusion provides immediate, vascular access for fluid and medication infusion for canine victims experiencing shock and trauma, and allows trainees to rapidly, safely and reliably administer tibial I/O infusions. The I/O training sites use a multi-use, infusible skin/bone plug to accommodate repeated simulations.

Simulated Bleeding

K9 Diesel has 3 potential bleeding sites: 2 limb amputations and the axillary wound. To set a wound to bleed, use the Configuration screen on the remote control transmitter to select which wound or wounds will be active. Up to 2 sites can be used at any one time. To start the bleeding, press the Bleed button on the remote corresponding to the wound as setup in the Configuration. Press the button again to disable bleeding at that site.

When correct pressure is applied, the bleeding will stop and the blinking red LED above the Bleed button on the remote control transmitter will blink green. If pressure is removed, the bleeding will resume and the LED will blink red again.

Simulated Amputated Limb Wound Site

K9 Diesel is designed with swappable limbs, and had both front and hind amputations featuring arterial bleeding. Instructions on how to remove and install the limbs is given in chapter 3. To stop the bleeding on the amputated limbs, the user can apply direct pressure to the bleeding stump, or pressure to the vessel leading to the wound. For the front limb, pressure to the stump just above the amputation will stop the bleeding, while the pressure point for the rear limb is in the inguinal crease.

Simulated Axillary Wound Site

The axillary wound site offers the user the choice of a left or right side axillary wound. Once set up and the bleeding is turned on, the site will need to be packed with gauze and held with pressure to stop the bleeding. The site will hold an entire roll of gauze.

Simulated Gastric Dilatation Volvulus Site

K9 Diesel has a simulated gastric dilatation volvulus (GDV) site on the right side. The user can activate this site from the TP and GDV submenu on the remote control transmitter to fill the GDV bladder with air. The student will pierce the swollen site with a 14ga needle and catheter, and the air will release through the catheter.

Powering Down

Turn off the power to K9 Diesel by pressing the On/Off button located at the lower back under the fur. The blue light will turn off. Turn off the Remote Control by pressing the On/Off button; the lights will turn off.

Cleaning

Prior to turning off K9 Diesel, the blood system should be drained of all simulated blood and flushed with potable water. The blood can be manually drained back into the blood fill bucket using the gravity fill technique described below:



IMPORTANT: Make sure there is no water or simulated blood in the K9 Diesel blood system prior to storing the unit.

To manually remove blood from inside K9 Diesel:

1. **Connect** the quick connect blood fill hose to the quick connect valve on the upper right side of K9 Diesel (Figure 54).
2. **Connect** the other end of the quick connect blood fill hose to the quick connect valve on the bottom of the bucket (Figure 55).
3. **Place K9 Diesel** on a table or elevated surface to raise it above the level of the bucket.



Figure 54

Users should clean the blood system after each use (see Chapter 5) by filling K9 Diesel with water via the gravity fill and letting the blood pump circulate the water through the blood system until it is clean (indicated by clear liquid pumping out from the wound site). Once clean, the water can be removed from K9 Diesel by placing it on a table or elevated surface such as a litter to raise the unit above the level of the bucket.



Figure 55

To clean K9 Diesel's exterior features:

1. Gently **clean** K9 Diesel after each use with water only (never use abrasive materials on K9 Diesel's skin or fur).
2. If stains persist on K9 Diesel's exterior, gently clean with a soft wet cloth or sponge. **DO NOT** vigorously scrub the skin or surface area as this can remove hair and skin coloring, and cause permanent abrasions.
3. Clothing that comes into contact with simulated blood can be cleaned using standard laundry techniques, but should be cleaned separately from other items to avoid discoloration. Simulated bloodstains should be pre-treated and washed out of clothes within 24 hours to avoid permanent staining.

Cleaning the Inlet Blood Filter

In the event that the unit will not fill or empty when connected to the blood bucket, it may be necessary to clean the inlet filter.

To clean the filter:

1. Locate the filter wrench that was provided with the unit (Figure 56).
2. Unscrew the unit filter assembly located at the waist plate (Figure 57).
3. Remove the spring and the unit filter.



Figure 56

Clean the filter under running water, using a wire brush if necessary to loosen debris.



Figure 57

Packing

Prior to storing K9 Diesel in its storage case, always perform the following procedures:

1. **Power down** K9 Diesel
2. **Remove** the battery from K9 Diesel and recharge fully before storing
3. **Store** the batteries and its charger in their proper places provided in the K9 Diesel storage case

4. **Turn off** the RC Transmitter and **Remove** the batteries from the RC transmitter, recharge fully, and place it in their proper place in the K9 Diesel storage case
5. **Place** the RC transmitter in its proper place in the K9 Diesel storage case
6. **Empty and rinse out** the blood fill bucket with water
7. **Place** the dry K9 Diesel in its proper place in the storage case. **DO NOT** place the unit into the case while it is still wet as this could encourage microbial growth. K9 Diesel can be placed on the included drying rack until the fur is completely dry.

Chapter 5: After Use Care



To keep K9 Diesel operating as designed, the following preventive maintenance actions must be completed after each training session.

These easy to perform maintenance actions will help ensure K9 Diesel remains in peak operating condition for each training session:

1. **Flush K9 Diesel's blood system with water** after each use and prior to storage lasting longer than one day.
2. **Empty K9 Diesel's simulated blood bladder** after each use either by running the pump dry or by connecting the blood fill bucket to the unit and placing the bucket at an elevation lower than the unit. Leave a small amount of liquid in the bladder, this will prevent damage to the bladder from exposure to extreme heat or cold.
3. **Remove batteries** daily after training is complete. Do not store batteries in the K9 Diesel unit or in the transmitter as this could cause the batteries to fail.
4. **Fully recharge the K9 Diesel battery** after each training exercise. Also fully recharge the transmitter batteries prior to each training exercise. To extend the service life of the batteries, do not run the batteries until they are completely out of charge.
5. **Only use** approved chargers supplied with the K9 Diesel system to recharge the K9 Diesel unit and transmitter batteries.
6. **Wash fur and wounds with water** after each day of use and let air dry (do not use forced air or a hair dryer to dry K9 Diesel's fur. Blood paste is cellulose based and could attract insects if left on TraumaFX or other training products.
7. **Read the User's Manual** for the Battery Chargers and follow instructions and precautions listed inside the manual.

Chapter 6

Chapter 6: Troubleshooting & Repair

Contact TraumaFX at: MATTSupport@traumafx.net, or 1-800-200-7465 if troubleshooting steps do not resolve an issue you are experiencing.

Issue	Actions
<p>Simulated bleeding is not working</p>	<p>Check batteries:</p> <ul style="list-style-type: none"> ▪ Charge K9 Diesel battery ▪ Charge the RC transmitter batteries ▪ Ensure all batteries are fully seated or locked into position. ▪ Check to see if switch power blue LED is on
<p>Blood not flowing out of the K9 Diesel unit</p>	<p>Check batteries:</p> <ul style="list-style-type: none"> ▪ Make sure K9 Diesel and RC Transmitter power is turned on ▪ Charge K9 Diesel battery ▪ Charge RC transmitter batteries ▪ Ensure all batteries are fully seated or locked into place <p>Fill K9 Diesel with blood:</p> <ul style="list-style-type: none"> ▪ Verify blood bladder is full by connecting gravity fill bucket to K9 and topping off reservoir ▪ Test bleeding
<p>K9 Diesel does not fill with simulated blood</p>	<p>Faulty quick connectors</p> <ul style="list-style-type: none"> ▪ Test each quick connector by pressing in the valve on the connector to see if air and fluid can pass through <p>Clogged filters</p> <ul style="list-style-type: none"> ▪ Unit filter may be clogged; clean if needed ▪ Filter in bucket might be clogged with debris ▪ If so, remove, clean and reinstall or replace filter <p>Unable to fill with blood</p>

Issue	Actions
	<ul style="list-style-type: none"> ▪ If cavitations (air pockets) arise, the hose can be primed again using objects such as Allen keys or pencil erasers to push in the valve of the quick-connect attachment at each end of the hose <p>Full blood reservoir</p> <ul style="list-style-type: none"> ▪ Bleed for 30 seconds and attempt to refill
<p>IV Training Site Leaking Blood</p>	<ul style="list-style-type: none"> ▪ Lower the sock over the training site and replace the tubing with a new piece. ▪ Ensure both ends of the tubing are firmly attached to the connectors at either end.
<p>RC transmitter is not working</p>	<ul style="list-style-type: none"> ▪ Charge RC transmitter batteries ▪ Ensure batteries are fully seated or locked into place
<p>K9 Diesel will not turn on</p>	<ul style="list-style-type: none"> ▪ Charge K9 Diesel battery ▪ Ensure battery is fully seated or locked into place

Additional Support

For other troubleshooting issues not identified above, please contact TraumaFX at MATTSupport@traumafx.net or 1-800-200-7465.

O-Ring Procedures and Replacement

To prevent leaking, small, black rubber O ring seals have been added to both quick connect valves (Figure 58) on K9 Diesel as well as on the blood filling bucket. Replacement O-rings are provided and may need to be replaced due to wear or loss from time to time.

Maintaining O-Rings

The O rings will last longer if the connection with the fill hose is made carefully, approaching the connector on the body straight on with the thumb holding down the 'quick connect' lever on the connector in hand.

When to Replace an O-Rings

The O-ring on each quick connect valve should be inspected at the beginning and end of each training cycle for each K9 Diesel unit. **ANY** nick or cut in the O-ring requires immediate replacement.



Figure 58

When connecting and disconnecting, a small amount (a couple of drops) of blood left over from the connecting action is normal, but if a large amount is visible, or if there is a constant drip after the quick connect hose is connected, then the O-ring should be removed and replaced with a new one.

NOTE: Additional O-rings can be obtained at most major hardware or home improvement stores – reference #011 O-ring (Aerospace Standards), 5/16” internal diameter, for 1/4” coupler.



Appendix A – K9 Diesel Technical Specs

K9 Diesel Unit

Weight: 60 lbs.

Power Supply: One (1) 18V Makita Li-ion battery

Bleed-out time (with full reservoir and no resistance): approx. 30-50 minutes

CAUTION: Tubing contains latex

Indoor or Outdoor Use

Altitude Rating: Altitude up to 2000 m

Temperature Rating: Temperatures between 32°F and 104°F (0°C to 40°C)

Humidity Rating: Maximum relative humidity 80% for temperatures up to 88°F (31°C) decreasing linearly to 50% relative humidity at 104°F (40°C)

Makita DC18RC Battery Charger

Input: A.C. 120 V 50 – 60 HZ

Output: D.C. 7.2 V – 18 V

Weight: 1.0 kg (2.2 lbs)

Remote Control Transmitter

Effective Range: Outdoor range is 200 meters (line of site); indoor range is 50 meters but is subject to building construction materials that may impede signal.

Power supply: 2 x 3.6V Lithium Ion Battery

Transmit power: 63mW (18dBm)

RF Data Rate: 250,000 bps

FCC ID: Contains FCC ID: OUR-XBEEPRO**

The enclosed device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (i.) this device may not cause harmful interference and (ii.) this device must accept any interference received, including interference that may cause undesired operation.

FCC Approval: Systems that include XBee/XBee-PRO Modules inherit MaxStream's Certifications. FCC ID: OUR-XBEEPRO

ISM (Industrial, Scientific & Medical): 2.4 GHz frequency band
Manufactured under ISO 9001:2000 registered standards XBee/XBee-
PRO RF Modules are optimized for use in US, Canada, Australia, Israel, and
Europe (contact MaxStream for complete list of approvals).

IMPORTANT: The XBee/XBee-PRO OEM RF Module has been certified by
the FCC for use with other products without any further certification (as per FCC
section 2.1091). Modifications not expressly approved by MaxStream could void
the user's authority to operate the equipment.



Appendix B – Safety Data Sheets

- **Blood Paste**
- **Blood Powder**
- **Lithium-Ion Batteries**
- **Airway Lubricant**

Blood Paste SDS

SAFETY DATA SHEET

blair adhesives

"BLOOD" PASTE

www.blairadhesives.com

SECTION 1: IDENTIFICATION

PRODUCT NAME: "BLOOD" PASTE
MANUFACTURER NAME: BLAIR ADHESIVE PRODUCTS, INC
11034 LOCKPORT PLACE
SANTA FE SPRINGS, CA 90670
562-946-6004
EMERGENCY PHONE: CHEMTREC 1-800-424-9300

SECTION 2: HAZARDS IDENTIFICATION

SKIN CONTACT: PROLONGED OR REPEATED CONTACT MAY CAUSE SLIGHT SKIN IRRITATION IN PEOPLE PRONE TO ALLERGIC REACTIONS.

EYE CONTACT: DIRECT CONTACT WITH MATERIAL MAY CAUSE IRRITATION.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS#	%
METHYL CELLULOSE	9004-65-3	TRADE SECRET
WATER	7732-18-5	TRADE SECRET
PROPRIETARY FOOD COLORS	8028-89-5	TRADE SECRET
SODIUM BENZOATE	532-32-1	TRADE SECRET

SECTION 4: FIRST AID MEASURES

SKIN CONTACT: WASH AFFECTED SKIN AREAS THOROUGHLY WITH SOAP & WATER.

EYE CONTACT: FLUSH EYES WITH LARGE QUANTITIES OF WATER UNTIL IRRITATION CEASES.

SECTION 5: FIRE FIGHTING MEASURES:

EXTINGUISHING AGENTS: NO SPECIAL REQUIREMENTS FOR THIS PRODUCT; USE FOAM, CARBON DIOXIDE, OR DRY CHEMICAL FIRE-FIGHTING APPARATUS APPROPRIATE FOR SURROUNDING FIRE.

UNUSUAL HAZARDS: NONE.

PERSONAL PROTECTIVE EQUIPMENT: NONE REQUIRED.

SECTION 6: ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS: NONE REQUIRED

EMERGENCY PROCEDURES: SPILLAGE MAY BE CLEANED WITH WATER. USE CAUTION, PRODUCT IS SLIPPERY. DO NOT WASH INTO STORM SEWER OR OPEN WATERWAY.

CONTAINMENT: NONE REQUIRED

DISPOSAL: DISPOSE OF USED PRODUCT IN ACCORDANCE WITH APPLICABLE LOCAL, COUNTY, STATE AND FEDERAL REGULATIONS.

SECTION 7: HANDLING AND STORAGE

HANDLING PROCEDURES: USE CAUTION, AS PRODUCT IS SLIPPERY.

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STORAGE CONDITIONS: KEEP PRODUCT AS CLEAN AS POSSIBLE TO AVOID POSSIBLE PRODUCT CONTAMINATION. STORE IN CLOSED CONTAINERS AT 80° - 90° F. AVOID EXTREME VARIATIONS OF TEMPERATURE AND HUMIDITY.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

CHEMICAL NAME	OSHA PEL		ACGIH	
	ppm	mg/M	ppm	mg/M
METHYL CELLULOSE	NONE LISTED		NONE LISTED	
WATER	NONE LISTED		NONE LISTED	
PROPRIETARY FOOD COLORS	NONE LISTED		NONE LISTED	
SODIUM BENZOATE	NONE LISTED		NONE LISTED	

ENGINEERING CONTROLS: MECHANICAL GENERAL ROOM VENTILATION.

RESPIRATORY PROTECTION: NO RESPIRATORY PROTECTION IS EXPECTED TO BE NEEDED IN NORMAL USE.

EYE PROTECTION: GENERALLY NOT NECESSARY. PERSONAL PREFERENCE.

HAND PROTECTION: GENERALLY NOT NECESSARY. PERSONAL PREFERENCE.

OTHER PROTECTIVE EQUIPMENT: NONE REQUIRED.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE	SMOOTH THICK RED LIQUID
ODOR	NONE
MELTING POINT	NOT APPLICABLE
BOILING POINT	212° F WATER
FLASH POINT	NOT APPLICABLE
EVAPORATION RATE	NOT APPLICABLE
FLAMMABILITY	NOT APPLICABLE
UPPER EXPLOSIVE LIMIT	NOT APPLICABLE
LOWER EXPLOSIVE LIMIT	NOT APPLICABLE
VAPOR PRESSURE	NOT APPLICABLE
VAPOR DENSITY	NOT APPLICABLE
SPECIFIC GRAVITY	1.2 - 1.4 (WATER =1)
SOLUBILITY IN WATER	COLLOIDAL SUSPENSION
AUTO IGNITION TEMP.	NOT APPLICABLE

SECTION 10: STABILITY AND REACTIVITY

REACTIVITY: NONE KNOWN.

CHEMICAL STABILITY: THIS MATERIAL IS CONSIDERED STABLE.

SECTION 11: TOXICOLOGICAL INFORMATION

NO TOXICITY DATA ARE AVAILABLE FOR THIS MATERIAL.

SECTION 12: ECOLOGICAL INFORMATION

NO APPLICABLE DATA.

SECTION 13: DISPOSAL CONSIDERATIONS

PROCEDURE :
DISPOSE OF USED PRODUCT IN ACCORDANCE WITH APPLICABLE LOCAL, COUNTY, STATE, AND FEDERAL REGULATIONS.

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CONTAINERS :
 'EMPTY' CONTAINERS SHOULD NOT BE GIVEN TO INDIVIDUALS, BUT BE DISPOSED OF IN ACCORDANCE WITH APPLICABLE LAWS AND REGULATIONS.

SECTION 14: TRANSPORT INFORMATION

US DOT HAZARD CLASS ----- NOT REGULATED

SECTION 16: REGULATORY INFORMATION

WORKPLACE CLASSIFICATION: THIS PRODUCT, **AS SUPPLIED**, IS NON HAZARDOUS UNDER THE OSHA HAZARD COMMUNICATION STANDARD (29CFR 1910.1200).

THIS PRODUCT IS NOT A 'CONTROLLED PRODUCT' UNDER THE CANADIAN WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS).

EMERGENCY PLANNING & COMMUNITY RIGHT TO KNOW:

SARA TITLE III. SECTION 311/312 CATEGORIZATIONS (40CFR 370)
 THIS PRODUCT IS NOT A HAZARDOUS CHEMICAL UNDER 29CFR 1910.1200, AND THEREFORE IS NOT COVERED BY TITLE III. OF SARA.

SARA TITLE III. SECTION 313 INFORMATION (40CFR 372)
 THIS PRODUCT DOES NOT CONTAIN A CHEMICAL WHICH IS LISTED IN SECTION 313 AT OR ABOVE 'de minimis' CONCENTRATIONS.

CERCLA INFORMATION (40CFR 302.4): RELEASES OF THIS MATERIAL TO AIR, LAND, OR WATER ARE NOT REPORTABLE TO THE NATIONAL RESPONSE CENTER UNDER THE COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT (CERCLA) OR TO STATE AND LOCAL EMERGENCY PLANNING COMMITTEES UNDER THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT (SARA) TITLE III. SECTION 304.

RCRA INFORMATION & WASTE CLASSIFICATION: WHEN A DECISION IS MADE TO DISCARD THIS MATERIAL, **AS SUPPLIED**, IT DOES NOT MEET RCRA'S CHARACTERISTIC DEFINITION OF IGNITABILITY, CORROSIVITY, OR REACTIVITY, AND IS NOT LISTED IN 40CFR 261.33.

THE TOXICITY CHARACTERISTIC (TC), HOWEVER, HAS NOT BEEN EVALUATED BY THE TOXICITY CHARACTERISTIC LEACHING PROCEDURE (TCLP).

UNITED STATES: CHEMICAL CONTROL LAW STATUS: ALL COMPONENTS OF THIS PRODUCT ARE IN COMPLIANCE WITH THE INVENTORY LISTING REQUIREMENTS OF THE U.S. TOXIC SUBSTANCES CONTROL ACT (TSCA) CHEMICAL SUBSTANCE INVENTORY.

CALIFORNIA PROPOSITION 65: THIS PRODUCT DOES NOT CONTAIN A COMPONENT OR COMPONENTS KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER.

<u>NFPA HAZARD RATING :</u>		<u>SCALE :</u>
TOXICITY	1	4=EXTREME
FIRE	0	3=HIGH
REACTIVITY	0	2=MODERATE
SPECIAL	-	1=SLIGHT
		0=INSIGNIFICANT

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SECTION 16: OTHER INFORMATION

REVISED: 05/18/2017

THE INFORMATION CONTAINED HEREIN RELATES ONLY TO THE SPECIFIC MATERIAL IDENTIFIED. BLAIR ADHESIVES BELIEVES THAT SUCH INFORMATION IS ACCURATE AND RELIABLE AS OF THE DATE OF THIS MSDS, BUT NO REPRESENTATION, GUARANTEE, OR WARRANTY, EXPRESS OR IMPLIED, IS MADE AS TO THE ACCURACY, RELIABILITY, OR COMPLETENESS OF THE INFORMATION. BLAIR ADHESIVES URGES PERSONS RECEIVING THIS INFORMATION TO MAKE THEIR OWN DETERMINATION AS TO THE INFORMATION'S SUITABILITY AND COMPLETENESS FOR THEIR PARTICULAR APPLICATION.

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Blood Powder SDS

SDS Name: Blood Red Dye Blend



Safety Data Sheet (SDS)

North American

Revision date:5/1/2015

SECTION 1: Identification

Product identifiers:

Product trade name: Blood Red Dye Blend
 Company product number: 26DA6787
 Other means of identification: Not Available

Recommended use of the chemical and restrictions on use:

Uses: Cosmetics
 Restrictions on use: None identified

Details of the supplier:

Manufacturer/Supplier: DyStar LP
 9844-A Southern Pine Blvd
 Charlotte, NC, 28207
 USA

Emergency telephone number: Chemtrec (24 hours): USA: 1-800-424-9300; International: +001-703-527-3887.

SECTION 2: Hazard(s) identification

Information in accordance with 29 CFR 1910.1200 (Hazcom 2012) in effect on May 25, 2012:

Classification of the chemical in accordance with 29 CFR 1910.1200(d):

Combustible Dust (OSHA Defined)

Label elements in accordance with 29 CFR 1910.1200(f):

Hazard pictogram(s): Not Applicable

Signal word:
 Warning

Hazard statements:

USH001 May form combustible dust concentrations in air.

Precautionary statements: Not Applicable

Supplemental information: Dermal contact may discolor the skin due to dye characteristics.

Notes: No Additional Information

Hazards not otherwise classified: No Additional Information

See Section 11 for toxicological information.

SECTION 3: Composition/information on ingredients

Mixture:

No Hazardous Components found under applicable regulations.

Amounts specified are typical and do not represent a specification. Remaining components are proprietary, non-hazardous, and/or present at amounts below reportable limits. Exact percentage values for components are proprietary in accordance with 29 CFR 1910.1200(i).

SDS Name: Blood Red Dye Blend

SECTION 4: First-aid measures**Description of first aid measures:**

General: If irritation or other symptoms occur or persist from any route of exposure, remove the affected individual from the area: see a physician/get medical attention.

Eye contact: Any material that contacts the eye should be washed out immediately with water. Get medical attention if symptoms occur.

Skin contact: Wash the affected area thoroughly with plenty of soap and water. Get medical attention if symptoms occur.

Inhalation: If affected, remove to fresh air. Get medical attention if symptoms occur.

Ingestion: Get medical attention if symptoms occur.

Protection of first aid responders: Wear proper personal protective clothing and equipment.

Most important symptoms and effects, both acute and delayed: Irritation, Skin discoloration due to dye. Preexisting sensitization, skin and/or respiratory disorders or diseases may be aggravated. See section 11 for additional information.

Indication of any immediate medical attention and special treatment needed, if necessary: Treat symptomatically.

SECTION 5: Fire-fighting measures

NFPA flammability class: N/A (Combustible solid)

Extinguishing media:

Suitable: Carbon dioxide, foam, dry chemical, water.

Unsuitable: Avoid hose streams or any method which will create dust clouds.

Special hazards arising from the chemical:

Unusual fire/explosion hazards: Concentrated dust/air combinations may produce explosive conditions. As with all organic dusts, fine particles suspended in air in critical proportions and in the presence of an ignition source may ignite and/or explode. Dust may be sensitive to ignition by electrostatic discharge, electrical arcs, sparks, welding torches, cigarettes, open flame, or other significant heat sources. As a precaution, implement standard safety measures for handling finely divided organic powders. See Section 7 for suggested measures.

Hazardous combustion products: Irritating or toxic substances may be emitted upon burning, combustion or decomposition. See section 10 (10.6 Hazardous decomposition products) for additional information.

Special protective equipment and precautions for fire-fighters: Avoid hose streams or any method which will create dust clouds. Wear self-contained breathing apparatus (SCBA) equipped with a full facepiece and operated in a pressure-demand mode (or other positive pressure mode) and approved protective clothing. Personnel without suitable respiratory protection must leave the area to prevent significant exposure to hazardous gases from combustion, burning or decomposition. In an enclosed or poorly ventilated area, wear SCBA during cleanup immediately after a fire as well as during the attack phase of firefighting operations.

See section 9 for additional information.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures: See Section 8 for recommendations on the use of personal protective equipment. If spilled in an enclosed area, ventilate. Avoid raising powdered material due to explosion hazard. Use spark-proof and explosion-proof equipment. If inhalation of dust cannot be avoided, wear an approved particulate respirator.

Environmental precautions: Do not flush product into public sewer, water systems or surface waters.

Methods and materials for containment and cleaning up: Contain spill. Wear proper personal protective clothing and equipment. Using care to avoid dust generation, vacuum or sweep into a closed container for reuse or disposal. Use approved industrial vacuum cleaner for removal. Avoid causing dust. Place into labeled, closed container; store in safe location to await disposal. Change contaminated clothing and launder before reuse.

SDS Name: Blood Red Dye Blend

SECTION 7: Handling and storage

Precautions for safe handling: As with any chemical product, use good laboratory/workplace procedures. Wash thoroughly after handling this product. Always wash up before eating, smoking or using the facilities. Use under well-ventilated conditions. Avoid eye contact. Avoid repeated or prolonged skin contact. Avoid drinking, tasting, swallowing or ingesting this product. Avoid routine inhalation of dust of any kind. Exercise care when emptying containers, sweeping, mixing or doing other tasks which can create dust. Wash contaminated clothing before reuse. Provide eyewash fountains and safety showers in the work area. As a precaution to control dust explosion potential, implement the following safety measures: Eliminate ignition sources (e.g., sparks, static buildup, excessive heat, etc.). In general, dust of organic materials is a static charge generator which may be ignited by electrostatic discharge, electrical arcs, sparks, welding torches, cigarettes, open flame, or other significant heat sources. Use spark-proof tools and equipment. Bond, ground and properly vent conveyors, dust control devices and other transfer equipment. Prohibit flow of polymer, powder or dust through non-conductive ducts, vacuum hoses or pipes, etc.; only use grounded, electrically conductive transfer lines when pneumatically conveying product. Good housekeeping and controlling of dusts are necessary for safe handling of product. Prevent accumulation of dust (e.g., well-ventilated conditions, promptly vacuuming spills, cleaning overhead horizontal surfaces, etc.). A properly engineered explosion suppression system must be considered. See standards such as the National Fire Protection Association NFPA 654, "Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids"; NFPA 69, "Standard on Explosion Prevention Systems"; NFPA 68, "Standard on Explosion Protection by Deflagration Venting"; NFPA 77, "Recommended Practice on Static Electricity" and other standards as the need exists.

Conditions for safe storage, including any compatibilities: Store cool and dry, under well-ventilated conditions. Store this material away from incompatible substances (see section 10). Do not store in open, unlabeled or mislabeled containers. Keep container closed when not in use.

SECTION 8: Exposure controls / personal protection

Control parameters:

Occupational exposure limits (OEL): No applicable exposure limits.

Exposure controls:

Appropriate engineering controls: Always provide effective general and, when necessary, local exhaust ventilation to draw dust away from workers to prevent routine inhalation. Ventilation must be adequate to maintain the ambient workplace atmosphere below the exposure limit(s) outlined in the SDS. Eliminate ignition sources (e.g., sparks, static buildup, excessive heat, etc.). Prohibit flow of powder or dust through non-conductive ducts, vacuum hoses, or pipes, etc. Bond, ground, and properly vent conveyors, dust control devices and other transfer equipment. (Ventilation guidelines/techniques may be found in publications such as Industrial Ventilation: American Conference of Governmental Industrial Hygienists, 1330 Kemper Meadow Drive, Cincinnati, OH, 45240-1634, USA.) (<http://www.acgih.org/home.htm>).

Individual protection measures, such as personal protective equipment (PPE):

Eye/face protection: Wear eye protection.

Skin and body protection: Wear protective gloves. Use good laboratory/workplace procedures including personal protective clothing: labcoat, safety glasses and protective gloves.

Respiratory protection: Respiratory protection is not needed with proper ventilation. In case of insufficient ventilation, wear suitable respiratory equipment. If inhalation of dust cannot be avoided, wear an approved particulate respirator. Use respirator in accordance with manufacturer's use limitations and OSHA standard 1910.134 (29CFR).

Further information: Eyewash fountains and safety showers are recommended in the work area.

SECTION 9: Physical and chemical properties

Form:	Powder	pH:	Not Available
Appearance:	Brown, Orange	Relative density:	Not Available
Odor:	None	Partition coefficient (n-octanol/water):	Not Available

SDS Name: Blood Red Dye Blend

Odor threshold:	Not Available	% Volatile by weight:	Not Available
Solubility in water:	Soluble	VOC:	Not Applicable
Evaporation rate:	Not Available	Boiling point °C:	Not Applicable
Vapor pressure:	Not Available	Boiling point °F:	Not Applicable
Vapor density:	Not Available	Flash point:	Not Applicable
Viscosity:	Not Available	Auto-ignition temperature:	Not Available
Melting point/Freezing point:	Not Available	Flammability (solid, gas):	Not flammable (may form combustible dust-air mixtures)
Oxidizing properties:	Not oxidizing	Flammability or explosive limits:	LFU/LEL Not Available
Explosive properties:	Not explosive		UFL/UEL Not Available
Decomposition temperature:	Not Available		

Other information: Amounts specified are typical and do not represent a specification.

Dust combustibility data: YELLOW DYE COMPONENT: Particle size variation is considered a critical factor in regards to dust explosion hazard information. Results applicable as follows: sample particle size <75 um, <5% moisture content. Sample tested may not be typical of product.:

- Minimum explosive concentration: 100 g/m3
- Minimum Autoignition temperature (dust cloud): 570 °C
- Minimum Autoignition temperature (dust layer): 325 °C
- Maximum pressure of explosion: 7.9 bars-gauge
- Deflagration Index, Kst: 109 bar-m/sec
- Dust Hazard Class: 1 (weak)

SECTION 10: Stability and reactivity

Reactivity: None known.

Chemical stability: This product is stable.

Possibility of hazardous reactions: Hazardous polymerization will not occur.

Conditions to avoid: Avoid dust formation.

Incompatible materials: Avoid strong bases and oxidizing agents.

Hazardous decomposition products: Carbon dioxide, carbon monoxide, oxides of nitrogen, and oxides of sulfur.

SECTION 11: Toxicological information

Information on likely routes of exposure:

General: Caution must be exercised through the prudent use of protective equipment and handling procedures to minimize exposure.

Eyes: Solid particles on the eye (powder/dust) may cause pain and be accompanied by irritation.

Skin: Repeated or prolonged skin contact may cause irritation. Repeated or prolonged skin contact may cause allergic reactions with susceptible persons.

Inhalation: Dust inhalation may cause respiratory irritation.

Ingestion: Ingestion may cause irritation.

Symptoms/effects, acute and delayed: Irritation, Skin discoloration due to dye

Acute toxicity information: Not classified (based on available data, the classification criteria are not met). No toxicity studies have been conducted on this product. ATEmix (oral): >2000 mg/kg.

Skin corrosion/irritation: Not classified.

Serious eye damage/irritation: Not classified.

SDS Name: Blood Red Dye Blend

Respiratory or skin sensitization: Not classified.

Carcinogenicity: Not classified.

Carcinogenic status: The components of this mixture are not known to be listed or regulated by IARC, NTP, OSHA or ACGIH.

Germ cell mutagenicity: Not classified.

Reproductive toxicity: Not classified.

Specific target organ toxicity (STOT) - single exposure: Not classified.

Specific target organ toxicity (STOT) - repeated exposure: Not classified.

Aspiration hazard: Not classified (technical impossibility to obtain the data).

Other toxicity information: No additional information available.

SECTION 12: Ecological information

Ecotoxicity: No ecological testing has been conducted on this product.

Persistence and degradability: No specific information available.

Bioaccumulative potential: No specific information available.

Mobility in soil: No specific information available.

Other adverse effects: No additional information available.

SECTION 13: Disposal considerations

Although this product is not defined or designated as hazardous by current provisions of the Federal (EPA) Resource Conservation and Recovery Act (RCRA, 40CFR261), recognize that in appropriate dust/air ratio, dust cloud in air may have explosion potential. Incinerate or landfill waste in a properly permitted facility in accordance with federal, state and local regulations.

See Section 8 for recommendations on the use of personal protective equipment.

SECTION 14: Transport information

The information below is provided to assist in documentation. It may supplement the information on the package. The package in your possession may carry a different version of the label depending on the date of manufacture. Depending on inner packaging quantities and packaging instructions, it may be subject to specific regulatory exceptions.

UN number: N/A

UN proper shipping name:

Not regulated - See Bill of Lading for Details

Transport hazard class(es):

U.S. DOT hazard class: N/A

Canada TDG hazard class: N/A

Europe ADR/RID hazard class: N/A

IMDG Code (ocean) hazard class: N/A

ICAO/IATA (air) hazard class: N/A

A "N/A" listing for the hazard class indicates the product is not regulated for transport by that regulation.

Packing group: N/A

Environmental hazards:

Marine pollutant: Not Applicable

Hazardous substance (USA): Not Applicable

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC code: Not Applicable

Special precautions for user: Not Applicable

SDS Name: Blood Red Dye Blend

SECTION 15: Regulatory information

Safety, health and environment regulations/legislation specific for the product:

U.S. federal and state regulations/legislation:

This SDS has been prepared in accordance with the hazard criteria of the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

U.S. Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Reportable Quantity (RQ):

Not Applicable

U.S. Superfund Amendments and Reauthorization Act (SARA) - SARA Section 313:

None Known

California Proposition 65:

Warning: The following ingredients present in the product are known to the state of California to cause Cancer:

None known to be present or none in reportable amounts for occupational exposure as per OSHA's approval of the California Hazard Communication Standard, Federal Register, page 31159 ff, 6 June 1997.

Warning: The following ingredients present in the product are known to the state of California to cause birth defects, or other reproductive hazards:

None known to be present or none in reportable amounts for occupational exposure as per OSHA's approval of the California Hazard Communication Standard, Federal Register, page 31159 ff, 6 June 1997.

Canada regulations/legislation:

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the SDS contains all the information required by the Controlled Products Regulations.

Canadian Workplace Hazardous Material Information System (WHMIS) classification: Not controlled

Canadian Ingredient Disclosure List:

None known to be present or none in reportable amounts

Mexico regulations/legislation:

This SDS contains the information required by NOM-018-STPS-2000 Workplace Hazardous Chemical Substances Communication and Identification Standard.

Chemical inventories:

<u>Regulation</u>	<u>Status</u>
Canadian Domestic Substances List (DSL):	Y
Canadian Non-Domestic Substances List (NDSL):	N
U.S. Toxic Substances Control Act (TSCA):	Y

A "Y" listing indicates all intentionally added components are either listed or are otherwise compliant with the regulation. A "N" listing indicates that for one or more components: 1) there is no listing on the public inventory; 2) no information is available; or 3) the component has not been reviewed.

SECTION 16: Other information

SDS Revision date: 5/1/2015

HMIS (Hazardous Materials Identification System) Ratings:

Health: 1 Flammability: 1 Reactivity (Stability): 0 Personal Protection: X

NFPA (National Fire Protection Association) Ratings:

Health: 1 Flammability: 1 Instability: 0

Key: 0=Insignificant; 1=Slight; 2=Moderate; 3=High; 4=Extreme. An asterisk appearing after the HMIS Health numerical rating denotes a chronic hazard.

Hazardous Materials Identification System (HMIS), National Paint and Coating Association, rating applies to product "as packaged" (i.e., ambient temperature). Ratings are based upon HMIS® III and NFPA 704 (2007). An asterisk appearing after the HMIS Health® III numerical rating

SDS Name: Blood Red Dye Blend

denotes a chronic hazard. National Fire Protection Association (NFPA) rating identifies the severity of hazards of material during a fire emergency (I.e., "on fire").

Legend:

ACGIH: American Conference of Governmental Industrial Hygienists

N/A: Not Applicable

N/E: None Established

STEL: Short Term Exposure Limit

TWA: Time Weighted Average (exposure for 8-hour workday)

Users Responsibility/Disclaimer of Liability:

As the conditions or methods of use are beyond our control, we do not assume any responsibility and expressly disclaim any liability for any use of this product. Information contained herein is believed to be true and accurate but all statements or suggestions are made without warranty, expressed or implied, regarding accuracy of the information, the hazards connected with the use of the material or the results to be obtained from the use thereof. Compliance with all applicable federal, state, and local laws and local regulations remains the responsibility of the user.

This bulletin cannot cover all possible situations which the user may experience during processing. Each aspect of your operation should be examined to determine if, or where, additional precautions may be necessary. All health and safety information contained in this bulletin should be provided to your employees or customers. It is your responsibility to develop appropriate work practice guidelines and employee instructional programs for your operation.

Safety Data Sheet Preparer:
Product Compliance Department
Emerald Performance Materials, LLC
2020 Front Street, Suite 100
Cuyahoga Falls, Ohio 44221
United States

Lithium-Ion Batteries SDS

SECTION 1. CHEMICAL PRODUCT AND COMPANY NAME

**Lithium-Ion Rechargeable Battery Pack
BL1815N & BL1850**

Symbol  at the bottom of the battery.

Safety Data Sheet

Complies with the OSHA Hazard
Communication Standard :
29 CFR 1910 1200

Makita U.S.A., Inc. 14930-C Northam Street La Mirada, CA 90638	Prepared By : Stan Rodrigues Date Revised: 2/11/2015
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EMERGENCY CONTACT INFORMATION

Telephone Number for Information: MAKITA: 1-510-657-9881

Emergency Response

For Chemical Emergency
Spills, Leak, Fire, Exposure, or Accident
Call CHEMTREC Day or Night
Within USA and Canada 1-800-424-9300

SECTION 2. HAZARD IDENTIFICATION:

Route(s) of Entry:	There is no hazard when the measures for handling and storage are followed.
Signs and Symptoms of Exposure:	In case of cell damage, possible release of dangerous substances and a flammable gas mixture.
OSHA Hazard Communication:	This material is not considered hazardous by the OSHA Hazard Communication Standard 29CFR 1910 1200.
Carcinogenicity (NTP):	Not listed
Carcinogenicity (IARC):	Not listed
Carcinogenicity (OSHA):	Not listed
Special hazards for human health and environment:	There is no hazard when the measures for handling and storage are followed. In case of cell damage, possible release of dangerous substances and a flammable gas mixture.

SECTION 3. COMPOSITION, INFORMATION OR INGREDIENTS

CAS-No.	Chemical Name	Quantity
1307-96-6	Cobalt oxide	< 30 %
1313-13-9	Manganese dioxide	< 30 %
1313-99-1	Nickel oxide	< 30 %
7440-44-0	Carbon	< 30 %
	Electrolyte (*)	< 20 %
24937-79-9	Polyvinylidene fluoride (PVdF)	< 10 %
7429-90-5	Aluminum foil	2 - 10 %
7440-50-8	Copper foil	2 - 10 %
	Aluminum and inert materials	5 - 10 %

Full text of each relevant R phrase can be found in Section 16

CONTINUED: SECTION 3. COMPOSITION, INFORMATION OR INGREDIENTS

For information purposes:	(* Main ingredients: Lithium hexafluorophosphate, organic carbonates Because of the cell structure the dangerous ingredients will not be available if used properly. During charge process a lithium graphite intercalation phase is formed.
Mercury content:	Hg < 0.1mg/kg
Cadmium content:	Cd < 1mg/kg
Lead content:	Pb < 10mg/kg
Wh rating:	Under 100Wh
Anode (negative electrode):	Based on intercalation graphite
Cathode (positive electrode):	Based on lithiated metal oxide (Cobalt, Nickel, Manganese)

SECTION 4. FIRST AID MEASURE

General information:	The following first aid measures are required only in case of exposure to interior battery components after damage of the external battery casing. Undamaged, closed cells do not represent a danger to the health.
After inhalation:	Ensure of fresh air. Consult a physician.
After contact with skin:	In case of contact with skin wash off immediately with plenty of water. Consult a physician.
After contact with eyes:	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Seek medical treatment by eye specialist
After ingestion:	Drink plenty of water. Call a physician immediately.

SECTION 5. FIRE FIGHTING MEASURES

Suitable extinguishing media:	Cold water and dry powder in large amount are applicable. Use metal fire extinction powder or dry sand if only few cells are involved.
Special hazards arising from the chemical:	May form hydrofluoric acid if electrolyte comes into contact with water. In case of fire, the formation of the following flue gases cannot be excluded: Hydrogen fluoride (HF), Carbon monoxide and carbon dioxide.
Protective equipment and precautions for firefighters:	Wear self-contained breathing apparatus and protective suit.
Additional information:	If possible, remove cell (s) from firefighting area. If heated above 125°C, cell (s) can explode/vent. Cell is not flammable but internal organic material will burn if the cell is incinerated.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions:	Use personal protective clothing. Avoid contact with skin, eyes and clothing. Avoid breathing fume and gas.
Environmental precautions:	Do not discharge into the drains/surface waters/groundwater. Methods for cleaning up/taking up Take up mechanically and send for disposal.

SECTION 7. HANDLING AND STORAGE

Handling	
Advice on safe handling:	Avoid short circuiting the cell. Avoid mechanical damage of the cell. Do not open or disassemble. Advice on protection against fire and explosion Keep away from open flames, hot surfaces and sources of ignition.
Storage	
Requirements for storage rooms and vessels:	Storage at room temperature (approx. 20°C) at approx. 20- 60% of the nominal capacity (OCV approx. 3.6 - 3.9 V/cell). Keep in closed original container.

SECTION 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Ingredient	Risk Codes	Safety Description	Hazard	Exposure Controls/Personal Protection
Cobalt oxide	R22, R43, R50/53	S24; S37; S60; S61	Xn (Harmful)N (Dangerous for the environment)	0.1 mg/m ³ (TWA)
Manganese (VI) oxide	R20/22	S25	Xn (Harmful)	Airborne Exposure Limits: - OSHA Permissible Exposure Limit (PEL): 5 mg/m ³ Ceiling for manganese compounds as Mn - ACGIH Threshold Limit Value (TLV): 0.2 mg/m ³ (TWA) for manganese, elemental and inorganic compounds as Mn
Nickel oxide	R43, R49, R53	S45, S53, S61	T (Toxic)	Airborne Exposure Limits: For Nickel, Metal and Insoluble Compounds, as Ni: - OSHA Permissible Exposure Limits (PEL) - 1 mg/m ³ (TWA) For Nickel, Elemental / Metal: - ACGIH Threshold Limit Value (TLV) - 1.5 mg/m ³ (TWA), A5 - Not suspected as a human carcinogen. For Nickel, Insoluble Compounds, as Ni: - ACGIH Threshold Limit Value (TLV) - 0.2 mg/m ³ (TWA), A1 - Confirmed human carcinogen
Carbon	R36/37/38 R36/37 R20, R10	S22, S24/25	F (Highly Flammable) Xn (Harmful) Xi (Irritant)	Airborne Exposure Limits: - OSHA Permissible Exposure Limits (PELs): activated carbon (graphite, synthetic): Total particulate = 15 mg/m ³
Aluminum foil	R17, R15, R36/38, R10, R67, R65, R62, R51/53, R48/20, R38, R11,	S7/8, S43, S26, S62 S61, S36/37, S33, S29, S16, S9	F (Highly Flammable) Xn (Harmful) Xi (Irritant)	Airborne Exposure Limits: -OSHA Permissible Exposure Limit (PEL): 15 mg/m ³ (TWA) total dust and 5 g/m ³ (TWA) repairable fraction for Aluminum metal as Al -ACGIH Threshold Limit Value (TLV): 10 mg/m ³ (TWA) Aluminum metal dusts

CONTINUED: SECTION 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Ingredient	Risk Codes	Safety Description	Hazard	Exposure Controls/Personal Protection
Copper foil	R11 R36 R37 R38	S5, S26, S16, S61, S36/37	F (Highly Flammable) N (Dangerous for the environment) Xn (Harmful) Xi (Irritant)	Copper Dust and Mists, as Cu: - OSHA Permissible Exposure Limit (PEL) - 1 mg/m ³ (TWA) - ACGIH Threshold Limit Value (TLV) - 1 mg/m ³ (TWA) Copper Fume: - OSHA Permissible Exposure Limit (PEL) - 0.1 mg/m ³ (TWA) - ACGIH Threshold Limit Value (TLV) - 0.2 mg/m ³ (TWA)
Polyvinylidene fluoride (PVdF)		S22, S24/25		
Additional advice on limit values:		During normal charging and discharging there is no release of product.		
Occupational exposure controls:		No specific precautions necessary.		
Protective and hygiene measures:		When using do not eat, drink or smoke. Wash hands before breaks and after work.		
Respiratory protection:		No specific precautions necessary.		
Hand protection:		No specific precautions necessary.		
Eye protection:		No specific precautions necessary.		
Skin protection:		No specific precautions necessary.		

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	
Form:	Solid
Color:	Various
Odor:	Odourless
Important health, safety and environmental information	
Test method	
pH Value:	n.a.
Flash point:	n.a.
Lower explosion limits:	n.a.
Vapour pressure:	n.a.
Density:	n.a.
Water solubility:	Insoluble
Ignition temperature:	n.a.

SECTION 10. STABILITY AND REACTIVITY

Stability:	Stable
Conditions to avoid:	Keep away from open flames, hot surfaces and sources of ignition. Do not puncture, crush or incinerate.
Materials to avoid:	No materials to be especially mentioned.
Hazardous decomposition products:	In case of open cells, there is the possibility of hydrofluoric acid and carbon monoxide release.
Possibility of Hazardous Reactions:	Will not occur
Additional information:	No decomposition if stored and applied as directed.

SECTION 11. TOXICOLOGICAL INFORMATION

Empirical data on effects on humans:	If appropriately handled and if in accordance with the general hygienic rules, no damages to health have become known.
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SECTION 12. ECOLOGICAL INFORMATION

Further information:	Ecological injuries are not known or expected under normal use. Do not flush into surface water or sanitary sewer system.
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SECTION 13. DISPOSAL CONSIDERATIONS

Advice on disposal:	For recycling consult manufacturer.
Contaminated packaging:	Disposal in accordance with local regulations.

SECTION 14. TRANSPORT INFORMATION

<ul style="list-style-type: none"> • When a number of batteries are transported by ship, vehicle and railroad avoid high temperature and dew condensation. • Avoid transportation which may cause damage of package. • Lithium-ion batteries are not subject to dangerous goods regulation for the purpose of transportation by the International Maritime Dangerous Goods regulations (IMDG). For Lithium-ion batteries, the Watt-hour rating is no more than 20Wh/cell and 100Wh/battery pack can be treated as "non-dangerous goods" by the United Nations Recommendations on the Transport of Dangerous Goods/Special Provision 188, provided that the products are prevented from being short-circuited with each other and are packaged in an appropriate condition which satisfies Packing Group II performance level. • IATA (International Air Transport Association): Dangerous Goods Regulation Packing Instruction 965 (Lithium-ion or lithium polymer cells and batteries without electronic equipment) • US Hazardous Materials Regulations 49 CFR (Code of Federal Regulations) Sections 173-185 Lithium batteries and cells. <p>Section II requirements apply to lithium-ion cells with a Watt-hour rating not exceeding 20 Wh and lithium-ion batteries with a Watt-hour rating not exceeding 100 Wh packed in quantities that within the allowance permitted in Section II, Table 965-11.</p>			
TABLE 965-II			
Contents	Lithium-ion cells and/or batteries with a Watt-hour rating of 2.7 Wh or less	Lithium-ion cells with a Watt-hour rating of more than 2.7Wh but not more than 20Wh	Lithium-ion batteries with a Watt-hour rating of more than 2.7Wh but not more than 100Wh
Maximum number of cells / batteries per package	No limit	8 cells	2 Batteries

CONTINUED: SECTION 14. TRANSPORT INFORMATION:

Contents	Lithium-ion cells and/or batteries with a Watt-hour rating of 2.7 Wh or less	Lithium-ion cells with a Watt-hour rating of more than 2.7Wh but not more than 20Wh	Lithium-ion batteries with a Watt-hour rating of more than 2.7Wh but not more than 100Wh
Maximum net quantity per package	2.5 kg	N/A	N/A
<p>Lithium-ion cells and batteries meeting the requirements in this section are not subject to other additional requirements of these Regulations except for:</p> <ul style="list-style-type: none"> Each cell and battery is of the type proven to meet the requirements of each test in the UN Manual of Tests and Criteria, Part III, subsection 38.3; <ul style="list-style-type: none"> cells and batteries must be manufactured under a quality management program; for batteries, The Watt-hour rating must be marked on the outside of the battery case; Each package must be capable of withstanding a 1.2m drop test in any orientation without: <ul style="list-style-type: none"> damage to cells or batteries contained therein; shifting of the contents so as to allow battery to battery (or cell to cell) contact; release of contents. Each package must be labeled with a lithium battery handling label. <p>Section IB requirements apply to lithium-ion cells with a Watt-hour rating not exceeding 20 Wh and lithium-ion batteries with a Watt-hour rating not exceeding 100 Wh packed in quantities that exceed the allowance permitted in Section II, Table 965-II.</p> <p>Quantities of lithium-ion cells or batteries that exceed the allowance permitted in Section II, Table 965-II must be assigned to Class 9 and are subject to all of the applicable provisions of Regulation.</p> <p>Even classified as lithium batteries packed with equipment (UN3481), IATA Dangerous Goods Regulations packing instruction 966 is applied.</p> <p>Even classified as lithium batteries installed in equipment (UN3481), IATA Dangerous Goods Regulations packing instruction 967 is applied.</p>			

SECTION 15. REGULATORY INFORMATION

U.S. Regulations	
National Inventory TSCA:	All of the components are listed on the TSCA inventory.
SARA:	To the best of our knowledge this product contains no toxic chemicals subject to the supplier notification requirements of Section 313 of the Superfund Amendments and Reauthorization Act (SARA/EPCRA) and the requirements of 40 CFR Part 372.

SECTION 16. OTHER INFORMATION

Hazardous Materials Information Label (HMIS)	
Health:	0
Flammability:	0
Physical Hazard:	0
NFPA Hazard Ratings	
Health:	0
Flammability:	0
Reactivity:	0
Unique Hazard:	
Full text of R-phrases referred to under Sections 2 and 3	

CONTINUED: SECTION 16. OTHER INFORMATION

R10	Flammable.
R20/22	Harmful by inhalation and if swallowed.
R22	Harmful if swallowed.
R34	Causes burns.
R40	Limited evidence of a carcinogenic effect.
R43	May cause sensitization by skin contact.
R48/23	Toxic: danger of serious damage to health by prolonged exposure through inhalation.
R49	May cause cancer by inhalation.
R50	Very toxic to aquatic organisms.
R53	May cause long-term adverse effects in the aquatic environment
Further Information	
<p>Data of sections 4 to 8, as well as 10 to 12, do not necessarily refer to the use and the regular handling of the product (in this sense consult package leaflet and expert information), but to release of major amounts in case of accidents and irregularities. The information describes exclusively the safety requirements for the product (s) and is based on the present level of our knowledge. This data does not constitute a guarantee for the characteristics of the product(s) as defined by the legal warranty regulations. '(n.a. = not applicable; n.d. = not determined)'</p> <p>The data for the hazardous ingredients were taken respectively from the last version of the sub-contractor's safety data sheet.</p>	

Airway Lubricant SDS

1



Safety Data Sheet (SDS) (Industrial Use Only)

1. Product and Company Identification

Product:

Product Name: SS-50 Silicone Oil
 Intended Use: Sealant

Manufacturer/Supplier:

Silicone Solutions
 338 Remington Road
 Cuyahoga Falls, OH
 Preparer: Casey Linx
 Chemical Family: Silicone Rubber
 Formula: SiO₂CH₃
 Emergency Telephone Number: 330-920-3125

2. Hazards Identification

Hazard Classification:

This material's composition is minimally hazardous according to regulatory guidelines. *See Section 15 for hazard ratings.*

Label: None required.

Hazard Statements:

Physical: None known

Health:

Ingestion	None known.
Skin Contact	Manufacturing experience has shown that skin hazard is not applicable in this form.
Inhalation	None known.
Eye Contact	May cause mild eye irritation.
Medical Conditions Aggravated	None known.
Subchronic (target organ) Effects	None known.
Chronic Effects/Carcinogenicity	This product or one of its ingredients that is present in 0.1% or more is NOT listed or is suspected as a carcinogen by NTP, IARC, or OSHA.
Principle Routes of Exposure	None known.

Precautionary Statements:

General: Obtain special instructions before use, and do not handle until all safety precautions have been read and understood.

Other Hazard Information:

- This product contains methylpolysiloxanes, which can generate formaldehyde upon exposure above 300 degrees centigrade in atmospheres that contain oxygen. Formaldehyde is a skin, eye, and throat irritant.

3. Composition/Information on Ingredients**Chemical Characterization:**Formula: SiO_2CH_3 **Composition and Information on Ingredients:** Non-hazardous components unless otherwise specified.

Component	CAS #	Approximate % Weight
Dimethylpolysiloxane	63148-62-9	100

4. First Aid Measures**General Information:****Ingestion:** None known.**Skin:** Wash with soap and water.**Inhalation:** None known.**In case of eye contact:** Flush with water for fifteen minutes and get medical attention.**Note to Physician:** None known.**5. Firefighting Measures****Flammability Properties:****Flash Point:** > 250°C or 482°F**Method:** ISO 2592**Ignition Temperature:** 395°C or 743°F**Flammable Limits in Air-Upper % :** NA**Flammability Limits in Air-Lower % :** NA**Sensitivity to Mechanical Impact:** No**Sensitivity to Static Discharge:** No**Extinguishing Media:** All standard firefighting material.**Special Firefighting Procedures:** None known.**6. Accidental Release Measures****Action to be taken if material is released or spilled:** Scrape up and place in an inert material for disposal. See Section 8 for protective equipment upon exposure and Section 7 for information on safe handling.**7. Handling and Storage****Precautions to be taken during handling and storage:** None required.

8. Exposure Controls/Personal Protection

Control Parameters:

Components with limit values that require monitoring at the workplace:

Component	CAS #	ACGIH TWA	TLV STEL	OSHA TWA	PEL STEL
Dimethylpolysiloxane	63148-62-9	NE	NE	NF	NE

Exposure Controls and Protection:

Engineering Controls: None known.
 Respiratory Protection: None required.
 Protective Gloves: None required.
 Eye and Face Protection: None required.
 Other Protective Equipment: None required.
 Ventilation: None required.

9. Physical and Chemical Properties

Information on basic physical and chemical properties:

Boiling Point: NA
 Vapor Pressure: NA
 Vapor Density: NA
 Freezing Point: NA
 Melting Point: -55°C (-67°F)
 Physical State: Liquid
 Odor: Odorless.
 % Volatile by Volume: <1
 Evaporation Rate: <1
 Density: 0.96 g/cm³
 Acid/Alkalinity: Unknown.
 pH: Approximately 7
 VOC: NT
 Solubility in Water: Insoluble.
 Solubility in Organic Solvents: Partially soluble in toluene.

10. Stability and Reactivity

Chemical Stability:

Stability: Stable.

Reactivity:

Hazardous Polymerization: Will not occur.

Hazardous Thermal Decomposition/Combustion Products:

- Carbon Dioxide
- Carbon Monoxide
- Silicon Dioxide
- Formaldehyde

Conditions to Avoid: None known.

11. Toxicological Information**Product Information on Toxicological Effects:**

Acute Oral LD50: Unknown.
Acute Dermal LD50: Unknown.
Acute Inhalation LC50: Unknown.
Ames Test: Unknown.

12. Ecological Information**Ecotoxicity:**

Ecotoxicological Information: Unknown.
Chemical Fate Information: Unknown.

13. Disposal Considerations

Disposal Method: Disposal should be made in accordance with federal, state, and local considerations.

14. Transport Information**General:**

DOT Shipping Name: NA
DOT Hazard Class: Not DOT regulated.
DOT Label: NA
UN/NA Label: NA
Placards: None.
IATA: NA
IMO IMDG-code: NA
European Class:
RID (OCTI): NA
ADR (ECE): NA
RAR (IATA): NA

15. Regulatory Information**Regulatory Status and Applicable Laws and Regulations:**

SARA Section 302: None found.
SARA (311, 312) Hazard Class: None.
SARA (313) Chemicals: None.
CPSC Classification: NA
WHMIS Hazard Class: None.
Export Schedule:
B/HTSUS: 3910.00 Silicones in primary form.
ECCN: EAR99
California Proposition 65: None.
TSCA Inventory Status: All components of this product are listed (or exempt) on the EPA TSCA inventory.

Hazard Rating Systems:

HMIS (scale 0-4):
• Health = 0
• Flammability = 0
• Reactivity = 0
NFPA (scale 0-4):
• Health = 0
• Flammability = 0
• Reactivity = 0

16. Other Information

Revision Date: 06/20/2013

SDS Preparer: Casey Linx

This product or its components are on the European inventory (EINECS) of existing commercial chemicals. This data is offered in good faith as typical values and not as a product satisfaction. No warranty, either expressed or implied, is made. The recommended handling procedures are believed to be generally applicable. However, each user should review these recommendations in the specific content of the intended use.

Abbreviations and Acronyms:

OSHA: Occupational Safety and Health Administration

ACGIH: American Conference of Governmental Industrial Hygienists

LD50: Lethal Dose, 50 percent

LC50: Lethal Concentration, 50 percent

DOT: US Department of Transportation

IATA: International Air Transport Association

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)

IMDG: International Maritime Code for Dangerous Goods

NFPA: National Fire Protection Association (USA)

HMIS: Hazardous Materials Identification System (USA)

WHMIS: Workplace Hazardous Materials Information System (Canada)

SAFETY DATA SHEET: Gamsol
 REVISED: 8/1/2015



SAFETY DATA SHEET

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT

Product Name: Gamsol
Product Description: Odorless Mineral Spirits (OMS)
Intended Use: Artists' oil painting solvent. Intended for thinning oil colors, thinning oil painting mediums, grounds and varnishes, and for general brush clean-up.

COMPANY

Company Name: Gamblin Artists Colors
Company Address: 323 SE Division Pl.
 Portland, OR 97202
 USA
Company Phone: 503-235-1945
Emergency Phone: Local Emergency Room

SECTION 2: HAZARDS IDENTIFICATION

GHS LABELING

GHS Classification: Flammable liquid Category 4
 Aspiration toxicant Category 1

GHS Pictogram(s):



Signal Word: Danger

HAZARDS

Hazard Statements:
 H227 Combustible liquid
 H304 May be fatal if swallowed and enters airways
Precautionary Statements:
 P210 Keep away from flames and hot surfaces. -- No smoking
 P280 Wear protective gloves and eye / face protection

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- P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician
- P331 Do NOT induce vomiting
- P370 + P378 In case of fire: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish
- P403 + P235 Store in a well-ventilated place. Keep cool
- P405 Store locked up
- P501 Dispose of contents and container in accordance with local regulations

Physical/Chemical Hazards:

Material can accumulate static charges which may cause an ignition. Material can release vapors that readily form flammable mixtures. Vapor accumulation could flash and/or explode if ignited. Combustible.

Health Hazards:

Repeated exposure may cause skin dryness or cracking. May be irritating to the eyes, nose, throat, and lungs.

Environmental Hazards:

No significant hazards

NFPA Hazard ID: Health: 1 Flammability: 2 Reactivity: 0

HMIS Hazard ID: Health: 1¹ Flammability: 2 Reactivity: 0

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

This material is defined as a complex substance.

Hazardous Substance(s) or Complex Substance(s) required for disclosure

Chemical Name	CAS#	Concentration (%) ²	GHS Hazard Codes
Naphtha (petroleum), hydrotreated heavy	64742-48-9	100%	H227, H304

SECTION 4: FIRST AID MEASURES

- Eyes:** Flush thoroughly with water. If irritation occurs, get medical assistance.
- Skin:** Wash contact areas with soap and water. Remove contaminated clothing. Launder contaminated clothing before reuse.
- Inhalation:** Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation,

¹ All concentrations are percent by weight unless material is a gas. Gas concentrations are in percent by volume. Concentration values may vary.
² As per paragraph (f) of 29 CFR 1910.1200, formulation is considered a trade secret and specific chemical identity and exact percentage (concentration) of composition may have been withheld. Specific chemical identity and exact percentage composition will be provided to health professionals, employees, or designated representatives in accordance with applicable provisions of paragraph (f).

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Ingestion: dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation. Seek immediate medical attention. Do not induce vomiting.

NOTES TO PHYSICIANS OR FIRST AID PROVIDERS: If ingested material may be aspirated into the lungs and cause chemical pneumonia. Treat appropriately.

SECTION 5: FIRE FIGHTING MEASURES

FIRE FIGHTING

Appropriate Extinguishing Media: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.
Inappropriate Extinguishing Media: Straight Streams of Water
Special Fire Fighting Procedures: Combustible. Evacuate area. Prevent runoff from fire control or dilution From entering streams, sewers, or drinking water supplies. Firefighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.
Hazardous Combustion Products: Oxides of carbon, Smoke, Fume, Incomplete combustion products.
Unusual Fire Hazards: Combustible.

FLAMMABILITY PROPERTIES

Flash Point [Method]: 62°C 144°F [ASTM D-93]
Flammable Limits (Approximate volume % in air): LEL: 0.7 UEL:5.3
Autoignition Temperature: 335°C 635°F

SECTION 6: ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES

General: In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations. US regulations require reporting releases of this material to the environment which exceed the applicable reportable quantity or oil spills which could reach any waterway including intermittent dry creeks. The National Response Center can be reached at (800)424-8802.

PROTECTIVE MEASURES

General: Avoid contact with spilled material. Warn or evacuate occupants in surrounding and downwind areas if required due to toxicity or flammability of the material. See Section 5 for fire fighting information.

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See the Hazard Identification Section for Significant Hazards. See Section 4 for First Aid Advice. See Section 8 for advice on the minimum requirements for personal protective equipment. Additional protective measures may be necessary, depending on the specific circumstances and/or the expert judgment of the emergency responders.

For emergency responders:

Respiratory protection: half-face or full-face respirator with filter(s) for organic vapor and, when applicable, H₂S, or Self Contained Breathing Apparatus (SCBA) can be used depending on the size of spill and potential level of exposure. If the exposure cannot be completely characterized or an oxygen deficient atmosphere is possible or anticipated, SCBA is recommended. Work gloves that are resistant to aromatic hydrocarbons are recommended. Note: gloves made of polyvinyl acetate (PVA) are not water-resistant and are not suitable for emergency use. Chemical goggles are recommended if splashes or contact with eyes is possible. Small spills: normal antistatic work clothes are usually adequate. Large spills: full body suit of chemical resistant, antistatic material is recommended.

SPILL MANAGEMENT

Land Spill:

Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do it without risk. All equipment used when handling the product must be grounded. Do not touch or walk through spilled material. Prevent entry into waterways, sewer, basements or confined areas. A vapor suppressing foam may be used to reduce vapors. Use clean non-sparking tools to collect absorbed material. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. Large Spills: Water spray may reduce vapor; but may not prevent ignition in closed spaces. Recover by pumping or with suitable absorbent.

Water Spill:

Stop leak if you can do it without risk. Confine the spill immediately with booms. Warn other shipping. Remove from the surface by skimming or with suitable absorbents. Seek the advice of a specialist before using dispersants.

Note:

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted.
 Local regulations may prescribe or limit action to be taken.

SECTION 7: HANDLING AND STORAGE

HANDLING

General:

Avoid contact with skin. Prevent small spills and leakage to avoid slip hazard. Material can accumulate static charges which may cause an electrical spark (ignition source). When the material is handled in bulk, an electrical spark could ignite any flammable vapors from liquids or residues that may be present (e.g., during switch-loading operations). Use proper bonding and/or ground procedures. However, bonding and grounds may not eliminate the hazard from static accumulation. Consult local applicable standards for guidance. Additional references include American Petroleum Institute 2003 (Protection Against Ignitions Arising out of Static, Lightning and Stray Currents) or

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National Fire Protection Agency 77 (Recommended Practice on Static Electricity) or CENELEC CLC/TR 50404 (Electrostatics - Code of practice for the avoidance of hazards due to static electricity).

Loading/Unloading Temperature: [Ambient]

Transport Temperature: [Ambient]

Transport Pressure: [Ambient]

Static Accumulator:

This material is a static accumulator. A liquid is typically considered a nonconductive, static accumulator if its conductivity is below 100 pS/m (100x10E-12 Siemens per meter) and is considered a semiconductive, static accumulator if its conductivity is below 10,000 pS/m. Whether a liquid is nonconductive or semiconductive, the precautions are the same. A number of factors, for example liquid temperature, presence of contaminants, anti-static additives and filtration can greatly influence the conductivity of a liquid.

STORAGE

General:

The container choice, for example storage vessel, may effect static accumulation and dissipation. Keep container closed. Handle containers with care. Open slowly in order to control possible pressure release. Store in a cool, well-ventilated area. Storage containers should be grounded and bonded. Fixed storage containers, transfer containers and associated equipment should be grounded and bonded to prevent accumulation of static charge.

Storage Temperature: [Ambient]

Storage Pressure: [Ambient]

Suitable Containers/Packing:

Tankers; Tank Trucks; Railcars; Barges; Drums

Suitable Materials and Coatings (Chemical Compatibility):

Inorganic Zinc Coatings; Epoxy Phenolics; Teflon; Neoprene; Stainless Steel; Carbon Steel

Unsuitable Materials and Coatings:

Vinyl Coatings; Natural Rubber; Butyl Rubber; Ethylene-propylene-diene monomer (EPDM)

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

EXPOSURE LIMIT VALUES

Exposure Limits/Standards:

Substance Name	Form	Limit / Standard			Source
NAPHTHA (PETROLEUM), HYDROTREATED HEAVY	N/A	TWA	400 mg/m3	100 ppm	OSHA Z1
NAPHTHA (PETROLEUM), HYDROTREATED HEAVY	Vapor	RCP - TWA	1200 mg/m3	171 ppm	Manufacturer

Note: Exposure limits are not additive. Limits/standards shown for guidance only. Follow applicable regulations. No biological limits allocated.

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ENGINEERING CONTROLS

Control measures to consider:

Adequate ventilation should be provided so that exposure limits are not exceeded. Use explosion-proof ventilation equipment.

Note: The level of protection and types of controls necessary will vary depending upon potential exposure conditions.

PERSONAL PROTECTION

Note: Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

Respiratory Protection:

If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include: Half-face filter respirator. For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapor warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

Hand Protection:

Any specific glove information provided is based on published literature and glove manufacturer data. Glove suitability and breakthrough time will differ depending on the specific use conditions. Contact the glove manufacturer for specific advice on glove selection and breakthrough times for your use conditions. Inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include: If prolonged or repeated contact is likely, chemical resistant gloves are recommended. If contact with forearms is likely, wear gauntlet style gloves.

Eye Protection:

If contact is likely, safety glasses with side shields are recommended.

Skin and Body Protection:

Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include: If prolonged or repeated contact is likely, chemical, and oil resistant clothing is recommended.

Specific Hygiene Measures:

Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practice good housekeeping.

ENVIRONMENTAL CONTROLS

Comply with applicable environmental regulations limiting discharge to air, water and soil. Protect the environment by applying appropriate control measures to prevent or limit emissions.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

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NOTE: Physical and chemical properties are provided for safety, health and environmental considerations only and may not fully represent product specifications. Contact the Supplier for additional information.

GENERAL INFORMATION

Physical State: Liquid or gel
 Form: Clear
 Color: Colorless
 Odor: Odorless
 Odor Threshold: N/D

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density (at 15 °C): 0.765
 Density (at 15 °C): 764 kg/m³ (6.38 lbs/gal, 0.76 kg/dm³)
 Flammability (Solid, Gas): N/A
 Flash Point [Method]: 62 °C (144 °F) [ASTM D-93]
 Flammable Limits (Approximate volume % in air): LEL: 0.7 UEL: 5.3
 Autoignition Temperature: 335 °C (635 °F)
 Boiling Point / Range: 189 °C (372 °F) - 209 °C (408 °F)
 Decomposition Temperature: N/D
 Vapor Density (Air = 1): 5.6 at 101 kPa
 Vapor Pressure: 0.041 kPa (0.31 mm Hg) at 20 °C
 Evaporation Rate (n-butyl acetate = 1): 0.09
 pH: N/D
 Log Pow (n-Octanol/Water Partition Coefficient): N/D
 Solubility in Water: Negligible
 Viscosity: 1.56 cSt (1.56 mm²/sec) at 40 °C | 2.02 cSt (2.02 mm²/sec) at 25 °C
 Oxidizing Properties: See Hazards Identification Section.

OTHER INFORMATION

Freezing Point: N/D
 Melting Point: N/D
 Pour Point: -69 °C (-92 °F)
 Molecular Weight: 162
 Hygroscopic: No
 Coefficient of Thermal Expansion: 0.00078 V/VDEGC

SECTION 10: STABILITY AND REACTIVITY

REACTIVITY: See sub-sections below.

STABILITY: Material is stable under normal conditions.

CONDITIONS TO AVOID: Avoid heat, sparks, open flames and other ignition sources.

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MATERIALS TO AVOID: Strong oxidizers

HAZARDOUS DECOMPOSITION PRODUCTS: Material does not decompose at ambient temperatures.

POSSIBILITY OF HAZARDOUS REACTIONS: Hazardous polymerization will not occur.

SECTION 11: TOXICOLOGICAL INFORMATION

INFORMATION ON TOXICOLOGICAL EFFECTS

HAZARD CLASS	CONCLUSION/REMARKS
Inhalation	
Acute Toxicity: (Rat) 8 hour(s) LC50 > 5000 mg/m ³ (Vapor)	Minimally Toxic. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 403
Irritation: No end point data for material.	Negligible hazard at ambient/normal handling temperatures.
Ingestion	
Acute Toxicity (Rat): LD50 > 5000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 401
Skin	
Acute Toxicity (Rabbit): LD50 > 5000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 402
Skin Corrosion/Irritation: Data available.	May dry the skin leading to discomfort and dermatitis. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 404
Eye	
Serious Eye Damage/Irritation: Data available.	May cause mild, short-lasting discomfort to eyes. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 405
Sensitization	
Respiratory Sensitization: No end point data for material.	Not expected to be a respiratory sensitizer.
Skin Sensitization: Data available.	Not expected to be a skin sensitizer. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 406
Aspiration: Data available.	May be fatal if swallowed and enters airways. Based on physico-chemical properties of the material.
Germ Cell Mutagenicity: Data available.	Not expected to be a germ cell mutagen. Based on test data for structurally similar materials. Tests equivalent or similar to OECD Guideline 471 473 474 476 478 479

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Carcinogenicity: Data available.	Not expected to cause cancer. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 453
Reproductive Toxicity: Data available.	Not expected to be a reproductive toxicant. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 414 421 422
Lactation: No end point data for material.	Not expected to cause harm to breast-fed children.
Specific Target Organ Toxicity (STOT)	
Single Exposure: No end point data for material.	Not expected to cause organ damage from a single exposure.
Repeated Exposure: Data available.	Not expected to cause organ damage from prolonged or repeated exposure. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 408 413 422

OTHER INFORMATION

For the product itself:

Vapor concentrations above recommended exposure levels are irritating to the eyes and the respiratory tract, may cause headaches and dizziness, are anesthetic and may have other central nervous system effects. Prolonged and/or repeated skin contact with low viscosity materials may defat the skin resulting in possible irritation and dermatitis. Small amounts of liquid aspirated into the lungs during ingestion or from vomiting may cause chemical pneumonitis or pulmonary edema.

SECTION 12: ECOLOGICAL INFORMATION

ECOLOGICAL INFORMATION

Ecotoxicity: Not expected to be harmful to aquatic organisms.
 Not expected to demonstrate chronic toxicity to aquatic organisms.

PERSISTENCE AND MOBILITY

Biodegradation: Expected to be inherently biodegradable.
Hydrolysis: Transformation due to hydrolysis is not expected to be significant.
Photolysis: Transformation due to photolysis is not expected to be significant.
Atmospheric: Expected to degrade rapidly in air.

OTHER ECOLOGICAL INFORMATION

VOC (EPA Method 24): 6.401 lbs/gal

ECOLOGICAL DATA

Ecotoxicity

Test	Duration	Organism Type	Test Results
Aquatic - Acute Toxicity	96 hour(s)	Oncorhynchus mykiss	LLO 1000 mg/l; data for similar materials
Aquatic - Acute Toxicity	48 hour(s)	Daphnia magna	ELO 1000 mg/l; data for similar materials

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Aquatic - Acute Toxicity	72 hour(s)	Pseudokirchneriella subcapitata	ELO 1000 mg/l: data for similar materials
Aquatic - Chronic Toxicity	21 day(s)	Daphnia magna	NOELR 1 mg/l: data for the material
Aquatic - Acute Toxicity	72 hour(s)	Pseudokirchneriella subcapitata	NOELR 1000 mg/l: data for similar materials

Persistence, Degradability and Bioaccumulation Potential

Media	Test Type	Duration	Test Results
Water	Ready Biodegradability	28 day(s)	% Degraded 31.3 : similar material

SECTION 13: DISPOSAL CONSIDERATIONS

NOTE: Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at the time of disposal.

- Waste Disposal:** Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products.
- RCRA Information:** The unused product, in our opinion, is not specifically listed by the EPA as a hazardous waste (40 CFR, Part 261D), nor is it formulated to contain materials which are listed as hazardous wastes. It does not exhibit the hazardous characteristics of ignitability, corrosivity or reactivity and is not formulated with contaminants as determined by the Toxicity Characteristic Leaching Procedure (TCLP). However, used product may be regulated.
- Empty Container:** Empty containers may contain residue and can be dangerous. Do not attempt to clean container without proper instructions. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

SECTION 14: TRANSPORT INFORMATION

LAND (DOT)

- Proper Shipping Name:** Petroleum distillates, N.O.S.
- Hazard Class:** Combustible liquid

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ID Number: 1268
Packing Group: III
ERG Number: 128
Label(s): None
Transport Doc. Name: UN1268, PETROLEUM DISTILLATES, N.O.S., COMBUSTIBLE LIQUID, PG III
Note: This material is not regulated under 49 CFR in a container of 119 gallon capacity or

less
 when transported solely by land, as long as the material is not a hazardous waste, a marine pollutant, or specifically listed as a hazardous substance.

LAND (TDG)
 Not Regulated for Land Transport

SEA (IMDG)
 Not Regulated for Sea Transport according to IMDG-Code
Marine Pollutant: No

AIR (IATA)
 Not Regulated for Air Transport

SECTION 15: REGULATORY INFORMATION

OSHA HAZARD COMMUNICATION STANDARD
 This material is considered hazardous in accordance with OSHA HazCom 2012, 29 CFR 1910.1200.
 Listed or exempt from listing/notification on the following chemical inventories: AICS, DSL, ENCS, IECSC, KECI, PICCS, TSCA

EPCRA SECTION 302
 This material contains no extremely hazardous substances.

CERCLA
 This material is not subject to any special reporting under the requirements of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). CERCLA petroleum exclusion applies for this product. Contact local authorities to determine if other reporting requirements apply.

SARA (311/312) REPORTABLE HAZARD CATEGORIES
 Fire. Immediate Health. Delayed Health.

SARA (313) TOXIC RELEASE INVENTORY
 This material contains no chemicals subject to the supplier notification requirements of the SARA 313 Toxic Release Program.

The following ingredients are cited on the lists below: None

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--REGULATORY LISTS SEARCHED--

- | | | | |
|---------------|------------------|-------------------|-------------|
| 1 = ACGIH ALL | 6 = TSCA 5a2 | 11 = CA P65 REPRO | 16 = MN RTK |
| 2 = ACGIH A1 | 7 = TSCA 5e | 12 = CA RTK | 17 = NJ RTK |
| 3 = ACGIH A2 | 8 = TSCA 6 | 13 = IL RTK | 18 = PA RTK |
| 4 = OSHA Z | 9 = TSCA 12b | 14 = LA RTK | 19 = RI RTK |
| 5 = TSCA 4 | 10 = CA P65 CARC | 15 = MI 293 | |

Code key: CARC=Carcinogen; REPRO=Reproductive

SECTION 16: OTHER INFORMATION

N/D = Not determined, N/A = Not applicable

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:

Updates made in accordance with implementation of GHS requirements.

The information and recommendations contained herein are, to the best of Gamblin's knowledge and belief, accurate and reliable, but it is not warranted to be. You can contact Gamblin to ensure that this document is the most current available. The information and recommendations are offered for the user's consideration and examination. It is the user's responsibility to satisfy itself that the product is suitable for the intended use and it is the user's responsibility to carefully read the product label and follow instructions for safe use of the product.

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