



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, DC 20460

OFFICE OF CHEMICAL SAFETY
AND POLLUTION PREVENTION

March 29, 2016

Abigail T. D. Wacek
Regulatory Consultant
Multi-Chem Group, LLC
3401 West Admiral Doyle Drive
New Iberia, LA 70560

Subject: Label Amendment – Revised Label and Product Manual
Product Name: AcroCide
EPA Registration Number: 71173-1
Application Date: December 11, 2015
Decision Number: 512161

Dear Ms. Wacek:

The amended label referred to above, submitted in connection with registration under the Federal Insecticide, Fungicide and Rodenticide Act, as amended, is acceptable. This approval does not affect any conditions that were previously imposed on this registration. You continue to be subject to existing conditions on your registration and any deadlines connected with them.

A stamped copy of your labeling is enclosed for your records. This labeling supersedes all previously accepted labeling. You must submit one copy of the final printed labeling before you release the product for shipment with the new labeling. In accordance with 40 CFR 152.130(c), you may distribute or sell this product under the previously approved labeling for 18 months from the date of this letter. After 18 months, you may only distribute or sell this product if it bears this new revised labeling or subsequently approved labeling. "To distribute or sell" is defined under FIFRA section 2(gg) and its implementing regulation at 40 CFR 152.3.

Should you wish to add/retain a reference to the company's website on your label, then please be aware that the website becomes labeling under the Federal Insecticide Fungicide and Rodenticide Act and is subject to review by the Agency. If the website is false or misleading, the product would be misbranded and unlawful to sell or distribute under FIFRA section 12(a)(1)(E). 40 CFR 156.10(a)(5) list examples of statements EPA may consider false or misleading. In addition, regardless of whether a website is referenced on your product's label, claims made on the website may not substantially differ from those claims approved through the registration process. Therefore, should the Agency find or if it is brought to our attention that a website contains false or misleading statements or claims substantially differing from the EPA approved registration, the website will be referred to the EPA's Office of Enforcement and Compliance.

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Your release for shipment of the product constitutes acceptance of these conditions. If these conditions are not complied with, the registration will be subject to cancellation in accordance with FIFRA section 6. If you have any questions, please contact Wanda Henson by phone at (703) 308-6345, or via email at henson.wanda@epa.gov

Sincerely,

A handwritten signature in blue ink that reads "Wanda G. Fuller, for". The signature is written in a cursive style.

Demson Fuller, Product Manager 32
Regulatory Management Branch II
Antimicrobials Division (7510P)
Office of Pesticide Programs

Enclosure

**RESTRICTED USE PESTICIDE
DUE TO A HIGH ACUTE TOXICITY**

For retail sale to and use by Certified Applicators and only for those uses covered by the Certified Applicator's certification. This product must be accompanied by an EPA-approved product label and the EPA-approved ACROCIDE(TM) – Acrolein Products Description and Use Manual. Read and understand the entire labeling and manual prior to use. All parts of the labeling and manual are equally important for safe and effective use of this product.

AcroCide™

(Acrolein, Stabilized)

EPA Registration No. 71173-1

EPA Est.: 71173-TX-13

Distributed by:
Multi-Chem Group, LLC
13858 Hwy 92
Maurice, LA 70555
+1-325-223-6200



CONTENTS UNDER PRESSURE
For Use in Oilfield Water Injection Recovery Systems

Product of China
ACTIVE INGREDIENT:
Acrolein.....96.0%
OTHER INGREDIENTS:.....4.0%
TOTAL.....100.0%
This product contains the toxic inert ingredient hydroquinone.
(ACROCIDE(TM) contains 6.7 pounds of active ingredients per gallon)
Net Contents: □370 lb / □ 2490 lb



POISON

**KEEP OUT OF REACH OF CHILDREN
DANGER PELIGRO**

**See right panel for additional precautionary statements
and first aid statements.**

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail)

FIRST AID
Call poison control center or doctor immediately for treatment advice. Have the product container or label with you when calling a poison control center, doctor, or going for treatment.

IF SWALLOWED	<ul style="list-style-type: none"> Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by the poison control center or doctor. Do not give anything by mouth to an unconscious person.
IF INHALED	<ul style="list-style-type: none"> Move person to fresh air If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible. Call a poison control center or doctor for further treatment advice.
IF IN EYES	<ul style="list-style-type: none"> Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for further treatment advice.
IF ON SKIN	<ul style="list-style-type: none"> Take off contaminated clothing Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for further treatment advice.

NOTE TO PHYSICIAN

Probable mucosal damage may contraindicate the use of gastric lavage. Measures against circulate shock, respiratory depression and convulsion may be needed.

WARNING SIGNS AND SYMPTOMS: Liquid ACROCIDE(TM) is absorbed by the skin and is particularly irritating to any lesion and to the eyes. The vapors act principally on the mucous membrane of the eyes and respiratory tract. Because of the extreme lachrymatory warning effect, the concentration tolerable by man is far below the minimum lethal concentration.

TREATMENT: Treat exposed areas as a chemical burn. Thoroughly flush eyes with water and treat symptomatically. Persons ex-posed to ACROCIDE(TM) vapors have a delayed reaction and

experience irritation of the respiratory tract. In severe cases, this may progress to pulmonary edema. Therefore, it is advisable to keep persons exposed to ACROCIDE(TM) under observation for 24 hours following exposure.

PRECAUTIONARY STATEMENTS
Hazards to Humans and Domestic Animals

DANGER. Fatal if swallowed or inhaled. Corrosive. Causes irreversible eye damage. May be fatal if absorbed through the skin. Extremely flammable and irritating vapor and liquid. Poisonous by inhalation, skin contact or swallowing. Do not breathe vapor, corrosive, causes eye and skin burns. Do not get in eyes, on skin or on clothing. Keep away from fire, sparks and heated surfaces.

When setting up and breaking down application equipment and during visual inspection, a full-face air purifying respirator with organic vapor (OV) cartridges approved by the National Institute of Occupational Safety and Health (NIOSH) and butyl rubber gloves must be worn. If spilled on clothing, gloves or shoes remove them immediately and wash thoroughly with soap and water before reuse. Use with adequate ventilation.

USER SAFETY REQUIREMENTS

Users must wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.

Users must remove PPE immediately after this using product. Wash the outside of the gloves before removing. As soon as possible, wash thoroughly and change into clean clothing. If ACROCIDE(TM) is spilled or leaked on clothing, gloves, or shoes, immediately remove them and wash thoroughly with soap and water. Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry. Discard clothing, gloves, shoes, and other absorbent materials that have come into contact with ACROCIDE(TM). Do not reuse them.

ENVIRONMENTAL HAZARDS

This pesticide is extremely toxic to fish and wildlife. Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans or other waters unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to discharge.

Do not discharge this product to sewer systems without previously notifying the local sewage treatment authority. For guidance contact your State Water Board or Regional Office of the EPA. Do not contaminate water when disposing equipment washwaters.

PPE REQUIREMENTS

All certified applicators participating in the application during setting up and breaking down of application equipment and during visual inspection must wear:

- Long-sleeved shirt and long pants,
- Shoes and socks,
- Chemical-resistant gloves made of butyl rubber, and
- A NIOSH-approved full face respirator with either
 - o Organic-vapor removing cartridges with a pre-filter approved for pesticides (MSHA/NIOSH approval number prefix TC-23C), or
 - o a canister approved for pesticides MSHA/NIOSH approval number prefix TC-14G).

Respirator fit testing, training and medical qualification:

Employers must ensure that all ACROCIDE(TM) handlers are:

- Fit-tested and fit-checked using a program that confirms to OSHA's requirements (see 29CFR part 1910.134)
- Trained using a program that conforms to OSHA's requirements (see 29CFR part 1910.134).
- Examined by a qualified medical practitioner to ensure physical ability to wear the style of respirator to be worn. A qualified medical practitioner is a physician or other licensed health care professional who will evaluate the ability of a worker to wear a respirator. The initial evaluation consists of a questionnaire that asks about medical conditions (such as heart condition) that would be problematic for respirator use. If concerns are identified, then additional evaluations, such as a physical exam, might be necessary. The initial evaluation must be done before respirator use begins. Handlers must be reexamined by a qualified medical practitioner if their health status or respirator style or use-conditions change.

ENGINEERING CONTROLS

Handlers must use a closed system that is designed by the manufacturer to prevent dermal and inhalation exposures. At any disconnect point, the system must be equipped with a dry disconnect or dry couple shut-off device that will limit drippage to no more than 2 ml per disconnect. The closed system must function properly and be used and maintained in accordance with the manufacturer's written operating instructions. Handlers must wear the personal protective equipment required on this labeling.

PHYSICAL AND CHEMICAL HAZARDS

DANGER: Acrolein, the active ingredient in ACROCIDE(TM), is highly reactive chemically and readily forms polymers. If alkalis (such as ammonia and caustic) or strong acids are brought in contact with ACROCIDE(TM) in a closed system, the biocide can polymerize with sufficient violence to rupture the container. Do not apply the equipment used for acids and alkalis. Contamination of ACROCIDE(TM) with any foreign matter must be avoided. Clean application equipment with large amounts of water after using. Do not use or store near fire, sparks, and heated surfaces.

A supply of sodium carbonate (soda ash) and water should be readily available for neutralizing spilled ACROCIDE(TM). All spills should be confined and neutralized before disposal. Running water should be readily available to wash down the area after neutralization.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in any manner inconsistent with its labeling.

ACROCIDE(TM) is a water soluble material for the control of bacteria and fungi in oilfield water injection systems. This material must only be applied in accordance with directions in the ACROCIDE(TM) Description and Use Manual under the supervision of trained personnel or licensed applicators.

AcroCide™ microbiocide applications must be made using a closed application system. All application equipment must be of a design approved by Multi-Chem Group, LLC. Application manifolds must be procured from a Multi-Chem Group, LLC approved vendor. Prior to disconnecting equipment following an application or when changing AcroCide™ containers the application system must be flushed with methanol and nitrogen to clear AcroCide™ residuals from the injection lines. Prior to removal of the AcroCide™ injection manifold attached to the AcroCide™ container, the AcroCide™ liquid manifold line should be cleared with pressurized nitrogen, thus forcing any liquid in this line back into the AcroCide™ container. Application concentrations detailed below indicate the desired active AcroCide residual. Application rates may need to be increased to overcome chemical demand from sulfides, primary amines and other reactive chemical species.

At least two certified applicators must be at the application site and able to maintain visual contact with all certified applicators participating in the application.

No handlers are allowed to participate in the application unless they are state certified applicators and have completed the registrant's training program with in the last 12 months. **WATER FLOODS, SALT WATER DISPOSAL SYSTEMS, AND PRODUCED FLUID SYSTEMS**

For controlling anaerobic and aerobic bacteria in oil field and gas field water systems.

Continuous Treatment: Inject AcroCide with a metering pump into the water system continuously at 5 to 100 ppm depending on the degree of contamination, bacteria populations and system conditions.

Slug Treatment: Dose at 50 ppm to 11,875 ppm. Typical treatments range from 2 to 6 hours and treatment frequency will vary depending upon many factors that influence the recovery rate of the bacteria populations.

Batch Treatment: Batch treatments are used to treat water vessels including storage tanks and separators. Application concentrations may vary from 50 ppm to 1.5% depending on degree of bacteria contamination and vessel residence time.

HYDRAULIC FRACTURING FLUIDS

AcroCide should only be injected into the frac fluid system downstream of the blender.

Dose Range: AcroCide should be applied at concentrations ranging from 50-500 ppm depending on the degree of bacterial contamination in the source water.

OIL AND GAS PRODUCTION WELLS AND GAS STORAGE SYSTEMS

Squeeze Applications: AcroCide should be metered into water being injected into the well to achieve an AcroCide concentration of 100-11,875 ppm depending on the degree of bacterial contamination, sulfide concentration and down hole temperature.

STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage and disposal. **STORAGE OF ACROCIDE(TM) TANKS** All containers of ACROCIDE(TM) should be stored in a secured, well-ventilated area, away from all other chemicals. No alkalis or oxidizing materials should be near any electrical equipment should be Class 1 – Division 2 and properly grounded.

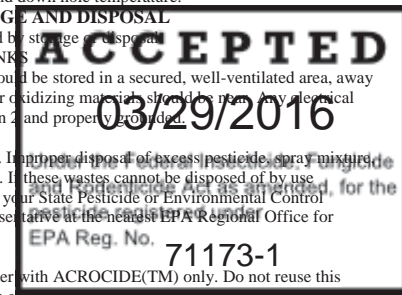
PESTICIDE DISPOSAL Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture or rinsate is a violation of Federal Law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

CONTAINER DISPOSAL

Refillable container. Refill this container with ACROCIDE(TM) only. Do not reuse this container for any other purpose. Return empty containers to Tarr Manufacturing Company. Cleaning the container before final disposal is the responsibility of the person disposing the container. Cleaning before refilling is the responsibility of the refiller. For cleaning and residue removal of cylinders, follow the Standard Operating Procedure: TMC-140. For cleaning and residue removal of skids, follow the Standard Operating Procedure: TMC-141.

NOTICE OF WARRANTY

MULTICHEM MAKES NO WARRANTY OF MERCHANTABILITY FITNESS FOR ANY PURPOSE, OR OTHERWISE EXPRESSED OR IMPLIED concerning this product or its uses which extend beyond the use of the product under normal conditions in accord with the statements made on this label.



For Emergencies Call
INFOTRAC (Inside US) 1-800-535-5053
INFOTRAC (Outside US) 1-352-323-3500

AcroCide™ Field Application Procedures

Acrolein Products Description and Use Manual

For use with *AcroCide™* (EPA Reg. No. 71173-1)

**THIS PRODUCT MUST BE ACCOMPANIED BY THE EPA-APPROVED PRODUCT
LABEL**

<p>RESTRICTED USE PESTICIDE DUE TO A HIGH ACUTE TOXICITY For retail sale to and use by Certified Applicators and only to those users covered by the Certified Applicator's certification</p>

Revision Date: December 11, 2015

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1.0 PURPOSE

This document outlines the field application protocols and procedures for the use of AcroCide™.

Application concentration requirements and other important information are detailed on the label that accompanies the product. The certified applicator must comply with label requirements for all AcroCide™ applications.

2.0 SCOPE

This manual applies to all field applications of AcroCide™.

3.0 RESPONSIBILITIES

All Multi-Chem personnel that are or will be applying acrolein must familiarize themselves with this manual and follow all procedures and requirements in this manual.

AcroCide™ is a restricted use pesticide. All federal and state regulations relating to the use of restricted use pesticides must be followed by the applicator. Additionally, all Multi-Chem personnel that will be applying acrolein must successfully complete the appropriate level of training within the Certified Acrolein Technical Specialist (CATS) program.

4.0 OPERATING PROCEDURES

Current, clearly written standard operating procedures (SOPs) and safe work practices ensure that employees (including contract employees) will operate in a safe, consistent and prescribed manner. Multi-Chem has developed a written operating procedures program to ensure that written procedures/practices are developed, reviewed, implemented, and certified as reflective of current plant practice.

The operating procedures are described in the following pages and include tasks specific to the equipment set-up and application of AcroCide™ including the following:

- Site assessment

- General Procedure Checklist
- Equipment inspection
- Equipment installation
- Leak detection
- Application
- Equipment clearing
- Equipment disassembly

The operating procedures are kept current and accurate through annual certification and management of change (MOC). The MOC procedure is also used to manage temporary operating procedures. The revised documents are routed to the appropriate EH&S supervisors for review and certification.

The procedures detailed in the following sections will guide you through typical AcroCideTM treatment applications. Refer to the Manifold Illustration on Page 9 for valve numbers and equipment descriptions mentioned in the detailed procedures.

4.1 Site Assessment

Prior to AcroCideTM being transported to the application site, a site inspection must be completed to assess the risk potential. The following must be considered:

- Personnel and public exposure potential in the event of a release
- Site security
- Spacing requirements sufficient for application equipment (i.e. proximity of electrical panels, access for changing out skids or cylinders, etc.)
- Location and suitability of application point
- Proximity of surface water such as ponds, lakes, creeks, or rivers
- Containment options in the event of a release
- Water supply for clean-up in the event of a release
- Weather conditions including prevailing wind direction

4.2 *Commitment to Safety*

AcroCide™ primary ingredient, acrolein, is highly reactive and requires special handling and application expertise. Multi-Chem employees receive an comprehensive AcroCide™ treatment awareness training. Field personnel receive additional in-depth application training. Multi-Chem also provides training to customers to increase awareness of the proper application of AcroCide™. In addition, all AcroCide™ applications are subject to unannounced audits to assure strict adherence to Health, Safety and Environment (HSE) procedures.

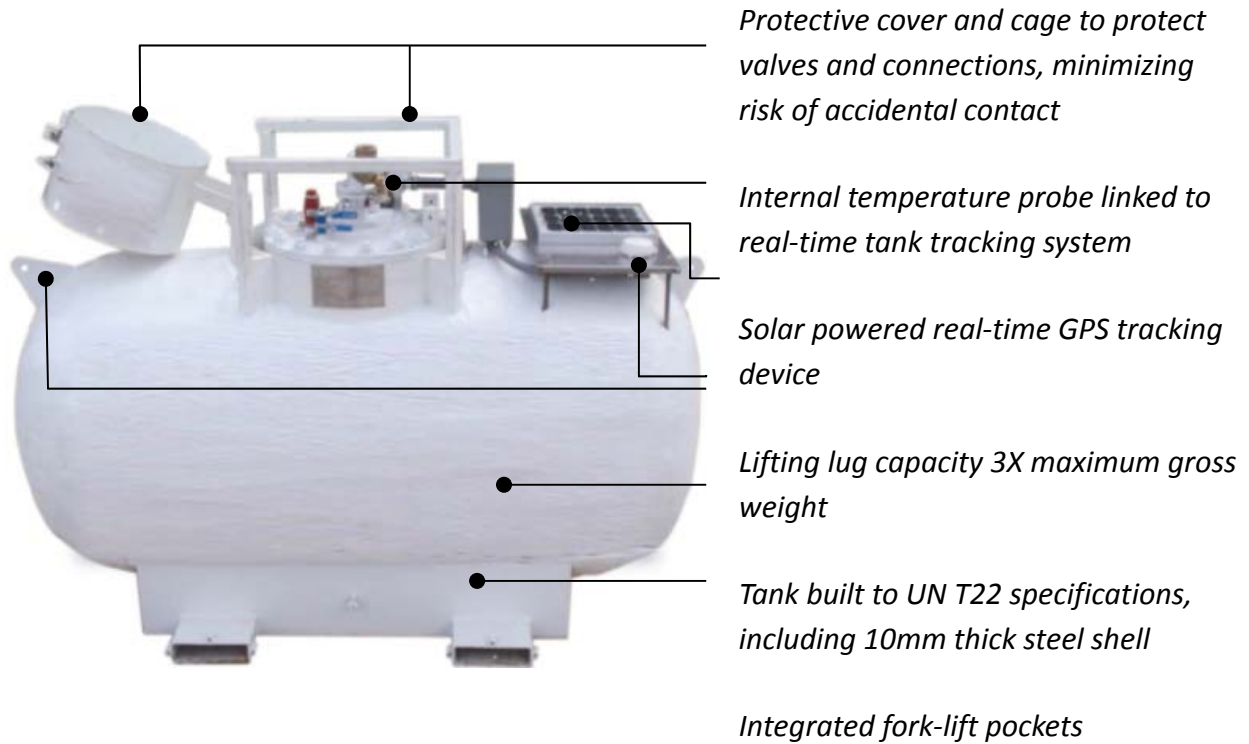
Acrolein, also known as acrylic aldehyde, allylaldehyde, propenal, 2-propenal, prop-2-enal, prop-2-en-1-al, is a volatile, colorless, highly flammable liquid at ordinary temperature and pressure with a pungent odor. Its Chemical Abstract Service (CAS) number is 107-02-8. The chemical formula for acrolein is C₃H₄O and the molecular weight is 56.06. Acrolein has a density of 0.84 g/mL, a water solubility of 206 g/L, and a vapor pressure of 29.3 kPa at 20°C. The log Kow (octanol/water partition coefficient) is -0.01 (high water solubility) and the log Koc (organic carbon/water partition coefficient) is 0.5 (low adsorption to soil) (WHO, 1991; U.S.EPA, 2003; ATSDR, 2007).

4.3 *Certified AcroCide™ Technical Specialist (CATS)*

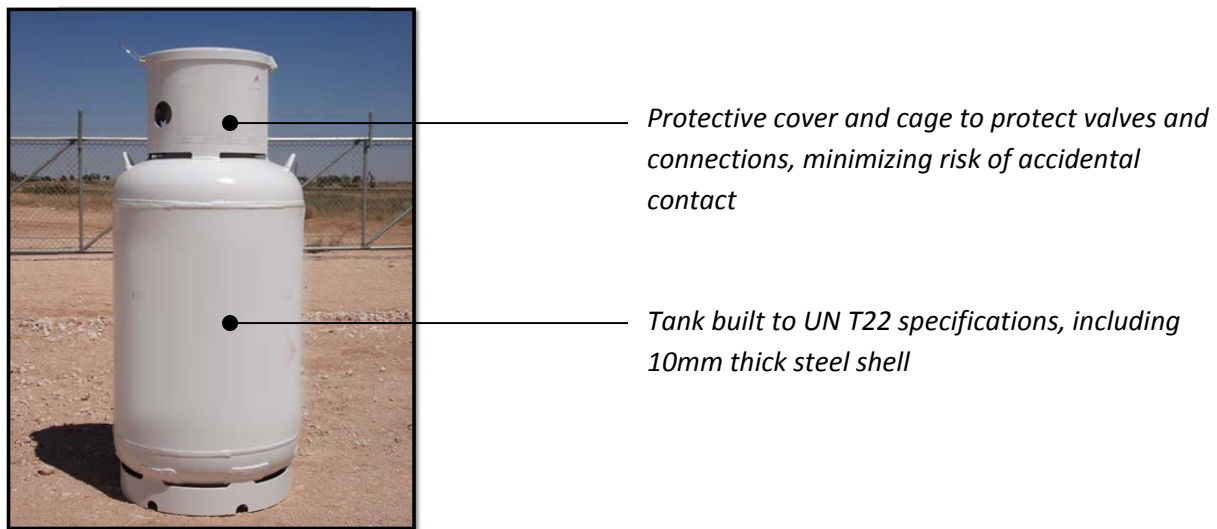
AcroCide™ is handled only by certified Multi-Chem personnel. Select employees from each region are chosen to become CATS-candidates are highly technical and conscientious individuals with exemplary safety records. Once selected, CATS complete a comprehensive program of field and classroom training to obtain their AcroCide™ certification.

4.4 *AcroCide™ Skid Tank*

The patent pending AcroCide™ tank design from Multi-Chem incorporates a satellite based temperature monitoring system that detects any polymerization or contamination of the product. In the event of a temperature excursion, the GPS transmitter immediately notifies key Multi-Chem response personnel. The AcroCide™ field tanks are built to meet extremely high quality standards.



4.5 AcroCide™ Cylinder



4.6 *Acrolein Tank Maintenance*

All AcroCide™ skids and cylinders are subject to inspection each time tank is returned to Denver City Plant from the field. The following flow chart should be utilized for the maintenance process. Anytime a tank is flushed, filled, opened, valves or rupture disks replaced or repairs to GPS system are made, activity should be noted in the tank activity log.

4.7 *General Procedure Check List for AcroCide™ Applications*

4.7.1 *Pre-Job Equipment Check*

Nitrogen Regulator

- (Qty 1) – check valve
- (Qty 1) – excess flow valve

Inlet nitrogen manifold

- (Qty 2) – check valves

Outlet liquid manifold

- (Qty 4) – check valves

Injection stinger/quill

- (Qty 2) – check valves

4.7.2 *Pre-Job Safety Meeting*

- JSA
- Roles and Responsibilities

4.7.3 *Continuous Application Equipment Set-up*

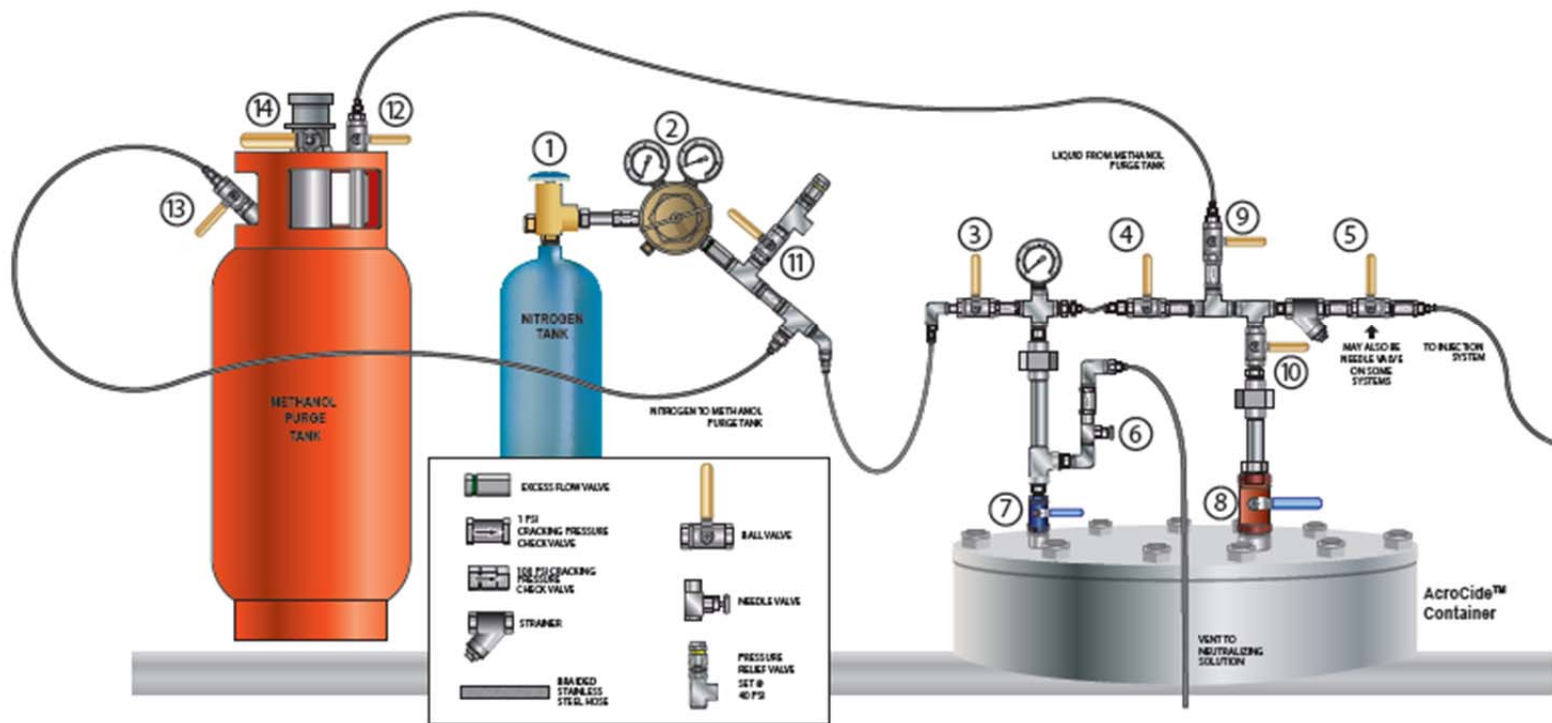
- Evacuate non-essential personnel
- Install nitrogen regulator, inlet nitrogen manifold, outlet liquid manifold, injection stinger, and all hoses as per established procedure
- Pressure test and leak test all connections as per established procedure
- Use methanol purge tank to displace nitrogen from manifold and pump suction supply line and to prime the chemical pump
- To change AcroCide™ skid or tank, purge manifold using methanol and nitrogen as per established procedure

4.7.4 *Batch Application Equipment Set-up*

- Evacuate non-essential personnel
- Install nitrogen regulator, inlet nitrogen manifold, outlet liquid manifold, injection stinger, and all hoses as per established procedure

- Pressure test and leak test all connections as per established procedure
- Instruct pressure truck to begin pumping water and establish stable desired rate
- Determine desired AcroCide™ rate based on stable truck pumping rate
- Initiate AcroCide™ flow and set to desired rate
- When desired amount of AcroCide™ has been applied, shut nitrogen and liquid valves on skid/cylinder tank
- Warn pressure truck driver that nitrogen purge is about to begin
- Purge manifold and equipment with methanol followed by nitrogen as per established procedures
- Once purge is complete, close all application valves and allow pressure truck to complete overflush water application
- Once pressure truck is finished, evacuate non-essential personnel, and disconnect all equipment as per established procedures

Container Mount AcroCide™ Application Manifold



4.8 Equipment Inspection

4.8.1 Nitrogen Pressure Regulator Inspection

The nitrogen pressure regulator assembly should be inspected prior to installation each time a nitrogen bottle is connected to an acrolein application system.

4.8.2 AcroCide™ Application Manifold Inspection

This inspection procedure should be conducted prior to initial installation and each time the AcroCide™ container is changed.

4.9 Equipment Installation

Be sure to use a back-up wrench on the valve bodies on the AcroCide™ tank to prevent valves from rotating when connecting and disconnecting equipment to the tank.

4.10 Leak Detection

Prior to starting any AcroCide™ application each connection should be tested for leaks. Leak detection of the manifold system should also be done each time an AcroCide™ container is changed. All leak detection should be done with nitrogen pressure and should use “Simple Green” soap for visual detection of leaks. Simple Green diluted at 10% in water has been tested for compatibility with acrolein and has been found to be safe to use with this product. Many other soaps and leak detection liquids are not compatible with acrolein and should not be used for leak detection. You should also listen for leaks – large leaks may not be detected using Simple Green soap solution, but may be heard. The general process of leak detection is to sequentially apply pressure to isolated sections of the application equipment and spray a fine mist of the Simple Green soap solution on each connection. If a small leak is present you will see small bubbles for at the leak site. Larger leaks may be detected by sound. Each time a leak is detected it should be repaired before moving on to the next part of the system. Maximum delivery pressure of the pressure regulator (80 psig) should be used for all leak detection steps.

- 1) Close all valves on the nitrogen tank, pressure regulator, application manifold, acrolein tank, pump, pump bypass system, and injection line.
- 2) Open Valve 1 and set Valve 2 to deliver 80 PSI. Ensure Valve 11 below PRV valve is closed or nitrogen will escape.
- 3) Apply Simple Green solution to all connections between Valve 1 and Valve 3. Inspect for leaks and make repairs as necessary.

- 4) Open Valve 3 and apply soap to all connections between Valve 3, Valve 4, Valve 7, and Valve 6. Inspect for leaks and make repairs as necessary.
- 5) Open Valve 4 and Valve 10 and apply soap to all connections between Valve 4, Valve 5, and Valve 8. Inspect for leaks and make repairs as necessary.
- 6) Open Valve 5 and apply soap to all connections between Valve 5 and the next valve in the system. Inspect for leaks and make repairs as necessary.
- 7) Continue this inspection process to the injection point if using a GPI flow meter. If using a Neptune pump, open the pump suction valve and discharge valve to continue the leak detection process to the injection point.
- 8) Open the injection point valve for 1 – 2 minutes to allow nitrogen to flow through the GPI flow meter or the Neptune pump to purge air from the system. Close the injection point valve.
- 9) Open Valve 6 slowly to purge air from vapor manifold prior to application.
- 10) While Valve 6 is open, set Valve 2 to deliver 20 PSI.
- 11) Close Valve 6.
- 12) Close all valves on application system.
- 13) Open Valve 11 on nitrogen regulator assembly.

4.11 Application

4.12.1 General Procedure for Application

The following procedure is for use on applications that utilize a Neptune pump package which may be for a continuous application or a batch application. The procedures may need to be slightly modified for some applications.

- 1) Follow “*Equipment Inspection*” procedures, Section 4.5.
- 2) Follow “*Equipment Installation*” procedure, Section 4.6.
- 3) Follow “*Leak Detection*” procedure, Section 4.7.
- 4) Apply product according to job requirements.

4.12 Equipment Clearing

4.12.1 Procedure for Equipment Clearing Utilizing a Neptune Pump Package

When the application has been completed and prior to disassembly of the application equipment the equipment should be cleared of liquid acrolein as thoroughly as possible. This is best accomplished by utilizing the methanol purge tank and nitrogen.

- 1) Close Valve 7, Valve 8, and Valve 10.
- 2) Ensure the methanol purge tank is filled with uninhibited methanol (SS-5189).
- 3) If the methanol purge tank is not already connected, proceed as follows. Otherwise skip to Step 4.
 - a. Close Valve 1 and Valve 3.
 - b. Carefully remove cap from unused ¼” FJIC fitting on nitrogen manifold; be aware that there will be nitrogen pressure behind the cap.
 - c. Attach a ¼” stainless steel braided hose from the nitrogen regulator manifold second fitting to the inlet on the methanol purge tank.
 - d. Attach another ¼” stainless steel braided hose from the outlet of the methanol purge tank to Valve 9 on the liquid manifold.
 - e. Open Valve 1 and Valve 3.
- 4) Close Neptune pump suction valve.

-
- 5) Attach ¼" stainless braided hose to valve on top of sight glass and route to pail of saturated soda ash solution. *Secure hose in pail to prevent it from blowing out of pail.*
 - 6) **Ensure vent hose is inserted below soda ash liquid level!**
 - 7) **Ensure soda ash pail has sufficient venting to prevent over-pressuring during nitrogen purging!**
 - 8) Carefully open valve on bottom sight glass valve then valve on top of sight glass to allow purging into soda ash solution.
 - 9) Make sure Valve 3 and Valve 5 are open.
 - 10) Ensure Valve 1 is open and adjust Valve 2 to deliver 5 – 10 PSI greater than the application pressure that was used.
 - 11) Carefully open Valve 4 for 30 – 60 seconds. *Ensure hose from top of sight glass to soda ash pail is secure.*
 - 12) Close Valve 5 then close the valve both bottom and top sight glass valves.
 - 13) Open Valve 10 and then cycle Valve 8 fully open and closed at least 3 times to force the liquid Acrolein in the riser back into the Acrolein tank.
 - 14) Close Valve 10.
 - 15) Close Valve 8 and install carabiner latch.
 - 16) Close Valve 4.
 - 17) ***This is sufficient purging to allow for removal of the application manifold from the skid tank to allow for placement of a new skid tank and immediate re-connection for continued application.***
 - 18) Close all valves.
 - 19) If the AcroCide™ tank is empty, the pressure on the tank prior to returning it to Denver City must be 15 – 20 PSI. If it is between 15 – 20 PSI, skip to Step 22; otherwise continue to Step 20.
 - 20) Open Valve 7.
 - 21) Slowly open Valve 6 and vent vapor into the soda ash solution until the pressure in the AcroCide™ tank is down to 15 PSI.
 - 22) Close Valve 7 and install carabiner latch.
 - 23) Close Valve 6.

4.12.2 Procedure for Equipment Clearing Utilizing Nitrogen Displacement

When the application has been completed and prior to disassembly of the application equipment the equipment should be cleared of liquid acrolein as thoroughly as possible. This is best accomplished by utilizing the methanol purge tank and nitrogen.

- 1) Close Valve 7, Valve 8, and Valve 10.
- 2) Ensure the methanol purge tank is filled with uninhibited methanol (SS-5189).
- 3) If the methanol purge tank is not already connected, proceed as follows. Otherwise skip to Step 4.
 - a. Close Valve 1 and Valve 3.
 - b. Carefully remove cap from unused ¼" FJIC fitting on nitrogen manifold; be aware that there will be nitrogen pressure behind the cap.
 - c. Attach a ¼" stainless steel braided hose from the nitrogen regulator manifold second fitting to the inlet on the methanol purge tank.
 - d. Attach another ¼" stainless steel braided hose from the outlet of the methanol purge tank to Valve 9 on the liquid manifold.
 - e. Open Valve 1 and Valve 3.
- 4) Ensure Valve 3, Valve 5, and all other valves downstream of Valve 5 are open including the injection point valve.
- 5) Ensure Valve 1 is open and adjust Valve 2 to deliver 5 – 10 PSI greater than the application pressure that was used.
- 6) Open Valve 4 for 30 – 60 seconds.
- 7) Close Valve 5.
- 8) Open Valve 10 and then cycle Valve 8 fully open and closed at least 3 times to force the liquid Acrolein in the riser back into the Acrolein tank.
- 9) Close Valve 10.
- 10) Close Valve 8 and install carabiner latch.
- 11) Close Valve 4.
- 12) Open Valve 5.
- 13) Open the inlet and outlet valves on the methanol purge tank.

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- 14) Open Valve 9, this will purge the AcroCide™ from the liquid line to the injection point.
 - 15) Once the methanol tank is empty, close Valve 9 and both valves on the methanol purge tank.
 - 16) Open Valve 4 and allow nitrogen to displace methanol from the injection lines into the system being treated.
 - 17) Once the methanol is purged from the injection lines, “walk” the stainless steel braided line all the way to the injection point to remove liquid traps and close the injection point valve.
 - 18) Slowly open discharge valve at injection quill and vent vapor into the soda ash solution until there will be no pressure in the lines.
 - 19) Close Valve 4 and Valve 5.
 - 20) Close all valves.
 - 21) If the AcroCide™ tank is empty, the pressure on the tank prior to returning it to Denver City must be 15 – 20 PSI. If it is already between 15 – 20 PSI, skip to Step 23; otherwise continue to Step 21.
 - 22) Open Valve 7.
 - 23) Slowly open Valve 6 and vent vapor into the soda ash solution until the pressure in the AcroCide™ tank is down to 15 PSI.
 - 24) Close Valve 7 and install carabiner latch.
 - 25) Close Valve 6.

4.13 Equipment Disassembly

Be sure to use a back-up wrench on the valve bodies on the AcroCide™ tanks to prevent valves from rotating when connecting and disconnecting equipment to the tank; this could cause leaks that cannot be resolved in the field!

4.13.1 Equipment Disassembly Utilizing a Neptune Pump Package

This procedure is to be utilized only for a skid change-out and immediate re-connection for continued application!

- 1) Don APR and butyl rubber gloves.
- 2) Ensure all valves are closed.

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- 3) Carefully disconnect nitrogen hose from vapor manifold near Valve 3; be aware that nitrogen pressure may still be present.
 - 4) Disconnect by-pass hose from Valve 4; be aware that nitrogen pressure may still be present.
 - 5) Disconnect vent hose from Valve 6.
 - 6) Remove vapor manifold from skid tank and set aside in a clean area.
 - 7) Apply Teflon tape to blue ½" plug and install in Valve 7.
 - 8) Disconnect methanol hose from Valve 9.
 - 9) Disconnect union on liquid manifold below Valve 10; be aware that nitrogen pressure may still be present.
 - 10) Carefully set aside liquid manifold in a safe clean area. Leave liquid hose connected to Valve 5.
 - 11) Remove riser nipple from Valve 8 and set aside in clean area.
 - 12) Apply Teflon tape to red 1" plug and install in Valve 8.
 - 13) Remove empty skid tank and place new skid tank in location.
 - 14) Re-install vapor manifold on new skid tank; connect nitrogen hose to Valve 3 and vent hose to Valve 6.
 - 15) Re-install liquid manifold on new skid tank; connect by-pass hose to Valve 4 and methanol hose to Valve 9.
 - 16) Follow "*Leak Detection*" procedure, Section 4.7.
 - 17) Start with all valves in the closed position on the application manifold, AcroClear tank, injection line, pump, and nitrogen system.
 - 18) Open Valve 1 and set Valve 2 to deliver the desired nitrogen pressure. Typically 15 – 20 PSI is all that will be needed to feed the suction of a pump. Exceeding 40 PSI will cause nitrogen to vent from the PRV. Ensure Valve 11 is open.
 - 19) Ensure pump suction and all sight glass valves are closed.
 - 20) Install a ¼" stainless steel braided vent hose on the check valve side on the top of the sight glass and route to a pail with saturated soda ash solution.
 - 21) Open the inlet (vapor) valve on the methanol purge tank to pressurize with nitrogen.

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- 22) Open the outlet (liquid) valve on the methanol purge tank, then Valve 9, Valve 10, and Valve 5 to allow methanol to reach the pump suction valve. **Do not open Valve 8!**
 - 23) Slowly open the bottom sight glass valve. Methanol may start to fill the sight glass.
 - 24) Slowly open the top sight glass vent valve to allow nitrogen to vent to the soda ash pail. It may be necessary to allow some methanol to exit the top of the sight glass to allow all the nitrogen bubbles to leave the hoses.
 - 25) Once nitrogen bubbles stop entering the sight glass, close the top and the bottom sight glass valves.
 - 26) Open valve at injection point and then the pump discharge valve and the bottom sight glass valve. The level of the sight glass should not drop due to the 50 PSI pump discharge check valve. If the sight glass level drops, either the 50 PSI pump discharge valve is malfunctioning or the nitrogen regulator pressure is set too high.
 - 27) Reset pump stroke and speed to desired settings to achieve previous rate; then start pump.
 - 28) Monitor sight glass to confirm pump is operating properly; *do not let sight glass go empty.*
 - a. If pump is not operating properly it may be vapor locked; it may be necessary to repeat the full pump priming steps in Section 4.8.1.
 - b. If pump appears to be operating properly, proceed to Step 30 below.
 - 29) Shut-off pump and close bottom sight glass valve, Valve 9, and both valves on methanol purge tank.
 - 30) Open the following valves in sequence: Valve 3, Valve 7, and Valve 8.
 - 31) Start the pump. Verify pump is operating properly and confirm application rate using sight glass.
 - 32) If may be necessary to follow the *“Procedure for Applications Using a Neptune Pump Package”* in Section 4.8.1 to remove nitrogen and re-prime the pump.

4.13.2 Equipment Disassembly for Applications Utilizing Nitrogen Displacement

- 1) Don APR and butyl rubber gloves.
- 2) Carefully disconnect all hoses from application manifold, nitrogen pressure regulator, and downstream injection equipment; be aware that equipment may still have trapped nitrogen pressure. Carefully coil hoses to prevent damage and install plugs to prevent contamination.

- 3) The vent line should be stored separately from the other application equipment to prevent contamination of the equipment with soda ash.
- 4) Disconnect the union on the liquid manifold.
- 5) Remove riser nipple from liquid valve. Reassemble union on liquid manifold, install caps and plugs, and place manifold in storage case.
- 6) Remove vapor manifold, install caps and plugs, and place in storage case.
- 7) Apply suitable Teflon tape to AcroCide™ tank plugs and install into both valves on tank.
- 8) Once plugs are installed in AcroCide™ tank valves.
- 9) Remove nitrogen regulator from nitrogen tank and install cap on nitrogen bottle. Install caps on nitrogen manifold and place in storage case.
- 10) All ancillary equipment such as sight glass, flow meter, pump, etc. should have plugs installed in any openings prior to transport or storage.
- 11) Carefully depressure methanol purge tank through nitrogen inlet valve.