The Pioneer Of Geosynthetics

S I N C E 1 9 7 2

Technical Note

Linear Low Density Polyethelene (LLDPE) vs. Polyvinyl Chloride (PVC)

GSE UltraFlex LLDPE geomembranes are manufactured from high grade resin blended with antioxidants and carbon black for enhanced UV resistance. Because no plasticizers are used, GSE UltraFlex is not subject to the embrittlement that can occur when plasticizers leach out. Additionally, GSE UltraFlex is unsupported which allows for outstanding biaxial and multiaxial elongation. Due to its chemical structure, polyethylene has the best chemical resistance among available geomembrane types. The table below lists different physical characteristics of both LLDPE and PVC geomembranes.

Property	GSE LLDPE (GSE UltraFlex)	PVC
Maximum Temperature*	150° F	140° F
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
Ultimate Tensile Strength	> 3,700 psi	< 2,300 psi
Ultimate Tensile Elongation	> 850%	< 500%
Plasticizer Requirement	None	Yes***
Filler Requirement	None	Yes
Molecular Structure	Contains only carbon-carbon and carbon-hydrogen bonds which require much energy to cleave	Includes carbon-chlorine bond which require less energy to cleave
Crosslinking Due to UV	None	Yes and results in cracking
Seaming Integrity	Uses same material as the parent sheet	Uses solvents which may alter the parent sheet's chemical composition
Maximum Available Thickness	120 mil	45 mil
Low Temperature Brittleness	< -90º C	-40º C

NOTES:
* Maximum allowable temperature may be limited by chemical exposure. Contact GSE for more details.
** Material resistance varies according to the particular exposure media. Contact GSE for more details.
*** The plasticizer(s) tend(s) to migrate to the surface and escape due to their low molecular weight. They also greatly affect the material's resistance to various exposure media.

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