

ARKEMA COATING RESINS

Storage and Handling

A Basic Guide to the Bulk Storage and Handling of
Emulsion Polymers

STORAGE AND HANDLING OF ARKEMA COATING RESINS PRODUCTS – A BASIC GUIDE

Contents

Introduction	3
General Layout of Bulk Storage System	4
Location	4
Storage Tank Size.....	4
Storage Tank Design	4
Bulk Storage System Design and Construction	5
Storage Tanks.....	5
Piping.....	6
Valves.....	7
Pumps.....	7
Level Indicators.....	8
Filters.....	8
Meters.....	8
Latex Storage	9
Maintenance of Bulk Storage Systems.....	9
Latex Shipments	10
Shipment Modes.....	10
Skin Formation.....	10
Cold-Weather Handling	10
Unloading Procedures	11
Tank Cars.....	11
Tank Trucks	12
Handling and Storage of Packaged Goods	12
Environmental, Health and Safety Considerations	13
Health Hazards.....	13
Spills.....	13
Combustibility.....	13
Disposal of Waste Latex Products	13
Product Stewardship	14

Note: While reasonable efforts will be made to assist customers in establishing appropriate storage and handling facilities for Arkema Coating Resins products, Arkema is not responsible for procedures and equipment not under its control. Responsibility for such procedures and equipment is that of the customer-user and/or equipment manufacturer.

INTRODUCTION

An important goal of Arkema Coating Resins is to ensure that our customers are aware of the appropriate and safe handling practices for our latex products. The information in this brochure is intended to provide general handling guidelines for our waterborne emulsion products. Customers are encouraged to contact Arkema Coating Resins directly with any specific questions or concerns related to receiving, transferring, storing and handling of our products that are not addressed in this document. Customers using larger volumes of latex may find it advantageous and more economical to handle and store Arkema Coating Resins products in bulk quantities.

Arkema Coating Resins products are stable aqueous emulsions which are easily transferred from a tank car or tank truck unloading station into storage tanks. A simple system of pumps and pipelines can accomplish this, and also can make the latexes readily available at suitable manufacturing or compounding facilities on any floor or at other suitable locations in the plant.

When bulk storage facilities are installed, handling operations are simplified. Drum handling and storage, lift truck operation, and elevator service are unnecessary. Costs may be lower because of the bulk price advantage and because of reduced overhead of handling and storage. The sum of these advantages can repay the initial expense of installing bulk storage and handling facilities in a manufacturing plant.

Much of the information contained in this guide is based on years of experience in bulk storage and handling of latexes in our manufacturing plants. Most of the equipment or materials listed are the same as those used in Arkema plants; however, references to types of material and equipment should not be considered as specific recommendations or manufacturer endorsements. All information contained in this guide should be used in conjunction with the equipment manufacturers' guidelines and recommendations.

The information contained in this guide is relevant to most latex products presently supplied by Arkema Coating Resins including: vinyl acrylic, 100% acrylic, styrene acrylic, modified acrylic, vinyl acetate ethylene, styrene-butadiene and vinyl acetate homopolymer latexes.

Bulk handling, storage conditions, reactivity with metals, etc, may vary with each latex. To achieve maximum operating efficiency, supplemental details for each particular type of latex are available to customers using that latex, as well as Safety Data Sheets (SDS)¹, product specifications, and technical data sheets (TDS). Please contact the Arkema Coating Resins Response Line using the telephone number listed on the back cover.

¹Also referred to as "Material Safety Data Sheets" or "MSDS."

GENERAL LAYOUT OF BULK STORAGE SYSTEM

A schematic diagram for the bulk transfer and storage of latex is shown in Figure 1. The latex is unloaded through the flexible hose connected to the tank car or tank truck and passes through the pump and into the storage tank through the side inlet pipe. It is drawn from the tank through a bottom outlet, passing through a filter, pump, and pipelines to the point of use in the plant. Water must be available at the unloading station for cleaning out the carrier after emptying, as well as for flushing out the hose and pipelines used in unloading.

Location

Latex storage tanks may be located at any convenient point in the plant, but preferably close to the tank car or tank truck unloading station. Close proximity limits head pressure on the pump and hoses during off loading.

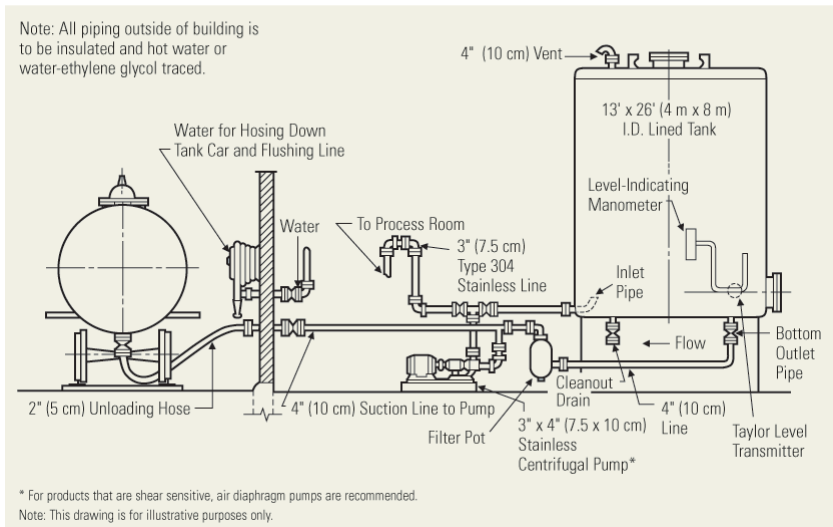
Latex may be transferred in the plant by gravity flow, pump or by air pressure. Avoid agitation and consequent foaming over of the latex in the receiving tank. Also avoid any pressures that might rupture the pipelines or tanks.

Storage Tank Size

The capacity and number of storage tanks depend primarily on the volume of latex used. Sufficient capacity should be planned to allow normal withdrawals while awaiting arrival of new bulk shipments. Having two storage tanks is preferable, since this permits periodic cleaning without production interruption.

The 13-foot (4-meter) diameter (I.D.) by 26-foot (8-meter) high tank shown in Figure 2, page 5, has a useable capacity of 25,000 gallons (95,000 liters) and thus accommodates deliveries up to 20,000-gallon (76,000-liter) tank cars, including a minimum stock inventory. Storage tanks of this size can be supplied by rail, which may be a convenient and economic advantage.

Figure 1 — Tank Car Unloading and Latex Storage Facilities using a Centrifugal Pump



Storage Tank Design

During storage, a skin layer usually forms on the surface of the latex exposed to air and acts as a floating cover that rises and falls with the level of the latex. The speed and amount of skin formation are more dependent on the individual latex than on the type of storage tank employed. Humidification or gas blanketing of the air space above the latex will minimize skin formation but is not required. Also, periodic circulation with jet-mixing has been found to minimize this floating layer as well as the skin formation on the walls.

A vertical cylindrical tank exposes a minimum of latex surface area to the air,

reducing the skin layer. Also, a cylindrical tank is easier to coat with a protective lining and requires only minimum reinforcing across the top dependent upon design.

Horizontal, cylindrical or rectangular storage tanks may also be used in plants that have storage area limitations. In a horizontal cylindrical tank, latex surface skin build up may be thicker, and this may interfere with bulk storage operations. In addition, a rectangular storage tank may require reinforcement of both sides and ends to prevent bulging.

BULK STORAGE SYSTEM DESIGN AND CONSTRUCTION

Storage Tanks

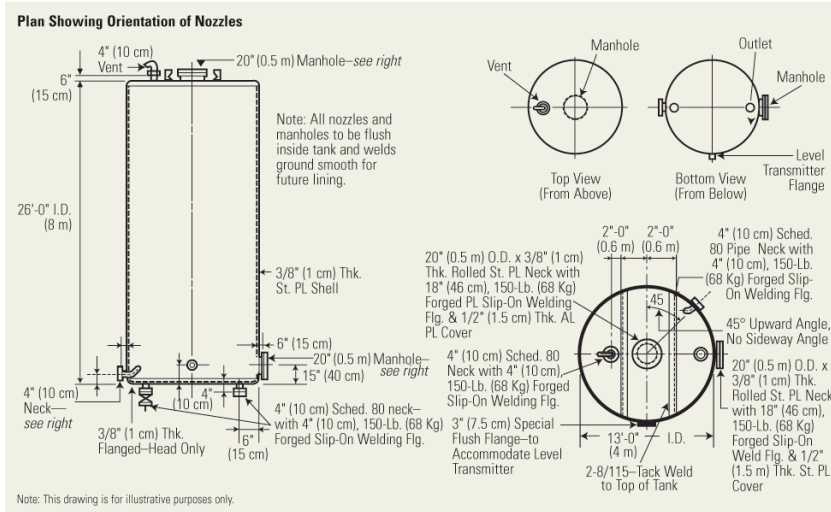
Storage tank construction details are shown in Figure 2. The tank has a large cleanout manhole at the bottom and an inspection manhole at the top. A 4-inch (10-cm) inlet neck is provided in the side near the bottom of the tank with a 45-degree elbow inside to direct the flow of latex up and away from the 4-inch (10-cm) outlet located in the bottom of the tank. This helps in uniform mixing of the latex when new material is added to the storage tank. It also is a means for recirculation and mixing if the latex requires agitation after being unused for an extended period. Extension of the angled nozzle further into the tank can significantly improve mixing. For high viscosity or high solids latexes, installation of a mixer should be considered.

The tank in the diagram has a flatplate top that usually requires reinforcing. A bumped head can be used without reinforcing. The top of the tank is vented with a 4-inch (10-cm) pipe, permitting air movement during loading, unloading, or latex expansion or contraction.

Materials of Construction

Latex storage tanks may be fabricated from a variety of materials, including stainless steel, resin lined steel or glass fiber-reinforced polyester. Stainless steel tanks are recommended since they provide advantages of permanency and inertness to most chemicals. Also, stainless steel tanks may be cleaned without risk of damaging coatings or lining systems (needed in carbon steel tanks).

Figure 2 — 13'-0" Dia. x 26'-0" I.D. (4 x 8 meter) Storage Tank Construction Details



The most widely used type is the resin-lined steel tank. It is commonly fabricated from 3/8-inch (1-cm) steel plate with all-welded construction and is then lined with a baked phenolic, polyester/glass fiber, epoxy or epoxy/glass fiber system.

Room-temperature-cured epoxy and phenolic linings are commonly used since they can be field applied and repaired.

These linings include: Plasite® 7122, and Phenoline® 373 (Carboline International Corp.). Be careful not to damage the lining when cleaning lined storage tanks.

Glass fiber-reinforced plastic tanks are satisfactory for latex storage if they are properly designed and correctly installed. The inert surface is generally resistant to contamination or chemical attack.

Temperature Protection

Latexes must be protected against freezing and against extended exposure to temperatures above 100°F (37°C). The desired storage temperature is 40-90°F (4-32°C). Storing latexes in indoor tanks is preferred due to reduced temperature cycling. Indoor tanks can be protected using typical building heating and cooling systems.

Outdoor tanks can be insulated with 1 1/2 inches (15 cm) of TRYMER® (Illinois Tool Works) a polyisocyanurate material or its equivalent and should be covered with sheet metal to protect the insulation from weathering. Stainless steel pencil coils, fed by a hot water or water-glycol circulating system, may be located at the bottom of the tank to keep the latex from freezing. This, in turn, requires a constant-temperature liquid reservoir and circulating pump located near the storage tank. An alternative is radiant heat in the cement pad or foundation. Steam heated coils should NOT be used because of possible localized overheating, causing latex coagulation on the coils and a resultant drop in heat transfer.

Heating is unnecessary in areas where freezing is not a problem. Outdoor tanks should be coated with reflective white paint to avoid extreme heating by strong sunlight.

Piping

Cross contamination of latex products should be avoided. Latex performance can be affected by cross contamination with other products or raw materials. Separate offloading and piping systems for each product used will eliminate the potential for cross contamination. Some latexes will interact with one another, causing destabilization. Special care should be taken with these systems to prevent any contact between these latexes.

Piping installations should be designed to eliminate dead spaces where material might accumulate or stand for long periods of time. Pipelines not in continuous use should be inclined to permit complete drainage when not in use.

If lines are kept full with latex at all times, skin formation or plugging should not occur. If lines must be emptied, they should be drained and flushed well with clean (preferably potable) water.

Metal Piping

The optimum piping material for handling and transporting Arkema Coating Resins products is Type 304L stainless steel with Type 316 stainless steel as the alternative. Copper, brass, carbon steel, and galvanized steel are not suitable long-term for this service because of the potential adverse effects of these metals on latex product quality.

Type 304L stainless steel pipe (schedule 10) and tubing can give long and satisfactory service with all types of Arkema Coating Resins products. A minimum diameter of 2 inches (5 cm) is recommended for effective flow in a bulk storage and bulk handling system. Quick-opening couplings provide an efficient and economical method of joining lengths of stainless steel pipe. The sections are generally limited to 20 feet (6 m) in length to facilitate easy removal.

The practice of burning out lines is not recommended due to the damage that this can do to the pipe: stress corrosion cracking of the stainless steel piping. The only ways of removing dried latex are mechanical dislodgement such as peeling or scraping or hydroblasting methods.

Copper and brass are less desirable piping for latexes because of possible reaction with certain latex components. Galvanized and black iron pipes are not acceptable and should not be used in latex bulk storage systems due to skin buildup, rust contamination and corrosion.

Plastic Piping

Polyethylene, rigid vinyl, epoxy glass fiber and plastic-lined steel piping present inert surfaces to Arkema Coating Resins products and are suitable if designed to meet the conditions of use. Polypropylene-lined steel pipe is especially good for latex service. In bending such pipe around corners, keep the arc long enough to prevent weakening or fracture. Many of these pipes are heat sensitive and should be kept away from hot areas, such as uninsulated steam lines, to prevent weakening and possible rupture.

Arkema Coating Resins latex plants use plastic piping in some piping systems with satisfactory results. Reinforced neoprene rubber hose may be used for temporary transfer of latex.

Temperature Protection

Outdoor lines should be electrically traced and insulated to keep the latex from freezing. The tracing should be self-limiting or otherwise controlled to avoid temperatures above 120 °F (48 °C). Steam tracing is not recommended but hot water or water-propylene glycol tracing may be used if desired.

An enclosed heated header can be used with multiple lines, or the line may be incorporated into an existing multiple-line heated system if the temperature is controlled in the correct range. Tracing lines should be of welded construction and tested for leaks before insulating. Underground lines should be below the frost line. Electrical line tracing is equally applicable with adequate over temperature protection.

Valves

Stainless steel ball valves are the optimum choice for latex service and are typically used in Arkema Coating Resins latex manufacturing facilities. Valves which operate with a wiping action at a close tolerance, or which have mechanical parts exposed to the latex, should be avoided because latex buildup may occur.

Pumps

Diaphragm pumps and stainless steel, open-impeller centrifugal pumps are satisfactory for use with Arkema Coating Resins products. For latexes that are shear sensitive, it is recommended that only diaphragm pumps be used.

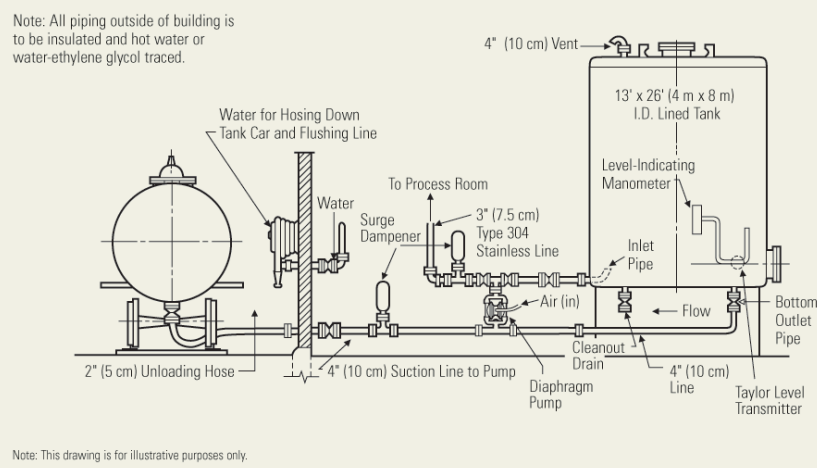
Many companies use stainless steel gear and Moyno® (Moyno, Inc.) pumps without problems, but these types are not usually recommended for continual pumping of pure latex. They are satisfactory for the transfer of pigmented formulations containing latex.

Piston pumps having large areas of close tolerance are generally unsatisfactory because of the possibility of polymer buildup.

Centrifugal Pump Seals

Many latexes wet various surfaces and seep through most packings in a very short time. Skins may form around the pump shaft, slowing down the operation of centrifugal pumps and even scoring the shaft. The best solution to this problem is the use of a double mechanical seal with a lubricant on the seal side. The lubricant needs to be compatible with the latex. An FDA-compliant synthetic oil is typically used.

Figure 3 — Typical Air Diaphragm Pump in Latex Service (versus Centrifugal Pump)



The seal needs to be installed as recommended by the manufacturer. The installation will typically include a pressurized seal oil pot with provisions to ensure thermosiphon recirculation of the oil through the seal chamber.

An installation of this kind has proven to be effective in eliminating leakage from a latex transfer pump. Good manufacturing practices will need to be applied to ensure that this seal system maintains its effectiveness long-term.

If a certain amount of water leakage into latex can be tolerated and the double mechanical seal is too complex for your operation, then the alternative of a water seal and packing gland is recommended. Clean water is fed into the lantern ring around the shaft through the lubricating hole. The three rings of regular packing on either side are left loose enough so half the water flows into the pump and

the other half flows to the outside. The amount of water is regulated by a pressure-reducing valve and an orifice in the line. Water is turned on and off by a solenoid valve operated by one phase of the motor power circuit.

The pressure regulator and orifice size are adjusted to deliver 100 cm³ per minute when pumping through a 3-inch (7.5-cm) line at a rate of approximately 100 gallons (400 L) of latex per minute. Smaller amounts of water are required if smaller latex lines and slower pumping rates are involved.

Do not use an excess amount of water or it will dilute the latex being pumped. The packing should be adjusted so there is some leakage both into and out of the pump. This will act as a lubricant and prevent latex from getting into the packing.

Level Indicators

The latex level in a bulk storage tank can be determined with a pneumatic-type level indicator. As shown in the general layout diagram, Figure 1, page 4, the level indicator is connected so that latex head pressure on the stainless steel diaphragm is converted to level reading on a manometer or pressure gauge.

Redundant high level indicators are recommended on the storage tank to prevent overfilling.

Filters

All Arkema Coating Resins products are filtered during processing. They are also filtered just prior to drumming and tank car or tank truck loading; however, many Arkema Coating Resins products are excellent film formers and may develop skins or particles during shipping and storage. These can be removed by filtering the latex as it is sent to the point of use in the production plant. See Figure 1 on page 4 and Figure 4 below.

Filter Design

Because a small number of particles can cover a fairly large screen area, the filter pot should be large. It should also be designed for easy cleaning. A filter pot arrangement that gives good service is shown in Figure 4. The latex flows into the end of the tank and through a nylon sock. The sock is supported over a number 4-mesh screen cartridge, which is removable for cleaning.

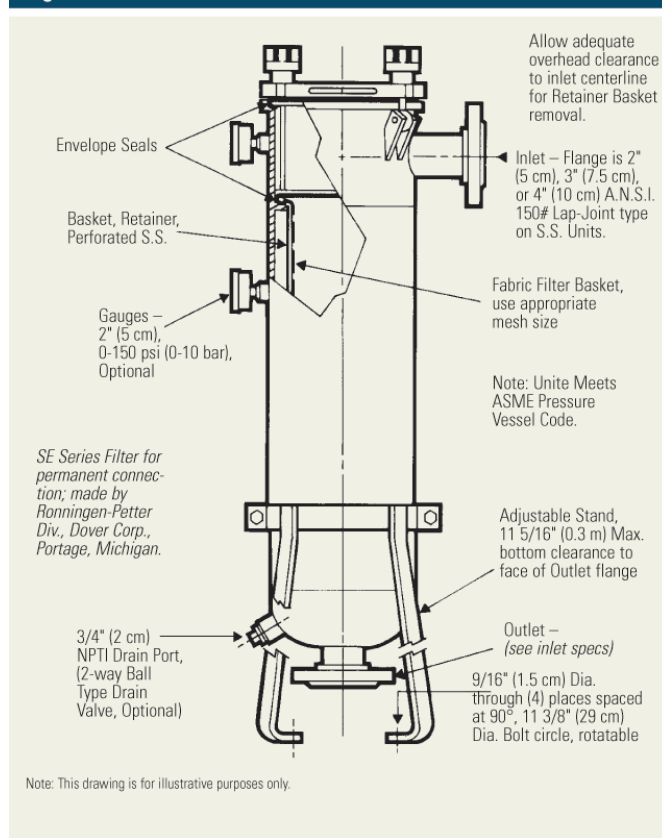
Meters

Positive displacement flow meters in 1-inch (2.5-cm) and 2-inch (5-cm) sizes are used successfully with most Arkema Coating Resins products. With reasonable care, these meters provide an accurate method of latex volume measurement. If meters require cleaning, warm water may be tried;

however, solubility of dried latex depends on the latex composition.

Excellent performance has been given by magnetic flow meters. These flow meters appear to be superior to positive displacement meters for film-forming materials.

Figure 4 — Filter



LATEX STORAGE

Most Arkema Coating Resins products are storage stable with a shelf life of at least six months, depending on chemistry. Consequently, only routine attention is necessary for storage. During periods of extended storage, certain latexes may show tendencies to stratify (layer) or pH drift. Such tendencies are accelerated by storage at elevated temperatures.

Stratification does not impact latex quality. Periodic recirculation of the latex in the storage tank usually prevents such separation.

Occasionally, with long-term storage, a downward drift in pH might be observed and could indicate a product performance change. Contact your Arkema Coating Resins sales representative for assistance.

Maintenance of Bulk Storage Systems

In most cases, a well-designed bulk storage system can be operated trouble-free with a minimum of maintenance. Arkema Coating Resins products contain a biostat to prevent microbial growth when the product is shipped. Latexes are, however, an ideal nutrient medium for microbes, which can grow if conditions are suitable. The risk of microbial problems can be minimized by avoiding contamination and by cleaning the latex containment system regularly.

Avoidance of Contamination

Aqueous raw materials can often support microbial growth; therefore, care should be taken to avoid contamination of latexes with such materials.

Water supply systems are another potential source of microbial contamination, especially where process water is recycled;

they should, therefore, be regularly monitored and treated as necessary.

To limit contamination by airborne microbes, tank hatches and covers should generally be kept closed. Care should also be taken to avoid introducing air with the latex as it is pumped into storage tanks.

To obtain further information on avoiding contamination, please contact the Arkema Coating Resins Response Line using the telephone number listed on the back cover.

Cleaning Procedure

A bulk storage system should be cleaned on a regular basis. Generally, a six-month to one year cleaning schedule is sufficient. After being emptied, a storage tank should be thoroughly ventilated before personnel are allowed to enter it. Personnel should be provided with appropriate safety equipment and information before entering a tank (pursuant to applicable regulatory codes).

A bulk storage tank may be cleaned by hosing down the interior with potable water and removing loose skins by hand. Hot water or hydroblasting may also be used to clean large surfaces or remove tightly adhered skins. Scraping or use of excessive high pressure for hydroblasting should be avoided in resin-lined tanks because of the possibility of damaging the lining. If the tank will not be returned to service immediately, care should be taken to drain all wash water from it.

Lines should be drained and flushed with water. Latex films can be removed from pipe work by using detergents or water surges. It may be beneficial to use combinations of these methods. After flushing, lines should be completely drained.

Sanitation Procedure

The above procedures are generally sufficient to keep a bulk storage system in good operating condition. If sanitation becomes necessary, the tank should first be cleaned (as described previously) before applying one of the following treatments:

- a) Fill the whole system (tanks, lines and pumps) with water and add chlorine bleach to the tank. Circulate the contents through the system for 4 to 8 hours. Drain the system and put back into service.

An alternative to (a) above is to atomize a diluted hypochlorite solution into the empty vessel with a standard paint sprayer and leave it closed for a minimum of 4 hours. Provide electrical grounding for the sprayer. Rinse tanks with water before filling with latexes.

WARNING: AVOID BREATHING THE VAPORS AND AVOID SKIN OR EYE CONTACT. WEAR A SELF CONTAINED, POSITIVE PRESSURE BREATHING APPARATUS. GOGGLES AND OVERALLS MUST BE WORN.

- b) Stainless steel storage tanks may be sanitized by steaming them for 12 to 24 hours. (The outside wall of the tank needs to reach 180 °F [~80 °C].)

If the sanitized system is not to be returned to service immediately, care should be taken to completely drain and dry the system.

LATEX SHIPMENTS

Shipment Modes

Arkema Coating Resins products are typically available in bulk shipment sizes including 20,000-gallon (76,000-liter) rail cars; 5,000- to 6,500-gallon (19,000- to 25,000-liter) tank trucks; 250-gallon (950-liter) totes; and 52- or 55-gallon (~200-liter) drums. Drums are composed of plastic. Other bulk sizes may be available under special circumstances. Representative samples from each shipment are tested to help assure the high quality of Arkema Coating Resins products.

Skin Formation

Skins are most likely to form during hot summer months. The amount of such material is small. Skins can be filtered out if necessary and in no way impair the quality of the latex if removed.

Cold-Weather Handling

Cold-weather bulk shipments of Arkema Coating Resins products are made in insulated tank cars or tank trucks. The latex is loaded at a temperature of 60 to 70 °F (15-21 °C). During normal cold-weather shipping, the latex will show an overall drop in temperature of only 10 to 20 °F (5-11 °C).

Package shipments are more susceptible to freezing conditions than bulk shipments. Shipping dates of packaged goods during cold weather months will be limited to allow for delivery by Friday of the same week.

As seen in Figure 5, page 11, tank cars usually have a drain leg with both an internal and external valve arrangement to prevent loss of latex should the internal valve fail.

UNLOADING PROCEDURES

Tank Cars

These steps briefly describe recommended practices followed in unloading Arkema Coating Resins products from tank cars. (See Figure 5, right.) Should customers be unfamiliar with such practices, they should contact their Arkema Coating Resins sales representative for additional information.

A. Bottom Unloading

1. Remove valve stem cover over the stuffing box and tighten internal valve (it sometimes loosens in travel). During lockups, the internal valve must be tightly closed to avoid latex loss should the drain leg have been damaged in transit. Use notched portion of cover as valve wheel. If use of wrench is necessary to turn valve, place wrench on cover and not on valve stem.
2. Check bottom valve and be sure it is closed, then remove 2-inch (5-cm) pipe plug.
3. Turn valve to open position.
4. Open dome cover to prevent pulling a vacuum on the car.
5. Open internal valve slowly at first and check for leaks at the connections. Car should unload through a 2-inch (5-cm) line in about three hours, depending on size of pump.
6. CAUTION: If the dip pipe plug is inadvertently removed before the car is vented, a pressure differential caused by temperature changes may force some latex out the dip pipe opening.

B. Bottom Unloading with Air Pressure

(Same procedure as in "A," Steps 1-3, except)

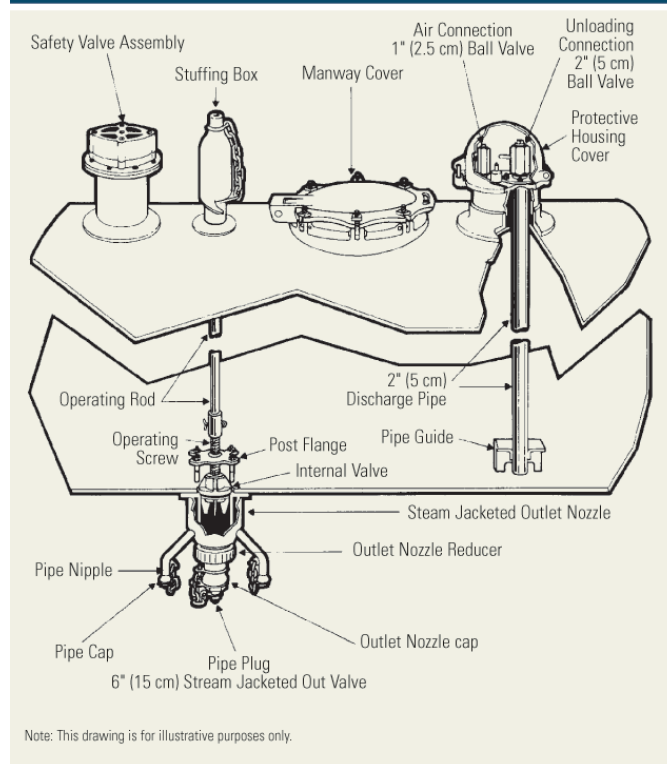
1. Do not open dome cover. Check hold down bolts. Tighten, if loose.
2. Remove 1-inch (2.5-cm) air inlet plug and make air connection. Connection should consist of pressure gauge, safety pop valve, air shutoff valve and air vent valve. IMPORTANT—DO NOT UNLOAD AT MORE THAN 20 PSI AIR PRESSURE. WORKING PRESSURE OF 15 PSI IS ADEQUATE.

C. Top Unloading with Air Pressure

(Same as Procedure "B," Steps 1 to 4, except)

1. Do not open bottom valves until car is empty and ready for rinse and drain.
2. Top outlet pipe has 2-inch (5-cm) plug and ball valve. NOTE: As in "B, 4"—watch the receiving tank for foamover.

Figure 5 — Tank Car Unloading Schematic



3. On rare occasions, the tank car may arrive with a frozen drain leg. Should this occur, check the internal valve to make certain it is closed. Proceed as in Step 4 of Procedure A, "Bottom Unloading," to open the outlet valve. Thaw the drain leg with hot water or steam. After thawing, close the outlet valve and proceed as described under Procedure A, "Bottom Unloading," Steps 3 to 6
4. If unloading is interrupted for some reason during freezing weather, the drain leg should either be protected from freezing or drained after closing the internal valve.

5. Steam tracing of unloading lines is not recommended because coagulation of the latex can occur.

D. Wash-Up of Tank Car and Unloading Lines

1. Immediately after unloading, wash out the tank car, the hose and all other unloading equipment to prevent formation of skins. If clean and reasonably mineral-free water is used, and if a slight reduction in latex solids can be tolerated, a small quantity of the initial wash water can be pumped into the latex storage tank. Your Arkema Coating Resins sales representative should be contacted prior to use of this recovery procedure because some latex processes will be impaired by dilution.
2. When weather is above freezing, leave about 20 gallons (75 liters) of water in the tank car for the return trip.
3. During freezing weather, drain the wash water from the tank car, the unloading lines, and other exposed equipment to prevent freeze-ups and consequent breaks. Close bottom internal valve and open bottom external valve for return trip.
4. Secure the manhole cover before releasing the empty car.

Tank Trucks

Tank trucks may vary in both equipment and design. The tanks are usually constructed of stainless steel, have a capacity of 5,000 to 6,500 gallons (19,000 to 25,000 liters) and may or may not be compartmented. Outlets or drain legs are usually 3 inches (7.5 cm) in diameter and have quick-connect fittings. Most tank trucks carry adapters to fit any size line, but specific adapters may be requested to accompany each latex shipment.

Latex purchase orders should specify all specific delivering equipment requirements such as air or pump capability, hose size and length and fittings needed.

Handling and Storage of Packaged Goods

Handling

Arkema Coating Resins products shipped in packaged goods (i.e., drums, totes) provide excellent protection and storage performance if certain minimum handling and storage standards are followed.

In some cases, latex stored in packaged containers for an extended period of time may have a tendency to stratify. Stratification may or may not impact quality – it depends whether the sediment can be re-dispersed by gently stirring the contents before use.

When moving drums, care should be taken to avoid back strain. Steel toe shoes and leather gloves, in addition to all other appropriate personal protection, are recommended for the job. Do not roll drums on their sides. Use a hand truck or a fork truck. Fork trucks with a top chime grabbing device may be used; however, side-clamping devices should never be used. Do not drop drums from any height, strike them on the side or damage them in any other way.

Storage

Drums and totes should be stored in an upright position. Tilt only to dispense product. Drums and totes may be stacked in straight columns on level floors. We recommend a maximum height of two drums or two totes. Drums and totes should not be stored in direct contact with the ground. Storage on concrete floors or wood pallets is preferred. Drums and totes should be protected from direct sunlight, rain, wet floors and steam. Avoid extreme temperatures. Protect from freezing environments. The desired storage temperature range for drums and totes is 40-90°F (4-32°C). Drums and totes should be stored away from high traffic areas of warehouses and otherwise protected to minimize the risk of damage to the container and subsequent leakage of its contents.

Packaging-Off Bulk Shipments

Arkema Coating Resins does not recommend packaging-off bulk shipments. Therefore the Customer assumes all risk. Material packaged off by Customer or any other third party may not be returned unless it is determined that the material was either out of specification or microbially contaminated when originally shipped by Arkema Coating Resins.

Consumption of Packaged Goods

The preferred arrangement for consuming drums and totes is a dip pipe equipped with a quick-close valve and a flexible suction hose connected to a centrifugal or diaphragm pump, preferably stainless steel. In order to avoid contamination, ensure that all hoses and handling

equipment used to consume the container are clean, dry and odor-free. The quick-closing valve is used to keep the system primed and to keep air out of the line. As the latex level nears the bottom of the container, the valve is closed and the suction hose is transferred to another latex container where the valve is again opened. This keeps the pump primed and little or no air enters the system.

The discharge side of the pump may be connected to another flexible hose or to any other type of suitable piping. This, in turn, may empty through a suitable filtering system into the receiving container.

PRESSURIZATION OF CONTAINERS TO UNLOAD LATEX IS NOT SAFE AND SHOULD NOT BE USED.

Microbial Contamination of Packaged Goods

The introduction of dip pipes and other unloading equipment to packaged goods can be a source of microbial contamination. It is important to follow good sanitization procedures when introducing this equipment to packaged goods that will be used for an extended time after opening.

Disposal of Empty Drums and Totes

Disposal of empty drums and totes must be in compliance with federal, state, provincial and/or local laws. Check with the appropriate agencies for your location. As a service to its customers, Arkema Coating Resins can provide lists of companies that may recondition or recycle used drums. For more information please contact the Arkema Coating Resins Response Line using the telephone number listed on the back cover.

Safety Data Sheets (SDS) on all Arkema Coating Resins Latex products are available to help customers satisfy their own handling standards and those that may be required by OSHA and other regulatory agencies. For more information contact Arkema Coating Resins using the telephone number listed on the back cover.

ENVIRONMENTAL, HEALTH AND SAFETY CONSIDERATION

Health Hazards

In general, Arkema Coating Resins products, in the form supplied, are not anticipated to produce significant adverse human health effects upon acute exposure. While exposure to most latex products is a relatively low hazard to personnel, the best practice is to avoid human contact and to have workers wear the appropriate personal protective equipment per the product SDS. In case of eye or skin contact, thoroughly flush the affected area with plenty of water. Remove and wash contaminated clothing and boots before reuse.

The following health hazard information is representative for most Arkema Coating Resins products; however, for a particular latex of interest, please refer to the appropriate sections of the SDS, which will provide more specific information for that particular product.

Ingestion

Generally Arkema Coating Resins products have low single-dose toxicity.

Eye Contact

Most Arkema Coating Resins products may cause minor to slight irritation of eyes. Should eye exposure occur, flush with plenty of low pressure water.

Skin Contact

The majority of Arkema Coating Resins products should cause no irritation from short exposure, but prolonged exposure (especially if confined within clothing or boots) can result in mild irritation, depending on the severity and duration of exposure. Generally, Arkema Coating Resins products have low single dose toxicity. In case of gross skin contact, wash skin with plenty of water. Remove contaminated clothing and wash before reuse. Dried product may stick to the skin causing irritation upon removal.

Inhalation

In general, Arkema Coating Resins products should pose no significant health problems when used with adequate ventilation. It is good industrial hygiene practice to avoid unnecessary exposure, such as avoiding inhalation of vapor from the vapor space of a storage container. Should mists be generated, care should be taken to avoid their inhalation. Refer to the product SDS for additional information.

Spills

Avoid unnecessary exposure and contact. Workers engaged in spill cleanup or disposal of spills should be protected from exposure. Contain all spills with inert material (i.e., dirt or sand) to prevent latex from entering municipal sewers or surface waters. Recover and recycle spilled latex if possible; otherwise collect with absorbent material and transfer to appropriate labeled containers for disposal. Contact your Arkema Coating Resins representative to discuss the ecological and product safety considerations that may surround the mixing, use and waste disposal of Arkema Coating Resins products.

Combustibility

As latexes (aqueous dispersions of polymer particles), these products are not flammable. Dried resin and films will burn, however, under the right conditions of heat and oxygen supply. In open burning of dried resin or films, dense black smoke may be emitted. See the product SDS for substances that may be emitted by polymer decomposition during combustion.

Water fog is the preferred method for extinguishing a fire of dried resin or film. Fire fighters and others who may be exposed to products of combustion should wear full fire fighting turn out gear (full Bunker Gear) and self-contained breathing apparatus (pressure demand/NIOSH-approved or equivalent).

Disposal of Waste Latex Products

In their “as sold” state, most used or discarded liquid latexes will not be hazardous materials as defined by the Resource Conservation and Recovery Act (RCRA). Please refer to the appropriate section of the SDS for specific details, and dispose of in accordance with federal, state and local waste disposal regulations. For unformulated and uncontaminated latex, the preferred disposal method is incineration. The same disposal options are preferred for formulated or contaminated material, although additional evaluation is required (see, for example, 40CFR, Part 261, “Identification and Listing of Hazardous Waste”). **DO NOT DUMP WASTE LATEX PRODUCTS INTO ANY SEWERS, ON THE GROUND OR INTO ANY BODY OF WATER.**

Disposal practices must be in compliance with all regulatory requirements. Waste characterizations and compliance with applicable laws are the sole responsibility of the waste generator. If other components are added to the liquid latex under the conditions in which it is used, the resulting mixture may, depending on what components are added, become subject to local regulatory requirements. Since Arkema Coating Resins has no knowledge of the components that may be added to its customers’ liquid latex during or after use, Arkema Coating Resins is not in a position to recommend a disposal method.

PRODUCT STEWARDSHIP

Arkema Coating Resins has a fundamental concern for all who make, distribute and use its products and for the environment in which we live.

This concern is the basis for our Product Stewardship philosophy by which we assess the safety, health and environmental information on our products and then take appropriate steps to protect employee and public health and the environment.

Arkema Coating Resins encourages its customers to review their applications of our products from the standpoint of human health and environmental quality. No latex product should be used as or in a food, drug, medical device, or cosmetic, or in a product or process in which it may contact a food, drug, medical device or cosmetic until the Customer has determined the suitability and legality

of the use. To help ensure that Arkema Coating Resins products are not used in ways for which they are not intended or tested, Arkema Coating Resins personnel will assist customers in dealing with ecological and product safety considerations. Your Arkema Coating Resins sales representative can arrange the proper contacts.

Arkema Coating Resins is continually updating its product safety and handling information. If a significant period of time has passed since the publication date listed on the back cover, please contact Arkema Coating Resins for updated information or revisions to this bulletin.

For more information please contact the Arkema Coating Resins Response Line using the telephone number listed on the back cover.



IMPORTANT: The statements, technical information and recommendations contained herein are believed to be accurate as of the date hereof. Since the conditions and methods of use of the product and of the information referred to herein are beyond our control, Arkema expressly disclaims any and all liability as to any results obtained or arising from any use of the product or reliance on such information; **NO WARRANTY OF FITNESS FOR ANY PARTICULAR PURPOSE, WARRANTY OR MERCHANTABILITY OR ANY OTHER WARRANTY, EXPRESS OR IMPLIED, IS MADE CONCERNING THE GOODS DESCRIBED OR THE INFORMATION PROVIDED HEREIN.** The information provided within relates only to the specific product designated and may not be applicable when such product is used in combination with other materials or in any process. The user should thoroughly test any application before commercialization. Nothing contained herein constitutes a license to practice under any patent and it should not be construed as an inducement to infringe any patent and the users is advised to take appropriate steps to be sure that any proposed use of the product will not result in patent infringement.

The product data provided in this document are typical values, intended only as guides, and should not be construed as sales specifications.

DISCLAIMER: Please consult Arkema's disclaimer regarding the use of Arkema's products on <http://www.arkema.com/en/products/product-safety/disclaimer/index.html>

ARKEMA
INNOVATIVE CHEMISTRY

Headquarters: Arkema Coating Resins

410 Gregson Drive
Cary, NC 27511
Tel.: 919-469-6700
Toll Free: 1-800-777-8227
arkemacoatingresins.com

Headquarters: Arkema France

420, rue d'Estienne d'Orves
92705 Colombes Cedex – France
Tel.: 33 (0)1 49 00 80 80
Fax: 33 (0)1 49 00 83 96
arkema.com