



**CRA LIQUID SWEETENER
TERMINAL AND WASH GUIDELINES**

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CRA LIQUID SWEETENER TERMINAL AND WASH GUIDELINES



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Corn Refiners Association
Liquid Sweetener Terminal and Wash Guidelines

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INTRODUCTION

The CRA Liquid Sweetener Terminal and Wash Guidelines were developed by a committee of CRA members comprised of representatives from the industry.

This document has been prepared to provide general, voluntary guidelines to manufacturers, suppliers, and terminals of sweetener products. This manual has been prepared in order to provide best practices and minimum quality guidelines for the handling, storage, transporting, receiving, testing, and system maintenance of sweeteners. This document also is to help in achieving compliance with certain aspects of applicable regulatory standards such as Good Manufacturing Practices (GMP), customer requirements, and industry standards.

Personal safety must be stressed when performing the tasks included in these guidelines. Adequate fall protection should be used when inspecting railcars/tanks and OSHA lockout/tagout procedures should be used when cleaning pumps and automatic valves, and inspecting air and steam systems. Personal protective equipment (PPE) including safety glasses, helmets, safety shoes and gloves shall be used when appropriate.

REVISIONS

This is the second revision of the CRA Liquid Sweetener Terminal and Wash Guidelines.

GENERAL INFORMATION

Section 1 Facility Requirements and Practices

1.1 Good Manufacturing Practices

The facility shall be in compliance with Good Manufacturing Practices (GMP) documented in 21 CFR 110 and customer requirements.

1.1.1 Basic Principles

Appropriate quality operations shall be employed to ensure that food meets all applicable regulatory requirements and is suitable for human consumption, and that food-packaging materials are safe and suitable for their intended use.

- a. Documented GMPs and Hazard Analysis and Critical Control Point (HACCP) measures shall be present. The implementation of these programs is shown by monitoring and verifying practices and documentation.
- b. All food processing equipment shall be designed, installed, operated and maintained in such a condition to minimize spills or leaks and to prevent contamination.
- c. All food processing equipment shall be utilized under such conditions and controls necessary to minimize bacteria and micro growth in the product. This requires monitoring such physical factors as age, temperature, etc.
- d. Facility buildings and site shall be of suitable design, construction and size to facilitate maintenance and sanitary operations.

1.1.2 Personal Hygiene Program

Employees should maintain good standards of personal hygiene at all times.

Employees working under conditions where they are likely to contact food, food ingredients, food packaging materials and food equipment shall observe the following rules:

- a. Perform proper hand washing by thoroughly washing (using warm water and liquid soap) and drying (using disposable towels or air) hands regularly. This includes when returning to work, after using the restroom, after eating, etc.
- b. Wear clean clothes and, where practicable, protective food handling gloves.
- c. Use a hair net or cap at all times, and a beard net as necessary.
- d. Cover cuts or sores with clean waterproof dressings.
- e. Do not wear jewelry, false nails or other items that might fall into food.
- f. Do not cough or sneeze over food.
- g. Do not smoke in or near food handling areas.

1.1.3 Cleaning Schedule

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The facility shall have a Cleaning Schedule that is documented and complies with the GMP regulations in 21 CFR 110. The schedule should contain details on specific cleaning tasks and frequencies. Tasks shall be documented when completed by dates and initials. The cleaning schedule will ensure that the facility is consistently maintained in a clean condition.

1.1.4 Security

The security of the facility is of extreme importance to prevent contamination of food products. Every employee is a part of the local security team and it is important that they understand the specific security measures. The facility should have a security policy that includes:

- a. Completion of a site security and vulnerability risk assessment, which includes identifying credible security threats, risks and hazards, and developing measures to reduce risks where reasonable and appropriate.
- b. At the start of each business day an inspection of the facility should be conducted to make sure that a breach of security has not occurred.
- c. Positive identification and recognition system is in place for all employees and contractors.
- d. Visitors shall sign in at the office before they are allowed outside the office area and shall be accompanied by an employee.
- e. All access points such as gates and buildings shall be locked when personnel are not in the immediate area (immediate area would be defined as within eyesight of personnel) or when the area is not in use by personnel.
- f. All trailers, railcars and storage tanks shall have tamper evident seals on them at all times. Exceptions include activities where:
 - 1) vessels are within secured or supervised areas for washing, loading or heating
 - 2) empty vessels that have been returned unsealed that are awaiting inspection and cleaning.

1.1.5 Product Traceability/Recall

The facility shall have product traceability and a recall program for incoming and outgoing shipments.

- a. Traceability of all products is accomplished through the vessel number, ship date, Bill of Lading (BOL) and storage tank number,

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- if applicable. The shipping records and log sheets are references that support the traceability.
- b. The recall program shall provide a prompt response and action for determining if a recall or withdrawal is necessary. The recall program shall coordinate all activities with customers, distributors and transfer stations and shall implement the recall from start to final disposition of the product, including corrective action.
 - c. A practice recall exercise shall be conducted yearly. The results shall be documented and filed.
 - d. The facility shall have an Emergency Action Plan that includes an emergency contact list.

1.1.6 Glass, Brittle Plastic, Metal and Wood Program

The facility shall have a glass, brittle plastic, metal (i.e. brittle and hard plastics, or small metal wires from cleaning brushes) and wood program. This program shall include guidelines for prevention of these items in food handling areas. An inventory of these items shall be maintained and an audit of these items shall be performed documenting condition.

1.1.7 Preventative Maintenance Program

All equipment and utensils shall be adequately maintained according to GMP regulations given in 21 CFR 110. The facility shall have a physical inventory of equipment. The equipment shall be monitored when operating. A preventative maintenance program shall be in place and documented for equipment. The schedule program shall contain details on specific maintenance tasks and frequencies. Tasks shall be documented when completed by dates and initials.

1.1.8 Pest Control Program

There shall be an effective, preventative and documented Pest Control program at the facility. The Pest control program must meet requirements in 21 CFR 110.

Pests, including but not limited to birds, rodents and insects, shall not be allowed in any area of the food plant. Facilities should be designed, constructed, and maintained to prevent pest entry and to eliminate harborage areas. Cleaning practices should eliminate potential food supplies for pests. Pest control practices, such as rodent traps, pesticides and other approved pest control methods should be utilized by qualified pest control contractors or qualified in-house employees.

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1.2 GMP Auditing Guidelines

The facility should have an internal audit process where GMPs and the facility conditions are reviewed and documented at least monthly. The audit should include documentation of comments. There should be a documented corrective action program to address any findings. Items reviewed during the audit should include:

1.2.1 Grounds

- a. No standing water present.
- b. No weeds or overgrown vegetation near buildings.
- c. Roadways, yards and traffic areas are maintained to control dust and other potential contaminants.
- d. Storm drains are open and clean.
- e. Rodent burrows and runs, and any conditions attracting rodents or other pests in interior and exterior areas of the facility are promptly eliminated when discovered except where impractical or not allowed (i.e. endangered species).

1.2.2 Buildings

- a. No holes in siding to allow pests to enter.
- b. Walls are free of cobwebs, dust and dirt.
- c. Doors are self-closing and weather-stripping is in good condition.
- d. Adequate lighting is in place throughout the building with proper glass protection.
- e. Floors are in good condition with no standing water and no product spills.
- f. Roof leaks are promptly identified and repaired.
- g. All painted surfaces in Food Areas including structural beams, supports and other structural systems are maintained to avoid chipping, peeling or flaking paint.
- h. Fixtures, ducts and pipes are maintained to prevent drips or condensation from contacting foods, raw materials or food contact surfaces.

1.2.3 Equipment

- a. Pipes, tanks, pumps or other equipment are maintained to prevent leaks.
- b. All safety equipment is in place and in good working order.
- c. Equipment insulation is clean.
- d. Hoses are clean, capped and stored off the ground if not in use.
- e. All equipment is properly maintained and follows a Preventative Maintenance (PM) schedule.

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1.3 Hazard Analysis and Critical Control Points (HACCP)

Through the use of HACCP, significant food safety hazards (example: biological, chemical, physical) are identified and critical control points in the manufacturing process are established, as necessary. This should include the process of identifying the hazards, establishing controls for the identified hazards, monitoring the controls and periodically verifying that the system works in an effort to minimize or eliminate all identified hazards.

1.4 Training

Training shall emphasize to all employees that they are handling food grade products. The training process shall include familiarization with the transfer stations' Operational Procedures. Training should be completed and documented by all employees, management and contractors. Training should include but not be limited to:

1. Equipment and Operational Requirements and Procedures for a Tanker Wash Station
2. Facility, Equipment and Operational Procedures for a Transfer Station
3. HACCP Training
4. GMP Practices
5. Sanitation Schedule and Procedures
6. Maintenance Schedule and Procedures
7. Quality Control Test Procedures
8. Railcar Receiving and Testing
9. Railcar Heating Procedures and Documentation
10. Railcar Unloading Procedures
11. Tanker Sanitizing Procedures and Documentation
12. Tanker Loading Procedures
13. Internal Audit and Inspection Procedures when applicable

1.5 Building and Grounds

The facility must have dedicated physical areas that only wash tankers which carry food grade materials. Hot water wash systems must be dedicated to sweetener approved prior commodity tankers only. The use of detergents or sanitizers is not permitted in sweetener tanker wash systems. All pumps, tanks and lines must be arranged to prevent cross contamination with other wash systems.

The sweetener facility may consist of railcar and vessel unloading and loading, with or without a wash facility. The facility may have portable equipment or be set up with fixed pumps, lines and storage tanks. The grounds of the facility should be in compliance with GMP regulations given in 21 CFR 110 and customer requirements. Exterior and interior drains shall provide adequate drainage to discharge water to the sewer without backup and to prevent standing

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water.

The grounds shall be paved and maintained to prevent pest harborage by controlling tall grass and weeds. The roads and surrounding property should be paved or constructed to eliminate dust and standing water.

1.6 Potable Water Supply

Plumbing shall be of adequate size and design to provide sufficient quantities of water to all points within the terminal. The water system for the facility should have a filter capable of removing sediment from the incoming city water. There shall be adequate back flow prevention devices in place.

Water must meet EPA requirements for potable water. A water analysis report should be available at least yearly to document that the water meets EPA requirements for chemicals, pesticides, heavy metals, etc.

Municipal water shall be sampled at least annually from within the terminal and tested for microbiological analysis. Well water, if in use, shall be tested at least quarterly. The micro analysis shall include total plate count, coliform count and fecal coliforms. The micro results shall meet current U.S. Environmental Protection Agency regulatory standards for potable water.

1.7 Steam

Steam may be used for heating the railcar to unload the product and to heat water to wash trailers. Please refer to Section 2.3 Heating and Section 3.2 Washing, for guidelines for steam.

In cases where steam is used to wash trailers directly, the steam shall be filtered prior to use in the interior of the trailer.

Boiler treatment chemicals shall be approved for food contact use. The certificate for FDA or USDA approval of each boiler treatment chemical shall be kept on file along with the Material Safety Data Sheet (MSDS) of each chemical. Written boiler start-up and shutdown instructions shall be present and follow boiler manufacturer instructions. Boiler maintenance log sheets and service reports shall be kept on file.

1.8 Tank and Tank Accessories

1.8.1 Tank design and construction

- a. The general construction of the tank shall be stainless steel (304, 304L, or 316). Any tank liner used must be approved by the International Society of Beverage Technologists (ISBT).

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- b. Horizontal tanks shall be adequately pitched to prevent dead zones. Vertical tanks shall have a sloped bottom. If agitator is specified, then it shall be vertical. Anti-swirl outlet baffles can be used, especially if there are problems with mass flow measurements or entrained air.
- c. All welding shall be done by certified welders. The interior welds shall be polished with no snags or pits. All tanks and lines shall be inspected after any repair and prior to placing into service.
- d. Each tank should be equipped with the ability to clean in place (CIP). Each tank shall have the capability to re-circulate within the tank.
- e. Gaskets shall be Ethylene Propylene Diene Monomer (EPDM), Teflon, Neoprene or other high temperature FDA or equivalent approved material for CIP.
- f. An in-swing manway or flanged manway shall be located on the tank to allow for ease of inspecting headspace and cleaning the tank.
- g. A properly calibrated temperature probe shall be located near the bottom of the tank and inserted into the interior of the tank to be able to accurately read the internal temperature.
- h. The sanitary sampling port or petcock is located near the tank discharge.
- i. The tank should be equipped with sanitary level indicators.
- j. A separate storage tank shall be used for each liquid sweetener.

1.8.2 Tank air systems

- a. To control condensation and microbiological growth, a steady air flow shall be maintained across the surface of the tank. The tanks should be equipped with a High Efficiency Particulate Arresting (HEPA) filter system and air blower.
- b. The system shall be a properly designed and maintained system to prevent foreign material from entering the process.
- c. The air intake filter shall be a HEPA filter with 99% efficiency at 0.3 microns on the inlet. The air discharge vent shall be fitted with a filter. All systems should be maintained in accordance with manufacturers' recommendations.
- d. All actions and maintenance taken on UV Lamps/Air Blower/Air Filters should be recorded on a log sheet.

Sanitary wash systems that have an air dryer shall have a 0.3-micron (maximum) air filter element. This air drying system shall be inspected at least annually to ensure proper operation. Please see Section 2 Railcar Handling.

1.9 Pipes and Fittings

1. The piping materials of construction used for sweeteners are 304, 304L or 316 stainless steel. The piping shall be heli-arc welded, purged and polished, or joined by sanitary in-line clamp gaskets.
2. There should be separate piping with no interconnections or cross connections for each sweetener type.
3. The piping shall allow for complete drainage of the lines. The pipes and lines shall not have any dead-legs to allow for cleaning and sanitizing. Dead legs are considered piping segments that are continuously exposed to the process but without normal flow or provision for flow, including lines closed by flanges, welded caps or other fittings.
4. Piping for the tank inlet shall be large enough for desired flow rates for filling. Piping should also be designed to empty storage tanks to allow for cleaning. Tank discharge piping shall be large enough for process demand and to maintain adequate flow to the pump. Other elements that shall be considered in the size of the piping are temperature, viscosity, pipe length, elbows and flow meters.
5. Pipes, fittings and valves may require electric or steam heat tracing and/or insulation to prevent crystallization and to maintain temperature specification for the specific product. The outside lines should be protected with a weatherproof covering.
6. Acceptable gasket materials for piping include Teflon, EPDM, nitrile, Viton white food grade and Neoprene. The hose and tubing couplings/fittings shall be constructed of compatible material.

1.10 Pumps and Filters

1. A facility may use its own pump or a pump located on a trailer to transfer product. Common transfer pumps shall not be permissible for different sweetener types, unless the pump and equipment is cleaned and sanitized between uses.
2. A positive displacement rotary with a bypass and/or an internal pressure relief valve pump shall be used. The pump should have 316 stainless steel wetted parts and be of sanitary construction. A sanitary pressure gauge should be installed near the pump discharge.
3. The pump size is determined by the flow rate (gallons or liters per minute). Other items to consider in determining pump size are number of use points and the viscosity of the sweetener. The pump should have the capability of pumping to all use points.
4. To protect the pump, a perforated basket style strainer should be installed on the intake side. If installed, the strainer shall be inspected and cleaned on a predetermined schedule. There shall also be an inline strainer or filter after each tank to maintain the integrity of the product being handled.
5. All products that are transferred shall be pumped through a filter prior to going to a customer. All filters shall be inspected on a predetermined

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- schedule. These filters can be stainless steel, y-strainers, filter bags or filter screens.
6. The filter size depends on what product is being handled. The ranges for the strainers are 100 micron max for HFCS and 500 micron max for corn syrup.
 7. If using a pump on a trailer it must have an inline filter. The filter should be placed after the railcar or storage tank and before entering the trailer. This strainer must be checked before each use and documented.

1.11 Documentation

Procedures shall be documented. Procedures shall have a unique procedure number and have a revision date. All required tasks shall be documented by the date of completion and be initialed by the employee, at a minimum.

1.12 Sealing

The facility shall have a documented program regarding seals. The sealing program shall guarantee that the tanks, trailers, and railcars are sealed with tamper-evident cable seals when applicable. The inventory of seals shall be controlled and tracked.

Section 2 Railcar Handling

2.1 Equipment

Sweeteners are transported in insulated rail tank cars equipped with steam coils located in the lower half of the car between double walled carbon steel jackets. A standard six inch diameter product outlet is positioned in the bottom center of the tank car. Cars are lined with food contact approved lining.

2.2 Car Inspection

Each railcar will be inspected for external integrity and product identification prior to unloading. Fall protection systems must be used when inspecting rail car dome lids and other items from heights. Proceed with the following steps:

1. Confirm that the railcar hand break has been set, the wheels are chocked and a blue flag is placed at nearest rail switch.
2. Inspect car for leaks. Contact the delivering railroad if the tank car exhibits evidence of damage or leakage.
3. Confirm that all product access points are cable sealed; record seal numbers and verify against incoming rail car paperwork. The tank car dome lid can be opened once the external inspection and seal verification has been conducted.
4. Check for the presence of any off-odors, condition of inner dome and gasket, and physical condition of product surface (i.e., crystals, surface

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- condensation, extraneous material, etc.).
5. Take product temperature using an unbreakable National Institute of Standards and Technology (NIST) thermometer or a thermometer that is cross checked with a NIST traceable thermometer on a scheduled basis.
 6. Sample the car from the dome using a sanitized ladle by plunging below the product surface. Collect a sample for analytical confirmation and a 4oz. retain sample. Retain samples should be kept for a minimum of 6 months from offloading the railcar.
 7. If condensation is present, you may want to avoid taking a dome sample. Instead, take the sample from the bottom of the car. This is done by attaching the railcar fitting to the bottom outlet, positioning a drip bucket beneath the fitting discharge, and slowly but carefully opening the bottom discharge valve. After discharging at least half of a gallon, take the sample.
 8. Do not attempt to take samples from a car if crystals are suspended in the product or are on the product surface, unless checking for color or non-dry solids dependent parameters. The crystals must first be dissolved; see Heating below.
 9. Check solids using a refractometer; compare solids to product specification.

2.3 Heating

Sometimes it is necessary to heat sweetener tank cars prior to unloading (i.e., crystals present or temperature requirement).

1. Connect a steam fitting and hose to the 2" steam coil inlet and a fitting and hose to the 2" condensate discharge outlet. These connection points are clearly marked "inlet" and "outlet" and are located near the main product outlet (note: some tank cars have two sets of coils).
2. Heating may proceed with low pressure steam (10-20 psi; 25 psi max) until a dome temperature of 95°F for HFCS and 125°F for CS is reached or until crystals have dissolved. Both products can be heated 10°F warmer, if needed, to ensure all crystals are melted.
3. Some type of agitation, such as filtered air agitation, has proven to be effective in reducing heating requirements. If air agitation is to be used, this compressed air should be introduced in a one-half inch (1/2") line, containing a check valve (to prevent backflow), in the unloading elbow. Air pressure at 15 to 20 psi, with volume controlled by a ball valve for gentle agitation. Air should be filtered as described below. Using an air lance is not recommended.
4. Steam (and air agitation, if used) should be shut off when desired temperatures are reached. If crystals have not dissolved, adjust steam flow to maintain temperature until all crystals melt into solution.
5. Steam shall be shut off when a tank car is two-thirds empty. Product scorching and railcar liner damage will occur if steam is maintained on a

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car when steam coils are exposed.

Compressed air shall be of a quality permissible to be incorporated into a food product. Dry compressed air shall be filtered through a coalescing filter to remove oil (food grade), followed by a 0.2 or less micron filter to remove microorganisms.

2.4 Unloading

After the railcar has been inspected, approved and heated (if necessary), the railcar can be offloaded. The railcar can be offloaded either by pumping or pressurized air.

Offloading Via Pump:

1. Remove flange plate from main product outlet located in bottom center of railcar. Use a standard unloading adaptor with a 4" diameter cam lock fitting.
2. Attach a 4" diameter FDA approved hose to railcar adaptor.
3. Manually open the main product outlet valve. Start railcar unloading pump, if one is used, after confirming that all applicable valves are open.
4. If compressed air is used for unloading, see procedure for Off Loading via Pressurized Air.

Offloading Via Pressurized Air:

Railcars can be unloaded by using filtered compressed air in the headspace above the product. Compressed air shall be of a quality permissible to be incorporated into a food product. This air shall be dry and clean. A coalescing filter is required to remove water after the compressor and a finite filter, 0.2-micron rated or finer, shall be used to remove solid particles and microorganisms. To extend the life of the coalescing and finite filters, a 5-micron pre-filter is recommended before the coalescing filter. Inspections of in-line and air compressor particulate filters and oil/water coalescers shall be made on a predetermined schedule to assure proper operation.

1. Safety considerations prohibit pressures higher than 25 psi.
2. Remove flange plate from main product outlet located in bottom center of railcar. Use a standard unloading adaptor with a 4" diameter cam lock fitting.
3. Attach a 4" diameter FDA approved hose to railcar adaptor.
4. Attach and open up airline to nozzle on top of railcar with a check valve in the line to prevent back flow.
5. Manually open the main product outlet valve.
6. When railcar is suspected empty, disconnect air supply and relieve pressure prior to opening dome to visually inspect.

2.5 Returning Empty Railcar

The following steps shall be undertaken after unloading a tank car of sweeteners:

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1. Verify car is empty by opening the dome hatch (use Fall Protection).
2. Close, bolt down and seal the dome cover. Reattach and seal the vent cap, if applicable.
3. Close hand valve on main outlet.
4. Disconnect railcar unloading hose from bottom outlet fitting.
5. Remove railcar fitting and reattach bottom flange plate.
6. Disconnect steam and condensate hoses and fittings from steam inlet and condensate outlet.
7. Advise the railroad when car is ready for return.

Section 3 Tanker Vessel Washing (Fall Protection and Lockout/Tagout should be used when applicable)

3.1 Pre-Wash Inspection

1. The wash operator must inspect the prior bill of lading for the vessel being washed to ensure the previous product handled is on the ISBT list for approved prior commodities (see Appendix I).
2. Vessels must be inspected to assure all applicable food safety requirements are met including condition and ability to properly seal.
3. The interior of the vessel must be inspected prior to the start of the cleaning process. The interior should be inspected for foreign material, glass, debris, evidence of mold, off-odor, old sweetener or other foreign liquid and discoloration. If anything unusual is found, the vessel should not be washed. The supplier should be contacted immediately and a risk assessment performed. Trailer contents should be drained and disposed of according to applicable regulations.

3.2 Washing

1. The manway cover or hatch covers vent assemblies; dome lid gaskets, shall be washed thoroughly with a high-pressure wand or hose followed by a dilute chlorine solution (approximately 100 - 200 ppm). Disassembly of some vent housings may be necessary to properly clean the internal parts.
2. The hoses may be sanitized by two methods: the preferred method is by connecting them to the trailer outlet for sanitization by trailer wash water. The hoses must be positioned to ensure the hoses are filled with water during the sanitizing process. The second method is washing with hot water to remove residual sweetener, testing for presence of glucose with glucose test strips, and then filling or soaking them in water containing approximately 200 - 100 ppm chlorine. All hose connections shall be kept off the floor at all times during and after sanitizing.

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3. All hose caps and plugs, fittings and removable gaskets must be sanitized. These pieces of equipment should be cleaned with warm water to remove residual sweetener prior to sanitizing.
 - a. Sanitizing can be done by using water at 180°F for 15 minutes. A wash box located at the end of the wash system and prior to the wash temperature probe can be used to sanitize fittings.
 - b. Sanitizing can also be done using a sodium hypochlorite solution measured as 100 - 200 ppm chlorine.
4. A tanker wash spinner or spray ball should be inserted into the trailer dome so that the trailer opening is completely covered. The spinner / spray nozzle shall be inspected on a predetermined schedule for proper operation.
5. The tanker should be flushed with warm/hot water until all obvious traces of the previous contents are gone. The water or steam introduced into the trailer should be filtered to at least 100 micron as close to the spinner / spray ball as possible. After all flush/rinse water has drained, the wash cycle should be started by introducing water at a temperature of approximately 190°F through the wash spinner / spray ball.
6. Timing of the wash cycle shall not begin until the discharge water from the tanker reaches 180°F. The wash must continue at 180°F for a minimum of 15 consecutive minutes. At this time, the wash water may be recycled by returning it to a hot water source (i.e., a holding tank) or it may be allowed to dump to a sanitary drain. If wash water is recycled into a water tank, the water must be drained and tank cleaned on a scheduled basis.
7. An in-line sensor mounted in a section of piping at the tanker discharge along with a chart recorder shall be utilized to verify the temperature of the discharge water and the time of wash. The wash temperature sensor shall be cross checked with a NIST traceable thermometer at least weekly to ensure that the wash temperature is accurate. The cross check temperatures shall agree within $\pm 2^{\circ}$ F. Recalibrate the sensor if the temperature differs more than 2° F.
8. Direct steam injection into the barrel of the tanker is another effective means of maintaining interior surfaces at 180°F or above for a minimum of 15 consecutive minutes. If steaming is used, a combination of steaming and power rinses shall be employed to effectively remove all traces of the prior commodity.
9. After the wash cycle and final rinse are completed, the tanker shall be cooled with tempered water or filtered air prior to inspection of the

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interior. If air tempering/drying is used, suitable filters shall be employed to remove dust particles, oil and odors.

10. When the tanker is cool, it shall be inspected. If it is not adequately clean, it shall be rewashed. On a predetermined schedule, test the final discharge water draining from the trailer with a glucose test strip. If it tests positive, review the wash procedures and take appropriate corrective action.
11. After cleaning and sanitizing, fittings and in-line product filters should be stored in a clean container (i.e., bucket) or plastic bag then placed inside a sealed cabinet (i.e., pump or fitting box) on the trailer, if applicable. If the pump is not cleaned during the normal washing procedure of the tanker, a separate procedure for pump cleaning shall be applied. Hose ends must not touch the ground when placing into the hose tubes after cleaning.
12. After the tanker has passed inspection and the gaskets are replaced, all access points shall be tightly closed and sealed prior to leaving the wash station unless being loaded immediately. Seal numbers shall be recorded on the wash ticket. The wash ticket shall be completed and signed by the sanitary wash operator or supervisor prior to releasing the tanker to the driver.
13. Washed tankers shall be delivered to the production plant or sweetener station so that filling can be accomplished within 24 hours of washing. If 24 hours elapse prior to loading, the tanker shall be rewashed.

Section 4 **Trailer Loading**

4.1 Pre-Load Inspection

The loader is responsible for verifying that all vessels are suitable for loading. This includes all customer supplied vessels and/or customer arranged pickups. All tankers hauling sweetener products should be dedicated to sweeteners or products permitted on the ISBT prior commodity list (See Appendix I). The wash ticket is required to confirm that the tanker was sanitized within 24 hours. Security seals shall be applied properly on all openings, cabinet doors and hose tubes of the tanker upon arrival. The seal numbers shall be confirmed against the wash ticket. The interior of the tanker shall be inspected prior to loading. Vessels that do not pass an inspection shall not be loaded.

4.2 Loading

All products shall be loaded at their specified loading temperature or customer specification. There must be screen protection (or dome adapter with a filter vent) around the dome loading spout (or over the entire open

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hatch). The temperature of the outgoing product shall be taken and recorded. The temperature probe used shall be calibrated on a predetermined schedule. Samples shall be taken during or after trailer loading. A retain sample must be taken to represent the product from every trailer loaded. The retain sample should be tested for solids, visual color and clarity, odor and the presence of extraneous material. If the product does not pass inspection, it should not be shipped. The retain sample shall be appropriately labeled to allow traceability. All access points, including hose tubes and pump boxes shall be sealed with identifiable cable seals. The seal numbers shall be recorded on the bill of lading.

4.3 Shipping Documentation

The Bill of Lading, Certificate of Analysis and tanker wash certificate shall be sent with outgoing shipments and should conform to regulatory requirements and specific customer requirements.

Appendix I: Approved Prior Commodities

Clear, Non-Flavored Beverage Alcohol	Liquid Sucrose/HFS/Glucose Syrup Blends
Citric Acid	Mannitol
Glucose Syrup	Sorbitol
High Fructose Syrup	Potable Water
Medium Invert/ Invert Sugars	Phosphoric Acid
Liquid Sucrose	Liquid Dextrose
Liquid Maltodextrins	Hydrogenated Glucose Syrups
Lactic Acid	

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