STORAGE AND HANDLING
OF
LIQUID SCINTILLATORS

Introduction
Eljen liquid scintillators are formulated with particular care regarding purity and long-term service for a wide variety of research applications. They are all based on organic liquids which vary greatly to satisfy the wide range of uses intended for them. Hence, they exhibit greatly varying levels of solvent activity for many of the commonly encountered storage and handling materials such as rubbers and plastics. All of our liquids, as supplied to our customers, can be relied upon to exhibit long performance life and storage stability, typically lasting for many years. This, however, depends on their not being contaminated by improper handling.

The following are general guidelines for handling all of these liquids. There will be some exceptions for special formulations such as those intended for use in very cold or hot environments or for unusual liquids such as fluorinated ones.

Temperature
Store near room temperature, typically 20± 5^{O}C (70±10^{O}F). Short-term excursions of an additional 5^{O}C (10^{O}F) will do no harm.

Storage Conditions
Dry conditions, generally inside a building where direct sun or rain is avoided.

Inert Gases
All organic materials slowly oxidize in the presence of oxygen to develop yellow discoloration. This is accelerated by UV light and heat. The presence of oxygen (air) in the liquid also reduces the scintillation efficiency by 15-20%. It also quenches pulse shape discrimination (PSD) properties.

Humid air can slowly introduce trace amounts of moisture to the liquid until saturation, generally at a very low water concentration, is achieved. Once saturation is achieved, a small drop in temperature can make the moisture condense into tiny droplets in the liquid to form a fog.

All Eljen liquids are factory sealed under an inert gas, and the liquid is saturated with an inert gas, usually nitrogen. We strongly recommend that you store your liquid scintillators under similar conditions, whether in a detection chamber or in a storage container. This is normally achieved by simply passing a fine stream of dry nitrogen bubbles through the liquid and venting the container so the gas space above the liquid can be filled with the nitrogen at the end of the process. Argon gas may also be employed here.

Short-term exposure to air while handling the liquids will not harm them.

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Storage Containers

It is best to keep the liquid in the original containers if practical. Large tanks should be made of stainless steel (304 alloy is adequate). Care should be taken to assure that moist or humid air cannot enter such tanks where night cooling may condense the moisture to form a liquid layer at the bottom of the tank.

Gaskets, Hoses and Container Materials

Safe materials:

- Stainless steel
- Aluminum
- Glass
- High quality tinned tinned metal
- Teflon, plain and glass-filled
- Viton rubber
- Some epoxies

Unsafe materials

- Extruded acrylic plastic
- Most plastics
- Most rubber materials
- Most commercial paints
- Bare steel

Safe for some liquids under certain conditions

- Cast acrylic sheet
- PVC plastic sheet and pipe
- Nylon plastic sheet or rod
- Clear vinyl tubing (Tygon)

Summary

- Always exercise caution regarding possible chemical toxicity, fumes and fire hazard. Read the Material Safety Data Sheet (MSDS) provided.
- Maintain good cleanliness in all of your containers and handling equipment.
- Avoid greases and lubricants.
- When transferring, pumping and pouring, use grounded equipment and practices to avoid static build-up.

Factory Advice

Please do not hesitate to ask us for help with your particular situation.

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