

EMERGENCY RESPONSE INFORMATION

For all products, call CHEMTREC at 1-800-424-9300



STORAGE & HANDLING GUIDE

TELONE™ II Soil Fumigant

TELONE™ Technical Soil Fumigant

CURFEW™ Soil Fumigant

TELONE™ C-35 Soil Fungicide and Nematicide

TELONE™ EC Soil Fumigant

INLINE™ Soil Fungicide and Nematicide

STORAGE & HANDLING GUIDE

To obtain additional copies of this Guide or other information about TELONE™ soil fumigants, visit www.teleosag.com or contact your Teleos Ag Solutions™ TELONE™ Specialist.

INTRODUCTION	4
PRODUCT INFORMATION	5
SDS Information and Physical Properties.....	5
Material Compatibility	8
PERSONAL SAFETY	11
Education, Hygiene and Protective Procedures.....	11
Personal Protective Equipment (PPE)	13
Exposure Symptoms, First Aid, and Note to Physician.....	18
BULK SITE DESIGN & EQUIPMENT	20
Steps to Establish or Expand a Bulk Site.....	20
Typical Components and Illustration.....	21
General Requirements and Recommendations.....	23
Secondary Containment	26
Bulk Tank.....	28
Bulk Tank Venting, Inerting, and Air Drying	30
Piping, Hoses, and Valves	32
Pumps, Meters, Scales, Couplers and Other Equipment.....	34
Bulk Tank Labeling.....	36
Filling Bulk Tanks from Truck or Railcars.....	37
Cleaning Bulk Tanks.....	41
TANK TRUCKS AND RAILCARS	42
Requirements and Recommendations.....	42
Safety Equipment on Trucks.....	46
Rail Security for Chloropicrin Products	47

Cleaning Tank Trucks and Railcars	48
Filling Tank Trucks.....	49
CYLINDER AND PORTABLE REFILLABLE CONTAINERS (PRC).....	52
General requirements And Recommendations.....	52
Filling Cylinders and PRCs.....	56
Cleaning Cylinders and PRCs.....	57
Cylinder and PRC Storage and Transport.....	59
ENVIRONMENTAL & EMERGENCY INFORMATION	61
Environmental Fate and Wildlife Toxicity.....	61
Fire, Spills, and Clean-Up	61
CERCLA Reportable Quantities and SARA Listing.....	67
FIFRA § 6(a)(2) Adverse Effects Reporting.....	67
REFERENCES.....	68

INTRODUCTION

This Guide is intended for use in the United States of America. Consult Teleos Ag Solutions™ for guidance in other countries. This Guide includes information about the following fumigants:

- TELONE™ II Soil Fumigant
- TELONE™ Technical Soil Fumigant
- CURFEW™ Soil Fumigant
- TELONE™ C-35 Soil Fungicide and Nematicide
- TELONE™ EC Soil Fumigant
- INLINE™ Soil Fungicide and Nematicide

This Storage & Handling Guide is part of the continuing Product Stewardship Program initiatives of Teleos Ag Solutions. This Guide describes practices and equipment believed to be suitable for handling Teleos Ag Solutions' products, as noted. This Guide also includes Teleos Ag Solutions' requirements for new bulk systems and explains how to improve existing bulk systems. This Guide is not intended as, and should not be used as, a substitute for engineering or legal advice. Applicable legislation and regulations are constantly changing. Future regulatory and judicial developments may necessitate changes in the guidelines and procedures recommended in this Guide. Each user or handler of bulk products is responsible for compliance with all applicable federal, state, and local laws, regulations, and codes. Each user or handler of products is responsible to always read and follow product label directions. For more information, contact your local government agencies responsible for regulating the operations in question.

NOTICE: The information, procedures, methods, and recommendations herein are presented in good faith and are believed to be accurate and reliable as of the publication date, but may well be incomplete and/or not applicable to all conditions or situations. No representation, guarantee, or warranty is made as to the accuracy, reliability, or completeness of said information, procedures, methods, and recommendations. Nor is any representation, guarantee, or warranty made that application or use of any of the same will avoid hazards, accidents, losses, damages, or injury of any kind to persons or property, or give desired results, or that the same will not infringe patents of Teleos Ag Solutions or others. Readers must satisfy themselves as to the suitability of said information, procedures, methods, and recommendations prior to use.

For the purposes of this Guide, all technical references shall refer to the chemical makeup of the product and not the trade name (i.e. TELONE™). Unblended/straight TELONE™ products shall be referred to as 1,3-Dichloropropene; TELONE™/Chloropicrin blends shall be referred to as 1,3-Dichloropropene + Chloropicrin blends.

PRODUCT INFORMATION

SDS INFORMATION AND PHYSICAL PROPERTIES

Consult the Safety Data Sheet (SDS) for specific product information before handling any pesticide. For additional copies of the SDS:

- Go online to www.teleosag.com
- Call your Teleos TELONE™ Specialist, or
- Go online to <https://www.agrian.com/labelcenter/results.cfm>

The SDS contains information on:

- Product and Company Identification
- Composition/Information on Ingredients
- NFPA Hazards Identification (Health, Flammability, Reactivity)
- First Aid Procedures
- Fire Fighting Measures
- Accidental Release Measures
- Handling and Storage
- Exposure Controls/Personal Protection
- Physical and Chemical Properties
- Stability and Reactivity
- Toxicological Information
- Ecological Information
- Disposal Considerations
- Transport Information
- Regulatory Information
- Other Information

EPA Label Signal Word	
WARNING	DANGER
TELONE™ II CURFEW™ TELONE™ EC TELONE™ Technical (1,3-Dichloropropene is the active ingredient)	INLINE™ TELONE™ C-35 (1,3-Dichloropropene + Chloropicrin are the active ingredients)

If you need additional information about physical properties that do not appear below or on the SDS, contact Teleos Ag Solutions. Key considerations include:

- These products are classified as a Flammable Liquid by the Department of Transportation (DOT), Department of Labor (DOL), National Fire Protection Association (NFPA), and the Occupational Safety and Health Administration (OSHA). The flash point of a liquid is the minimum temperature at which it gives off sufficient vapor to form an ignitable mixture with the air near the surface of the liquid or within the test vessel used.
- The vapors of these products are heavier than air. Vapors may accumulate in sumps and low areas.
- These products are denser than water and therefore will form a layer below water. INLINE™ and TELONE™ EC will disperse in milky emulsion in most ratios with water.
- Products are highly soluble in hydrocarbons, but most are relatively insoluble in water.

DENSITY

Temperature affects the density (weight per volume) of a product. This affects meters that are not temperature compensated. The following information is only a guide. The chart may not reflect exact standard density used for billing, and individual lots may vary within normal limits.

	Temperature -- °F (°C)							
	20 (-7)	30 (-1)	40 (4)	50 (10)	60 (16)	70 (21)	80 (27)	90 (32)
Product	Density -- (lb./gal.)							
INLINE™						11.2		
TELONE™ II / CURFEW™		10.41	10.34	10.28	10.22	10.15	10.09	10.02
TELONE™ C-35					11.24	~11.2		11.0
TELONE™ EC		10.33	10.27	10.20	10.14	10.08	10.01	9.95
TELONE™ Technical		10.41	10.34	10.28	10.22	10.15	10.09	10.02

VAPOR PRESSURE

	Temperature -- °F (°C)							
	20 (-7)	30 (-1)	40 (4)	50 (10)	60 (16)	70 (21)	80 (27)	90 (32)
Product	Vapor Pressure (mm/Hg)							
INLINE™						~30		
TELONE™ II / CURFEW™			9.04	12.66	17.46	23.74	31.84	42.19
TELONE™ C-35						~30		
TELONE™ EC						~28		
TELONE™ Technical			9.04	12.66	17.46	23.74	31.84	42.19

BOILING POINT, HEAT OF VAPORIZATION, SOLUBILITY, MOLECULAR WEIGHT

	Latent Heat of Vaporization (BTU/lb.)	Approximate Solubility in Water @ 25°C	Coefficient of- Thermal Expansion/°C	Molecular Weight gm/mole
INLINE™		.2 g/100 ml	.0016	274
TELONE™ II / CURFEW™	126	.2 g/100 ml	.00148	120
TELONE™ C-35		1.2 g/1000ml	.00137	111
TELONE™ EC	134	1.2 g/100 ml	.00141	111
TELONE™ Technical				111

OTHER PHYSICAL PROPERTIES

Property	Value (All products)	Comment
DOT, NFPA, and OSHA Rating	Class 1C Flammable	
Spark Ignition Energy	0.15 millijoules	Static discharge is sufficient to ignite vapors.
Flammability Limits	LFL: 5.5% @ 80°C, 176°F UFL: 14.5% @ 80°C, 176°F	Limits indicate the typical flammable range for product mixtures in air at ambient pressure.
Odor	Pungent, sweet, penetrating to irritating	Odor of products containing chloropicrin is considered "irritating", especially to eyes.
Freezing point	Approx. -84.5°C (-120°F)	Produce will not freeze under ambient conditions.
Physical State	Colorless to straw colored liquid	Products are liquid at ambient temperature.

MATERIAL COMPATIBILITY

Material compatibility depends on the end use; shrinking, swelling or slight corrosion may be acceptable in some applications, but not others. Maintenance, such as draining and flushing pumps, will extend component life. See other sections in this Guide for maintenance instructions. The performance of the rubbers and plastics is dependent upon the resin grades and quality control procedures used by the manufacturer. Contact the parts supplier for further compatibility information. The data below reflects field experience and laboratory studies. The laboratory studies partially submerged material coupons in fumigant for 60 days at 122°F. Use this chart as a screen only.

Metals	Rating	Comment
Mild Steel, Cast Iron	OK	Mild steel was moderately corroded by 1,3-Dichloropropene + Chloropicrin blends, but only slightly corroded by other formulations. If not maintained, may develop scale or surface rust capable of discoloring product or plugging orifices. Mild steel storage tanks should be nitrogen padded to limit corrosion and protect product quality.
304 and 316 Stainless Steel	OK	Acceptable for most applications. Trace of corrosion in liquid phase. Pinhole corrosion may occur rapidly in presence of moisture, air, and 1,3-Dichloropropene products. Some studies indicate an advantage of using low carbon alloys, especially 316L. Stainless steel storage tanks should be nitrogen padded to limit corrosion and protect product quality.
Tantalum	OK	Not tested, but tantalum is considered totally inert.
Copper	OK	Acceptable for most. Moderately corroded by 1,3-Dichloropropene + Chloropicrin blends. Non-corroded by other formulations.
Hastelloy ^{®1} , Monel ^{®2} , Nickel	OK	
Yellow Brass	Caution	Acceptable for most short-term applications. Slight corrosion. Although commonly used in 1,3-Dichloropropene couplers, severe corrosion has occurred in long-term exposure of brass nipples when moisture was not controlled.
Tungsten-Carbide	Caution	Not tested. Tungsten Carbide includes a nickel-cobalt matrix. Compatibility with 1,3-Dichloropropene products is likely OK but may depend on the matrix and whether other alloy materials are present.
Aluminum, Tin, Zinc, Magnesium, Cadmium or their alloys (Galvanized products)	Do Not Use	Will corrode. Hazardous decomposition may occur with release of hydrogen chloride when 1,3-Dichloropropene products contact aluminum or its alloys ³ . Decomposition may occur in a reaction and may release heat.
Glass filled polymers	Caution	Avoid use in pump impellers or other parts exposed to wear.

¹®Hastelloy is a trademark of Haynes International, Inc.

²®Monel is a trademark of Special Metals Corporation.

³ Some laboratory data indicates that corrosion of aluminum is less with formulations containing chloropicrin. However, it is best to avoid aluminum altogether, as severe corrosion can occur with formulations which only contain 1,3-Dichloropropene.

Rubbers / Plastics	Rating	Comment
Buna N, Neoprene, Silicon Red Rubber, Rigid or Plasticized PVC (Tygon®), Polyurethane, ABS, Butyl Rubber, Hypalon®, Lexan®, SBR Rubber, Polysulfone, Vinyl	Do Not Use	Swells severely or disintegrates. Silicone Red Rubber shows only moderate swelling may vary slightly by formulations with the same active ingredients, but are likely to be similar.
Teflon® Pastes, Fiberglass, Epoxy	Do Not Use	1,3-Dichloropropene may dissolve the paste constituents and is incompatible with epoxies and fiberglass.
Viton®	Caution	Acceptable for most applications. Grades of Viton vary. Viton A has performed well, but will swell. Standard Viton swelled between 118% and 131% in coupon tests. Highly fluorinated grades such as Viton F/G may be better.
EPDM	Caution	Acceptable for some applications. Grades of EPDM vary from little to severe swelling. Swelling may vary slightly by formulations with the same active ingredients, but are likely to be similar. Use only for trapped gaskets, preferably in the vapor phase only.
Vellumoid Gasketing	Caution	Shrinks slightly.
Silicone Gasket Material	Caution	Works fairly well if thoroughly cured before product contact. Super Blue Silicon, Type 613, from Versa Chem has been used for thread & gaskets. Permatex Ultra Blue and Permatex/Loctite Blue RTV Silicone Gasket Maker have been used. Color will leach.
Nylon, Teflon, Cross-linked Polyethylene, PEEK™	OK	Acceptable. Little to no swelling. PEEK™ (PolyEtherEtherKetone) is especially inert.
Polypropylene, Hi-Density Polyethylene, Lo-Density Polyethylene UHMW Polyethylene	OK	Acceptable. Swells slightly. Low-density polyethylene will swell slightly more than hi- density polyethylene.
Santoprene®	OK	Limited testing showed slight shrinkage with 1,3-Dichloropropene with an added emulsifier, and slight swelling with 1,3-Dichloropropene + Chloropicrin + added emulsifier. Other formulations are likely to behave the same. Test before use.
Nylon, Teflon, Cross-linked Polyethylene, PEEK™	OK	Acceptable. Little to no swelling. PEEK™ (PolyEtherEtherKetone) –is especially inert.
Polypropylene, Hi-Density Polyethylene, Lo-Density Polyethylene UHMW Polyethylene	OK	Acceptable. Swells slightly. Low-density polyethylene will swell slightly more than hi- density polyethylene.
Norprene®	OK	Limited testing showed excellent performance. Do not confuse Norprene (compatible) with Neoprene (incompatible). Test before use.
Kalrez®, Chemraz®	OK	Limited testing, but should perform adequately. Very little swelling. Test before use.
Kynar® (PVDF)	OK	Limited data shows <2% dimensional change in two-week test. Suitable for most applications, but avoid glass-filled Kynar, especially in parts subject to erosion. Glass- filled Kynar failure in such parts has been reported.
Delrin® (Acetal)	OK	Not tested with 1,3-Dichloropropene or 1,3-Dichloropropene + Chloropicrin, but slight to moderate swelling with the other formulations. Should be acceptable for most trapped applications.

Thread Sealants	Rating	Comment
Loctite® PST, 242, 243, 569, 570 or 577	OK	Medium strength Loctite® PST brand thread locker or equivalent is preferred for stainless steel piping less than 2" diameter. Use Loctite 577 or equivalent for metallic threaded connections, 2" or greater. Loctite 243, 242 (medium strength thread locking), Loctite 569 (high strength, permanent), and 570 sealants may also be used.
Teflon Tape	OK	Teflon tape is compatible and can be used, but easily leaves some shreds of material, without expert care, that plug filters. It is known to cold set, loosening with vibration.
Blue Silicone Caulks	OK	Blue Silicone caulks such as ZEP Blue Medium Threadlocker are allowed but must be cured before exposure to product.

®Hastelloy is a registered trademark of Haynes International, Inc. Monel is a registered trademark of International Nickel Corporation. Tygon is a trademark of Norton Company. Hypalon is a registered trademark of DuPont Dow Elastomers LLC. Lexan is a registered trademark of General Electric Company. Teflon and Viton, Kalrez, and Delrin are registered trademarks of Dupont Corporation. Santoprene is a registered trademark of Monsanto Corporation. Chemraz is a registered trademark of Green Tweed & Corporation. Saranex is a registered trademark of Dow Chemical Company. Norprene is a registered trademark of Norton Co. Kynar® is a registered trademark of Elf Atochem North America, Inc. Loctite is a registered trademark of Henkel Corporation. PEEK™ is a trademark of Victrex plc.

PERSONAL SAFETY

EDUCATION, HYGIENE AND PROTECTIVE PROCEDURES

Safe handling requires adequate equipment design, knowledge of product hazards, and knowledge of handling procedures. Consult the product label and SDS for worker protection standards and handling precautions.

Additional training may be required by your State, Local or Tribal authority.

PERSONNEL EDUCATION

Safety procedures and SDSs must be reviewed with workers according to the OSHA Hazard Communication Standard 29 CFR 1910. The training program must be in writing and records kept of individual participation. Emphasis should be placed on preventing the exposure, not reacting to it. Personnel handling fumigants must:

- understand and avoid hazards,
- be given specific instructions about personal protective equipment required for particular types of jobs,
- be trained in procedures to follow should an exposure occur,
- read, understand, and observe warnings on product labels, and
- implement procedures to avoid exposure.

Contact your Teleos TELONE™ Specialist for assistance in setting up a training seminar.

PERSONAL HYGIENE

Maintain good personal hygiene. After handling or applying product, immediately wash hands, arms, and face with soap and water. Do this particularly before using tobacco products, chewing gum, or eating. It is good practice to shower and change clothes daily after working with any pesticide, even if no known exposure has occurred.

Shower and clothes changing facilities near the work site are recommended in addition to emergency eye-bath and shower stations strategically located in the work area.

Avoid eye contact. Wear eye protection prescribed in the product label. Wearing contact lenses while handling any chemicals can be harmful because the contact lens may trap or absorb chemical liquids, vapors, gases, or dusts.

Avoid skin contact. Wear personal protective equipment prescribed in the product label. Aerate and separately wash all protective clothing and equipment thoroughly after use. Never wear clothing or protective equipment having the odor of these products. **Note: Contaminated clothing may be a fire hazard until cleaned or completely dry.**

Avoid ingesting product. Never put these products into the mouth. Do not use the mouth to siphon liquids or blow out clogged equipment.

PROTECTIVE PROCEDURES

1. Since these products are flammable, no spark-producing, flame-cutting, or welding operations may be performed on equipment, or in areas around equipment, until proper isolation, clearing, and testing with an approved combustible gas meter has established that safe conditions exist. Do not use, pour, or store these products near heat or open flame, and do not cut or weld containers which contained these products.
2. Clean leaks or spills immediately and properly dispose of clean-up materials to minimize exposure hazards from product contact and air contamination. Decontamination should be conducted by properly protected and knowledgeable people.
3. Keep everyone whose presence is not required away from areas where these products are stored, handled, or loaded. Keep people away from areas being treated or that have been recently treated.
4. Minimize contamination of work areas, such as mixing or loading sites, rail sidings, and truck floors.
5. Loading personnel, application equipment drivers, transport drivers, persons performing equipment repair, supervisors and any other individuals working with fumigants must understand the safety recommendations and emergency procedures. They must correct deviations from appropriate safety procedures. Safety equipment is to be specified for the job and used until the equipment is cleaned and the work area adequately cleared.
6. Do not wear shoes with small nails or studs in hazardous locations. They can produce sparks.
7. Avoid entering vessels. If entry must be made, it should be done only under strict procedures established and supervised by knowledgeable personnel experienced and certified in this type of operation.
8. Periodic inspections and preventive maintenance programs should be established to keep equipment and containers in good condition to prevent leaks of liquid and vapors.
9. Do not transport or store contaminated equipment in closed areas such as vehicles or buildings. Do not decontaminate exposed equipment inside buildings except in areas ventilated especially for such use.
10. Product transfers or repackaging should be conducted with equipment that meets requirements of the applicable state or local electrical code for flammable liquids, or *National Fire Protection Associate 70: National Electrical Code*, if no applicable state or local code exists. Operations should be performed in clean, well-ventilated areas, preferably separated from other operation.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

FOLLOW PPE INSTRUCTIONS ON THE PRODUCT LABELS OR SDS AS APPROPRIATE.

Safety equipment must be readily available and properly maintained. Personnel must be trained to use PPE and informed of the protection it may offer. In addition, OSHA minimum requirements must be met.

ACTIVITIES REQUIRING PERSONAL PROTECTIVE EQUIPMENT

The product labels specify personal protective equipment and clothing based on the activity being performed. REFER TO THE PRODUCT LABEL FOR DETAILS. Labels generally break users into groups:

- Handlers Performing Tasks with Liquid Contact
- Handlers Performing Tasks with No Liquid Contact
- Handlers in treated area 1 to 5 days of application
- Handlers exposed to high concentrations

Direct contact activities generally include tasks performed outdoors or in a well-ventilated area that may involve direct contact with product or direct venting of product vapor. Direct contact tasks include (but are not limited to):

- Equipment calibration or adjustment
- Equipment clean-up and repair
- Product sampling
- Any activity within 6-feet of an unshielded pressurized hose containing these products
- Rinsate disposal
- Fumigant transfer
- Clean-up of small spills
- Preparing containers for aeration
- Any other task not specifically listed in the PPE sections of the product label.

Tasks which are not Direct Contact Activities include (but may not be limited to):

- Tasks with no liquid contact potential, including inside/outside of cabs
- Handlers in treated areas, including inside/outside of cabs
- Handlers exposed to high concentrations

Most bulk site activities will be considered “tasks with liquid contact potential” but consult the label to be sure.

Activities in treated areas within 5 Days of Application are restricted to specific tasks. Do not enter the restricted area unless performing a required task and wearing PPE.

High airborne concentrations of soil fumigant products may occur during cleanup following spills, bulk tank cleaning, or in poorly ventilated areas. Note: In-tank cleaning must be performed only by trained persons. Refer to OSHA 29 CFR Part 1910.146 and this Guide's section on Tanks.

See further respirator requirements in the "User Safety Requirements" section on the product label.

GENERAL PPE INFORMATION

The product label specifies PPE that must be worn based on the activity being performed, guidance on chemical resistant materials, plus tips to avoid over-heating (heat stress) under hot working conditions. This section provides general comments about selection, care and sourcing of PPE.

Eye Protection: A face shield or safety glasses with brow and temple shields meeting OSHA standards are the minimum eye protection required in areas where there is a possibility of contact with liquid product. **DO NOT WEAR CHEMICAL GOGGLES.**

Properly fitted, full-face respirators provide eye protection from vapors and liquid splash exposures.

Wash face shield or safety glasses using soap and warm water at least daily, then rinse and dry with a clean, soft cloth or non-abrasive paper towel. If the shield or glasses contact these products, clean and dry them in a well-ventilated area. Do not reuse shield or glasses until they are free of any detectable odor of these products.

Body Protection: Several materials resistant to these products are listed below. For more options, follow the instructions for Category H on an EPA Chemical resistance category selection chart. PPE constructed of Saranex®, neoprene and chlorinated polyethylene provide short-term contact or splash protection. Longer-term protection is provided by PPE constructed of Viton, Teflon, and EVAL barrier laminates.

Leather or leather-like materials, canvas, or cotton materials do not offer adequate protection and increase the chance of injury after an exposure. Leather items should be made un-wearable and disposed immediately after an exposure. Do not try to salvage or reuse them.

Gloves such as barrier laminated (EVAL) or Viton are preferred over thin, disposable items of protective clothing, such as nitrile, latex rubber or polyethylene gloves. These lighter materials will provide adequate protection for very short periods such as taking samples and short-term equipment repairs. Gloves that tear easily are potentially more dangerous than no protection as they can entrap chemical in contact with the skin. Remove anything that can entrap the chemical next to skin, such as watch bands or rings.

Coveralls must be loose fitting and constructed of woven fabrics (e.g., tight knot cotton or cotton/polyester), non-woven fabrics (e.g., Tyvek or Sontara®), or fabrics containing microporous Teflon. Saranex coatings are often used for chemical-

resistant aprons, coveralls, or slicker suits. Many uses require full body cover-all. Avoid or minimize heat illness, using measures such as gradual adjustment to heat and respirator stress, fans for cooling, cooling vests, frequent breaks to cool down, frequent intake of drinking water, and maintaining weight from day to day.

After use, thoroughly wash protective clothing using soap and warm water. Dry in a clean, well-ventilated place. If the clothing has been contaminated, aerate it thoroughly after washing until all product odors are gone. Never wear clothing having product odor.

Respiratory Protection: National Institute for Occupational Safety and Health (NIOSH)-approved cartridge respirators for up to 1,000 ppm organic vapors should be adequate for short-term situations in open air. This includes activities like loading and unloading tank cars, tank trucks, and marine vessels; sampling, transferring, and filling containers; calibration; exposure to small spills in well-ventilated areas; and routine equipment maintenance. View NIOSH publications on respiratory protection at www.cdc.gov/niosh for more information. Note: respiratory protection is very important; there are specific requirements for half-face and full-face SCBA types of respiratory protection that vary by product and activity; users must comply with the label requirements for the specific TELONE™ product.

Respirators have limitations on the range of compounds against which they are effective, the length of time they can be relied upon for protection, and the conditions under which they can be used and stored. Use respirators in accordance with the manufacturers' directions and Occupational Safety and Health Administration (OSHA) regulations:

1. Prepare a written respiratory protection program as required by OSHA's Respiratory Protection Standard (1910.134).
2. Store the respirator and cartridges in a clean, dry place, preferably in a tightly closed plastic bag.
3. Replace cartridges or canisters according to your company's written respirator protection program. Typically, this may be daily, but should be prescribed in your company's program. Replace the cartridge immediately if odor or irritation from this product becomes apparent. Dispose of used cartridges and faulty parts and replace as needed.
4. Fit the respirator with head-bands snug enough to ensure a tight but comfortable seal. Top headbands must be above ears. Ensure that corrective glasses or facial hair do not affect the fit of the facepiece.
5. Test for leaks by placing a hand over the inlet valve housing and inhaling gently. If the mask is pulled toward the face, the fit is good. If not, readjust headbands and test again.
6. Clean respirators regularly in accordance with OSHA regulations. Wash the facepiece with soap and warm water after use. After washing, rinse to remove all traces of soap. Place in a well-ventilated area to dry.
7. Respirators must be fit-tested and fit checked using a program that conforms to OSHA's requirements described in 29 CFR Part 1910.134. This includes examination by qualified medical practitioner to ensure ability to safely wear the respirator, fit testing, and training on selection, use, and maintenance.

WARNING: Never use a cartridge respirator without carefully assessing exposure conditions. Do not use an air-purifying respirator in an area you could not safely escape if the respirator failed. The atmosphere must contain adequate oxygen (at least 19.5%). If in doubt, use an air-supplied respirator. Use a positive-pressure, self-contained breathing apparatus. Do not use any respirator if you have a medical or physical condition that prevents you from doing the job safely.

Consult with your supervisor. Contact lenses may be used with respirators where the wearer has successfully worn such lenses before.

Because of the possibility of inadequate oxygen, do not use cartridge respirators for firefighting. Positive-Pressure, Self-Contained Breathing Apparatus or Air-Supplied Respirators must be used during a fire involving these products or in any other situation where oxygen may be deficient.

PERSONAL PROTECTIVE EQUIPMENT AND SUPPLIERS

The following protective equipment appears to give good protection against 1,3-Dichloropropene and 1,3-Dichloropropene + Chloropicrin products. Other manufacturers may have comparable equipment. Safety equipment may be purchased from any supplier. The list below is provided for your convenience.

BODY PROTECTION

- Chemtursion model 3525 or 3530 (Trademark of ILC Dover)
- Zytron 500 (Trademark of Kappler)
- Tychem SL (Trademark of DuPont)

FOOTWEAR

- Neoprene snugleg boots (Trademark of Tingley Rubber Co.)
- Servus Neoprene III (Trademark of Norcross Safety Products)

GLOVES

- Silvershield (Trademark of North Safety Products)
- Model 334946 NL-34 Neoprene (Trademark of MAPA Pioneer Corp.)
- Model 6784 Neoprene (Trademark of Best Glove, INC)
- Viton Model F-101 (Trademark of North Safety Products)

RESPIRATORS AND CANISTERS (Full-face or half-face as required by product label)

- 3M or 3M Scott: respirators and organic vapor cartridges
- Honeywell North or North: respirators and organic vapor cartridges
- MSA: respirators and organic vapor cartridges

EXPOSURE SYMPTOMS, FIRST AID, AND NOTE TO PHYSICIAN

SIGNS AND SYMPTOMS OF EXPOSURE

CONSULT THE PRODUCT LABEL AND SDS FOR DETAILED DESCRIPTIONS OF HAZARDS, WHICH VARY BY PRODUCT. Below is an overview only. Preventing exposure and prompt removal from exposure are most effective in preventing injury.

Routes of exposure can be by inhalation, ingestion, skin absorption, or eyes. Severity of potential health effect will depend on the product involved, the route of exposure, and the duration and level of exposure. Potential health effects can be mild or severe, including life-threatening.

Immediately take appropriate action if exposure is suspected. See the "Section 4. First Aid" and "Section 11. Toxicological Information" of the SDS.

FIRST AID TREATMENT

The following emergency procedures should be followed until decontamination is complete, until a physician arrives, or until the person can be moved to a medical facility.

Eyes	Wash immediately and continuously with flowing water for at least as long as recommended on the SDS. In most cases this will be at least 15 minutes and may be up to 30 minutes. Remove contact lenses after the first 5 minutes and continue washing. Obtain prompt medical consultation, preferably from an ophthalmologist.
Skin	Wash immediately and continuously with flowing water for at least as long as recommended on the SDS while removing contaminated clothing. In most cases this will be at least 15 minutes and may be up to 30 minutes. Prompt medical consultation is essential. Wash clothing before reuse. Destroy contaminated leather items such as belts, watchbands, or shoes.
Ingestion	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. Never give anything by mouth to an unconscious person.
Inhalation	If person is not breathing, call 911 or an ambulance, then give artificial respiration. If by mouth-to-mouth use rescuer protection (pocket mask, etc.). Call a poison control center or doctor for treatment advice. If breathing is difficult, oxygen should be administered by qualified personnel.

Obtain medical assistance if:

- The material has been swallowed.
- High vapor concentrations have been inhaled.
- The material has splashed into the eyes.
- Large areas of skin have been contaminated.

-
- The individual has become ill or unconscious.

Try to determine the names of all materials (including active ingredients) with which the person had been working. Take available product literature, the label or label booklet, or a safety data sheet to the hospital or physician.

NOTE TO PHYSICIAN

FOR MEDICAL EMERGENCIES INVOLVING TELEOS PRODUCTS, PHYSICIANS CAN CONSULT WITH MEDICAL PERSONNEL KNOWLEDGEABLE ON TELEOS PRODUCTS BY CALLING 1-800-424-9300, OR VISIT WWW.CHEMTREC.COM.

Consult the individual product label and SDS for treatment guidance and hazards, which vary by product. See the “Notes to Physician” section at the end of Section 4 in the SDS for complete details, by product.

BULK SITE DESIGN & EQUIPMENT

STEPS TO ESTABLISH OR EXPAND A BULK SITE

Contact Teleos Ag Solutions before establishing or expanding a bulk facility. No product will be delivered to a site until the facility has been approved by a designated Teleos Ag Solutions representative. Planning, design, and installation of a new site may take several months to a full year.

Prior to establishing a bulk facility, the owner or operator must obtain all required permits governing the storage of bulk pesticides. The bulk pesticide facility must meet the requirements in this Guide, plus all applicable federal, state, and local codes, laws, regulations, and ordinances. These include, but are not limited to, those issued by the federal and state Department of Transportation (DOT), Occupational Safety and Health Administration (OSHA), and the Environmental Protection Agency (EPA).

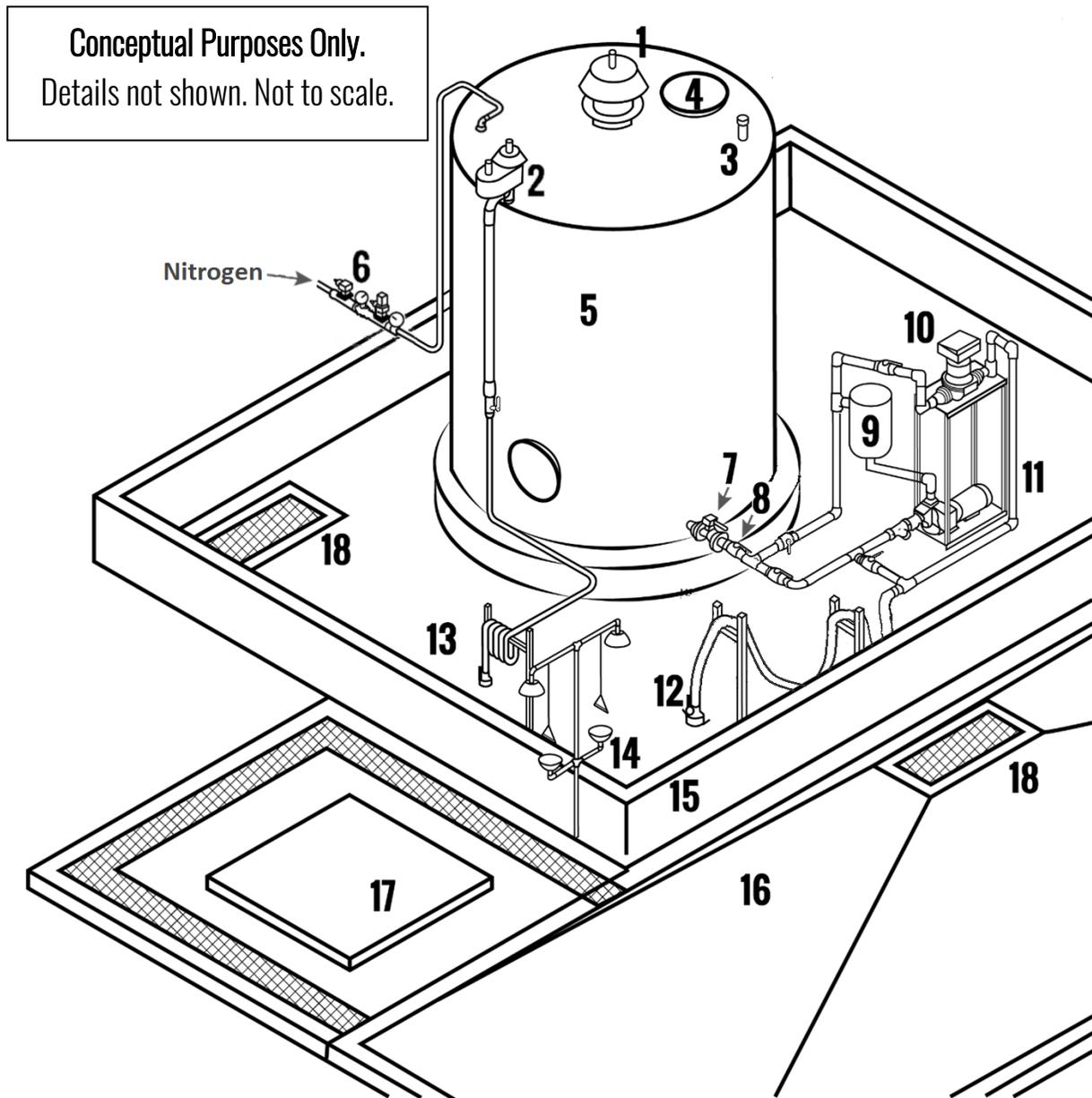
1. Review this Guide. Discuss plans and request a Repackaging Agreement (if needed) with Teleos Ag Solutions.
2. Survey property for a tank location to assess proximity to nearby buildings or environmental features such as businesses, residences, institutions, water bodies, wells, or sewer systems. Ask Teleos Ag Solutions for bulk stewardship input before the location is finalized.
3. Assure that a current, active EPA Establishment Number exists.
4. Register for required permits. Local zoning approval may be required. (Remember to check for air permits.)
5. Locate “code” tank and equipment vendors, and request bids that meet the criteria in this manual, plus any federal, state and local requirements. Consider using a licensed professional engineer who specializes in bulk containment to design and stamp containment plans. This may be a state requirement, and helps assure quality results.
6. Share the design plans with Teleos Ag Solutions for bulk stewardship input before construction starts.
7. When permits are approved, begin site preparation and order the bulk tank and other equipment.
8. Assemble and test the facility.
9. When the facility is complete, Teleos Ag Solutions must inspect and approve the facility prior to first product shipment.

TYPICAL COMPONENTS AND ILLUSTRATION

This table and illustration are a high-level overview of typical components. Sites may vary significantly in detail, but all will have components that perform similar functions.

	Key Component	Comment
1	Emergency Relief Vent (ERV)	Required by NFPA for flammable and combustible products. Relieves tank pressure in the event of a fire. Must vent outside building for products with less than 200°F (93.3°C) flash point.
2	Conservation Vent	Conservation vent, also called a Pressure Vacuum Relief Vent (PVRV) relieves tank during normal breathing. Required by NFPA due to product flammability. Must vent outside building for products < 200°F (93.3°C) flash point.
3	Level Indicator	Some means of indication required; may be manual. Sight tubes are prohibited by EPA.
4	Man-Way	Optional access to tank interior enables easier clean-out of tank.
5	Bulk Tank	See "Bulk Tank" section for materials and code requirements.
6	Nitrogen Blanket Regulation System	Used to inert tank head space. Air driers are allowed in certain regions. Source is usually nitrogen in compressed gas bottles.
7	Self-Closing Fire-Safe Valve	Required for flammable products.
8	Locking Ball Valves	Required on tank openings below liquid level.
9	Strainer or Filter	Protects meter or pump. Maintains product quality.
10	Meter	Scale may be used instead for container filling.
11	Centrifugal Pump and Motor	Electrical components must meet local code or NEC #70, including Hazardous Zone rated motor and wiring.
12	Liquid Transfer Connection with Dry Disconnect	Liquid connections must utilize dry disconnects. Confirm size with delivering carrier.
13	Vapor Exchange Line with Connection	Confirm vapor connection with delivering carrier.
14	Safety Shower and Eye-Wash	Required. Must be accessible from work areas. See OSHA requirements.
15	Containment Dike	Required by federal EPA.
16	Load/Unload Pad	Required by federal EPA.
17	Fill Pad and Scale	Container filling may also be within dike or load-pad area.
18	Sumps	Sumps are required by EPA for new construction. Automatic sump pumps are prohibited.
	Liquid Sample Port	Not shown. The system should have a method of obtaining a sample of the product.
	Headspace Sample Port	Not shown. A method of sampling headspace to verify oxygen content is recommended.

TYPICAL BULK SITE ILLUSTRATION



Complete systems are available from several vendors. See the References section at the end of this document. Equipment and designs used must comply with the requirements of this Guide plus federal, state, and local requirements.

GENERAL REQUIREMENTS AND RECOMMENDATIONS

For purposes of this document, the term “bulk” primarily refers to pesticide storage tanks with capacities of 500 gallons or greater that are fixed in place or portable tanks (500 gallons or greater) in place for 30 days or more. There are other bulk storage capacity definitions and requirements pursuant to EPA, NFPA, OSHA, DOT, and specific state regulations for flammable liquids that have to be met that may not be included in this document.

GENERAL BULK SITE REQUIREMENTS

1. Pesticide handling facility and operating procedures must comply with all federal, state, and local pesticide handling laws and regulations, including applicable portions of 40 CFR 165.
2. Rainwater management must comply with state and federal storm water regulations.
3. The tank and any pump, meter, hose, and piping must be located within the dike or containment area.
4. Equipment must be free from leaks at seams, couplings, packing glands, valves, points of closure, etc.
5. Bulk location must have a contingency plan for spills, leaks, fire, and other emergencies.
6. Pesticide handling must meet or exceed the Worker Protection Standard.
7. Current SDSs must be available on site to all employees.
8. Protective equipment, spill containment equipment and absorbent must be on site to handle minor spills or releases.
9. Safety equipment storage must be marked by signs that are highly visible from the work sites.
10. Install an OSHA-compliant emergency eye wash station near the bulk area.
11. Install an OSHA-compliant safety shower near the bulk area.
12. Identify loading and unloading risers by color or markings to indicate product and prevent cross- contamination.
13. Assure proper waste disposal where needed for systems operations and cleaning. Clean leaks or spills immediately and properly dispose of clean-up materials. Decontamination should be done by properly protected and knowledgeable people.
14. Keep everyone whose presence is not required away from areas where these products are stored, handled, or loaded.
15. Minimize contamination of work areas, such as mixing or loading sites, rail sidings, and truck floors.
16. Select materials for construction of tanks, screens, strainers, valves, fittings, hoses, meters, pipes, seals, gaskets, and pumps that are compatible with products.
17. 1,3-Dichloropropene products are Class 1C flammable liquids according to National Fire Protection Association (NFPA) and Class IC Group D liquids by National Electric Code (NEC). Keep sources of ignition, including cutting and

welding, away from vapors. Electrical transfer or repackaging equipment must meet NEC 70 or local requirements whichever is stricter. In most cases, this requires Class 1, Group D, Div 1 or Div 2 electrical equipment. Consult your local code inspector for more information.

18. A valid EPA Establishment Number must exist for each location where the product will be repackaged.
19. Facility must comply with the state fire code, or the NFPA Standards for Flammable and Combustible Liquids Code (NFPA 30) if no state fire code exists.
20. Bond and ground all bulk systems. Confirm and document electrical continuity. Bonding and grounding cables must be used at all product transfer stations.
21. Protect water sources from back siphoning.
22. Do not store pesticides in the same area as food, feed, clothing, or animal health products.
23. The site must have a security system. At minimum, this shall include a fence at least 6' tall immediately around the bulk storage location or entire site. Alarms, or a locked building, are recommended.
24. Post conspicuous signs which prohibit smoking within 50 feet of bulk handling area. Assess the storage and fill area to isolate liquid and vapors from possible ignition sources.
25. Fire extinguishing capability deemed appropriate by the responsible local or state authorities and/or by Underwriters' Laboratories (UL) codes must be present. As a minimum, a fire extinguisher rated at 20B must be at each site where these products are stored.
26. Emergency plans for spills, leaks, and other emergencies must be established and exit routes clearly identified.
27. Do not perform product transfers within 150 feet of an unprotected well site. Well sites should be identified and comply with state and federal guidelines.
28. Operations should be done in clean, well-ventilated areas, preferably separated from other operations.
29. Loading personnel, application drivers, transport drivers, persons performing equipment repair, supervisors, and any other individuals working with fumigants must understand the safety recommendations and emergency procedures. Deviations from appropriate safety procedures must be corrected. Safety equipment is to be specified for the job and used until the task is completed and the work area adequately cleaned and cleared.
30. These products are flammable. No spark-producing, flame-cutting, or welding operations may be performed on equipment, or in areas around equipment until proper isolation, clearing, and testing with an approved combustible gas meter has established that safe conditions exist. Do not use, pour, or store these products near heat or open flame, and do not cut or weld containers which contained these products.
31. Do not wear shoes equipped with small nails or studs in hazardous locations. They can produce sparks.

-
32. Avoid entering vessels. If entry must be made, it should be done only under strict procedures established and supervised by knowledgeable personnel experienced and certified in permit required confined space entry per OSHA regulations.
 33. Outdoor facilities are recommended, however, if the bulk tank is indoors, it must comply with all additional requirements for indoor facilities. This includes such items as proper air ventilation, building construction, and electrical wiring prescribed by NFPA 30.
 34. Do not transport or store contaminated equipment in closed areas such as vehicles or buildings. Do not decontaminate equipment inside buildings except in areas ventilated especially for such use.

GENERAL BULK SITE RECOMMENDATIONS

1. Implement a preventive maintenance program to repair and replace hoses and other equipment as appropriate.
2. Provide lighting around the bulk facility that is bright enough to easily read package label information.
3. Have a fire inspection conducted annually by an external party such as the local or state fire marshal. Maintain written records of inspections.
4. The fire department should review the "Emergency Action Plan" annually.
5. Prepare pumps, meters, piping, and dispensing hoses properly for the off season after the application season.
6. Perform housekeeping on a routine basis. This includes proper hose storage and removing debris and unneeded equipment.
7. Single inlet/outlet tanks or tanks with both an inlet and outlet may be used, but separate lines are preferred.

SECONDARY CONTAINMENT

REQUIREMENTS

1. All bulk tanks (500 gallons or greater) must have secondary containment. Containment design must follow state or federal requirements, plus those of NFPA 30 Flammable and Combustible Liquids Code, or those listed below—whichever is more stringent.
2. Containment structures (dikes and load pads) must be compatible with the pesticides stored or transferred. They must be constructed of reinforced concrete, steel or other rigid material. Concrete block walls—reinforced with rebar—which are filled, capped and sealed are permitted, but concrete block or steel systems are not recommended. Natural earthen material, unfired clay and asphalt are prohibited.
3. The structure must be liquid-tight with cracks, seams and joints sealed with chemically resistant materials. The containment must support the gravity load of all full tanks and be able to withstand the potential hydraulic load.
4. Dikes must contain 100% (under roof) or 110% (without roof) of largest tank volume plus displacement for all other storage tanks or be designed to applicable state or federal laws, regulations and codes if more restrictive.
5. A rigid, liquid-tight load pad must exist for transfer of product between the bulk tank and all delivery trucks, nurse vehicles, refillable containers, application equipment or other containers. Container cleaning must also be done over containment. The load pad must hold at least 750 gallons, or at least 100 percent of the largest container on the pad up to 750 gallons per EPA; or meet state requirements—whichever are more stringent.
6. Operational area containment (load pads) constructed after November 16, 2006, must slope to a sump per EPA. Some states may also require the dike floor to slope toward a sump.
7. Elevate or anchor the bulk tank per EPA requirements to prevent flotation.
8. The tank, pump, and meter (if used) must be located within the dike or other containment.
9. All outlets or drains in the secondary containment must be permanently plugged and sealed. However, drains to other adjacent containment areas may be permitted.
10. Automatically activated sump pumps are not allowed. Manual controlled pumps may be used. Pumps must be rated for flammable service if product flash point is less than 100°F (37.7°C).
11. Do not permit other bulk tanks made of combustible materials (polyethylene, fiberglass) in the same containment as tanks containing flammable and combustible liquids. This is an NFPA 30 requirement, and exceptions should be approved by the local authority having jurisdiction.
12. Visually check integrity of the stationary pesticide containers, secondary containment and load pad, including sumps, on a frequency to comply with EPA requirements, including 40 CFR 165.90 to 165.95. In general, this requires monthly documented inspections.

-
13. Tank-in-tank, or double walled tank designs which incorporate their own secondary containment are allowed. However, they are discouraged due to difficulty of inspecting the containment integrity. If used, tank-in-tank designs must meet the requirements for emergency venting and leak monitoring indicated in NFPA 30. NFPA also limits tank in tank size to 12,000 gallons or less.
 14. Rail site spill containment, drainage systems, or grading shall be present such that a spill of the entire rail car shall not run off the site or expose people, important structures, properties, and environmental features to uncontrolled spilled liquid. Impervious containment is recommended, at least for small spills at point of connection.

SECONDARY CONTAINMENT RECOMMENDATIONS

1. A roof over the bulk tank and diked area is recommended to minimize rainwater contamination and the need for proper disposal of this water. A roof over the load pad is also recommended. If flammable or combustible liquids are present, be sure the design does not constitute an indoor storage facility or building. This would trigger additional NFPA venting and electrical requirements.
2. Contiguous concrete containment between dike and transfer area is recommended.
3. Avoid passing piping through dike walls. However, drains to other containment areas may be permitted to pass through dike walls providing they can be valved-off and locked when not in use, if state law permits. Run piping within the dike rather than along the top of the wall.
4. The load pad should prevent liquids from seeping into or flowing onto it from adjacent land or structures during a 25 year, 24-hour rainfall event.
5. Spacing of the tank relative to other tanks, dike, and property lines shall follow NFPA 30. In general, there should be no less than 3 feet between the bulk tank and other tanks or the dike wall; 20 feet between the bulk tank and any property line that is or can be built upon; and 5 feet between the bulk tank and the nearest side of any public way or the nearest important building on the same property.
6. Slope the floor of newly constructed dikes to a sump to permit withdrawal of liquid in the dike.
7. Avoid trapping liquid between the tank and the dike floor by setting tanks on a raised firm foundation within the dike, such as concrete or ring filled with pea gravel or oiled sand.
8. Use a vendor familiar with industry standard designs and procedures to construct containment.
9. Hydrostatically test new containment prior to installing the tank.

BULK TANK

BULK TANK REQUIREMENTS

1. Underground tanks are not permitted.
2. If the flash point is less than 110°F (43.3°C), the tank must be welded construction. It must be designed, built and marked to a recognized appropriate engineering standard, such as API or UL or other recognized body. As an alternative to a code tank, the owner may provide a letter from a certified Professional Engineer stating that the tank meets the requirements of use.
3. If the selected code is designed for products of specific gravity equal to or less than water, documentation declaring suitability for higher specific gravity products must be obtained. For example, exemptions are available from UL 142 tanks for materials with a specific gravity greater than water if the tank manufacturer submits design calculations and drawings for review by UL. API 650 standards or an approved equivalent may also be used.
4. Stainless steel or carbon steel tanks are allowed. Do not use polyethylene bulk tanks. They are not allowed by NFPA 30 “Flammable and Combustible Liquids Code”. Do not use fiberglass bulk tanks.
5. Tanks must have openings large enough for attaching emergency vents with the capacity required for products with flash point less than 200°F (93.3°C.)
6. Tanks holding products with flash points below 200°F (93.3°C) must be electrically grounded.
7. Top-loading tanks must have a dip tube to prevent product free-fall. Bottom-loading is recommended. The dip tube must be supported to suppress vibration and incorporate a siphon-breaker (unless top-unloading) just below the tank entry point to prevent siphoning. The lower end of the load dip tube shall be within 6 inches of the tank bottom. This is a requirement for products with flash point less than 200°F (93.3°C) to avoid static charging.

BULK TANK RECOMMENDATIONS

1. Select and install tanks with cleaning, inspection, or repair in mind. Design to minimize heel volume and include an access man-way for cleaning and inspection.
2. Bulk tanks should have a thorough inspection by knowledgeable professionals as prescribed by the requirements of the code to which it was built. As an alternative, follow guidance in STI SPO01-03, Standard for Inspection of In-service Shop Fabricated Aboveground Tanks for Storage of Combustible and Flammable Liquids. STI-SPO01-03 is available from the Steel Tank Institute (www.steeltank.com).
3. If the tank is exposed to sun, paint the bulk tank white to minimize the internal temperature changes that occur. The reduced expansion and contraction of the contents will decrease vapor losses. This will also decrease demand for inert gas or dry air, where used.

-
4. Internal tank linings or coatings (if used) should be selected with caution as stored products may cause deterioration. Contact Teleos Ag Solutions before attempting to use internal tank linings or coatings.
 5. Cone bottom tanks are recommended where codes permit.

BULK TANK VENTING, INERTING, AND AIR DRYING

Moisture and oxygen in storage tanks will greatly accelerate tank corrosion. The bulk storage tank will inhale moisture and oxygen from the atmosphere because of temperature changes of the liquid or head space, and whenever contents are removed. A dry atmosphere in the tank is vital for long tank life and to maintain product quality.

Carbon steel tanks will corrode as a fairly uniform, rust-like scale. Corrosion will be most severe at the liquid level and in the vapor space. The product may need to be filtered to avoid plugging application equipment. Stainless steel tanks are subject to grain boundary corrosion in the presence of chlorides. This corrosion may be evidenced by pitting that is small and hard to see, or internal in the metal, and can rapidly lead to small leaks. Therefore, stainless steel does not eliminate the need to maintain an inert or dry atmosphere in the tank head space.

The most common emergency relief vent (ERV) design in use with 1,3-Dichloropropene is a spring-loaded weight with a gasket. These typically seal well but cost more than "long bolt" weighted manways.

Long bolt systems may not be practical in some cases because a great deal of weight is needed to achieve a full seal, especially on nitrogen padded systems. Weak-roof-to-shell seam designs are permitted outdoors, but not encouraged because they are not self-closing.

Lowest cost systems may not seal well, increasing nitrogen losses or demand on air driers. Work with the device vendor to select an emergency relief design.

REQUIREMENTS

1. The bulk tank must have a pressure/vacuum relief vent (PVRV), sometimes called a conservation vent. Open vents must not be used.
2. The tank must have an emergency relief vent (ERV) or equivalent for pressure relief in case of fire. Note that some states require the ERVs on tanks containing flammable or combustible products to have an UL or API certification and be stamped with rated flow capacity.
3. Use calculations per NFPA 30 or other appropriate code to determine size and capacity of ERV and PVRV vents. The equipment vendor can assist in sizing and selection. Consider having the vent selection reviewed and stamped by a licensed Professional Engineer.
4. Nitrogen padding is required on all new bulk tanks unless specifically approved by Teleos Ag Solutions. This reduces moisture and oxygen in the tank. It will extend tank life and help retain product quality.
5. Nitrogen cylinders must be secured at all times and must be capped during transport. Follow manufacturer's instructions for safe handling. Understand and protect against nitrogen's potential to kill by asphyxiation.

-
6. Indoor tanks must comply with state or federal regulations for venting. Most states require inside tanks holding products with flash point less than 200° F must have the vapors from the PVRV and ERV vented to outside the building and released at least 12 feet above ground level in an area where vapors are not trapped by overhangs or other building structures.

RECOMMENDATIONS

1. Maximize the differential between nitrogen pressure and relief settings to avoid nitrogen loss: i.e. keep nitrogen pressure low and relief setting high. Make sure the PVRV does not exceed the working pressure of the tank, and the ERV is below the test pressure of the tank.
2. Keep a written record of the pressure and vacuum settings, and model numbers of all vent devices.
3. Inspect vents annually to assure gaskets are in good condition, weights are not corroded in place, and the units are free of dirt and debris.
4. Use commercially designed nitrogen pad systems. Pressure will be more constant and controllable.
5. Install a nitrogen low-level alarm.
6. A carbon adsorption system may be used to decrease product vapor emissions.
7. When commissioning a new tank or after maintenance or inspection, check the dew point and oxygen levels to confirm they are within the target levels.

PIPING, HOSES, AND VALVES

REQUIREMENTS

1. No underground piping is allowed.
2. Pump, meter, and plumbing to and from the tank must be dedicated to the product.
3. Do not use PVC material for any reason where it is exposed to product vapor or liquid. See the Material Compatibility section of this Guide.
4. Do not use plastic valves, fittings, connections, or piping on any liquid lines on a bulk facility.
5. Threaded fittings and valves may be used for liquid lines, provided that a compatible thread sealant is used. Welded and flanged stainless steel or carbon steel pipe is preferred for liquid lines.
6. Vapor and nitrogen lines may use threaded pipe or welded and flanged pipe. Stainless steel is preferred. Vapor lines may also use cross-linked polyethylene-lined hose, nylon-lined hose, or UV-protected rigid polypropylene. Do not use mild steel pipe between the tank and air driers or vapor exchange. Rust and scale may accumulate at the low point in the piping, blocking vapor flow.
7. Thread sealants must be compatible with the product. Teflon tape is acceptable for all systems. See Material Compatibility section for alternative Loctite or equivalent sealants.
8. The hose pressure rating must be above the maximum pump pressure.
9. Inspect all hoses as part of a regular bulk site inspection program. Replace hoses whenever signs of deterioration or significant wear are present.
10. Each opening below the liquid surface must have a normally closed remotely activated valve; or an automatic-closing heat activated valve; or another approved device. That valve must be rated as a fire-tested valve per API607 or other recognized standard. Also, the first control valve next to the tank must be lockable stainless steel. The order of these two valves is optional but the two must be placed as close as possible to the tank wall.
11. Gaskets used in rigid flanges next to tank must be fire-resistant.
12. Do not use expansion joints unless a specific situation warrants their use. In such case, a documented preventive maintenance program must be in place to reduce risk of leakage.
13. Test piping for leaks after construction and before being placed in service (Test at 150% of maximum pump output pressure). The lines must be free of moisture (- 40 C dewpoint) before use.
14. All handling system components, storage tanks, and transport equipment must be electrically bonded or grounded. Bonding cables must be available at all loading stations.
15. The system must be equipped with vapor exchange capability.

-
16. The system must allow a way to obtain a representative product sample. Preferably, a sampling port is installed on the pumping system.
 17. Select pipe schedule for liquid lines based on the following: Note: Threaded connections are not permitted with Schedule 10S pipe.
 - Stainless Steel <2" diameter: Schedule 40S.
 - Stainless Steel >2" diameter: Schedule 10S
 - Carbon Steel <2" diameter: Schedule 80
 - Carbon Steel > 2" diameter: Schedule 40

RECOMMENDATIONS

1. Slope all lines to low points which have drains to allow for easy inspection, cleaning, and maintenance.
2. Do not leave piping hydrostatically full. 1,3-Dichloropropene has a relatively high coefficient of thermal expansion. Rigid piping sections closed at both ends and completely filled with liquid can develop a high hydrostatic pressure. These pressures may cause leaks from packing, gaskets, and seals.
3. Line sizes should be selected based on product flow rate, system design and pump specifications. Normally, 2" diameter liquid lines and 1.5" diameter vapor lines are used to receive bulk deliveries.
4. Hoses with a braided cross-linked polyethylene or nylon liner are preferred. Empty hoses after each use. Flexible corrugated metal hoses of steel, or stainless steel are also satisfactory.
5. Cap or plug all connections, drains, and sample ports when not in use.
6. Identify loading and unloading risers and lines by color, markings, or mechanical interlocks to identify product and avoid cross contamination.
7. Flange-mounted external fire-safe ball valves equipped with spring return handles and fusible links are preferred over internal tank valves. Many of the internal valves leak around the stem packing. If the packing is tightened enough to stop the leak, the valve may not automatically close. If such valves are used, packing should be replaced regularly.
8. Valve packing should be nylon, Viton[®], Teflon[®], or braided Teflon[®] or equivalent. Ball and plug valves should have a Teflon[®] seat or equivalent.

PUMPS, METERS, SCALES, COUPLERS AND OTHER EQUIPMENT

REQUIREMENTS

1. Electrical installations must comply with Article 500 of the National Electrical Code #70, or the applicable local code, whichever is more stringent. At a minimum, the area within, and below, the top edge of the dike is considered a Hazardous Zone, as well as the area within 3 feet of where liquid connections are made. The load pad is also considered a Hazardous Zone. The pump motor, scales, wiring, and switches must meet the National Electrical Code or other codes of the authority having jurisdiction.
2. Meters or scales must meet local, state, and federal regulations concerning weights and measures if used for retail billing.
3. Do not use positive-displacement pumps such as gear pumps or rigid piston reciprocating pumps capable of immediate high-pressure build-up under dead-head conditions. Bypass or relief valves may fail to operate properly due to the corrosive nature of these products. Hoses and other components could be subject to over-pressurization and rupture. Positive displacement diaphragm pumps which are incapable of similar high-pressure build-up may be used. Diaphragm pump users should evaluate properly limiting supply air pressure or operating fluid pressure.
4. Use a female (coupler end) Model 1772-D dry-disconnect coupler from OPW/Civacon on the hose used to connect common carrier tank truck for receiving bulk shipments. In most areas this should be a 3" fitting. Some areas use 2" systems. Consult Teleos Ag Solutions before setting up a bulk site.
5. Customers may select other couplers for dispensing from the bulk tank into their own fleets, as long as the coupler meets requirements in the product label and this Guide. All liquid connection points for product transfer must be equipped with dry-disconnect fittings or combinations of equipment and procedures which meet or exceed the performance of a dry disconnect device.
6. Sight gauges on bulk tanks are not permitted by EPA. Alternatives include float level devices, meter readings, ultrasonic level instrument, or other devices which do not allow for cross-contamination.
7. Internal combustion engines are not allowed for use at fixed installations unless adequate electrical power is not available. Follow specific recommendations in NFPA 30 or NFPA 385, if applicable. Gasoline engines, if used, must have a spark-arresting intake and exhaust. The exhaust must not heat or impinge on any parts of the transfer system. There are additional regulations regarding the ignition system, emergency shut-off switch, spill shielding, and vapor intake prevention. Exhaust gases or the exhaust system must not interfere with the operator. Kits to modify conventional gasoline engines are available through most franchised dealers for engines or motor/pump combinations.
8. Automatic dike sump pumps are prohibited.

RECOMMENDATIONS

1. Size the pump to meet the transfer requirements. Product temperature, viscosity, and specific gravity must be considered when sizing the pump and motor.
2. Self-priming centrifugal pumps with stainless steel impeller shafts, brass impellers, and double mechanical seals are recommended. Mild steel may be used but will rust and may cause premature seal failure.
3. Do not operate pumps with the discharge line closed (dead head). Add a power monitor, casing temperature transmitter or flow switch which interlocks to shut centrifugal pumps off in case of a dead head situation.
4. Meters should be suitable for non-lubricating product service.
5. Elevate the pump, any electrical conduit, or electrical devices within the containment area to avoid submersion in rainwater or spills.
6. Maintain dry-disconnects according to manufacturer's instructions. Perform a visual inspection before each transfer, and replace seals if damage is apparent or significant leaking occurs. Place dust caps on the connections when not in use.
7. Provide protection against overfill of the bulk tank with a high liquid level detection device interlocked with the appropriate pump or valve.
8. A 40-80 mesh strainer placed ahead of the pump is recommended. Strainers may be brass, steel, ductile iron, or cast iron with stainless steel, Monel^{®4} alloy, or nylon screens.
9. Strainers, valves, and couplings are rated for a minimum of 150 psig.
10. If a filter is used, a high-volume, low-pressure drop filter placed ahead of the meter is recommended. The housing should be steel or stainless steel. Filter elements should be cotton-wound over a steel or stainless-steel mesh core. Filters should have a way to drain prior to servicing. Bag elements with Nomex^{®5}, nylon, or cotton can also be used. Elements with 150-mesh maximum are recommended.
11. Strainers use a stainless-steel screen ahead of the meter. The mesh size of the screen should be specified by the meter manufacturer but should not be finer than 40 mesh.
12. Dry-disconnects on vapor exchange lines are recommended, but not required.

⁴ Monel[®] is a registered trademark of International Nickel Corporation.

⁵ Nomex[®] is a registered trademark of I.E. DuPont Canada.

BULK TANK LABELING

Each bulk tank must have the following:

- Product label and booklet combo.
- The proper EPA Establishment Number and Net Contents noted on the label.
- NFPA 704 diamond label on tank, building, or dike area.
- Any other labels required by federal, state, or local regulations.

Obtain the product label and NFPA diamond label through the tank label/DOT literature and placards section at www.TeleosAg.com , or call your Teleos Ag Solutions TELONE™ Specialist.

Label according to the following:

1. Remove old bulk tank labels BEFORE affixing the new bulk tank label to the bulk tank.
2. Affix the product label/booklet combo onto the tank in an easily visible location near the tank outlet.
3. Write the net contents in the tank at the time of last shipment on the tank. This number need not be changed as product is withdrawn unless required by state law but must be updated when additional product is added.
4. Write the EPA Establishment Number of the last producing facility on the product label attached to the bulk tank. This EPA Establishment Number is typically the manufacturing location.

Note: If your site repackages into refillable containers for sale, you are performing the “act of production” according to EPA. In this case, write in the EPA Establishment Number of the repackaging or refilling facility (your site) on the product label attached to the refillable container. If your facility only fills service containers for the purpose of custom application, you are not a producing facility.

5. Add a NFPA 704 diamond label to the tank so it is visible from distance by first responders, or as required by local or state codes.

The Teleos Ag Solutions product label/booklet combo incorporates a product booklet and tank label in a single, adhesive backed design. Below are examples only. Actual labels will vary.

EPA Product Label/Booklet Combo



Place near the tank outlet.

NFPA Diamond



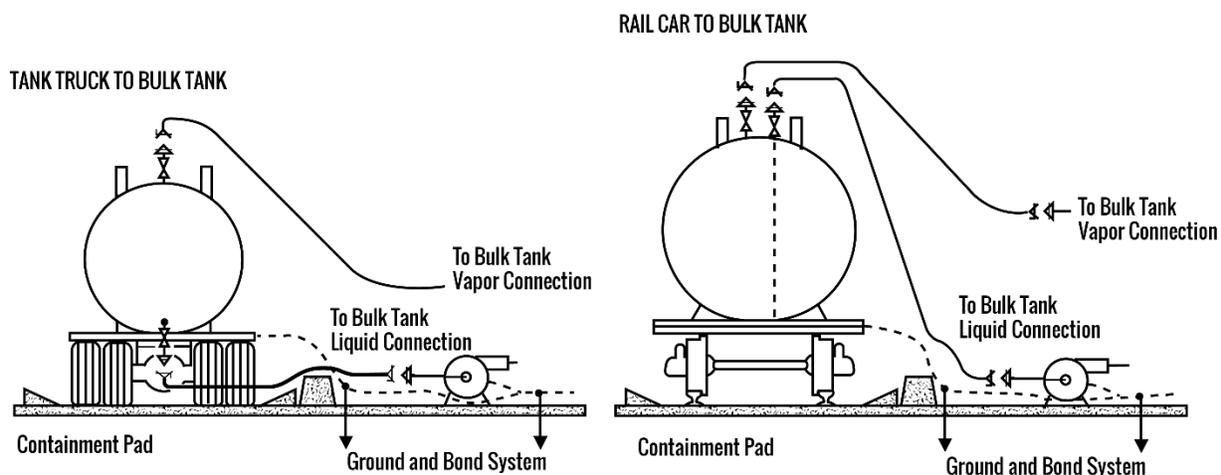
Place in visible area on the tank.

FILLING BULK TANKS FROM TRUCK OR RAILCARS

GENERAL REQUIREMENTS FOR BULK TANK FILLING

1. Transfers must comply with DOT requirements in CFR 49, Chapter 1, Part 174, Subpart C, 174.67.
2. For truck shipments from Teleos Ag Solutions or its terminals, the driver and at least one qualified employee of the receiver shall be present and attentive to the operation as long as the truck is connected to the system. Railcar unloading requires two qualified and attentive persons to be present.
3. Product from delivering trucks or railcars must be transferred directly into Teleos Ag Solutions' approved bulk tanks. Do not directly load into other trucks, cylinders, or other portable containers.
4. Personnel conducting the unloading operation must wear protective clothing as required by the product label. They must understand the safety precautions and know the location and how to use the eye wash stations, emergency showers, and fire extinguishing equipment. The label specifies PPE requirements for everyone in proximity of transfer activity as well as workers opening or closing valves, hatches, or other closures that could release product liquid or vapor.
5. If the unloading process is suspended, all valves and openings on the delivering container must be securely closed and disconnected from the unloading system.
6. A nitrogen pad is added to the shipment from Teleos Ag Solutions' production facilities or terminals. Receiving sites must protect the integrity of this nitrogen pad by vapor exchanging if the receiving bulk tank is nitrogen padded or providing make-up nitrogen to the headspace of the delivering vehicle.
7. Dry-disconnects are required on all product transfer hoses for bulk deliveries. See the section on piping and hoses in this Guide for details on style and size.
8. Permanent truck loading/unloading platforms, ladders, or other fall protection are to be used for any work above ground level.
9. Do not use the truck pump and hose unless specifically approved. Air unloading is strictly prohibited.
10. All product transfers must use connecting hoses, pipes, and/or couplings sufficiently tight to prevent workers or other persons from contacting product.
11. All hoses, piping and tanks used in connection with product shall be rated for the pressure and vacuum conditions to be encountered.

IMAGE ON NEXT PAGE



GENERAL PROCEDURE FOR FILLING BULK TANKS FROM TANK TRUCKS (CARGO TANKS)

The facility should use the below example to create site-specific procedures. Format and content will vary according to site needs and requirements.

1. Spot the truck on a loading/unloading containment pad. Chock wheels and set brakes. Secure ignition key, or place placard in windshield with notice: DO NOT MOVE TRUCK DURING UNLOADING.
2. Post signs which state NO SMOKING WITHIN 50 FEET along with required traffic barricades.
3. Connect grounding and bonding cables.
4. Wear PPE as required by the product label (e.g. respirator, eye protection, gloves...) for all subsequent steps.
5. Inspect the truck, check flanges, piping, and valves for tight seal. Examine the dry-disconnect fittings for good condition and good gaskets. Visually check the truck for any other hazards.
6. Verify the contents (material and quantity) by the bill of lading and outlet tag. Inspect for intact seals and record seal numbers.
7. Verify bulk tank has the current label with the EPA Establishment Number corresponding to the location where product was produced. If not, attach the Teleos Ag Solutions supplied bulk tank labels per the Bulk Tank Label Requirements section of this Guide.
8. Check and record the receiving tank contents and initial level. With bill of lading, verify the tank will contain contents of full truck without overflow and the truck unloading line is dedicated and in good condition (no external cracks). Verify that the unloading line is labeled and goes to the proper tank.
9. If a vapor return line is used, connect it to the truck. Open valves in the vapor line between the truck and bulk tank. If the truck supplies its own nitrogen make-up gas supply (or any other system), follow the carrier's procedure.

-
10. Connect the liquid transfer hose between the truck and the pump suction connection. Open the proper valves on the truck and tank to transfer.
 11. Prime and start the pump. Double check the lines, truck, and tank for leaks and proper alignment. If leaks are discovered, stop the operation and repair. During transfer, verify that the bulk tank level is increasing and the vent is functioning.
 12. When transfer is complete, elevate the hose and “walk” it toward the pump suction. Pump the hose dry. Close the liquid line valves, starting from the truck toward the bulk tank. Shut down the transfer pump.
 13. Disconnect the transfer hose from the truck. Close vapor line valves and disconnect the vapor line.
 14. Check that the volume increase in the bulk tank is equal to the billed truck contents.
 15. Ensure that transfer lines are not hydrostatically filled with product.
 16. Cap or plug all connections on the bulk tank, hose, and truck. Stow the transfer hose.
 17. Remove wheel chocks, ground cable, signs, and barricades. Return ignition key or remove windshield placard and release truck for departure.

GENERAL PROCEDURE FOR FILLING BULK TANKS FROM RAILCARS

The facility should use the below example to create site-specific procedures. Format and content will vary according to site needs and requirements.

1. Spot and protect the railcar with derails or switch closure and blue flags or blue lights. Blue flags are required for railcar loading/unloading per DOT or Federal Railroad Administration (FRA) regulations. Chock wheels in both directions and set hand brakes, if applicable.
2. Post signs which state NO SMOKING WITHIN 50 FEET along with required traffic barricades.
3. Connect grounding and bonding cables.
4. Properly position the gangway or loading platform, if present.
5. Inspect the railcar, check flanges, piping, and valves for tight seal. Examine the dry-disconnect fittings for good condition and good gaskets. Visually check the railcar for any other hazards.
6. Verify the contents (material and quantity) by the bill of lading and outlet tag or railcar commodity stenciling. Inspect for intact seals and record seal numbers.
7. Verify bulk tank has the current label with the EPA Establishment Number corresponding to the location where product was produced. If not, attach the Teleos Ag Solutions’ supplied bulk tank labels per the Bulk Tank Label Requirements section of this Guide.

-
8. Check and record the receiving tank contents and initial level. With bill of lading, verify the tank will contain contents of full railcar without overflow and the railcar unloading line is dedicated and in good condition (no external cracks). Verify that the unloading line is labeled and goes to the proper tank. High liquid level detection should be interlocked to avoid overfilling tanks.
 9. If a vapor return line is used, connect it to the railcar. Open valves in the vapor line between the railcar and bulk tank. If vapor exchange is not used, the railcar must be supplied with nitrogen make-up gas supply.
 10. Connect the liquid transfer hose between the railcar and the pump suction connection. Open the proper valves on the railcar and tank to transfer.
 11. Prime and start the pump. Double check the lines, railcar, and tank for leaks and proper alignment. If leaks are discovered, stop the operation and repair. During transfer, verify that the bulk tank level is increasing and the vent is functioning. Reminder: Railcar unloading requires two qualified persons to be present and attentive during entire transfer.
 12. Avoid large heels left due to a vortex in the rail car outlet by throttling the transfer rate from the output side of the pump when the tank car is nearing empty.
 13. When transfer is complete, elevate the hose and “walk” it toward the pump suction to pump the hose dry. Close the liquid line valves, starting from the railcar toward the bulk tank. Shut off the transfer pump.
 14. Disconnect the transfer hose from the railcar. Close vapor line valves and disconnect the vapor line.
 15. Confirm that residual excess pressure is not present in the railcar. A slight (<1 psig) pressure is preferred.
 16. Check that the volume increase in the bulk tank is equal to the billed railcar contents.
 17. Ensure that transfer lines are not hydrostatically filled with product.
 18. Cap or plug all connections on the bulk tank, hose, and railcar. Stow the transfer hose.
 19. Make final visual check of railcar valves, rupture disc, safety vents, gauging devices, internal valve rod packing gland, and caps. Gauging devices and thermowell covers must be tightened against O-ring seal. All other plugs and fittings must be tight.
 20. Assure placards are in place. If appropriate, reverse DOT placards to show residue on cars that have been unloaded of DOT-regulated products.
 21. Raise or clear any loading platform or gangway.
 22. Remove derails, blue flags, and chocks. Release hand brakes. Remove ground cable, signs, and barricades.
 23. Release railcar for departure.

CLEANING BULK TANKS

Bulk tank cleaning can be done safely but requires experienced personnel and proper equipment. Teleos Ag Solutions recommends hiring a commercial tank cleaning company.

In-tank cleaning of bulk tanks must be performed only by persons specifically trained according to OSHA guidelines described in 29 CFR 1910.146.

A written cleaning plan that addresses, but is not limited to, the following considerations should be created.

- 1,3-Dichloropropene is typically flammable in air. Control ignition sources and/or flammable vapor levels during all steps. This may include ventilation, water flooding, non-spark producing tools, and checking atmospheric vapors with an explosimeter or oxygen sensor.
- 1,3-Dichloropropene is considered moderately toxic when exposures are acute. Adequate measures must be taken to protect personnel from excessive exposure by vapor inhalation and skin contact. Compliance with PPE requirements of the label is required at all times.
- Tank entry operations must follow OSHA 29 CFR 1910.146. For instance, only personnel, including rescuers, with proper respiratory and PPE, including a harness and safety line, may enter the tank. Another person must attend the safety line and a third person must be within hailing distance. Written procedures for entering, isolating, and rescue must be in place.
- Remove as much product as possible prior to start of cleaning.
- The plan should include predetermined methods for collection and disposal of any waste (flush material, corrosion products, sludge, etc.).
- The inside of the cleaned tank must be absolutely dry and free of loose scale or solids prior to putting it back into service for 1,3-Dichloropropene. Water will react with these products to form acid, which can attack mild or stainless steel.
- Before placing the tank back into service, any fittings removed and electrical service disconnected should be replaced or restored. Also, the tank should be tested and inspected as required by any applicable codes prior to filling the tank.
- If the tank is to be used for other products, EPA required clean out limits for product integrity must be met per PR Notice 96-8. In addition, Teleos Ag Solutions' minimum requirements for product integrity must be followed.

TANK TRUCKS AND RAILCARS

This section applies to tank trucks and railcars.

Tank trucks include any tank vehicles with or without motor power, equipped with a mounted cargo tank and used to transport 1,3-Dichloropropene. This includes tank trucks, nurse tanks, and ISO containers. Certain parts also apply to vehicles carrying non-bulk containers, such as 110-gallon DOT 4BW cylinders.

REQUIREMENTS AND RECOMMENDATIONS

GENERAL REQUIREMENTS

CAUTION: Do not use equipment that contains magnesium, zinc, cadmium, aluminum, or alloys of aluminum for parts that may contact 1,3-Dichloropropene and its vapors when purchasing equipment. Confirm the absence of these metals when equipment is delivered. Study the Material Compatibility section of this Guide.

1. To prevent corrosion, containers must be thoroughly clean internally and externally, free of rust and debris, and dry before use.
2. Comply with this Guide, the product label, and all federal, state, and local codes, laws, and regulations including, but not limited to, those issued by the EPA, DOT, and OSHA. This includes any applicable codes such as NFPA 385: Tank Vehicles for Flammable and Combustible Liquids.
3. Cargo tanks must be DOT approved, be certified, and have a permanently affixed certification tag. The tank and frame must be electrically bonded. Tanks must be secured to the frame as required by law.
4. Each shipper and carrier are required to assure that each package is approved, the proper shipping papers are prepared, packages are marked and labeled appropriately, and the vehicle is properly marked or placarded. These requirements must be met by the location filling containers, and anyone who offers, transports, or ships regulated product.
5. Select placarding based on the Hazardous Material Shipping Description listed in section 14, "Transport Information", of the Safety Data Sheet, whether there are other hazardous materials on board (such as nitrogen), and container size. In general, placard all four sides of the vehicle, although exceptions exist for vehicles carrying non-bulk containers with less than 1001 lbs. of certain products.
6. Drivers should have proper shipping papers, an SDS or Emergency Response Guide on board, along with items listed in "Safety Equipment on Trucks" section of this Guide. An EPA Product Booklet with the proper EPA Establishment Number to be affixed on the transport vehicle.

-
7. Containers must be either dedicated or thoroughly cleaned prior to refilling according to applicable laws and regulations and this Guide's container cleaning procedures to prevent cross-contamination. Container cleaning must include draining of pumps and valves, if present. All wetted components must be fully dry before placing back in service to prevent moisture contamination in the product.
 8. The carriers and their drivers have responsibility for safe loading, transport and unloading operations. Respect for the nature of the cargo, knowledge of emergency procedures, and the availability of protective equipment will reduce the chances of injury from an accident or malfunction.
 9. Each driver must read the safety and handling information and emergency instructions for the product being transported. Verbal clarification will be made by a responsible person, if requested.
 10. If top loading is used, a dip tube must extend to within six inches of the bottom of the tank to prevent free fall of the liquid. Free-fall top-loading of flammable liquids is not allowed.
 11. The equipment must be provided with a bonding cable attachment.
 12. Do not use positive displacement pumps.
 13. Couplers on the bulk tank for receiving inbound shipments must be dry break disconnects to match distributor delivery trucks and rail cars. Customers have more discretion in selection of couplers for dispensing from the bulk tank into their own fleets. However, all temporary liquid connections must have a dry-disconnect adapter and cap.
 14. Containers must be designed to allow closed-dome loading.
 15. Plastic containers may not be used with these products.
 16. Cargo tank motor vehicles carrying 1,3-Dichloropropene classified as UN2903 must conform to 49 CFR [§173.243\(b\)](#) and [special provisions](#) listed in Column (7) of the Hazardous Materials Table in 49 CFR part [§172.101](#) under the proper shipping name for the material; and applicable provisions listed in Part §173 Subparts [A](#) and [B](#). At time of publication of this guide, this included specification MC 304, MC 307, MC 330, MC 331 cargo tank motor vehicles; and MC 310, MC 311, MC 312, DOT 407, and DOT 412 cargo tank motor vehicles with tank design pressure of at least 172.4 kPa (25 psig). Cargo tanks used must also conform to special requirements for Pressure relief systems in [§173.243\(b\)\(1\)](#) and Bottom outlet requirements found in [§173.243\(b\)\(2\)](#).
 17. Cargo tank motor vehicles carrying 1,3-Dichloropropene + Chloropicrin blends classified as UN3489 must conform to 49 CFR [§173.244\(b\)](#) and [special provisions](#) listed in Column (7) of the Hazardous Materials Table in 49 CFR Part [§172.101](#) under the proper shipping name for the material; and applicable provisions listed in Part §173 Subparts [A](#) and [B](#). At time of publication of this guide, this included specifications MC 312, 330, 331, and DOT 412 cargo tank motor vehicles. Note that applicable Special Provisions include requirements that MC 312 AND DOT 412 cargo tank motor vehicles must be ASME Code (U) stamped for 100% radiography of all pressure-retaining welds; have accident damage protection conforming to [§178.345-8](#) of 49 CFR; have a MAWP or design pressure of at least 87 psig; and have a bolted manway cover.

-
18. Portable tanks carrying 1,3-Dichloropropene classified as UN2903 must conform to 49 CFR [§173.243\(c\)](#) and [special provisions](#) listed in Column (7) of the Hazardous Materials Table in 49 CFR part [§172.101](#) under the proper shipping name for the material; and applicable provisions listed in Part §173 Subparts [A](#) and [B](#). At the time of publication of this guide, this included DOT Specification 51 and 60 portable tanks; UN portable tanks and IM 101 and IM 102 portable tanks meeting [T code](#) T11, which is specified in Column (7) of the [§ 172.101](#) Table of 49 CFR for UN2903 PG II materials; and marine portable tanks conforming to [46 CFR part 64](#) with design pressure of at least 172.4 kPa (25 psig) are authorized. Unless provided by [§ 173.32\(h\)\(3\)](#), an IM 101, 102 or UN portable tank, with a bottom outlet, used to transport a liquid hazardous material that is a Class 3, PG I or II, or PG III with a flash point of less than 38 °C (100 °F); Division 5.1, PG I or II; or Division 6.1, PG I or II, must have internal valves conforming to [§ 178.275\(d\)\(3\) of 49 CFR](#).
 19. Portable tanks carrying 1,3-Dichloropropene + Chloropicrin blends classified as UN3489 must conform to 49 CFR [§173.244\(c\)](#) and [special provisions](#) listed in Column (7) of the Hazardous Materials Table in 49 CFR part [§172.101](#) under the proper shipping name for the material; and applicable provisions listed in Part §173 Subparts [A](#) and [B](#). At the time of publication of this guide, this included DOT 51 portable tanks and UN portable tanks that meet the requirements of [T code](#) T20 which is specified in Column (7) of the [§ 172.101](#) Table of 49 CFR for UN3489 PG I materials. Additionally, a DOT 51 or UN portable tank used for UN3489 materials must be certified and stamped to the ASME Code as specified in [§ 178.273\(b\)\(6\) of 49 CFR](#).
 20. Railcars carrying 1,3-Dichloropropene classified as UN2903 must conform to 49 CFR [§173.243\(a\)](#) and [special provisions](#) listed in Column (7) of the Hazardous Materials Table in 49 CFR part [§172.101](#) under the proper shipping name for the material; and applicable provisions listed in Part §173 Subparts [A](#) and [B](#). At time of publication of this guide, this included DOT 103, 104, 105, 109, 111, 112, 114, 115, 117, or 120 fusion-welded tank car tanks; and Class 106 or 110 multi-unit tank car tanks. Note that applicable Special Provisions may include additional requirements or restrictions.
 21. Railcars carrying 1,3-Dichloropropene + Chloropicrin blends classified as UN3489 must conform to 49 CFR [§173.244\(a\)](#) and [special provisions](#) listed in Column (7) of the Hazardous Materials Table in 49 CFR part [§172.101](#) under the proper shipping name for the material; and applicable provisions listed in Part §173 Subparts [A](#) and [B](#). At time of publication of this guide, this included DOT 105 and 112 rail cars. Note that applicable Special Provisions may include additional requirements or restrictions.

RECOMMENDATIONS

1. Because of incompatibility of 1,3-Dichloropropene with other chemicals, such as fertilizers, dedicated use of trucks for 1,3-Dichloropropene is recommended.
2. Sight gauges with a spring-loaded, self-closing valve are permitted on transport vehicles if allowed by federal, local, or state regulations, but are not recommended.
3. Transfer pumps may be electric, hydraulic, PTO (power take-off), or gasoline driven. Gasoline driven systems should only be used where other power sources are impractical. If a gasoline engine is used, it must comply with NFPA requirements for flammable liquid service.

SAFETY EQUIPMENT ON TRUCKS

Trucks must carry, at a minimum, equipment specified by Federal Motor Carrier Safety Regulations specified in 49 CFR 393.95. Each truck should also carry the following; however, no person should attempt a clean-up or rescue without proper training and use of personal protective equipment.

- A current Safety Data Sheet (SDS)
- A fire extinguisher rated at 10 B:C or more; or as prescribed in 49 CFR 393.95
- Three bi-directional emergency reflective triangles to be used as warning devices for a stopped vehicle.
- A half-face respirator, approved for organic vapors, with a new unused cartridge or canister for 1,3-Dichloropropene or a full-face respirator, approved for organic vapors, with a new unused cartridge or canister for 1,3-Dichloropropene + Chloropicrin blends.
- If a full-face respirator is not used, a face shield or safety glasses with brow and temple shields. Do not wear chemical goggles.
- A portable eye wash bottle (full of potable water or saline wash fluid).
- Chemical resistant gloves and chemical resistant footwear plus socks. Do not use leather items. Refer to the "Body Protection" section of "PERSONAL PROTECTIVE EQUIPMENT" for guidance on materials."
- Coveralls.
- Chemical-resistant apron, slicker suit or other resistant body covering. Refer to the "Body Protection" section of "PERSONAL PROTECTIVE EQUIPMENT" for guidance on materials.
- Safety and emergency procedures summary printed on durable stock. DOT Emergency Response Guide.
- Shovel for diverting leaks or spills.
- A hard hat for overhead exposure.
- If traveling in rural areas, it is recommended to carry extra water in case of exposure to skin with any spill or clean-up procedure.
- Any other items specified in the Federal Motor Carrier Safety Regulations, Subpart H 393.95.

Each driver shall be required to read the safety and handling information and emergency instructions regarding the product being carried.

Although practices may vary by site, drivers should be aware that the Teleos Ag Solutions production facilities or terminals may ask them to sign and date statements that they:

- Have read and understand the handling and emergency instructions on the product SDS.
- Have the prescribed safety equipment on board and understand its use and operation.
- Have a copy of the SDS for attachment to the bill of lading, and an Emergency Response Guide Book in the vehicle.

RAIL SECURITY FOR CHLOROPICRIN PRODUCTS

The Transportation Security Administration (TSA) requires enhanced rail transportation security of certain products. The rules apply to 1,3-Dichloropropene + Chloropicrin blends because they are Toxic Inhalation Hazard (TIH) as defined by DOT. If you are involved with receiving or shipping these products in rail, be familiar with the Rail Transportation Security rules and whether they apply to your facility and activities.

Primary requirements include:

- Procedures for secure chain of custody and control; including secure rail areas.
- Route requirements.
- Location & shipping information of material in transit.
- Addressing High Threat Urban Areas (HTUA's).
- Reporting requirements to TSA upon request and of potential threats.
- Document requirements and retention.
- Designation of a rail security coordinator (RSC) and at least one alternate available to TSA on a 24-hour, seven days per week basis and providing this information to TSA.

Note that rail hazardous materials receivers not located in a high threat urban area (HTUA) are not subject to any of the requirements in this rule. However, if you receive a hazardous material railcar covered under this final rule and then re-ship it, i.e. return or divert it, then you are subject to the requirements of this rule. In addition, residue tank cars containing TIH (Toxic Inhalation Hazard) materials are excluded from these requirements.

CLEANING TANK TRUCKS AND RAILCARS

All transport tanks, valves, and hoses must be thoroughly clean and dry before use. Cleaning can be done safely but requires experienced personnel and proper equipment. Teleos Ag Solutions recommends using commercial cleaning facilities.

A written cleaning plan should address, but is not limited to, the following considerations:

- The products are typically flammable in air.
- Methods to control ignition sources and/or flammable vapor levels during all steps are required. These may include ventilation, water flooding, non-spark producing tools, and checking of atmospheric vapors with an explosimeter or oxygen sensor.
- Adequate measures must be taken to protect personnel from excessive exposure by vapor inhalation and skin contact. Compliance with PPE requirements of the label is always required.
- In-tank cleaning must be performed only by persons specifically trained for permit confined spaces per OSHA as described in 29 CFR 1910.146. Written procedures for entering, isolating, and rescue must be in place prior to entry. For instance, only personnel, including rescuers, with proper respiratory and PPE, including a harness and safety line, may enter the tank. Another person must attend the safety line and a third person must be within hailing distance.
- Remove as much product as possible prior to start of cleaning. This material may be used for application according to labeled rates if state rules allow.
- The plan should include predetermined methods for collection and disposal of any waste (flush material, corrosion products, sludge, etc.).
- The inside of the cleaned tank must be absolutely dry and free of loose scale or solids prior to putting it back into service. Water will react with these products to form acid, which can attack mild or stainless steel.
- Before placing the tank back into service, any fittings removed and electrical service disconnected should be replaced and restored. Also, the tank should be tested and inspected as required by any applicable codes prior to filling the tank.
- If the tank is to be used for other products, EPA required clean out limits for product integrity must be met per PR Notice 96-8.

FILLING TANK TRUCKS

Filling trucks (a.k.a. tank vehicles, cargo tanks), should be done in accordance with this Guide and NFPA 385: Tank Vehicles for Flammable and Combustible Liquids. Tank vehicle design and use must comply with this Guide, the product label and all federal, state, and local laws and regulations.

GENERAL REQUIREMENTS

1. The driver and at least one qualified employee of the facility shall be present and attentive to the operation as long as the truck is connected to the system.
2. 1,3-Dichloropropene must be transferred through hoses, pipes, and couplings sufficiently tight to prevent personnel from coming into contact with 1,3-Dichloropropene.
3. Pumps, hoses, and other fittings on the truck must be in good condition. Hoses must have dry-disconnect couplings.
4. Shut-off devices must be installed on the end of all hoses and at all disconnect points, to prevent product leaks when the transfer is stopped and hose is removed or disconnected.
5. The truck must have a “safety package” as indicated in this Guide.
6. The tank vehicle must be properly labeled and placarded to meet DOT standards.
7. The tank must be clean and absolutely dry unless the previous product was the same as being filled. Small amounts of water can initiate corrosion.
8. Ensure that no aluminum, magnesium, zinc, cadmium, or alloy containing aluminum or magnesium is present in any part of the system that will contact product. This includes galvanized materials. Plastic tanks are not approved for use with 1,3-Dichloropropene or 1,3-Dichloropropene + Chloropicrin for transport.
9. A bonding cable must be used for loading and unloading trucks.

GENERAL RECOMMENDATIONS

1. The transfer should comply with NFPA 30 sections on transfers. In part, this includes use of a pre-settable shutoff or other positive means to load a predetermined quantity, together with a secondary automatic shutoff control to prevent overfill when bottom loading a truck. This secondary automatic shutoff should prevent further product transfer by interlock with a valve or the transfer pump. (Example: Preset meter and high-level probe with alarm or shut-off.)
2. A means of liquid level detection in addition to overfill protection on the truck is recommended.
3. The truck should be nitrogen padded prior to transfer and a vapor exchange line between the truck and source tank should be used during transfer.

GENERAL PROCEDURE FOR LOADING TRUCKS (CARGO TANKS)

The facility should use the below example to create site-specific procedures. Format and content will vary according to site needs and requirements.

1. Spot the truck on containment which meets the requirements in the containment section of this guide. Shut down the engine, remove the keys, and chock the wheels.
2. Connect the ground or bonding cable. Bond portable tanks to the truck chassis also.
3. Check the area for and remove ignition hazards. Post the area against ignition hazards: NO SMOKING WITHIN 50 FEET.
4. Wear PPE as required by the product label (e.g., respirator, eye protection, gloves...) for all subsequent steps.
5. Check operation of gauges and overfill protection, if applicable, on the truck and bulk storage tank. Note the bulk tank and truck product levels. Calculate levels to be reached when loading is finished.
6. Inspect the truck: check flanges, piping, and valves for tight seal. Examine the dry disconnects for good condition and gaskets. Visually check the truck for any other hazards.
7. Remove plugs or caps from load connections on the truck. Residue from a previous load may be trapped behind plugs or caps.
8. Connect the liquid line from the pump to the loading connection. Connect the vent to a line leading down and away from work areas, or if receiving vehicle is nitrogen-padded, establish vapor exchange with the bulk tank. Open vent line connections.
9. Set the meter, if used, for the delivery quantity. Align the valves on the truck and the bulk site for delivery.
10. Start the pump. Watch for leaks. Start delivery of product by activating the truck's internal valve or meter mechanism. If leaks are detected, shut down the operation for repair.
11. Give constant attention to the truck level. Do not overfill the truck.
12. When filling is complete, shut off the flow at the dry-disconnect, or at the meter, before shutting off the pump. Close the truck tank valve. NOTE: If draining the hose is desired, a preferred method is nitrogen purging via appropriate valving to push the liquid into the receiving truck or back to the source tank.
13. Align the pumping system valves to "off". Shut off the bulk storage tank valve. Close the vent valve.
14. Read and record the gauge readings.
15. Disconnect hoses and plug or cap all openings.
16. Disconnect the grounding or bonding wire.

17. Remove the chocks, return the keys to the truck and release the truck for departure.

CYLINDER AND PORTABLE REFILLABLE CONTAINERS (PRC)

DOT cylinders are the most common container used for these products. It is also possible to use Intermediate Bulk Containers (IBCs), also called mini-bulks. EPA calls these containers Portable Refillable Containers, or PRCs.

A corrosion inhibitor is part of the product formulation. Careless handling of the system that allows moisture to enter the container may deplete the inhibitor. Once the inhibitor is consumed, degradation products may form that can cause pitting inside the tanks and eventual failure.

GENERAL REQUIREMENTS AND RECOMMENDATIONS

REQUIREMENTS

CAUTION: Do not use equipment that contains magnesium, zinc, cadmium, aluminum, or alloys of aluminum for parts that may contact 1,3-dichloropropene and its vapors when purchasing equipment. Confirm the absence of these metals when equipment is delivered. Study the Material Compatibility section of this Guide.

1. Comply with this Guide, the product label, and all federal, state, and local codes, laws, and regulations including, but not limited to, those issued by the EPA, DOT, and OSHA.
2. Containers must be inspected, tested, marked and documented to meet regulations as required by DOT. These are the responsibility of the container owner; however, no shipper may offer a container for transport if it is not in compliance with regulations. Current DOT rules require DOT 4BW cylinders to be retested within 5 years. Check the date stamp on the cylinder to confirm compliance.
3. Each shipper and carrier are required to assure that each package is approved, the proper shipping papers are prepared, packages are marked and labeled appropriately, and the vehicle is properly marked or placarded. These requirements must be met by the location filling containers, and anyone who offers, transports, or ships regulated product.
4. Refer to the Hazardous Material Shipping Description listed in section 14, "Transport Information", of the Safety Data Sheet. The SDS is available at www.teleosag.com.
5. Containers must be either dedicated or thoroughly cleaned prior to refilling according to applicable laws and regulations and this Guide's container cleaning procedures to prevent cross-contamination.
6. Each container must be clean and free of rust, debris, and water, prior to filling. If contaminants are present, clean the container in accordance with this Guide's container cleaning procedures.
7. Filling and cleaning of refillable containers must take place on a rigid, liquid-tight containment pad.

-
8. Containers must be stored within a diked area if required by state or local regulations.
 9. A valid EPA Establishment Number must exist for each location where the product will be repackaged.
 10. A current Teleos Ag Solutions repackaging agreement must be in place unless the site is 100% custom application.
 11. Container repackaging must comply with the Teleos Ag Solutions' repackaging agreements.
 12. Container filling system must be dedicated or have written rededication procedures in place.
 13. Attach Teleos supplied EPA product label/booklet combos to the container after filling. Remove all old labels. Teleos will provide a label packet if your facility meets all the repackaging requirements listed in this section. Order additional label packets from www.teleosag.com or call your local TELONE™ Sales Specialist. Each Label Packet contains: Product label, Product Information Booklet, DOT hazard labels as required. The packet does NOT include truck or cargo tank placarding that may be required by DOT.
 14. The filler's EPA Establishment Number and the net contents must be added on the product label or elsewhere on the container. EPA requires that net contents in the tank at the time of last shipment be recorded on the tank. This number does not need to be changed as product is withdrawn unless required by state law. For bulk storage tanks, check or write the EPA Establishment Number of the producing facility, on the product label. For refillable containers, write the EPA Establishment Number of the repacking or refilling facility, on the product label.
 15. In general, a 110-Gallon DOT 4BW cylinder will need an EPA Label/Booklet combo, a DOT hazard marking, an operating procedure label, a valve warning tag, a stacking label, and a nitrogen warning label (if a nitrogen bottle is present).
 16. In general, a 5, 10, 15 and 20-gallon DOT 4BW or 4BA cylinder used for 1,3-Dichloropropene products will need an EPA Label/Booklet combo, and a DOT hazard marking.
 17. Containers filled with less than the Reportable Quantity of 1,3-Dichloropropene must have the DOT hazard label modified appropriately.
 18. Placard vehicles carrying these containers according to DOT rules.
 19. Do not ship by vessel unless fully knowledgeable of regulatory requirements. There are additional considerations if 1,3-Dichloropropene + Chloropicrin blends are shipped by vessel because they are considered Marine Pollutants.
 20. Keep records of the product you received, repackaged, and shipped. Report these production records to the EPA annually on the appropriate forms.
 21. PRC capacity must exceed 55 gallons unless specifically allowed by Repackaging Agreement with Teleos Ag Solutions. Note that a cylinder is not considered a PRC.
 22. Containers must be compatible with the product and allowed by DOT regulations and NFPA. NFPA #30 prohibits storage of flammable products in large plastic storage or transport tanks.

-
23. Liquid connections must have couplers which comply with the “Couplers and Other Equipment” section of this guide. In most cases, this will mean use of closed end couplers (dry disconnect or hydraulic couplers). As an alternative, cylinder liquid connections may consist of equipment and procedures that meet or exceed the performance of a dry disconnect device, such as purging prior to disconnect.
 24. 1,3-Dichloropropene is heavier than water. Make sure containers are rated for the weight of the product.
 25. Only use containers allowed by 49 CFR 173.243, allowing for any Special Provisions as required by DOT, or containers allowed by specific DOT Exemption 1,3-Dichloropropene.
 26. Only use containers allowed by 49 CFR 173.244, allowing for any Special Provisions as required by DOT, or containers allowed by specific DOT Exemption for 1,3-Dichloropropene + Chloropicrin blends.
 27. Filling or unloading must be done without opening a hatch or port. Bottom filling and unloading is preferred. Top loading is acceptable if a dip tube is used.
 28. Use grounding cables during product transfers.
 29. Do not allow 1,3-Dichloropropene vapors or liquids to backflow into nitrogen bottles. If possible, dedicate nitrogen bottles to 1,3-Dichloropropene use only. Teleos Ag Solutions recommends placing a check valve between the nitrogen regulator and the 1,3-Dichloropropene container. Instruct users to open nitrogen valve prior to opening nitrogen regulator, and never to empty nitrogen bottles to avoid backflow.

RECOMMENDATIONS

1. DOT 4BW cylinders are the most common choice for containers with less than 1000-pound water capacity. Consult Teleos Ag Solutions before using any other container.
2. Each opening should have a one-way check valve or a tamper evident device to prevent unauthorized filling. The EPA Pesticide Container and Containment Rule requires this for containers which are not DOT specification cylinders, i.e., PRCs.
3. Air and Vessel Shipments: Some DOT regulated products are specifically prohibited from air or vessel shipments. Teleos Ag Solutions recommends avoiding air shipments even where it is allowed. Consult DOT experts and/or the SDS before shipping by air or vessel.
4. Outdoor filling of cylinders and PRCs is recommended due to additional safety requirements and costs for indoor filling. Work closely with the local or state fire marshal or inspector before setting up an indoor facility. NFPA 30 requirements for inside filling of Class 1C flammables which differ from outdoor filling include, but are not limited to:
 - Continuous exhaust ventilation systems must be continuous with at least 1 cubic feet of flow area. An alarm should be in place to signal ventilation failure.
 - Expanded hazard zone for electrical wiring. This will typically mean a more expensive electrical installation. Emergency pump shut off shall be in place in the event of a spill.

-
- Requirements for processing buildings to be fire-resistive or noncombustible construction unless building is equipped with a fire control system (e.g. sprinkler, foam).
 - Three-hour fire rated walls and doors at separations of dispensing area from other building areas. Limits on dispensing of Class 1 liquids in cutoff rooms or attached buildings of certain size.

FILLING CYLINDERS AND PRCS

The best way to fill containers is to use a weigh scale system that shuts off flow when the desired target weight is achieved. It is possible to use manual shutoff, but special attention must be given to avoid overfilling. The general procedure outline below assumes a manual shutoff. Site-specific filling procedures must be created.

- 1. DO NOT LEAVE THE FILL PROCESS UNATTENDED AT ANY TIME.**
2. Establish the target weight. Consider the weight of any product heel (0.5 gallon typically remains after cylinders have been emptied in the field); the nitrogen bottle (if present); cylinder appurtenances; and the product transfer hose and vapor return line. Hoses should be supported in the same manner during each filling operation. Recognize whether the container is being filled to net or gross weight.
3. Place the container on the scale and attach the fill and vapor exchange lines and grounding cable.
4. Open the vapor exchange valve(s) on the container (if applicable) and the fill lines.
5. Open the liquid valves on the fill lines.
6. Start the pump. Watch the scale display and slow the pump flow slightly before the target weight is reached. IMMEDIATELY CLOSE THE FILL VALVES, starting with the fill lines, then the container valve when the target weight is reached. Purge line with nitrogen if so equipped.
7. Close the vapor exchange valves. Remove the fill and vapor lines.
8. Record the gross and net container weights (without lines attached) and the date in a production log. Also include cylinder number, product name, and initials of the operator.

CLEANING CYLINDERS AND PRCS

Cleaning containers for 1,3-Dichloropropene or 1,3-Dichloropropene + Chloropicrin blends can be performed safely if proper procedures and precautions are followed; otherwise, injury and/or property damage may result. Teleos Ag Solutions recommends hiring a commercial cleaning company. Use the below information to create site-specific cleaning procedures.

At certain concentrations, 1,3-Dichloropropene products are flammable in air. See SDS for flammable ranges but note that the range increases at higher temperatures.

REQUIREMENTS

1. Personnel involved in tank cleaning must be familiar with these products. This includes flammability limits, toxicity, physical properties, and personal protective equipment.
2. Cleaning equipment and PPE must be in working order. Personnel must be instructed in the proper use of this equipment and be informed of the hazards involved with tank cleaning.
3. Do not work alone. Use the "buddy system" during all phases of the tank-cleaning operation.
4. Personal protective equipment as required by the label must be worn.
5. If equipment, such as fans, pumps, or vacuum trucks are used, place them away and upwind from the work area.
6. Plan for waste collection and disposal in advance.
7. Do not release large volumes of vapor into the atmosphere. If necessary, consider carbon adsorption of vapors.
8. Monitor vapor concentrations continually. When concentrations approach the flammable range, stop work until vapor concentrations are reduced to a safe level.
9. Procedures must address valve or other appurtenance opening and removal, along with removal of any product heel.
10. Procedures must address external inspection items, including any label removal or exterior painting.
11. Reassembly instructions must include proper torque of closures; plus relabeling, placarding, or marking.
12. Welding on DOT containers must only be performed by a certified welder and are governed by DOT rules and regulations. Make necessary repairs (especially welding) only after the tank is clean and dry.
13. The container interior must be absolutely dry and free of loose scale prior to putting it back into service. Water will react with these products to form acid, which can attack mild or stainless steel.
14. Install all valves and fittings.

RECOMMENDATIONS

1. Keep cleaning and inspection records for each container.
2. Use flammable gas detectors to check equipment or areas for flammable atmospheres containing 1,3-Dichloropropene fumigants. Fire departments may be able to provide this service.
3. Pad the tank with nitrogen prior to putting it back into 1,3-Dichloropropene or 1,3-Dichloropropene + Chloropicrin blends service.

CYLINDER AND PRC STORAGE AND TRANSPORT

STORAGE

Cylinder and PRC storage and use must comply with this Guide, the product label and all federal, state, and local laws and regulations.

1. Unless other statutory or regulatory requirements conflict, comply with NFPA 30: Flammable and Combustible Liquids Code as you store these products. NFPA 30 addresses, among other things:
 - Design and construction of inside storage areas for flammable liquids. This includes fire ratings of walls and doors, plus electrical requirements.
 - Storage limits such as number of containers per pile, maximum pile height, distance between piles, and maximum total quantity that can be stored indoors.
 - Limits on outdoor storage including distance from roads, buildings, property lines; maximum containers and volume per pile; maximum distance between piles; grading to divert spills; and protection of the area against trespassers.
2. Store containers on a firm foundation to avoid shifting or sinking.
3. Secure storage areas from entry by animals and unsuspecting or unauthorized individuals.
4. Train employees regarding product properties and handling. This includes emergency procedures, use of safety equipment including safety showers and eye wash stations, and personal hygiene requirements.
5. Prepare a written warning and evacuation plan and train employees.
6. Access to safety showers and eye wash stations are recommended.
7. Keep the local fire department up-to-date on the storage floor plan and characteristics of each material stored.
8. DO NOT store these products with food, feeds, drugs, clothing, seeds, fertilizers, or plants. Do not store in other than original containers; or in below-grade areas such as basements or pits.

TRANSPORT

Refillable containers must be secured during transport according to the Federal Motor Carrier Safety Regulations (FMCSR) and DOT requirements. The following requirements apply to all highway operations. This includes common or contract carriers, customer pick-ups, and all truck types: tractors, semi-trailers, full trailers, or pole trailers.

OPTION A: The vehicle must have sides, sideboards or stakes, and a rear-end gate that are strong and high enough to prevent containers from falling from the vehicle. No opening should be large enough to allow a container to pass through it.

OPTION B: The vehicle shall have at least one tie-down assembly every ten linear feet of lading. Additional tie-downs may be required to meet load requirements. Tie-downs include chains, cables, steel straps, and webbing material. Tie-downs must have a working load limit 1-1/2 times the weight of the cargo being secured. Check Section 393 of the FMCSR for size and working load limit requirements.

Teleos Ag Solutions prefers a combination of Option A and Option B. Option B alone is permitted in conjunction with blocking or bracing secured to the trailer deck. This will prevent load shifting off the vehicle edge. Examples include timbers or channel iron secured to the deck.

The facility should develop checklists for vehicle loading and securing. Checklist should include, but not be limited to, identification of person loading, container inspection, vehicle immobilization and inspection, placards and shipping papers, blocking and bracing, load compatibility, post-loading container inspection, and emergency equipment on board.

ENVIRONMENTAL & EMERGENCY INFORMATION

Environmental Fate and Wildlife Toxicity

No residues of 1,3-Dichloropropene or 1,3-Dichloropropene + Chloropicrin blends from commercial agricultural applications have been found in crops. Always use these products in strict compliance with label instructions.

1,3-Dichloropropene is known to move through soil and under certain conditions has the potential to reach ground water as a result of agricultural use. Application in areas where soils are permeable and ground water is near the surface, in Karst geology, could result in groundwater contamination. Follow all application and stewardship requirements on the product label to assure protection of groundwater.

1,3-Dichloropropene and 1,3-Dichloropropene + Chloropicrin blend products are toxic to aquatic organisms. To avoid injury to fish and other wildlife, do not spill or empty these products into streams, ponds, or other bodies of water. Do not load these products near a body of water.

The SDS has additional information about environmental fate in Section 12, "Ecological Information."

FIRE, SPILLS, AND CLEAN-UP

The following procedures are intended for immediate, temporary control of emergencies. Call CHEMTREC at 1-800-424-9300 to obtain advice and arrange for professional help as needed, to assist with an emergency.

Written Emergency Response Plans should be in place for minor and major emergencies, including injuries, personnel exposures, spills, vapor releases, and fires. Plans should be regularly reviewed with personnel.

Written Emergency Response Plans must be reviewed with local emergency service groups. These plans must include locations and amounts of product and other hazardous substances per the SARA Title II Emergency Planning and Community Right to Know Act.

The product SDS provides recommended extinguishing media, firefighting instructions and information such as flash point and flammability limits. The SDS also contains information about controlling and cleaning up spills. An SDS for each product must be available on site and should be shared with local emergency responders.

A stock of emergency supplies, including personal protective equipment, absorbent materials, and disposal drums should be kept on hand. DOT approved disposal drums can be purchased from most drum suppliers or safety supply houses. The disposal drum should be DOT approved for wastes as required by law. Bulk sites should stock several of these drums and clearly mark them as "Disposal for Pesticides."

FIRE

TELONE™ fumigants are chlorinated hydrocarbons. Combustion products will vary depending on the heat of the fire and available oxygen. A normal fire will produce significant amounts of carbon dioxide with some carbon monoxide, hydrogen chloride, and chlorine. A smoldering fire could include the above plus phosgene. A very hot fire will yield carbon dioxide, water vapor, and chlorine.

Except for carbon dioxide and carbon monoxide, these major oxidation products are heavier than air; however, updraft during fire conditions should be considered.

The flammability limits are approximately 5.3% LFL and 14.5% UFL at 80°C (176°F).

Although these products are liquid at normal temperatures, they are moderately volatile. The vapors are heavier than air. Flash points are between 81°F to 83°F.

1. **Notify Emergency Responders.** If appropriate, immediately notify local police, fire department, and CHEMTREC at 1-800-424-9300, from a safe distance to the fire. Identify all products that might be involved. Have SDSs ready when firefighters arrive.
2. **Evacuate the Area:** Move all personnel from the immediate area to a safe distance, upwind from the smoke and vapors. Reroute traffic if necessary.
3. **Use Full Turn-Out Gear:** Unless otherwise instructed in the SDS, firefighters should wear full turn-out clothing including heavy neoprene or rubber boots, chemical-resistant gloves, and positive-pressure, self-contained breathing apparatus (SCBA) for protection against both toxic vapors and oxygen-deficient atmospheres.
4. **Caution:** Respirator cartridges or canisters commonly used for protection against pesticides offer limited protection against vapors with no protection against oxygen deficiency, and should not be used in firefighting.
5. **Use Fire-Fighting Techniques as Specified in the SDS.** This will include standard techniques and equipment to combat the fire such as water fog, foam, CO₂, and dry chemical.
6. **Limit Fire Spread:** Keep containers of unaffected product cool, if possible, with a water spray. Use only as much water as necessary because excess water compounds contamination and cleanup issues.
7. **Control Run-Off:** Dike or trench around the area to keep contaminated water from reaching streams, water supplies, and sanitary or storm sewers.

SPILLS, LEAKING CONTAINERS, OR VEHICLE WRECKS

1. Notify Emergency Responders. If appropriate, immediately notify local police or fire department. Call CHEMTREC at 1-800-424-9300 from a safe distance to the spill.
2. Wear Personal Protective Equipment (PPE). Consult the Safety Data Sheet (SDS) for PPE requirements in areas with high concentrations of vapor and product. Depending on the product and size of the spill, chemical suits and positive-pressure, self-contained breathing apparatus (SCBA) may be required. For a small leak outside, a NIOSH-approved cartridge respirator may be adequate for short-term respiratory protection. For small spills in a confined area or large spills, a positive-pressure, self-contained or air-supplied respirator is needed.
3. Isolate the Area. Keep upwind and isolate the contaminated area and keep unnecessary personnel away using barricades or other means. Stop road traffic if necessary. Indoor spills may require evacuating and ventilating the area to minimize vapor concentrations.
4. Control Fire Hazards. Extinguish all flames, shut off all spark-producing equipment; prevent anyone from smoking, and only allow persons with spark-proof footwear in the area. Use care not to create sparks with hand tools. Do not allow any smoking.
5. Treat Any Exposures or Injuries. Get medical help for anyone injured or exposed to the products. Move affected people to fresh air. Render first aid for exposures according to the SDS or "Personal Safety" section of this Guide until they are under care of a physician or hospital.
6. Control the Spill. Make every effort to keep spills or leaks from spreading contamination, but in doing so, do not inhale or contact the product. If it can be done safely, invert or reposition the leaking container so flow is reduced or stopped. If practical, put the leaking container into an overpack. Cover or confine the leaked product with an absorbent such as diatomaceous earth, clay, sand or other noncombustible, absorptive material. Dispose of used material as directed by local, state and federal regulations.
7. Contain the Spill. Prevent product from entering public sewers, ditches, ponds, or waterways. Use absorbent pillows, dams, ditches or dikes to stop the flow and minimize the spread of contamination. If spilled product reaches or threatens to reach a stream, body of water, water supply, or an area that might lead to water supply, notify local health department authorities, the EPA and/or the U.S. Coast Guard immediately.
8. If an affected vehicle can be moved without spreading the contamination, move it to an area equipped with a pesticide sump and water supply. Do not move the vehicle by starting the engine when vapors are present as a spark could ignite flammable vapors.
9. If the spill is on the roadway or ground, confine the spill as much as possible with a dike or dam or any available material such as soil, clay, sand, etc.
10. If the spill is large, and occurs inside secondary containment, collect the product and recover it if possible. Leaking vehicles may be moved to containment if the move does not spread the contamination. **DO NOT START THE ENGINE**

if flammable vapors may be present. Do not create spark during towing. For smaller spills that cannot be recovered, apply a suitable absorbent material (diatomaceous earth, sand, clay, sawdust, etc.) onto the spill.

11. As soon as possible, proceed to “Clean-Up and Decontamination” as described in this Guide. Also, see the sections in this Guide on “CERCLA Reportable Quantities and SARA Listing” as well as “FIFRA § 6(a)(2) Adverse Effects Reporting” to begin the required reporting processes.

CLEAN UP AND DECONTAMINATION

Areas or equipment where spills or leaks have occurred must be cleaned and decontaminated as soon as practical. It is preferable to leave this task to a properly equipped and trained decontamination team.

1. Wear suitable protective clothing as prescribed on the label. Bear in mind that these products can be hazardous to the skin or eyes, and vapor can be hazardous if inhaled. Wear heavy rubber or polyethylene boots to protect feet. Wear adequate respiratory and eye protection. Make sure cartridge date on the respirator being used has not expired.
2. Remove undamaged containers after washing the exterior of any contamination. Collect rinsate for later disposal. Transfer remaining product from leaking containers to clean containers. Use caution to avoid igniting any flammable vapors.
3. Contaminated equipment may be washed with water and detergent, and then rinsed. Collect rinsate for later disposal. Absorbent materials such as wood may need to be removed and incinerated or disposed according to federal, state, and local regulations.
4. If a small amount of product is involved, spread a generous amount of noncombustible absorbent material (such as diatomaceous earth, clay, soil, etc.) on the spill area. Collect the spill clean-up material and any contaminated soil and place into disposal containers. A suitable waste disposal drum can be purchased from most drum suppliers. Secure the lids and label the container with the contents.
5. Do not allow the water to run off to the ground, sewers, or waterways.
6. Follow federal, state, and local laws and regulations to determine the appropriate method of handling, storing, and disposing of rinsate and wastes. If the material in the disposal drum can't be disposed of locally, call CHEMTREC at 1-800-424- 9300.
7. Report the spill to proper authorities. If the spill reaches or threatens to reach a stream, body of water, water supply, or area that might lead to a water supply, notify local health department authorities, the EPA, and/or Coast Guard immediately.
8. When the immediate threat is mitigated, determine whether the spill or release triggered a notification and/or reporting requirement under federal, state, or local laws and/or regulations. Reporting or notification is required if a release equals or exceeds the Reportable Quantity (RQ) for the chemical released. See the CERCLA/ SARA Reportable Quantities in the SDS. Note that individual state and local RQs may differ from the CERCLA/SARA RQs.
9. You may choose or be required to notify the local fire department, local health department, the state environmental management agency, and the state agricultural office. It is also advisable to notify CHEMTREC at 1-800-424- 9300. CHEMTREC will provide initial product emergency information and additional information. Adverse effects to

people or environment resulting from the spill must also be reported to satisfy the FIFRA § 6(a)(2) adverse effects reporting requirements (see below).

10. Complete initial phone calls as soon as possible after a spill occurs. You may only have a short time frame to make calls to meet regulatory requirements. Follow with a written report if required.
11. Properly dispose of the spill clean-up material. Contact local, state and federal environmental authorities to determine the regulatory requirements for proper disposal.

CERCLA REPORTABLE QUANTITIES AND SARA LISTING

CERCLA refers to the Comprehensive Environmental Response, Compensation, and Liability Act. SARA refers to the Superfund Amendments and Reauthorization Act. The CERCLA RQ and the SARA Listed Components are shown in the SDS.

Releases exceeding the CERCLA reportable quantity must be reported to the National Response Center (1-800- 424-8802) and to the appropriate state and local emergency response organizations. Individual state and local RQ's may differ from the CERCLA RQ's.

“SARA Listed Components” are substances subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372 as of the date of publication of this Guide.

FIFRA § 6(A)(2) ADVERSE EFFECTS REPORTING

Section 6(a)(2) of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) states that if a registrant has information regarding unreasonable adverse effects to people or the environment of a pesticide, the registrant shall submit the information to the EPA.

EPA regulations require that Teleos employees and agents be responsible for recognizing and reporting adverse effects. EPA considers agents to include not only employees, but also consultants, contract researchers, sub- registrants, and in some cases, retailers and distributors.

Adverse effects reporting deadlines are very short. Contact Teleos Ag Solutions Customer Service at 1-833-679-1942 or your Teleos TELONE™ Specialist for more information immediately in the event of an incident. Reporting information or allegations is not an admission of liability.

REFERENCES

The following organizations and references are not affiliated with Teleos Ag Solutions; nor are they incorporated into this guide. They are provided as a resource for further study of safe practices.

INDUSTRY ORGANIZATIONS AND RESOURCES

American Agronomic Stewardship Alliance (AASA)

(309) 827-2774. www.aginspect.com

AASA performs agricultural bulk site inspections for industry. The website includes their inspection form and other resources for retail ag bulk dealers.

ResponsibleAg

(270) 683-6777. www.responsibleag.org

ResponsibleAg is an ag industry initiative for a broad-based audit and compliance program. The website includes their inspection form and other resources for retail ag bulk dealers.

National Fire Protection Association (NFPA)

(800) 344-3555. www.nfpa.org

Codes from this association are frequently adopted as regulations by individual states. Specifically of interest is NFPA 30: Flammable and Combustible Liquids Code, and NFPA 70: National Electrical Code.

Asmark Institute

(270) 926-4600. www.asmark.org

Asmark provides risk management services and products to the ag industry. They have intellectual property, educational training materials, software technologies and compliance assistance materials, services and systems geared specifically to retail ag.

BULK SYSTEM AND TANK VENDORS

The following list is not an endorsement. Some listed companies sell complete bulk systems. Others may only sell tanks. Sites may use other vendors.

Superior Steel Products

Caldwell, ID 83605

(800) 743-9550

www.ssproducts.com

Spokane Industries

Spokane Valley, WA 99216

(509) 921-8865

www.spokanestainlessproducts.com

Novid Inc.

Rosenort, Manitoba, Canada
(204) 746-6843
www.novid.ca

Chemical Containers Inc.

Lakes Wales, FL 33859
(800) 346-7867
www.chemicalcontainers.com

FarmChem Corporation

Floyd, IA 50435
(800) 247-1854
www.farmchem.com

Murray Equipment Inc.

Fort Wayne, IN 46808
(800) 348-4753
www.murravequipment.com

REGULATORY REFERENCES**Department of Transportation (DOT)**

www.DOT.gov or Code of Federal Regulations <https://www.ecfr.gov/current/title-49>

Environmental Protection Agency

www.epa.gov/pesticides/

Also contact your state EPA, state chemist, agricultural or environmental departments.

Worker Protection Standard

www.ecfr.gov/current/title-40/chapter-I/subchapter-E/part-170

40 CFR Part 170 of the EPA at www.epa.gov

Recognition and Management of Pesticide Poisonings - EPA's Office of Pesticide Programs

www.epa.gov/pesticide-worker-safety/recognition-and-management-pesticide-poisonings

The National Institute for Occupational Safety and Health (NIOSH)

www.cdc.gov/niosh

Respiratory protection information.

EMERGENCY RESPONSE INFORMATION

For all products, call CHEMTREC at 1-800-424-9300

