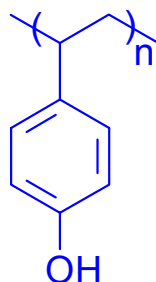


PHS-XE-01

ELECTRONIC GRADE Poly-(p-hydroxystyrene)



CAS Name: Homopolymer of 4-ethenylphenol
CAS Number: 24979-70-2

EP's PHS-XE-01 is a low metals, 100% linear vinyl homopolymer available in a variety of molecular weights. The EP route to electronic grade PHS (PHS-XE-01) is based upon the free radical polymerization of high purity p-acetoxystyrene monomer (ASM) to poly-(p-acetoxystyrene) (PAS) with subsequent hydrolysis of the acetoxy blocking groups to PHS. EP's electronic grade PHS differs from conventional phenolic resins not only in its purity, UV transparency at 248 nm, batch consistency and functional reactivity, but also in its structure. The linear structure lends itself to "blocking" with acid/base sensitive groups ideal for exposure and development in the semiconductor manufacturing process.

The electronic grade homopolymer is a high purity polymer with a total metal ion content of less than 500 ppb (specifications are 100 ppb max for individual metals, with typical product quality at less than 150 ppb total). PHS-XE-01 and other EP co/terpolymers are used as binder resins in fine line positive and negative photoresist formulations. In these applications, its higher glass transition temperature, excellent adhesion, solubility characteristics, and deep UV transparency (248 nm)

offer a unique combination of properties suitable for photolithography at this wavelength.

PHS-XE-01 is available in molecular weights ranging from 5,000 to 40,000. Standard product offerings have molecular weights of 11,000, 15,000, and 20,000 in either dry powder form, or in organic solvents such as PGMEA or Ethyl Lactate at solids levels from 20 to 40 wt%. PHS-XE-01 powder is hygroscopic and, as such, readily absorbs moisture from the air. PHS powder may be dried under vacuum at up to 70 °C.

PHS-XE-01 Physical Properties

Physical Appearance:	White to off-white, free flowing powder
Odor:	Characteristic phenolic
Glass Transition Temp:	165 to 180 °C
Typical Polydispersity:	2.0 to 2.4

Typical Specifications:

Absorbance, 248 nm, max:	200 L/mole cm by UV
Acetoxy Residual, wt% max:	Less than 0.5%
Chlorides, ppm max:	10
Individual Metal, ppb, max ^(a) :	100
Molecular Weight:	±1000 from standard ^(b)
Water, wt% max:	3.0

Notes:

- (a) Na, Fe, Ca, Al, K, Zn, Pb, Cu, Mn, Mg, Cr, Ni; all by GFAA
- (b) GPC measured MW of PHS will agree within ±1000 of the mutually agreed reference standard.

For additional information on deliveries, order placement and pricing, write or call us at our offices in Raleigh, NC at 919 248-5135, or by FAX at 919 248-5571