

**Technical Data Sheet**

**PEG 400( Pharmaceutical )**

Polyethylene Glycol 400

Polyethylene glycols (PEGs) are condensation polymers of ethylene oxide and water with the general formula  $H(OCH_2CH_2)_nOH$ . They are the most commercially important type of polyether. The low molecular weight compounds up to 700 are colorless, odorless viscous liquids with a freezing point from  $-10^{\circ}C$  (diethylene glycol), while polymerized compounds with higher molecular weight than 1,000 are wax like solids with melting point up to  $67^{\circ}C$ . While PEGs with different molecular weights find use in different applications and have different physical properties (e.g. viscosity) due to chain length effects, their chemical properties are nearly identical.

The numbers that are often included in the names of PEGs indicate their average molecular weights, e.g. a PEG with  $n=9$  would have an average molecular weight of approximately 400 and would be labeled PEG 400. Most PEGs include molecules with a distribution of molecular weights, i.e. they are polydisperse.

PEGs are soluble in water and most organic solvents.

**Application:**

Polyethylene glycols are non-toxic, odorless, neutral, lubricating, nonvolatile and nonirritating and are used in a variety of pharmaceuticals and in medications as a solvent, dispersing agent, ointment and suppository bases, vehicle, and tablet excipient.

Test	Standard	Reference
Color of Solution, 5g/50 ml of Water	Colorless	USP41-NF36
Viscosity @ $98.9 \pm 0.3^{\circ}C$ , Cst	6.8-8.0	USP41-NF36
PH,5% Solution in Water	4.5-7.5	USP41-NF36
Residue on ignition, %wt	Max 0.1	USP41-NF36
Assay (Average Molecular Weight),g/mol	380-420	USP41-NF36
Ethylene Glycol & Di-ethylene Glycol, %wt	Max 0.25	USP41-NF36
Heavy metals, ppm	Max 5	USP41-NF36
Ethylene Oxide & 1,4-Dioxane, ppm	Max 10 (for each of them)	USP41-NF36