



HDPE vs. PVC (Concrete Protection Liners)

GSE StudLiner is manufactured from high grade polyethylene resin blended with antioxidants and carbon black for enhanced UV resistance. Because no plasticizers are used, GSE StudLiner is not subject to the embrittlement that can occur when plasticizers leach out. Due to its chemical structure, polyethylene has the best chemical resistance among available geomembrane types. The table below lists the different typical physical and chemical characteristics of both HDPE and PVC concrete protection liners.

PROPERTY	GSE HDPE	PVC
Typical Chemical Properties		
Acid Resistance*	Excellent	Poor to good
Alkali Resistance*	Excellent	Good
Chlorinated Hydrocarbon Resistance*	Very Good	Poor
Aromatic Hydrocarbon Resistance*	Very Good	Poor
Aliphatic Hydrocarbon Resistance*	Excellent	Poor to moderate
Combustible By-products	Carbon Dioxide, Carbon Monoxide	Hydrogen Chloride gas, Chlorine gas, Carbon Dioxide, Carbon Monoxide
Typical Physical Properties		
Thickness	2.0 mm to 5.0 mm	1.75 mm
Maximum Temperature	160° F	150° F
Tensile Strength	3000 psi ASTM D6693	2200 psi ASTM D412
Tensile Elongation	400% ASTM D6693	200% ASTM D412
Water Absorption	0.01% ASTM D570	0.1 - 0.4% ASTM D570
Water Vapor Transmission	0.001 g/100 in ² per day ASTM E96	0.1 g/100 in ² per day ASTM E96
Coefficient of Thermal Expansion	1.2 x 10 ⁻⁴ cm/cm C ASTM D696	1 x 10 ⁻⁴ in/in F ASTM D696
Hardness	60 ASTM D2240	54 ASTM D2240
Abrasion Resistance	5 mg/1000 revolutions ASTM D1044 (CS-10 abrasive wheel)	35 mg/1000 revolutions) ASTM D1044 (CS-17 abrasive wheel)
Coefficient of Friction		
Static	0.31	0.75
Kinetic	0.22	0.54
Pull-out Resistance Green book 210; 2.3.4 - Lineal	> 100 lbs per lineal inch from cured concrete at 75° F	100 lbs per lineal inch from cured concrete at 75° F
Pull-out Resistance (Mechanical)	> 14,000 psf (approximately 110 studs per ft ²)	NA
Pull-out Resistance (Hydraulic)	> 85 psi (approximately 110 studs per ft ²)	NA
Specific Gravity	0.94 ASTM D792	1.28 ASTM D792
Tear Resistance	317 g/mil ASTM D1004	220 g/mil ASTM D1004
Brittleness Temperature	-130° F ASTM D746	5° F ASTM D746
Dielectric Strength	510 volts/mil ASTM D149	500 volts/mil ASTM D149
Volume Resistivity	6 x 10 ¹⁵ OHM-CM ASTM D257	5.8 x 10 ¹² OHM-CM ASTM D257
Welding Techniques	Electrofusion or Extrusion	Hot Air or Chemical Bonding
Repair	Easy repair for lifetime of geomembrane	Easy to difficult depending on percentage of plasticizer migration

NOTES:

* Material resistance varies according to the particular exposure media.

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