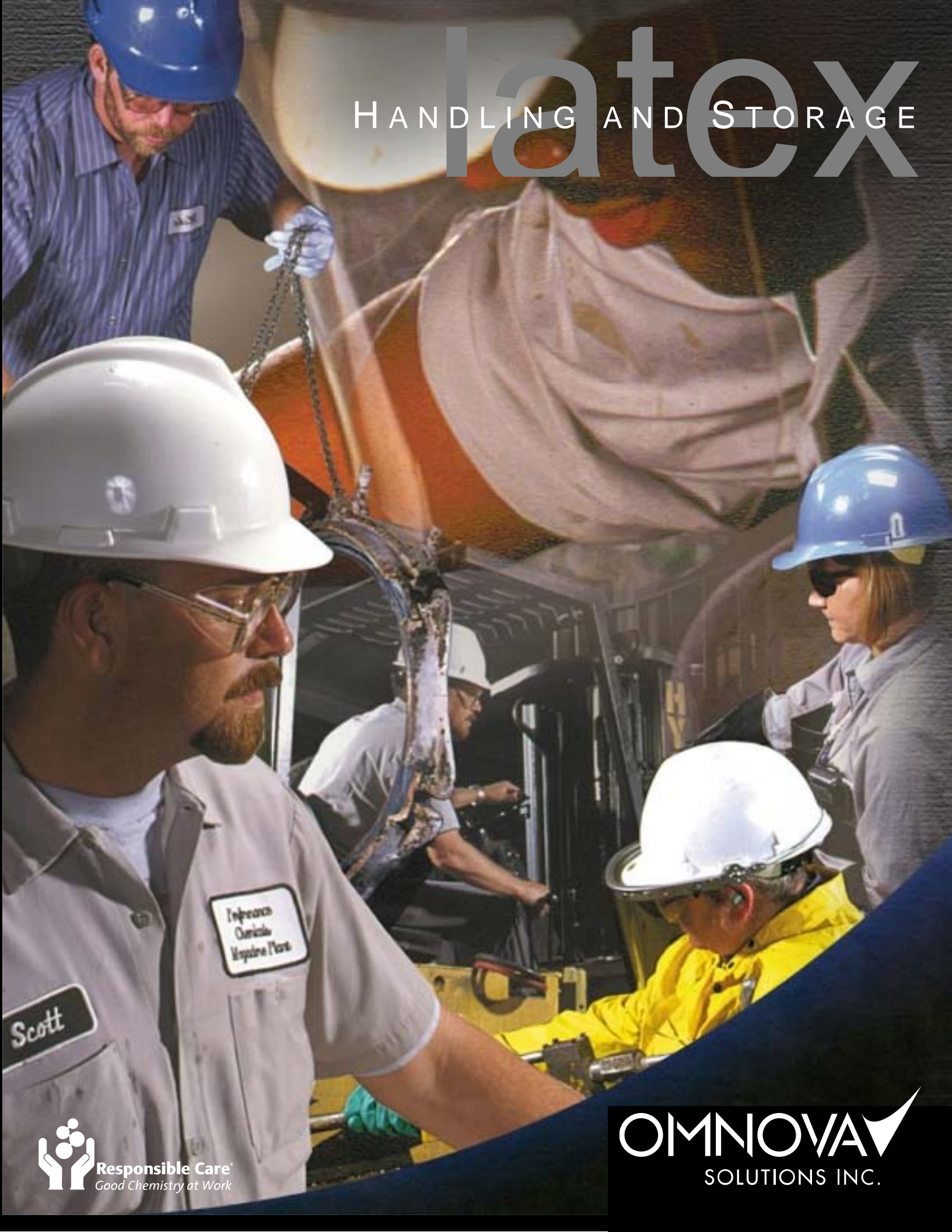


latex

HANDLING AND STORAGE




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Responsible Care®
Good Chemistry at Work

OMNOVA
SOLUTIONS INC.



This general information guide covers handling and storage of latexes currently manufactured by OMNOVA Solutions. This includes but is not limited to styrene-acrylic, styrene-butadiene, styrene-butadiene-acrylonitrile, vinyl pyridine latexes and plastic pigments. For more in-depth information on each product, you should refer to the applicable material safety data sheet.

OMNOVA strives to make safety, health and environmental protection an integral part of design, manufacturing, marketing, use, recycling, and disposal of the products we make. We strongly encourage our customers to review their applications for safe and appropriate use and from the standpoint of human health and environmental quality.

Please review all OMNOVA product literature with your Sales and Technical Service Representative prior to using it so that you fully understand the hazards associated with our products.

Contact your Sales and Technical Service Representative or call (888) 353-4173 to get more information covering product safety, health or environmental issues.

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Overview

OMNOVA latex products are non-toxic and safe for use in most applications without special precautions. However, direct contact with or ingestion of latex products should be avoided.

Specific uses or processing conditions may result in the need for additional protective measures. Always consult with your Safety Department to determine specific needs.

General health considerations

Most OMNOVA latex products are non-hazardous; some vinyl pyridine latexes are low hazard materials. Exposure hazards are relatively low, but avoiding direct contact with aqueous latex products is recommended.

People working with latexes should wear safety glasses and additional protective clothing as conditions of use warrant. Contaminated clothing should be removed as soon as possible to prevent the possibility of adhering to skin.

Respiratory protection

Respiratory protection is not required when OMNOVA latex products are used under normal conditions with adequate ventilation. The need for respiratory protection should be determined by process-specific Industrial Hygiene data.

Combustibility

Aqueous OMNOVA latex products are not flammable; however, dried residues and films will burn. Products of combustion include dense black smoke, carbon monoxide, carbon dioxide, low molecular weight hydrocarbons and nitrogen oxides. Firefighters should wear self-contained breathing apparatuses.

First aid

Eye contact	May cause slight irritation.	Immediately flush with water for at least 15 minutes.
Skin contact	Latex will bond clothing to hair or skin and can result in injury during removal.	Immediately flush with water and remove contaminated clothing before the material begins to dry.
Ingestion	Ingesting large quantities of latex may be harmful.	Contact a physician if large quantities are ingested. Never give anything by mouth to an unconscious person. Water or milk may be given to conscious victims.
Inhalation	Overexposure may cause nausea, disorientation, and headache.	Remove the victim to fresh air immediately and contact a physician.

WARNING! Latex products, if contaminated by bacteria, may evolve hydrogen sulfide gas. See “Bulk Latex Storage” (section 5) for further details.

General physical properties

	Paper/Textile	Vinyl Pyridine
Appearance and Odor	White to pale brown, mild, paint-like odor	Light purple, pungent odor
pH	4 – 9.5	7 – 11.9
Boiling Point	212 °F (100 °C)	~212 °F (100 °C)
Freezing Point	~32 °F (0 °C)	~32 °F (0 °C)
Specific Gravity	~1	~1
Solubility	miscible	miscible
Flash Point	N/A	N/A
Autoignition temp	N/A	N/A

Physical properties of specific products are listed on their respective material safety data sheets (MSDS).

FDA

Many OMNOVA latex products meet FDA requirements for contact and non-contact food packaging. Contact your Customer Service Representative for more information regarding specific FDA approvals.

Environmental considerations

Use inert diking material to contain spills. Latex products are harmful to aquatic life and should not be allowed to enter waterways or sewers.

Spilled latex should be recovered and recycled. Spilled latex may be collected with absorbent materials such as sand, earth or vermiculite for proper disposal. Absorbents that can be fuel blended, which is a form of recycling, are available.

Waste must first be characterized as hazardous or non-hazardous under the Resource Conservation and Recovery Act before selecting the appropriate disposal method. Preferred disposal options include use of licensed recyclers, reclaimers, or incineration.

Material safety data sheets

MSDSs for OMNOVA latexes are provided with the first shipment and periodically thereafter. Latex MSDSs may also be obtained at any time by contacting your Customer Service Representative or by calling (888) 353-4173.

Considerations

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All unloading procedures specific to a customer's unloading system should be observed. Some general considerations for unloading latex follow. Always consult with your Safety Department to ensure proper unloading.

Propylene glycol

During cold weather months, a 50/50 propylene glycol and water mixture acts as antifreeze to prevent freezing between the valve and end cap. The rest of the year, a 20/80 propylene glycol and water mixture keeps this valve system lubricated.

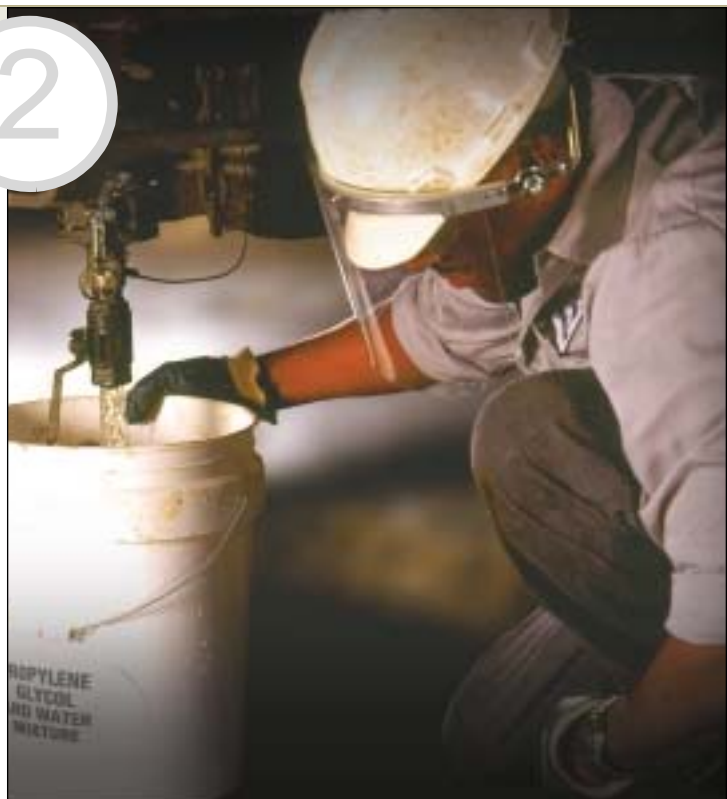
To avoid contaminating the storage system, the propylene glycol/water mixture should be drained and collected before the unloading process begins. Carefully open the drain plug from the outermost valve of the container with the internal valve closed.

Propylene glycol is non-toxic but should be collected for proper disposal. Contact your Environmental Department for proper disposal methods.

Railcar heating

Check the temperature of latex in a railcar if the car remains outside for more than two weeks during the winter months. If the latex temperature is below 75° Fahrenheit, the railcar will need to be heated to make the unloading process easier. (See drawing below.)

- Open the manway and the 1" safety vent on top of the car.
- Circulate tempered water through the internal coils of the railcar.
- Monitor the temperature and railcar level. Be careful to avoid overflow due to thermal expansion.



Skin formation

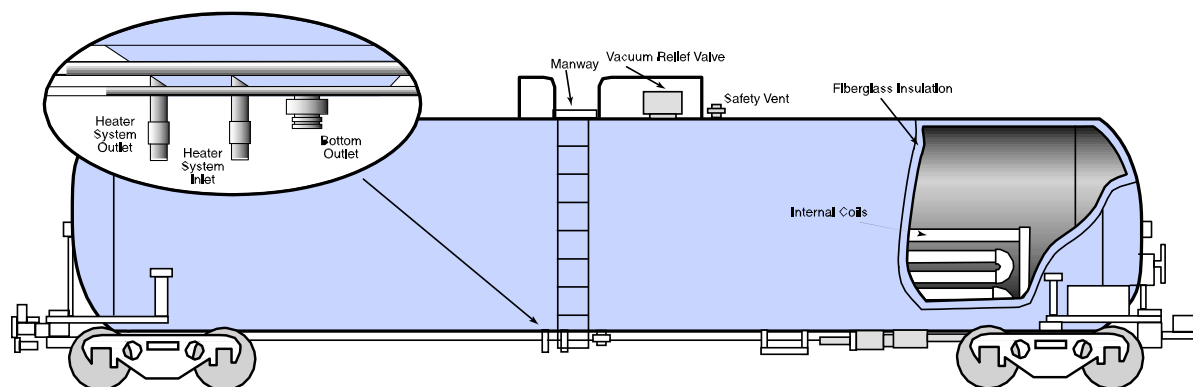
A thin solid layer (skin) may form on top of latex in containers. This condition is normal and protects the product from evaporating. Filters are recommended in the unloading system to prevent skins from entering and plugging the distribution system.

Unloading methods

Railcars and tank trucks are equipped with pressure and vacuum breaking devices and may be unloaded safely using unloading pumps, air or nitrogen pressure.

Most low shear positive displacement pumps are suitable for unloading latex. Ensure that the containers are properly vented while unloading to prevent them from collapsing.

If a pressure system is used to unload, OMNOVA recommends a regulated air or nitrogen system. The system pressure must be limited below the allowable working pressure of the lowest rated component in the system. Containers unloaded with air or nitrogen must be vented to atmospheric pressure before return transport.



! NOTE: See “Bulk Latex Storage” (section 5) for information on hydrogen sulfide gas due to bacteria decay and hazards of confined space entry.

U N L O A D I N G B U L K

Before beginning the unloading process

- Verify that the railcar brake has been set and the wheel(s) have been chocked.
- Check the product tag on the container valve against the bill of lading or Certificate of Quality.
- Confirm that there is enough room in the storage tank for the entire contents of the container.
- Inspect your unloading equipment. Unloading hoses should be clean and dry, and the end gaskets should be in good condition.
- Verify that clean unload filter(s) is in place.
- Check that container and storage system pressure relief vents are not plugged and are in working order.

Minimum personal protective equipment recommendations:

- Impervious gloves
- Boots
- Goggles
- Splash apron

Unloading process

If necessary, drain and collect the antifreeze solution in the drain leg. (See “Propylene glycol” on previous page.)

Secure hose connections by using locking connections or by tie wrapping camlock connections as shown in the photo to the right.

The rail car or tank truck internal valve should be opened last.

Check all valves and connections for leaks once flow has been established. Unloading operations should be continuously attended or monitored.

When unloading is complete, we recommend that the lines be flushed and then blown out with air to clean and dry in order to limit the opportunity for bacterial growth.

Wash unloading equipment with water immediately after unloading to prevent coagulants or skins from forming on and in the equipment. Collect wastewater

Containers

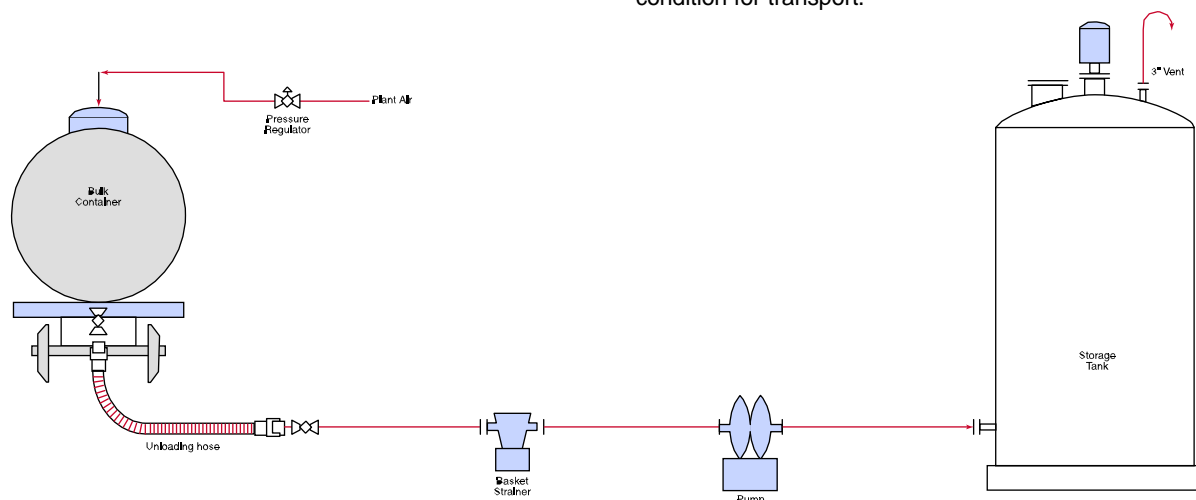
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All customer unloading procedures Specific to the unloading system should be observed. Some general guidelines for unloading latex follow.



and work with your Environmental Department for proper disposal.

Ensure that the container has been vented to atmospheric pressure, all valves and fittings have been properly tightened, and the container is in proper condition for transport.



Latex is available in lined steel, plastic, fiber 52–55 gallon drums as well as plastic 275-330 gallon tote quantities. Drum and tote quantities are typically used for products under trial and new start-up applications. They may also be used in low volume specialty uses.



D R U M A N D T O T E

Handling & Storage

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! WARNING! It is not safe to use air pressure to unload drums or totes. The container may rupture and cause serious injury or death.

Drumming-off bulk shipments

Use drums that are new or in like-new condition: clean, and without dents or rust. A gravity flow system that utilizes flexible hose and a dip pipe with a shutoff valve is safe and easy to use.

Never use air pressure to offload drums. The container may rupture and cause serious injury or death.

Drum handling

Wear steel toe shoes in addition to all the other appropriate personal protective equipment that is required for the job. Use caution and avoid back strain when handling drums.



A wide variety of drum dollies and lift-truck mounted carriers are available. Choose the appropriate handling device for the type of drum you are handling. Never use side clamping devices to move fiber drums.

Store drums and totes in an upright position, on level concrete floors or pallets, and away from high traffic areas to minimize the risk of damage. Container stacking options vary by container type, container level and storage conditions. For safety reasons, OMNOVA does not recommend that you go beyond double stacking of full drums and totes. Never stack full or partially full containers on top of empty or partially full containers.

Skin formation

A skin may form on top of latex in containers. This condition is normal and protects the product from evaporating.

If a skin forms, skim it before using the product to prevent the skin from entering and plugging the distribution system. Always agitate the latex in the container to remove the skin.

Drum and tote storage

Latex quality is temperature dependent and precautions need to be taken to avoid temperature cycling. The recommended storage temperature is 65° to 80° Fahrenheit.

To maintain recommended temperatures, store drums and totes in areas where they will not be exposed to direct sunlight or to sub-freezing temperatures.

OMNOVA adds biocides, which have a limited life, to its latexes to prevent bacteria from growing. See "Bacteria and hydrogen sulfide hazards," next page, for more information.

If stored as recommended, drums and totes of latex can maintain their quality for up to six months. Always sample containers that have been stored longer than six months before use. Mix the contents of the drum thoroughly before sampling.

Disposal of empty drums and totes

Thoroughly rinse empty containers to remove residue and then remove all labels.

The first consideration for disposal should be reuse or recycling. Disposal of empty drums and totes must be in compliance with federal, state, and local laws.

Storage

Confined space hazards

Storage tanks present confined space hazards. Only trained personnel should be permitted to enter a confined space.

Storage tanks and confined areas should be thoroughly purged, tested and monitored for hydrogen sulfide, proper oxygen levels, and any other potential air contaminants before entry.

Bacteria and hydrogen sulfide hazards

OMNOVA latexes are treated with biocide and bacterial growth should not occur under normal conditions. However, latex products are ideal mediums for bacterial growth under certain storage conditions. Bacterial counts can double every 20 minutes when conditions are favorable.

A purple or blue film or sheen sometimes indicates the presence of bacteria. Bacteria attack surfactants first. The latex may start to form blocks or chunks. Latex contaminated with bacteria may generate hydrogen sulfide due to bacterial decay and cause an odor similar to rotten eggs.

Hydrogen sulfide is a toxic gas that quickly incapacitates the sense of smell; therefore, odor is not a reliable indication of the presence of hydrogen sulfide. Testing may be accomplished using direct reading instruments, detector tubes, gas chromatography, photo-ionization, and other methods. Only trained personnel should perform these tests.

Latex storage

Latex in a bulk storage tank should be maintained at a temperature of 65° to 80° Fahrenheit. Specific sampling and testing schedules are necessary to assure latex quality.

Periodic mixing, for approximately thirty minutes every twenty-four hours, can help minimize skin formation of the latex and prevent possible stratification in the tank. Agitation is required for some products.

OMNOVA does not recommend using air agitation since it causes excessive foam and a reduction in pH values.

Skin formation

A skin may form on top of latex in storage tanks that are not periodically agitated. This condition is normal and protects the product from evaporating.

Skin formation will not present any quality issues as long as the tank is cleaned as recommended and the tank level is maintained. If the tank level drops too far, the skin can fall off the wall or collapse to the bottom of the tank.



Avoiding contamination and waste

Good housekeeping, clean tanks, and clean support equipment all help prevent growth. Do not pump re-blend material back into the storage tank as this can serve as a bacteria source, thereby contaminating the tank.

Dead areas or heels may permit bacteria to grow and serve as an ongoing source of contamination for the system. Storage tanks should be cleaned as often as necessary to prevent contamination.

Proper inventory management and periodic tank cleaning can minimize generating waste latex.

Latex sampling

Specific sampling and testing schedules are necessary to assure quality. Latex stored more than six months should be sampled and tested prior to use for properties, including bacteria. Mix the latex thoroughly before sampling.

During normal storage conditions there should not be an extreme drop in pH. If the pH drops below specification, contact your Technical Service Representative for instructions.

Use a thief or sample port to obtain a representative sample. To ensure a representative sample, recycle the material first, sample while filling, or purge the line with product before sampling.

Procedure

Storage tanks should be thoroughly cleaned and disinfected, especially whenever excessive bacteria growth occurs, or at least once per year. All procedures specific to a customer's tank system should be observed.

NOTE: Tank cleaning considerations include:

- hydrogen sulfide detection;
- personal protective equipment;
- confined space entry; and
- wastewater disposal.

Consult your Safety, Health and Environmental Department or contact your OMNOVA Sales or Technical Representative for assistance.

Tank cleaning process

Empty storage tank and blank lines.

Physically remove the latex build-up from the sides of the tank. Removal is easier using high-pressure water cleaning equipment. Hand scraping is also an option but, regardless of which method is chosen, care must be taken not to damage the tank or its lining.

Remove debris. Drain, clean and flush latex lines.

Inspect the tank lining, looking for breaks in the lining or other damage. Inspect the piping and valves for pitting and leaks.

Disinfect the tank and lines by treating them with a 2000 parts per million sodium hypochlorite solution. (Approximately 40 gallons of 5% bleach to 1,000 gallons of water.) Contact your Technical Service Representative if you have any questions.

Another less effective method that can be used to disinfect tank and lines is to fill the tank with water and heat it to 195° Fahrenheit. Hold the heated water in the tank for at least four hours. Purging with live steam can be used as a source of heat.



Design

What follows are general recommendations for designing a latex unloading and storage system. Work with your Technical Service and Sales Representative to design a system specific to your needs and to get a list of recommended suppliers.

Tank location and size

Storage tanks should be located as close to the bulk unloading area as is practical to minimize piping requirements. Provide proper pump and tank containment. Storage tanks are typically sized to hold normal bulk shipments plus a reserve amount. Keep in mind potential use and shipment options when sizing tanks.

Tank design

STORAGE TANKS NEED TO MEET ALL STATE AND FEDERAL CODES AND CONTAINMENT REGULATIONS.

OMNOVA recommends a vertical tank with a dish type head. This design requires less floor space, produces a minimum amount of surface air drying and provides better mixing characteristics. Mount this type of tank off the ground to permit easy access to the bottom inlet and outlet valves.

A sloped or dished bottom tank reduces solids build-up in the tank bottom because material is continuously purged to a downstream filter. Other advantages of a dished bottom are reduced product loss during tank cleanings and a minimization of contamination when switching products.

Recommended tank spec:

Wall thickness — 1/4", fitted with a top manhole 20" in diameter and side clean-out manhole (20–24"), agitation nozzle, 2" vent nozzle, 4" fill and discharge nozzles, 3" drain nozzle off bottom of tank and two 2" nozzles for thermometer and temperature probe (outdoor tanks only). Tank fitted with four baffles at 90° spacing each, 1/12 tank diameter in width and tank straight side dimensions in length.

Tank agitation

All storage tanks should be equipped with a method of periodic agitation for possible pH adjustments and for the reduction in skin formation and surface drying. Do not use air because it will cause excessive foam and reduce pH values.

Recommended agitator spec:

Low speed agitation (45) (RPM), dual turbine impellers, four bladed with diameter equal to 1/4 of the tank diameter, stainless steel shaft and impellers.

Tank level indication

High and low level indicators are recommended to prevent the tank from overflowing and provide accurate inventory monitoring. A wide array of level devices are acceptable for latex service. To reduce fouling, OMNOVA recommends using systems that minimize direct contact with the latex.

Tank materials of construction

Tanks may be constructed of Type 304 stainless steel or fiberglass reinforced polyester. Fiberglass is more cost effective for smaller tanks.

Carbon steel may also be used, but it is not recommended due to the potential for corrosion. If carbon steel is used, all surfaces, including baffles and nozzles, need to be coated with an epoxy phenolic lining to prevent corrosion.

Recommended temperature protection spec:

Tank walls and top insulation: Fiberglass #6 density board or Foamglas® block insulation 1 to 2" thick, two layers of reinforced glass fabric insulation seal to cover. Steel tanks: single-embossed carbon steel Platecoil® heaters, rolled to the outside tank diameter, bolted to tank walls with heat transfer cement sandwiched between. Hot water circulation is recommended, although low pressure steam may be used if necessary.

Tank temperature protection

Latex quality is temperature dependent. It is imperative that storage tanks exposed to cold weather be well insulated to keep the latex warmer than 65° Fahrenheit. There should also be some means of warming the latex when needed, either using hot water or heating tape.

System piping

Type 304 stainless steel, schedule 10 piping is preferred for latex systems. Black iron and carbon steel are not recommended because they may promote bacteria growth and are subject to corrosion. If plastic pipe is used, care must be taken to prevent small pieces of the pipe from entering and contaminating the tank system when cutting pipe during maintenance.

Use mass flow meters for precise latex flow rate measurements.

Piping systems that might be exposed to cold weather will require some type of temperature protection. Outside piping systems can be water traced using heat transfer cement and then covered with 1" thick fiberglass insulation and jacketing.

Low pressure steam tracing systems may be used as long as the steam tracing does not come into direct contact with the piping. Overheating will cause localized coagulation and may lead to dangerous pressure buildup in isolated lines. To prevent this, cover the pipe with 1" fiberglass, run 1/4" copper tubing for steam tracing on insulation layer and cover with 1/2" thick fiberglass with paper or PVC cover.

Unloading hoses and connections

Typical unloading systems consist of flexible hoses connected directly to storage systems or with pumps and filters in between. Hose systems and connectors should be pressure rated and tested to 1.5 times the allowable working pressure of the system.

A wide variety of chemical unloading hoses are suitable for latex applications. Your Technical Support or Sales Representative can assist.

Use 2-inch stainless steel dry-disconnect hose fittings to reduce spillage when making and breaking connections.

Valves

Full port stainless steel ball valves are preferred.

Pumps

Low shear pumps or compressed air or nitrogen are acceptable methods of moving latex in the system. The suction side of the pump should be protected by a pot strainer.

Nitrogen is preferred for use with vinyl pyridine latexes. Compressed air may be used with other latexes. Sparging air into latex storage systems must be avoided to prevent foaming.

If air supply is a problem, an open-impeller centrifugal pump, low speed (1150 or 1740)(RPM) with all stainless steel-wetted parts may also be used.

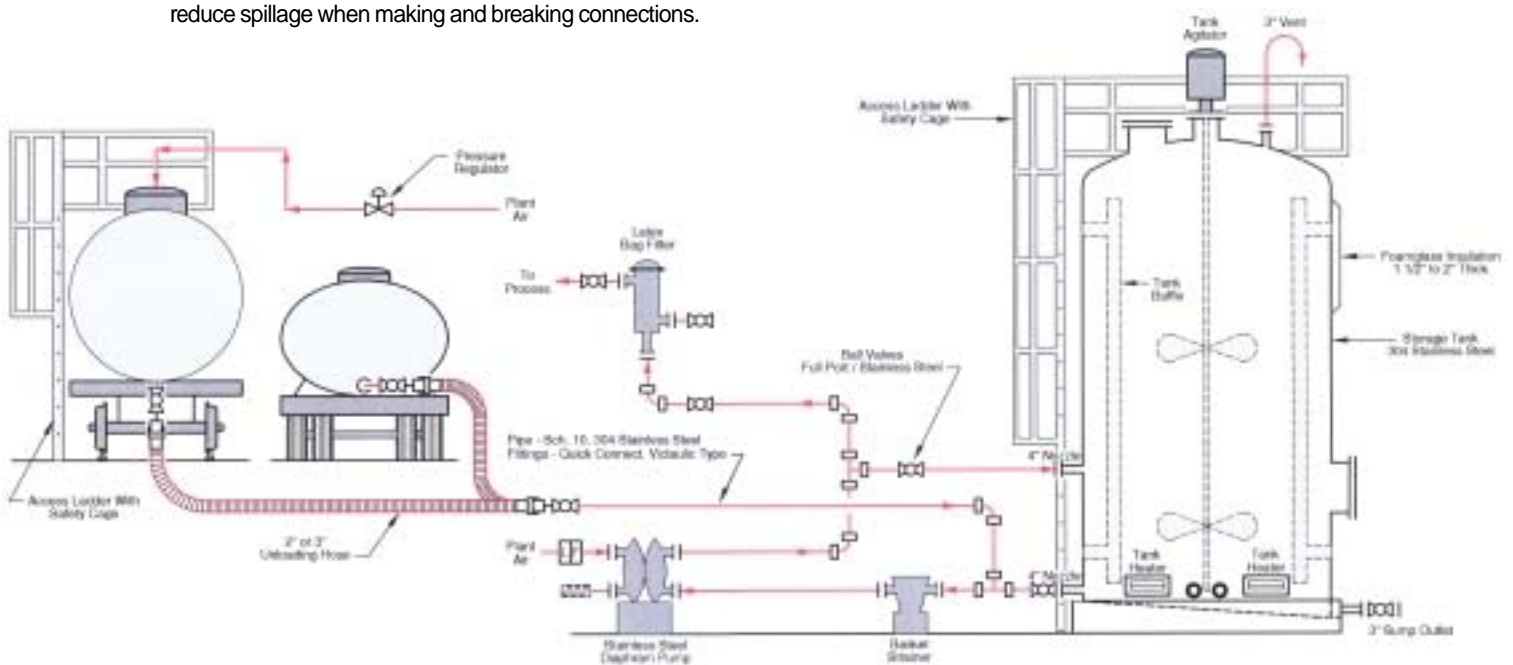
Filters and strainers

In-line strainers located in process lines remove any foreign matter which may have gotten into the storage system. They also function to remove any air-dried latex which may accumulate in the storage tank. These air dried latex or skins are typically small and do not affect the quality of the latex.

Stainless steel mesh screens can be cleaned with high-pressure water cleaning equipment. Fabric socks should be replaced at every unload and when the flow rate is noticeably restricted, and also to prevent bacterial activity.

Recommended strainer spec:

Strainer: basket type pot strainer with removable basket, drilled with 1/8" diameter holes. Filter: in-line pressure filter with removable fabric sock or 60–80 mesh stainless steel screen.



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