

Emergency Response Information
For this product, call CHEMTREC at 1-800-424-9300.

Bulk Storage and Handling Guide for Tenkoz ProaxisTM Insecticide



*Trademark Pytech Chemicals GmbH

TM Proaxis is a Trademark of Pytech Chemicals GmbH. Always read and follow label directions.

Bulk Storage and Handling Guide for Proaxis Insecticide

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Additional copies of the Bulk Storage & Handling Guide can be downloaded at www.tenkoz.com.

INTRODUCTION

This Bulk Storage and Handling Guide describes practices and equipment believed to be suitable for handling this product as noted. This Guide also includes requirements for new bulk systems and explains how to improve existing ones.

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 others. Readers must satisfy themselves as to the suitability of said information, procedures, methods, and recommendations prior to use.

To obtain additional copies of this Guide, call your Tenkoz Sales Representative or download them from www.tenkoz.com.

PRODUCT AND SAFETY INFORMATION

MSDS Information

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

- Call your local Tenkoz Sales Representative, or
- Go online at or <http://www.tenkoz.com>

The MSDS contains information on:

- Chemical Product
- Company Identification
- Composition/Information on Ingredients
- Hazards Identification (Potential Health Effects)
- First Aid
- 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

Product Density versus Temperature

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)								
	10 (-12)	20 (-7)	30 (-1)	40 (4)	50 (10)	60 (16)	70 (21)	80 (27)	90 (32)
Product	Density -- (lb./gal.)								
Tenkoz Proaxis							8.48		

NFPA Rating, Flash Point, & Storage Temperature

	NFPA 704 Diamond Ratings			Flash Point ¹ °F (°C)	Chart Notes	Min. Storage Temperature °F (°C)
	Health	Flammability	Reactivity			
Tenkoz Proaxis	2	0	0	>200 (93)	1	32 (0)

Chart Notes:

1. Formulation contains water and will freeze without harm at temperatures near the freeze point. However, extremely cold temperatures (close to 0 °F) may cause crystallization which can not be eliminated. Store in heated warehouse only.

¹ 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.

Personal Safety: PPE, Exposure Symptoms, and First Aid

Product Label and MSDS: Personal Protective Equipment (PPE)

The product use label describes the minimum Personal Protective Equipment (PPE) required for applicators and handlers of the product in a well-ventilated area per label instructions. More protective clothing can be worn. See the product label for PPE for entry into treated areas during any restricted entry interval (REI).

Consult the product's MSDS for manufacturing, commercial blending, and packaging worker protection standards and handling precautions. PPE for such uses may vary slightly from the product label.

General PPE Guidance

Label Statement or Signal Word: A quick point of reference is the EPA Label Statement from the product label. This will be CAUTION, WARNING, or DANGER. Sometimes, the increased signal word is for a particular characteristic, such as eye injury or irritation, higher signal words generally signal an increasing level of required PPE. Users should determine the required PPE from the product label for each of the following:

Eye Protection: Many labels will call for chemical goggles, which provide superior splash protection than safety glasses.

Hand Protection: Usually this is chemical resistant gloves.

Body Covering: This may vary from long sleeve shirt & pants, to a chemical resistant apron, to a full body chemical resistant suit.

Foot Protection: Shoes and socks should always be worn, but some labels require chemical resistant boots or shoe covering.

Inhalation Protection: Respiratory protection is not normally required where there is good ventilation, but there are exceptions. Some products require organic vapor respiratory protection if local ventilation is inadequate, and others may require it during any use. Check the label. Regardless, always avoid breathing vapor or spray mist.

Ingestion Protection: The obvious method of protection against ingestion, or swallowing, is good hygiene: Wash frequently, especially before eating, smoking, or using products like gum.

Closed Transfer System Requirements. Some product labels require the use of closed transfer systems, or optionally offer relief from certain PPE requirements if closed transfer systems are used. Generally, this information will appear on the first or second page under "Engineering Controls", or similar title.

Worker Protection Standard Exemptions. Some product labels allow for reductions in PPE if the use is considered a non-WPS use, or if the product is used with closed systems, closed cabs, or closed aircraft. See the specific product label, along with 40 CFR Part 170 for more information.

Other Personal Safety Practices

In addition to label and MSDS requirements, plus requirements listed in other sections of this guide, the following are good practices.

1. After a spill or leak, clean the area and equipment as soon as possible. Decontamination should be done by properly protected and knowledgeable people.
2. Maintain a NIOSH approved full-face air purifying respirator or self-contained breathing apparatus on site, and have key personnel trained to use it.
3. Maintain chemically resistant gloves, boots, face shield, full-body suit (or apron) on site.
4. Assure that a safety shower and eyewash station are present and working in the bulk area.
5. Instruct personnel to wash hands, arms, face, and any exposed skin with soap and water after handling or coming in contact with the product.
6. If clothing becomes contaminated, stop work immediately. Remove contaminated clothing and wash exposed skin with soap and water.
7. Leather is often very difficult to adequately decontaminate, depending on the product. Consult the product label, but a protective covering is recommended and may be required. Once contaminated, it may be necessary to destroy leather articles.

Exposure Symptoms and First Aid

The respective product MSDS is the first source of exposure hazard information in determining first aid treatment for an exposure. Have personnel review the MSDS before product use.

Section 11 of the MSDS, "Toxicological Information" provides potential exposure symptoms and potential exposure injuries.

See Section 4, "First Aid", for first aid instructions and a note to physicians.

The MSDS also lists the Emergency Response number (1-800-424-9300). Use this number to obtain advice and arrange for professional help, as needed, to assist with an emergency.

If a person is exposed to the product and requires medical treatment, have a copy of the MSDS available to medical responders and/or send a copy with the person to the medical treatment facility.

Material / Product Compatibility

Material compatibility depends on the end use; shrinking, swelling or slight corrosion may be acceptable in some applications, but not others. The data below reflects a short term study (60 days) at an elevated temperature (122°F). Use this chart as a screen only. Maintenance, such as draining and flushing pumps, will extend component life. See other sections in this Guide for maintenance instruction. 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.

Proaxis	Rating	Comment
304L and 316L Stainless Steel	OK	Recommended. May see slight brown film in vapor space.
Teflon (PTFE), Delrin (acetal)	OK	Recommended
Viton	OK	OK, but may swell some and may soften slightly.
Copper, Brass, Bronze	OK	Slight to trace corrosion, but these have useful resistance.
HDPE, Polypropylene, PVC	OK	Marginally acceptable. Some slight weight gain, softening, and reduction in tensile strength.
Fluorinated HDPE, Coextruded HDPE	OK	Recommended for small volume packaging.
Fluorinated LDPE	OK	Allowed for mini-bulks and drums or kegs.
Butyl Rubber, SBR	Caution	Marginally acceptable. Some weight gain, softening, and reduction in tensile strength.
Neoprene	Caution	Marginally acceptable. Slight weight loss, swelling, and softening.
Carbon Steel	Caution	Moderate corrosion due to water in the formulation.
Tin	Caution	Slightly corrosive.
Tin	Caution	Slightly corrosive.
Aluminum	No	Extended contact may negatively affect stability of the formulation. Discoloration or heavy brown buildup may form in the vapor space. Mild to moderate corrosion of the metal in the form of pitting.
Zinc	No	Moderately corrosive. Metal may discolor. Solid crust may form on formulation.
EPDM, Nitrile, Silicone, Hypalon	No	Swells and softens.
LDPE, ABS, Nylon	No	Not recommended due to significant reduction in tensile strength. Nylon will also yellow.
Tygon	No	Swells, softens, loses tensile strength and may discolor.
Polycarbonate	No	Will embrittle.

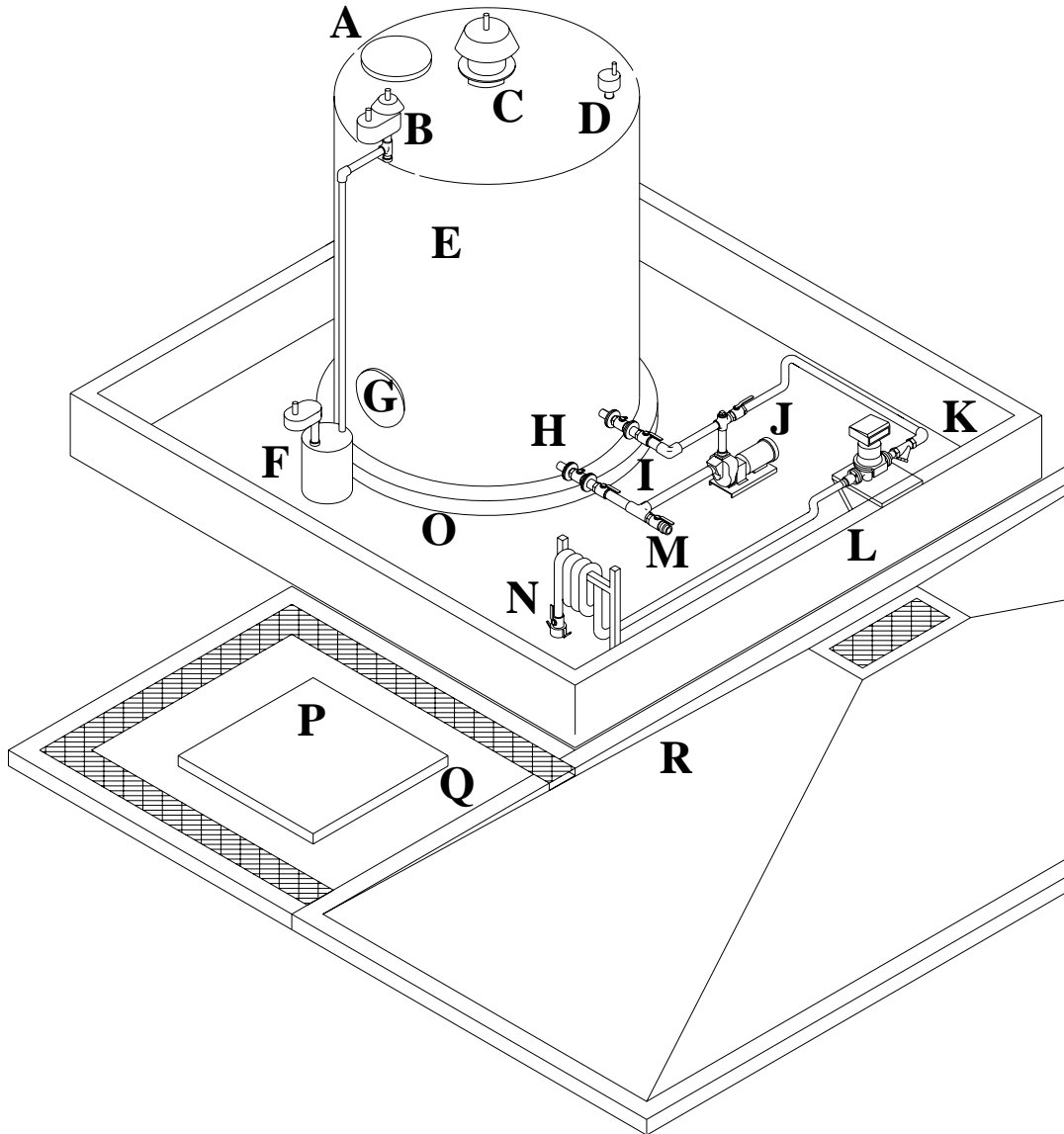
BULK EQUIPMENT AND PROCEDURES

Bulk Site General Issues

Prior to establishing a bulk handling facility, the owner or operator must obtain all required permits and comply with all applicable laws and regulations governing the storage of bulk pesticides. The bulk pesticide facility must meet federal, state, and local codes, laws, regulations, and ordinances covering such product systems. These include, but are not limited to, those issued by the federal and state Department of Transportation (DOT), Occupational Safety and Health Act (OSHA), and the Environmental Protection Agency (EPA).

Typical Bulk Site Components

Sites may vary in detail, but all will have components that perform similar functions. Refer the image below to the chart on the following page.



Typical Bulk Site Components (continued)

	Item	Comment
A	Man Way	Enables easier tank inspection & clean-out of tank. May serve as ERV in some cases.
B	Pressure / Vacuum Conservation vent	Required for certain suspensions to avoid drying. Required for flammable & combustible products per NFPA. Must vent outside building if flash point <200°F. Relieves tank during normal breathing.
C	Emergency Relief Vent (ERV)	ERV capability is required by NFPA for flammable and combustible products. Relieves pressure in a fire. Must vent outside building if flash point <200°F. See Venting section of this guide.
D	Level Indicator	Various systems exist. Some means of indication required; may be manual. New tanks should not use sight tubes.
E	Bulk Tank	See “Bulk Tank” section for materials and code requirements.
F	Air Dryer	Required for certain products. Nitrogen pad is an alternative.
G	Side Man Way.	Enables easier tank inspection & clean-out of tank. Confirm gasket compatibility.
H	Fire Safe Valve	First outlet valve below liquid surface of certain low flash point products must have (a) a normally closed remotely activated valve; (b) an automatic-closing, heat activated valve; or, (c) another approved device. Not required for most products.
I	Locking Ball Valves	Valves next to the tank below liquid level must be lockable.
J	Centrifugal pump and motor	Electrical wiring must meet local code or NEC #70, including Hazardous Zone wiring for products below 100°F flash point. ..
K	Strainer.	See other sections of this Guide for recommendations.
L	Meter	Scale may be used instead, if appropriate.
M	Fill Connection	See other sections of this Guide for coupler requirements.
N	Dispensing Hose	Confirm product compatibility.
O	Dike	Note raised pad for tank to help detect leaks. Slope floor to a sump.
P	Scale	May be used instead of a meter, if appropriate.
Q	Scale Containment	Container filling must be done within containment.
R	Truck Load Pad	Inbound and outbound truck transfers must be over a pad.

Not Shown

- Safety Shower & Eye-wash
- Internal mixing eductor or nozzle on circulation line.
- Dike sump.

Complete systems for most bulk products are available from:

Murray Equipment, Inc.; 800-348-4753, or 219-484-0382.
2515 Charleston Place. Fort Wayne, Indiana 46808.

Other vendors may also be used.

General Bulk Site Requirements

1. Pesticide handling facility and operating procedures comply with all state and local pesticide handling laws and regulations.
2. Rain water management complies with state and federal storm water regulations.
3. The tank, pump, meter, hose, and piping herbicides must be located within the dike or containment area.
4. Bulk location has a contingency plan for spills, leaks, fire, and other emergencies.
5. Pesticide handling meets or exceeds the Worker Protection Standard.
6. Protective equipment, spill containment equipment and absorbent are available on site to handle minor spills or releases.
7. Proper means of waste disposal are provided where needed for systems operations and cleaning.
8. A NIOSH approved emergency eye wash station is located near the bulk area.
9. A safety shower is available near the bulk area.
10. All bulk loading and unloading risers shall be identified by color or markings to identify product and prevent cross-contamination.
11. MSDS's are available on site to all employees.
12. Materials used for construction of tanks, screens, strainers, valves, fittings, hoses, meters, pipes, seals, gaskets, and pumps are compatible with products
13. Electrical installations meet the state and local electrical codes, or should conform to the National Electric Code (NFPA 70) if a state or local code doesn't exist.
14. Bulk handling and storage facility must comply with the state fire code, or the National Fire Protection Association (NFPA) Standards for Flammable and Combustible Liquids Code (NFPA 30) if no state fire code exists.
15. Water sources are protected from back siphoning.
16. Pesticides are not stored in the same area as food, feed, clothing, or animal health products.

General Bulk Site Recommendations

1. Implement a preventative maintenance program to repair and replace hoses and other equipment as appropriate.
2. Provide lighting around the bulk handling facility bright enough to provide for easy reading of package label information.
3. Post conspicuous signs which prohibit smoking within 50 feet of bulk handling area.
4. Proper air ventilation is present for indoor bulk facilities. (NFPA 30)
5. A fire inspection is conducted annually by an external party such as the local or state fire marshal. Written records of inspections are maintained.
6. The fire department reviews the “Emergency Action Plan” annually.
7. A security system is in effect at the site. This may include a fence immediately around the bulk storage location (minimum of 6 feet above ground level), alarms, or a locked building.
8. Equipment is free from leaks at seams, couplings, packing glands, valves, points of closure, etc.
9. At the end of the application season, pumps, meters, piping, and dispensing hoses should be prepared properly for the off season. Suggest rinsing and refilling with a 50:50 antifreeze/water mixture.
10. No bulk mixing or loading is done within 150 feet of an unprotected well site. Well sites are identified and comply with state and federal guidelines.
11. Housekeeping occurs on a routine basis to assure that spills are promptly cleaned up, debris is removed, and empty containers and hoses are properly stored.
12. Each bulk handling area has a fire extinguishing capability deemed appropriate by the responsible local or state authorities. (minimum: 20 lb ABC dry chemical fire extinguisher)

Secondary Containment

Requirements

1. All tanks are diked. Dikes are visually impervious to the pesticide liquids. The dike must support the gravity load of all full tanks and can contain the hydraulic load. (Concrete block walls--reinforced with re-bar--which are filled, capped and sealed are permitted in addition to concrete or steel).
2. 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.
3. Cracks and joints are sealed with a chemically resistant and impermeable crack and joint sealant.
4. Dike contains 110% (under roof) or 125% (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. Determine if local or state regulations require the tank to be elevated on a concrete or gravel pad within the dike. Some may also require the floor of the dike to be sloped toward a sump. If not required, it is recommended to elevate the tank and secure it within the dike to prevent movement from buoyancy or wind.
6. All outlets or drains in the secondary containment are permanently plugged and sealed.
7. Automatically activated sump pumps are not allowed. Manual controlled pumps may be used.
8. Containment pads must meet local, state, and federal requirements or the following—whichever are more stringent. An impervious containment pad exists for transfer of product between the bulk tank and all delivery trucks, nurse vehicles, mini-bulks, application equipment or other containers. Products with less than 100°F flash point must have at least 1000 gallons.
9. 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.

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 containment pad is also recommended.
2. Visually check integrity of the secondary containment and load pad, including sumps, at least annually.
3. Contiguous concrete containment between dike and transfer area is recommended.
4. 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.
5. 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.
6. The load pad should hold at least 1,000 gallons, or at least 100 percent of the largest container on the pad.

Bulk Tank

Bulk Tank Requirements

1. Underground tanks are not permitted.
2. The tank should be filled from the bottom or by a dip tube. Dip tubes must have a siphon break and terminate within 6 inches from the bottom. This avoids static charging, air entrainment and foaming.
3. Tanks holding products with flash points below 200°F must be electrically grounded. (For a list of products, see the “Physical Properties” section of this guide. It is *recommended* that *all* tanks be grounded.)
4. Circulation capability is recommended for all tanks for use flexibility, but is required for products as noted the “Bulk Tank Mixing” section of this guide.
5. Tank material of construction must comply with the following chart.

	Tank Material of Construction				Chart Notes
	Stainless Steel	Mild Steel	Aluminum	Plastic	
Tenkoz Proaxis	Preferred	Do Not Use	Do Not Use	Do Not Use	1, 2

Chart Notes

1. Metal tanks must be of welded construction, designed and built in accordance with good engineering standards.
2. Plastic bulk tanks are not recommended because they can not be fluorinated.

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/or inspection.
2. Maintain tanks above the product’s minimum storage temperature. See the “Physical Properties” section for a list of minimum storage temperatures.
3. Cone bottom tanks are recommended where codes permit.
4. Purchase tanks which have openings large enough for attaching emergency vents to assure future flexibility for use of the tank.

Venting

About Venting

The tank owner is responsible for knowing and complying with local, state, and federal laws on venting. Usually the local fire marshal is the “Authority Having Jurisdiction (AHJ).”

Normal venting of atmospheric tanks relieves pressure or vacuum when product is added or removed, or when temperature changes expand or contract head space vapors. This is usually accomplished with a self closing vent known as a normal vent or pressure/vacuum relief vent (PVRV).

Emergency venting is designed to relieve large vapor volumes in the event the tank is exposed to fire. The difference between “normal” and “emergency” venting is primarily the flow capacity of the vent. Flow capacity in an emergency relief vent (ERV) is often more than 10 times a PVRV. For most tanks, normal venting can be achieved with a 2” port but emergency venting requires a 6”, 8”, 10” or even larger port.

For products with flash point less than 200 °F, most state codes require:

- Bulk tanks to have emergency relief capability.
- ERVs and PVRVs which re-close when the pressure is relieved.
- That vapors not be released indoors (i.e. be piped outside the building).
- The release point of vapors piped to outside be at least 12 feet above ground level in an area where vapors are not trapped by overhangs or other building structures.

Defining emergency venting capability is subject to interpretation by the AHJ or state and local codes. Some states require ERVs to have an UL or API certification and be stamped with rated flow capacity. For other states, a simple hinged man-way or long-bolt lid is sufficient.

Emergency and normal vents must be below the rated test pressure of the tank, and the normal vent must be below the Maximum Allowable Working Pressure of the tank. Often, the normal vent will be set at 8 oz/in² and the ERV is set at 16 oz/in².

Vent Requirements

1. Comply with local, state or federal regulations for venting, including special requirements for indoor tanks, if applicable.
2. Comply with the product specific chart below for bulk tank venting:

Vent Requirement	Products
Self-closing PVRV Required on these products to minimize moisture loss from the formulation, avoiding any surface “skinning” or formulation evaporation.	Tenkoz Proaxis

Vent Recommendations

1. Prevent release of vapors to the inside of buildings even if local authority allows. This generally means venting the PVRV and ERV to outside and releasing vapors at least 12 feet above ground level in an area where vapors are not trapped by overhangs or other building structures. This is a requirement in many states for products with flash point less than 200°F.
2. Additional site requirements usually apply when storing products with flash point less than 200°F in indoor bulk tanks. Consult the AHJ or NFPA 30 before storing these products indoors.
3. Use equipment vendor assistance to select and size vents per calculations in NFPA 30 or other appropriate code.

Piping, Pumps, Meters, And Other Equipment

Piping and Hose Requirements

1. No underground piping exists.
2. Piping and hoses must be compatible with the product. (see the Material/Product Compatibility section in this guide). Threaded or welded stainless steel pipe is preferred.
3. Thread sealant must be compatible with the product. (see the Material/Product Compatibility section in this guide). Teflon tape is acceptable for all systems.
4. Pump, meter, and plumbing to and from the tank must be dedicated to the product.
5. First valve next to the tank should be stainless steel with a locking device.
6. The hose is rated above the maximum pressure of the pump.
7. All connections, drains, and sample ports should be capped or plugged when not in use.
8. If used, electrical heat tracing is UL-approved and self-limited to 100°F or less.
9. The system has a means of obtaining a representative product sample. Preferably, a sampling port is installed on the pumping system.

Piping and Hose Recommendations

1. All lines slope to low points which have drains to allow for easy inspection, cleaning, and maintenance.
2. Do not leave piping hydrostatically full. Rigid piping sections closed at both ends are not used or are designed to allow for thermal expansion of liquid without developing high pressures. (Rigid piping sections, completely filled with liquid, can develop a high hydrostatic pressure between blocks in the lines. Allowing these pressures to develop 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 is satisfactory.

Pump and Meter Requirements

1. Select a pump which minimizes shearing of product, such as a diaphragm pump. Avoid using a standard centrifugal pump. Avoid dead-heading or extensive pumping of product.
2. Wetted parts are compatible with the product (see the Material/Product Compatibility section).
3. Electrical motor switch and wiring meet National Electrical Code requirements where applicable.
4. Meter meets local, state, and federal regulations concerning weights and measures.

Pump and Meter Recommendations

1. The pump is sized to meet the transfer requirements at the bulk facility. Consider product temperature, viscosity, and specific gravity when sizing the pump and motor.
2. Do not operate pumps with the discharge line closed (dead head).
3. Positive-displacement pumps should not be used with products having flash point below 110 F. If used with other products, positive displacement pumps must be equipped with a relief valve to the suction side of the pump or a by-pass back to the tank.

4. Dike sump pump is a diaphragm pump with a polypropylene casing and Teflon diaphragms or their equivalent according to the material compatibility chart in this booklet. Automatic dike sump pumps are prohibited.

Couplers

The bulk tank shall have the following couplers on the tank piping for receiving inbound shipments. Customers have discretion in selecting couplers for dispensing from the bulk tank into their own fleets, as long as the coupler meets requirements in the section on mini-bulks, cylinders, or drums as appropriate.

Product	Coupler
Tenkoz Proaxis	Customer must have 2" male Kamvalok ¹ Style Adapter with cap on the connection point to the bulk tank. The delivering truck will supply the transfer hose.

Other Equipment Requirements Recommendations

1. Sight gauges are not permitted on new tank installations. Existing site gauges may not use glass tubes, and must use a self closing valve. Tank levels may be obtained by a float level device, meter readings, ultrasonic level instrument, or other device which does not allow for cross-contamination.
2. Strainers, valves, and couplings are constructed of stainless steel and rated for a minimum of 150 psig.
3. Valve packing, if required, is nylon, Viton, Teflon, or braided Teflon. Ball and plug valves have a Teflon seat.
4. Strainers use a stainless steel screen ahead of the meter. The mesh size of the screen should be specified by the meter manufacturer but not finer than 40 mesh. Mesh size for suspensions such as should be more coarse.

¹ Trademark of Civacon Corporation

Bulk Tank Labeling

Each bulk tank must be identified with a product label and have the proper EPA Establishment Number, product information booklet, and appropriately marked NFPA 704 diamond label. Other tank labels required by federal, state, or local regulations must be attached to the tank.

Bulk Tank Label Packets

Each Bulk Label Packet should contain one of each of the following:

- Product label
- Product Information Booklet in a plastic bag
- NFPA Diamond

The packets are identified by product name or Material Identification (MID) number.

Bulk Tank Label Instructions

The bulk tank label must be visible.

1. Remove the old bulk tank label BEFORE affixing the new bulk tank label to the bulk tank.
2. Affix the product information booklet onto the tank in a waterproof packet.
3. Write the net contents and EPA Establishment Number on the label.

The Net Contents label is meant to help satisfy EPA requirement that net contents in the tank at the time of last shipment be recorded on the tank. This number need not be changed as product is withdrawn. In addition, the Net Contents Label has room for the EPA Establishment Number of the originating producer of the material. This EPA requirement is usually the EPA Establishment Number of the location from which the product was received. If product from different EPA Establishments is being co-mingled in your tank, consult with experts to confirm which EPA Establishment Number belongs on your bulk tank.

Bulk Tank Filling

Preparation

Personnel conducting the unloading operation must wear protective clothing as required by the product label. Personnel must understand the safety precautions and know the location and how to use the eye washes, emergency showers, and fire extinguishing equipment.

For truck shipments, 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. Do not unload from truck cargo tanks directly into mini-bulks, portable tanks, or drums--only transfer to bulk tanks within a diked area.

Procedures

1. Spot tank truck on a loading/unloading containment pad. Secure ignition key or placard windshield with a notice to prevent movement of truck during unloading. Set up "No Smoking" signs in area and any required traffic barricades. No smoking is permitted within 50 feet of the tank truck.
2. Chock wheels, set brakes, and connect grounding and bonding cables.
3. Inspect truck, check flanges, piping, and valves for tight seal. Visually check truck for other hazards.
4. Verify truck contents (material and quantity) by the bill of lading and outlet tag. Inspect for intact seals and record seal number on full truckload shipments.
5. Attach the bulk tank labels per the "Bulk Tank Label Requirements" section of this guide. Verify bulk tank has the current label and that the correct EPA Establishment Number corresponding to the origin of the shipment is on the label.
6. Check and record receiving tank contents and initial level. With tank gauging charts and truck papers, verify that the tank will contain contents of the full truck (or compartment) contents 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.
7. Open vent line on the truck or open the hatch to permit in-breathing while unloading. There may be a vapor release. If the hatch is to be used for venting, first loosen to release pressure differential before fully unfastening the hatch cover. Do not leave the cover wide open. A wood block (about 1" thick) may be used to hold the hatch cover open for venting.
8. Examine fittings and gaskets on the truck unloading hose. Connect unloading hose between truck connection and pump suction connection.
9. Open valves on truck and tank for transfer.
10. When truck is empty, elevate the hose and "walk" it toward the pump suction, and pump the hose dry. Close liquid line valves, starting from the truck toward the bulk tank. Shut down the transfer pump.
11. Disconnect the transfer hose from the truck.
12. Check that the volume increase in the bulk tank is equal to the billed truck contents.
13. Cap or plug all connections on the bulk tank, hose, and truck. Stow the transfer hose.
14. Remove wheel chocks, ground cable, signs, barricades, and windshield placard. Return ignition key or remove placard and release truck for departure.

Bulk Tank Cleaning

Preparation

A bulk tank must be clean, dry, and free of all contaminants before it is filled. Bulk tanks containing bulk products can be cleaned using the cleaning procedure described below. Always wear proper protective equipment as recommended in the product's MSDS during inspection and cleaning.

Criteria for bulk tank clean-out approval includes the following:

No visible solids are allowed on the interior of the tank and piping.

EPA required clean out limits for product integrity are met per PR Notice 96-8.

Internal minimum requirements for product integrity are followed.

Procedures

1. Drain all liquid into a DOT approved disposal container.
2. Visually inspect the tank interior.
3. Remove any loose solid material.
4. Spray bottom first with water to loosen any residue in the sump or cone before cleaning. Use a pressure washer delivering 2 to 5 gpm to minimize water volume.
5. Spray under roof shell, then inside wall of tank, working from top of the walls down. Use water volume necessary to spray all surfaces. (If water fails to remove solids, consider using liquid fertilizer as an alternative to soften solids.)
6. If the system can circulate, circulate 10 minutes to loosen material and solids in the tank and piping. (Add water volume as needed to avoid starving the pump.)
7. Drain the tank using the system pump, preferably exiting through the meter.
8. Repeat steps 2 through 6 above two more times, for total of three rinses. Use hot water and detergent if residue remains.
9. Disassemble and clean or replace screen and hoses.
10. Inspect the inside of the container. The container must be free of residues on the inside wall of the container.
11. Drain and dry entire system, container, piping, meter and strainer prior to filling with another product.
12. Dispose of the wash water in accordance with the federal, state, and local laws and regulations.

Bulk Tank Mixing

Bulk products must be circulated if they require re-suspension of suspended solids, or they have product which has fallen out of solution and crystallized. Mixing suspension products generally requires an internal eductor or nozzle for better product homogenization. Re-dissolving crystals in emulsifiable concentrate formulations may not require an internal eductor, but it is recommended. Consult your equipment vendor for specific design advice.

Mixing Requirements

The following requirements will help avoid air entrapment or changes in physical properties of the product.

1. Do not use air to mix tank contents.
2. Do not free-fall product during loading or use mixing which results in significant splashing.
3. Keep ports and vents closed to avoid moisture loss.

Proaxis Circulation Requirements: This product should not be stored in a bulk tank in the off-season due to potential evaporation which could thicken the product or form a skin, or slight stratification. If necessary, store in small containers in heated warehouse which prevents freezing of product.

Prior to the next season, it may be necessary to mix the small containers by rolling, or transferring product back to the bulk tank for stirring.

During any transfer or mixing process, minimize exposing the product to high shear. Avoid centrifugal pumps or extended mix times.

Mixing Recommendations

1. Direct the primary eductor or nozzle across the tank 45° off centerline and at a 45° downward angle.
2. Add a second eductor/nozzle pointed 45° up for large tanks. Alternate flow between the two eductors. However, do not use the upper nozzle/eductor if liquid level is low enough to allow splashing.
3. Keep the suction line to the pump short and at least 2" diameter to avoid priming problems.

MINI-BULK AND SMALL CONTAINER HANDLING

DOT Transport Regulations

Each shipper and carrier is required to know whether a product is regulated by U.S. Department of Transportation (DOT). If the product is regulated for transport by DOT, each shipper and carrier is 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.

The Hazardous Material Shipping Description is listed in section 14, “Transport Information”, of the MSDS. Because shipping descriptions may change from time to time, refer to the current MSDS for each product.

The below was current at the time of publication, but is provided for reference only. Consult the Code of Federal Regulations and section 14, “Transport Information”, of the current MSDS as needed.

Product	Non-bulk ¹ by Land	Bulk by Land
Tenkoz Proaxis	Not DOT regulated	Regulated above 17,857 lbs.

Air and Vessel Shipments: Some DOT regulated products are specifically prohibited from air or vessel shipments. Others are allowed, but avoid air shipments even where it is allowed. Consult DOT experts and/or the MSDS before shipping by air or vessel.

¹ DOT regulations denote containers with capacity of 118.9 gallons and less as “Non-Bulk”. Larger containers are “Bulk”.

General Requirements & Recommendations

Mini-bulks, sometimes called Intermediate Bulk Containers (IBCs), and other containers must be legal and compatible with the product.

Requirements

1. Containers must meet applicable state and federal requirements. Containers for DOT regulated products must be inspected, tested, and marked to meet the indicated DOT Packing Group regulations. These inspections, tests, marking, and documentation are the responsibility of the packager or repackager; however, no shipper may offer any container for transport if it is not in compliance with regulations. See the DOT Transport Regulations section and the MSDS for more information.

Be aware that container rules proposed by EPA may require all pesticides to be packaged in DOT-approved Packing Group III containers in the future.

2. Liquid connections for mini-bulks, drums, or other containers are not required to utilize dry breaks, but their use is recommended. Top fill and withdrawal via a Micro Matic Drum Valve is the most common method of compliance with need for dry breaks in mini-bulks.
3. Mini-bulk tanks for DOT regulated products must have automatic pressure/vacuum relief vent (PVRV) compliant with DOT regulations. Non-regulated product tanks may use manual relief vents to relieve pressure and to permit pumping product from the mini-bulk.
4. Mini-bulk tanks used for repackaging must be either a) dedicated or b) thoroughly cleaned prior to refilling according to applicable laws and regulations to prevent any cross-contamination.
5. Certified weigh scales or certified meters are used for filling mini-bulks. Document the calibration as required by state and local regulations.
6. Each container is inspected by the Repackager prior to filling with product to assure it is clean and free of contaminants (including water). If contaminants are present, or the port seal is broken or missing, the tank must be cleaned in accordance with this Guide's mini-bulk tank cleaning procedures.
7. Dealers comply with all federal, state and local rules, regulations and standards regarding handling of bulk products.
8. Filling and cleaning of refillable containers takes place on a concrete containment pad.
9. Containers should be stored within a diked area if required by state or local regulations.
10. A current repackaging agreement is in place.
11. Repackaging complies with the repackaging agreements.
12. Tank filling system must be dedicated.

13. Containers must be compatible with the product, and allowed by DOT and NFPA regulations. The following materials of construction may be used.

Mini-bulk Material of Construction				
	Stainless Steel	Mild Steel	Polyethylene	Chart Notes
Tenkoz Proaxis	Allowed	Do Not Use	Allowed	1, 2
Chart Notes:				
<ol style="list-style-type: none"> 1. Mild steel not recommended due to potential for corrosion. 2. Polyethylene containers, if used, should be fluorinated. 				

Recommendations

1. Each opening has a one-way check valve or a tamper evident device to prevent unauthorized filling.
2. Where allowed at all, polyethylene mini-bulk tanks greater than 5 years old are not recommended. Polyethylene mini-bulk tanks should be free of cracks, UV degradation or other signs or aging or structural defects.
3. Use grounding cables during product transfers of products with flash points below 110 °F.

Complete container systems for most products are available from:

Murray Equipment, Inc.; 800-348-4753, or 219-484-0382.
2515 Charleston Place. Fort Wayne, Indiana 46808.

Other vendors may also be used.

EPA Repackaging Requirements & Mini-Bulk Labeling

Mini-Bulk Label Packets

Mini-bulk tanks must have labels that comply with the Worker Protection Standard.

Use approved mini-bulk label packet if your facility meets all the mini-bulk repackaging requirements listed in this section.

Each Mini-Bulk Label Packet should contain:

- Product label
- Product Information Booklet in a plastic bag
- DOT hazard labels as required.

The packet does NOT include truck or cargo tank placarding that may be required by DOT.

EPA Repackaging Requirements

1. A valid EPA Establishment Number must exist for each location where the product will be repackaged.
2. A current Repackaging Agreement which is a written authorization to repackage product must be in place.
3. Mini-bulk tanks must be dedicated to this product, or must be clean, dry, and free from contamination using a manufacturer's-approved cleaning procedure before filling.
4. Product labels and product information booklets must be attached to the mini-bulk tank after filling. Insert your EPA Establishment Number, address, and the net contents and lot code on the product label.
5. Records must be kept of the product you received, repackaged, and shipped. Report these records to the EPA annually on the appropriate forms.

Only mini-bulk tanks with a capacity in excess of 55 gallons are to be used unless specifically allowed by Repackaging Agreement.

Mini-Bulk Cleaning Procedures

Before filling, inspect the tank interior visually with a flashlight. If it contains residues, or the tamper evident tank seal is broken, clean the container as detailed below. Wear the proper protective equipment as required by the product MSDS during inspection and cleaning.

Criteria for tank clean-out approval includes the following:

No visible solids are allowed on the interior of the tank and piping.

EPA required clean out limits for product integrity must be met per PR Notice 96-8.

Internal minimum requirements for product integrity must be followed.

Procedures

1. Drain all liquid into a DOT approved disposal drum.
2. Remove any solid matter.
3. Close bottom drain if applicable and rinse inside walls with water (See Note 1 below). The use of a pressure washer is recommended
4. Drain and properly dispose of the wash water.
5. Inspect inside of container with flashlight.
6. Repeat washing procedure with hot water and detergent, and brush if residues remain.
7. Disassemble flanges, valves, pumps, meter, conservation vents, and other equipment on the tank. Replace all gaskets.
8. Rinse and circulate with clean water. Repeat this step until the water remains clean and residue free.
9. Drain and dry interior of mini-bulk tank, hose, meter, pump, etc., completely.
10. Dispose of residues and wash water in accordance with federal, state, and local laws and regulations.

Note 1: Using a solvent such as diesel fuel for products which are solvent based solutions of crystals may produce better results than water because the wash solvent will dissolve crystals. Confirm and understand all disposal methods and costs before any cleaning operation begins.

Mini-Bulk Mixing

Most products do not require mixing while in a mini-bulk. General good practices include:

1. Do not use air to mix tank contents as it may cause air entrapment or changes in physical characteristics of the product.
2. Keep ports and vents closed to avoid moisture loss.
3. Avoid mixing that causes splashing of the liquid to prevent air entrainment.

Specific Product Requirements

Product	Mixing Instructions	Comments
No Circulation Requirements: This product does not require mini-bulks with circulation capability.		

ENVIRONMENTAL & EMERGENCY INFORMATION

Environmental Fate and Wildlife Toxicity

Each product label and MSDS lists toxicity to birds, fish, and other wildlife, along with restrictions on application area.

Fire, Spills, and Clean-Up

The following procedures are intended primarily for immediate, temporary control of emergencies. Call the Emergency Response number listed on the MSDS to obtain advice and arrange for professional help, as needed, to assist with an emergency.

Plans should be made for minor and major emergencies, including injuries, personnel exposures, spills, vapor releases, and fires. Emergency procedures should be in writing and regularly reviewed with personnel.

Emergency plans must be reviewed with local emergency services 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 MSDS provides recommended extinguishing media, fire fighting instructions and information such as flash point and flammability limits. The MSDS also contains information about controlling and cleaning up spills. An MSDS 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. Disposal drums can be purchased from most drum suppliers or safety supply houses. The disposal drum will typically be an 18-gauge, 55-gal. steel drum with bolted ring, full removable head with 2" and ¾" flange openings, and foam rubber gasket under cover. Warehouses should stock several of these drums and clearly mark them as "Disposal for Pesticides."

Fire

1. **Notify Emergency Responders.** If appropriate, immediately notify local police, fire department, and Emergency Response at 1-800-424-9300, Option 2, from a safe distance to the fire. Identify all products that might be involved. Have MSDSs ready when fire-fighters arrive.
2. **Evacuate the Area:** Move all personnel from the immediate area to a safe distance, upwind from the smoke and fumes. Reroute traffic if necessary.
3. **Use Full Turn-out Gear:** Unless otherwise instructed in the MSDS, fire fighters should wear full turnout clothing including heavy rubber boots, chemical-resistant gloves, and positive-pressure, self-contained breathing apparatus for protection against both toxic fumes and oxygen-deficient atmospheres.
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 fire fighting.
4. **Use fire-fighting techniques as specified in the MSDS.** Usually, this will include standard techniques and equipment to combat the fire (water, spray, foam, etc.).
5. **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.
6. **Control run-off:** Dike or trench around the area to keep contaminated water from reaching streams, water supplies, and sanitary or storm sewers.

Spills

1. **Notify Emergency Responders.** If appropriate, immediately notify local police, fire department, and Emergency Response at 1-800-424-9300, Option 2, from a safe distance to the spill.
2. **Wear personal protective equipment (PPE).** Depending on the product and size of the spill, chemical suits and positive-pressure, self-contained breathing apparatus may be required. Consult the Material Safety Data Sheet (MSDS) for PPE requirements in areas with high concentrations of vapor and product.
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:** Check the product flash point on the MSDS to confirm if flammable vapors might be present. If so, extinguishing 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.
5. **Treat any Exposures:** If anyone has been exposed to the products, render first aid according to the MSDS or “Personal Safety” section of this Guide. If possible, remove affected people to fresh air immediately.
6. **Control the spill at the source.** Locate and stop the leak at the source. 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 over-pack.
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 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. For smaller spills which cannot be recovered, apply a suitable absorbent material (diatomaceous earth, sand, clay, sawdust, etc.) onto the spill.

8. **Clean up and decontaminate.** Areas or equipment where spills or leaks have occurred must be cleaned and decontaminated as soon as practical.

Undamaged containers may be removed after washing the exterior of any contamination. Remaining product from leaking containers may be transferred to clean containers if caution is used not to ignite any flammable vapors.

Contaminated equipment may be washed with water and detergent, 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.

Collect the spill clean-up material and any contaminated soil and place into disposal containers. Secure the lids and label the container with the contents. Flush or clean the contaminated areas, containing and collecting the rinsate. Do not allow the water to run off to the ground, sewers or waterways.

Follow federal, state, and local laws and regulations in determining the appropriate method of handling, storing, and disposing of the rinsates and wastes.

9. **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.

When the immediate threat is mitigated, determine whether the spill or release triggers notification and/or reporting requirements 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 table at the end of this section for product RQs. Note that individual state and local RQs may differ from the CERCLA/SARA RQs.

In addition, 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 INFOTRAC at 1-800-424-9300, Option 2. INFOTRAC will provide initial product emergency information and route you to the Emergency Response Team for 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).

Complete appropriate initial phone calls as soon as possible. Follow up with a written report if required.

- 10. Properly dispose of the spill clean-up material.** Contact your local, state and federal environmental authorities to determine the regulatory requirements for the proper disposal of the spill clean-up material.

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 registrant 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, so contact the registrant for more information immediately in the event of an incident. Reporting information or allegations is not an admission of liability.

CERCLA Reportable Quantities (RQ) and SARA Listing

Releases in excess of 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. Note that individual state and local RQ's may differ from the CERCLA RQ's.

“SARA Listed Components” in the table below 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.

Product	SARA Listed Components	CERCLA		
		CERCLA Compound	Compound RQ (lbs.)	Product RQ lbs. (gallons)
Tenkoz Proaxis	none	Napthalene (0.56%)	100	17,857 lbs. (2,105 gal.)

CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act

SARA = Superfund Amendments and Reauthorization Act

REFERENCES

Bulk Facility Inspections & Assessments

Retail Facility Checklist. and
*Manual for Conducting Retail Bulk Facility Site
Environmental and Safety Inspections*
American Agronomic Stewardship Alliance
(AASA). Washington, D.C. 20005
(202) 833-4480. Online at www.aginspect.com

Security Vulnerability Assessment Tool.
Web-based tool for security assessment of retail
facility and transportation practices. Sponsored by
Agribusiness Security Working Group, comprised
of Agricultural Retailers Association (ARA),
CropLife America (CLA) and The Fertilizer
Institute [TFI] in cooperation with Asmark Inc.
Online at www.aradc.org
or call ARA at (202) 457-0825

Bulk Facility Planning & Operation

*NFPA 30: Flammable and Combustible Liquids
Code* (~\$40)
NFPA 70: National Electric Code (~\$60)
National Fire Protection Association
Quincy, MA 02269
(800) 344-3555 www.nfpa.org

Guidelines to Help Ensure a Secure Agribusiness
Report by Ag Retailers Association, CropLife
America, and The Fertilizer Institute.
Online at www.croplifeamerica.org

*Environmental Handbook for Fertilizer and
Agricultural Dealers* (~\$75)
Tennessee Valley Authority (TVA)
National Fertilization and Environmental Research
Center; Muscle Shoals, AL 35662
(256) 386-2872

*Designing Facilities for Pesticide and Fertilization
Containment.* Publication # MWPS-37 (~\$20)
Midwest Plan Services, Iowa State University
Ames, IA 50011
(515) 294-4337

Bulk System Vendors (others may be used)

Murray Equipment Inc.
Fort Wayne, IN 46808
(800) 348-4753; www.murrayequipment.com

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

Chemical Containers Inc. 2003
Lakes Wales, FL 33859
(800) 346-7867 www.chemicalcontainers.com

Westheffer Company
Lawrence, KS 66044
(800) 362-3110. www.westheffer.com

Worker Protection

40 CFR Part 170 Worker Protection Standard.
Online at Government Printing Office homepage
<http://www.access.gpo.gov/nara/cfr/index.html> .
More information at EPA website www.epa.gov

*Recognition and Management of Pesticide
Poisoning.* EPA's Office of Pesticide Programs.
Online at www.epa.gov

Hazardous Waste

*How to Recognize A Hazardous Waste (even if it's
wearing dark glasses)* (~\$20)
Digby Books Ltd.
Pittsburgh, PA 15217
(412) 421-4995 www.digbybooks.8k.com

Emergency Response Information

For this product, call CHEMTREC at 1-800-424-9300.

TM Proaxis is a Trademark of Pytech Chemicals GmbH. Always read and follow label directions.