General Technical Information – Creative PEGWorks®
4-Arm PEG Products

Molecular Weight: MW of PEG was measured by MALDI-MS or GPC. PDI (polydispersity index) of our PEG products is very low with narrow MW distribution. PDI for 4-Arm PEG is 1.02-1.05 with higher PDI with increasing MW. Note that the PDI for a specific lot may vary slightly. The number of repeating ethylene oxide units (CH2CH2O) or the degree of polymerization is calculated dividing the PEG MW by 44 (44 is the molecular mass of one repeating unit). Note for 4-armed PEG, the MW indicated in the product name is for the entire PEG molecule and the MW of each arm is calculated dividing indicated MW divided by 4 (the number of arms). Our 4-Arm PEG has a core of pentaerythritol.

Solubility: PEGs are very soluble in water and aqueous buffer such as PBS, also in many organic solvents including chloroform, methylene chloride, DMF, DMSO, and less soluble in alcohol and toluene. Raising temperature can help dissolve PEG in toluene and isopropanol. Not soluble in ether. Note special PEGs functionalized with large hydrophobic groups will reduce its solubility in water.

Density: The density of polyethylene glycol is approximately 1.125 g/mL. PEG derivatives have approximately the same density.

Physical Form: PEG products generally appear as white or off-white powder, and for very low MW PEGs, such as 4-Arm PEG 2k, it may appear as wax-like, semi-solid material due to the low MW and the type of functional groups. All PEG products are packaged in vials as pure materials, there is no solvent in the vial.

Storage Condition: PEG product shall be stored in the original form as received in a freezer at -20°C or lower for long term storage. Stock solution of PEG reagents that DO NOT contain oxygen or moisture sensitive functional groups (e.g. NHS, thiol etc) may be temporarily stored in a refrigerator or ambient temperature for multiple days. Stock solution should avoid repeated freeze-and-thaw cycles. For moisture sensitive PEG reagents (NHS ester), anhydrous solvents are required. Also, light and oxygen sensitive PEG products including thiols and those with unsaturated carbon-carbon double bonds such as maleimide, DBCO, and acrylate, ideally shall be stored away from light (i.e. wrapped with aluminum foil) and in an air-free atmosphere. The best way to achieve inert atmosphere is to purge the vial with nitrogen or argon in an inert gas-filled glove box. To prepare stock solution of oxygen sensitive reagents, degassing the solvent with nitrogen or argon is preferred. Light sensitive PEG products are bottled in amber glass vials or plastic vials. Please contact us if you concern the storage and handling of a particular PEG reagent.

Handling: PEGs are highly hygroscopic and absorb moisture from air quickly. Follow these steps to aliquot: 1) Allow vials to thaw and equilibrate to room temperature before opening the vial; 2) Open vials and weigh the quantity you need quickly; 3) Flush vials with dry argon or nitrogen (if you have access to nitrogen or argon). Caution: adjust gas flow so that dry powders will not be blown away; 4) Tightly cap vials and wrap the cap/neck with parafilm; 5) Store in a freezer at or below -20°C.

Shelf-life: When stored as recommended, PEG products typically have 3 years of shelf life. Please refer to COA for the manufacture date and expiration date.

Analytical Characterization: PEG reagents are characterized by MALDI-MS for MW, GPC or HPLC for purity, NMR for identity and degree of substitution of functional groups and may also be analyzed by UV-Vis absorption, fluorescence (for fluorescent PEGs), FTIR (useful for PEG-Azide), and chemical assays to quantify the content of special reactive groups such as thiol.