

Henry Company Technical Information Bulletin

Wax Emulsion Storage & Handling Procedures

This bulletin is complementary to the Product Data Sheets and MSDS.

INTRODUCTION

Aqualite wax emulsions are dispersions of wax in water. As such, precautions are necessary to ensure uniformity and maximize efficiency of use. Because wax is less dense than water the natural tendency due to gravity is for the wax to float while the water sinks. If this separation does occur prior to use, the result can be poor water absorption values in the early stages of water-resistant board production.

All of the recommendations below are designed to keep the mixture uniform and prevent drying. Before any emulsion is used the total solids should be checked to make sure it is uniform and in specification.

MATERIALS OF CONSTRUCTION

Aqualite wax emulsions are alkaline with a typical pH >9. Storage tanks, pumps, valves, and all plumbing must be compatible. Carbon steel, stainless steel, PVC and most plastics are examples of appropriate materials of construction. Aluminum and brass should be avoided.

All fill and recirculation lines should be 3" ID (not less than 2" ID). The line from the storage tank to the board plant should not be less than 1¹/₂" ID. Hydraulic calculations are recommended to determine the appropriate pump size and piping design for each site.

UNLOADING

Aqualite wax emulsion generally arrives warm (>80° F) at the wallboard plant. Unloading should begin as soon as possible; at 50 – 100 gallons per minute with an air diaphragm pump. It is recommended that the emulsion be passed through a 10-mesh steel wire screen during offloading. A vent pipe must be open to discharge the tanker's contents. If a truck mounted gear pump is used for unloading, a slow speed (less than 100 gallons per minute) is recommended.

Another option for unloading is by first pressurizing the tanker, but only if the tanker and storage tank are designed for this purpose and both are equipped with properly sized relief valves. Keep in mind that as the storage tank fills, more pressure will be required to counter the increasing head pressure from the storage tank. Also, as soon as the tanker is emptied, it must be de-pressurized externally to prevent excessive foaming within the storage tank.

If the emulsion is to be used directly from a tanker that has stood idle for more than 6 hours, separation is likely to have begun and recirculation from the bottom to the top is required. The emulsion should be returned below the current liquid level to avoid foam

generation. The recommended equipment for recirculation is an air diaphragm pump set for 50 – 100 gallons per minute and the recirculation should continue for 10 minutes for each 500 gallons of emulsion. (NOTE: A typical 5,300 gallon tanker will require 1½ – 2 hours of recirculation prior to use). If an air diaphragm pump is not available, a progressive cavity pump can be substituted. Air should never be used to agitate the emulsion because excessive foaming will occur. Tanker manholes should be kept closed to minimize evaporation and solids buildup. If the tanker is used for long term storage, the emulsion should be completely recirculated every third day.

STORAGE

Aqualite wax emulsion can be stored for several months if sufficient agitation is available and precautions are taken to prevent the surface from drying.

Agitation

Sufficient agitation can be achieved with either a top or side entering impeller sized to gently move the emulsion from bottom to top without incorporating air. Violent agitation, or agitation with an insufficient volume of emulsion in the tank, is likely to generate unwanted foam. Foaming must always be avoided because it accelerates wax drying and eventual solids formation. Dried wax solids can foul the tank walls and clog the emulsion delivery system plumbing. Foam can also lead to process problems because it is very difficult to meter accurately.

Recirculation

The recommended equipment for recirculating the contents of a storage tank is an air diaphragm pump set for 50 – 100 gallons per minute. If an air diaphragm pump is not available a progressive cavity pump can be substituted. The emulsion should be pumped from bottom to top, with the return line as close to the top as possible, but below the liquid level of the tank to avoid unnecessary foam generation.

Humidification

For long term storage, the inclusion of a humidifier is recommended to maintain 100% humidity in the headspace and prevent evaporation. If proper humidity is not maintained and sufficient water evaporates from the emulsion, the emulsion surface can dry into a crust. If the storage tank is equipped with a humidifier, care should be taken to prevent unwanted addition of water and dilution of the emulsion.

Storage Temperature

It is recommended that storage temperatures remain between 50° F and 100° F. If heating is required during storage, the heat transfer surface should not exceed 100° F and must be thermostatically controlled to prevent overheating. The emulsion must be agitated whenever the heating element is activated.

The storage tank and all plumbing must be protected against the possibility of freezing. Be aware that even a partial freeze will likely break the emulsion and may plug lines and pumps.

Tank Cleaning

Storage tanks should be cleaned regularly with high pressure hot water to minimize the buildup of dried wax solids on the walls.