

PTZ® PHENOTHIAZINE LIQUID VEHICLE TECHNOLOGY (LVT)

Liquid Vehicle Technology (LVT) represents a technology developed by Cytec that facilitates the solubilization or dispersion of solid PTZ® Phenothiazine stabilizer into liquid systems. The liquid systems can be based on a variety of either organic or aqueous vehicles, and may contain a number of different solids. These liquid systems are then easily incorporated into various manufacturing processes or other application areas where liquid products are preferred.

LVT Products

The following table details the PTZ Phenothiazine stabilizer products that are currently available based on LVT. In developing this technology we have gained experience with a variety of liquid vehicles and solid products. It has also been found that they can be composed of either single or multiple components and can be made to varying degrees of product activity.

LVT PRODUCTS

Product	Composition
Phenothiazine LVT 2008	7% Phenothiazine/93% Ethyl Acetate
Phenothiazine LVT 2110	10% Phenothiazine/90% Acetone
Phenothiazine LVT 2235	35% Phenothiazine in NMP (N-Methyl Pyrrolidone)

Liquid Vehicle Technology - Applications

These products can be used in a variety of applications, from plant processes to shortstopping agents. Through close working relationships with our customers and our own in-house capabilities, we have developed this range of Phenothiazine LVT products to solve specific customer and industry wide problems.

A. Shortstopping Agents

Phenothiazine LVT products are used in the acrylics industry, where they serve as shortstopping agent solutions for runaway acrylic acid and methacrylic monomer polymerizations. Runaway polymerizations of acrylic acid or methacrylic monomer can lead

to potentially catastrophic tank explosions and fires, putting life and assets at risk.

To successfully shortstop a runaway polymerization, the active concentration of PTZ Phenothiazine in the storage vessel should be approximately 1000 ppm based on the amount of monomer stored. In shortstopping applications, the Phenothiazine LVT products are quickly added to the acid or methacrylic monomer to prevent or treat the runaway polymerizations. Many companies have Phenothiazine LVT solution products stored and readily available for use at their manufacturing sites or distribution terminals. Dependent upon the Phenothiazine LVT product selected, the amount that will need to be added to the vessel will have to be calculated.

B. Stabilizer Addition to a Chemical Process

Some customers also use Phenothiazine LVT solutions to incorporate PTZ Phenothiazine stabilizer into their manufacturing processes. These products afford easy addition and uniform distribution of the stabilizer system to the processes.

Features and Benefits

The features and benefits of LVT are as follows:

Features	Benefits
Simplified incorporation of a solid via a liquid medium	Easy to use, improves and enhances operational efficiency
Solution or dispersion of solid additive into liquid	Insures the uniform distribution of the additive product into the final medium
Improved product handling	Easy and accurate metering of the product into the chemical manufacturing process, product or storage tank
Minimizes solids handling	Reduces worker exposure to dust and particulates and improves industrial hygiene
Cost effective	Reduces the need for mixing tanks and agitation systems and other costs associated with solids handling

Health and Safety Information

Before handling any of the Phenothiazine LVT products, read the corresponding Cytec Industries Inc. Material Safety Data Sheet for safety, health and environmental data.

Storage and Handling

Handling and shipping information on the Phenothiazine LVT products can be found in the corresponding Cytec Industries Inc. Material Safety Data Sheets.

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