

Polyester vs. Fiberglass Reinforcement

Polyester or fiberglass: which is the better reinforcement for thermoplastic single-ply roof membranes?

Today, over 99% of all thermoplastic single-ply roofing membranes use a polyester reinforcement, yet a few holdouts still contend fiberglass reinforcement is better.

Polyester and fiberglass reinforcement both help to provide dimensional stability to thermoplastic membranes. Polyester reinforcement, however, offers the added benefits of enhancing the membrane's resistance to fatigue and punctures. Though polyester-reinforced membranes are traditionally used in mechanically fastened assemblies, they have also been used successfully in adhered systems for many years. Fiberglass-reinforced membranes, on the other hand, only provide marginal fatigue resistance, limiting their use to fully adhered assemblies or perhaps applications where the membrane is fully protected by a top surfacing material.

Wind Uplift

Wind uplift tests revealed that in mechanically fastened systems, polyester-reinforced PVC offers better resistance to tearing around fastener plates than fiberglass-reinforced PVC. While using fiberglass-reinforced PVC in a mechanically fastened system is not recommended, the increased tear resistance of polyester offers an advantage without any downside. In fact, when tested in adhered assemblies, polyester-reinforced membrane delivered superior adhesion and equal or greater wind uplift resistance than fiberglass-reinforced material.

Dimensional Stability

The slightly higher dimensional stability provided by fiberglass reinforcement is not a benefit in fully adhered assemblies where membranes are held in place by the adhesive. Since the adhesive provides substantially more holding power than forces exerted by the membrane, no membrane movement should occur.




Puncture

Dynamic puncture tests conducted using ASTM D5635-04 show that polyester reinforcement provides remarkably better results. Test results for fiberglass-reinforced PVC yielded 10.0 Joules, while the polyester-reinforced PVC yielded 22.5 Joules. Polyester-reinforced membranes are also easier to handle and will conform better to irregular surfaces than the more rigid fiberglass-reinforced membranes.

Lineal Dimensional Stability (% Difference)

Polyester		Fiberglass
.4%	.38% DIFFERENCE (1/3 of 1%)	.02%

Tearing/Breaking/Puncture (% Increase)

Polyester		Fiberglass
70 lbf	Tearing Strength  467% INCREASE	80 lbf/in
320 lbf/in	Breaking Strength  400% INCREASE	15 lbf
20 Joules	Puncture Resistance  100% INCREASE	10 Joules



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