

Why FiberTite® vs. TPO

Tried and true or new and improved.

Although initially introduced in 1992, the majority of TPO roofing membrane manufacturers didn't enter the market until the mid to late 90's. From their conception, TPOs have and continue to be experimental membranes. They are all in their 2nd, 3rd and in some cases 4th generation of formulations. FiberTite Roofing Systems were new and improved in 1979 when first introduced. FiberTite's integrated Fabric and KEE (Ketone Ethylene Ester) based coating technology are the same today as they were in 1979. Today's TPO manufacturers don't know whether they've got it right or not.

	FiberTite (36 mil)	TPO-Based Roofing Membranes (45-50 mil)
CHEMISTRY	<p>FiberTite was used as the benchmark membrane for the development of ASTM D6754-02 Standard Specification for KEE Based Sheet Roofing. The standard provides that properly compounded KEE coatings that utilize a minimum 50% KEE polymer content and are applied to high quality base fabrics can be good indicators for performance.</p> <p>FiberTite's formula for success is rooted in a half-century of Seaman Corporation high performance coated fabric technology and specifically derived from a combination of the selected attributes from Seaman's world renowned Shelter-Rite architectural fabrics, where the fabric is the roof, and XR-5 Geomembrane fabrics, the product of choice when protecting the environment from hazardous waste is at stake.</p>	<p>A basic Thermoplastic Poly Olefin compound is inherently inexpensive. TPOs often claim to be internally plasticized and therefore immune to the plasticizer loss associated with conventional PVC roofing membranes. However, additives are required to impart fire resistance properties to the finished membrane. Increased fire resistance not only aggravates cost but also usually yields an inherent susceptibility to UV exposure. Balancing cost with long-term weather-ability and a basic building code life safety requirement such as fire resistance continues to fuel the need for "new and improved" versions. Multiple manufacturers with multiple formulations and variations do yield a multitude of choices. So does a roulette wheel. ASTM is hard at work to provide a standard specification for TPO sheet roofing. Unfortunately, the standard is doomed to be a consensus of evaluations based upon the lowest common denominator among the multitude instead of proven historical insitu performance.</p>
UV RESISTANCE	<p>Intense UV exposure can break the chemical bonds within a thermoplastic compound over time. KEE is a solid and permanent polymer ensuring long-term resistance to harsh UV exposure.</p>	<p>UV exposure can break down even marginally fire retardant TPO materials.</p>
CHEMICAL RESISTANCE (ASTM ANIMAL FAT, COMPRESSOR OIL, JET FUEL A)	<p>Chemical discharge and environmental fallout are detrimental to many roofing systems across the country. Exposure to contaminants can soften and swell TPO roofing membranes. KEE is not only flexible; it has inherent chemical resistant properties. Subsequently, FiberTite's KEE membranes provide superior resistance to a broad array of chemicals including grease and fatty acids. Chemical exposures listed on the Warranty Request Form are automatically included into the terms of coverage.</p>	<p>TPO membranes exhibit similar characteristic to EPDM membranes when exposed to common environmental contaminants. Exposure to fatty acids, oil grease and jet fuels promote swelling of the membranes. Long-term exposure can lead to eventual softening and deterioration of the membrane. Most TPO roofing membrane manufacturers specifically exclude "exposure to chemicals" from their warranties.</p>
PUNCTURE RESISTANCE (ASTM 4833)	<p>Puncture generally applies to penetration by a blunt object. FiberTite maximizes puncture resistance by using the industry's heaviest fabrics to create an internal barrier to puncture within the membrane.</p>	<p>TPO membranes generally forgo the expense of using "fiber" as an internal puncture barrier in favor of using mass or thickness to provide the illusion of durability. Independent testing confirms that the thicker TPO membranes are no match for FiberTite's internal "fiber" barrier.</p>
TEAR STRENGTH (ASTM 751) TONGUE TEAR	<p>The "fiber" in FiberTite is engineered using high denier polyester fibers, knitted into a tight 18x19 yarn pattern to create a virtual framework that ensures toughness.</p>	<p>TPO manufacturers trade fiber for thickness to create the illusion of strength. Even though they have a tainted history, many manufacturers of TPO roofing membranes will forgo thickness also, to reduce costs, believing that since they're immune to the eventual loss of plasticizer that plagues conventional PVC technology, they can match performance with thinner materials. Regardless of thickness, they fail to exhibit even good tear values when compared to FiberTite Roofing Membranes.</p>

FiberTite (36 mil)

TPO-Based Roofing Membranes (45-50 mil)

<p>PONDING WATER DAMAGE RESISTANCE</p>	<p>Although one of the fundamental purposes of a roof system is shedding water, sloping a roof to achieve 100% drainage is not always economically feasible. A structural evaluation should always be performed in cases where excessive ponding is anticipated. If ponding is unavoidable, the KEE backbone for the FiberTite compound resists attack from the algae, biomass, and environmental contamination that can accumulate in ponding water. FiberTite Roofing System Warranties contain no exclusions for ponding water.</p>	<p>Ponding water can have a three-fold detrimental effect on TPO roofing membranes. Ponding water will magnify UV to intensify its effects. The "water" is often a concentration of chemical discharge and environmental fallout throughout the roof system. The concentration of these chemicals and UV can accelerate the breakdown of the fire resistant TPO compound. Eventually, algae can form and attach itself to the membrane. As the water evaporates, the algae attaches, dries and tears at the weathered compound, promoting cracks and eventually splitting. Most TPO roofing membrane manufacturers specifically exclude the effects of ponding water from their warranties.</p>
<p>HAIL DAMAGE RESISTANCE</p>	<p>Moderate hail, generally stones of an inch or less in diameter, is a common occurrence and can be expected in many areas of the country. Hail is not specifically excluded in FiberTite Roofing System warranties.</p>	<p>The lack of a viable history of performance forces most TPO roofing membrane manufacturers to specifically exclude "all" hail from warranty coverage.</p>
<p>WIND DAMAGE RESISTANCE</p>	<p>Wind is inevitable, and FiberTite Roofing Systems are engineered to stay in place. Standard FiberTite Roofing System warranty exclusions for wind do not begin with gale force but rather hurricane force. Specially engineered systems are eligible for higher peak gust coverage up to 100 mile per hour.</p>	<p>Most TPO manufacturers begin their wind exclusions with "Gales." Wind speeds as low as 39 mph can be considered "Gale Force."</p>
<p>EASE AND QUALITY OF REPAIR</p>	<p>Since the KEE backbone for the compound is naturally thermoplastic and permanent, FiberTite Roofing Systems retain their viability to be heat welded throughout the life of the membrane.</p>	<p>TPO roofing membranes have been known to be problematic at best when welding new materials. As the compounds age they can lose pliability and their subsequent thermoplastic capabilities. Effective heat welds on aged membranes may require an "activator" similar to hypalon to seal repairs.</p>
<p>COATING ADHESION (ASTM 751)</p>	<p>If the coating separates from the reinforcement, the system fails. FiberTite Roofing Systems have achieved an inherent synergy between the industry's heaviest base fabrics and the industry's most durable coating. A proprietary process actually bonds the KEE coating to the polyester fabric.</p>	<p>Adhesion is a primary indicator for the technical expertise for integrating the coating and the fabric into one high performance unit. The greater the adhesion, the better the welds and the greater the membranes' resistance to possible delamination. TPO roofing membrane manufacturers have failed to master the art of truly integrating the coating and fabric into a truly monolithic membrane.</p>
<p>TENSILE STRENGTH (ASTM D882)</p>	<p>Thickness can promote a deceptive perception of strength. FiberTite Roofing Systems are engineered with strength at their core. Built with the heaviest and most tightly knit fabrics in the industry, is it any wonder that FiberTite Roofing Systems exhibit superior tensile/breaking strengths.</p>	<p>Typically, the lower the fiber content, the lower the tensile values.</p>
<p>TEAR STRENGTH AT 'REAL WORLD' ROOF TEMPERATURES (ASTM HIGH TEMP DEAD LOAD)</p>	<p>Load strain evaluation can be a good indicator of a membrane's endurance against the long-term effects of cyclical wind uplift and thermal shock. ASTM D751 now includes a means for evaluating roofing membranes under a high temperature dead load. FiberTite Roofing System membranes exhibit the benefits of a truly integrated fabric and coating system with unmatched dead load testing results.</p>	<p>Slippage, excessive elongation and actual pull-through of the fiber within the welds are indicators for the lack of true integration between the fiber and the coating.</p>
<p>FLAME RESISTANCE</p>	<p>Underwriters Laboratories have a test method for evaluating a membrane's flame resistance in a stand-alone procedure. Unlike E108 flame spread, UL 214 measures a membrane's burning characteristics after the ignition source is removed. FiberTite is self-extinguishing.</p>	<p>TPO roofing membranes exhibit combustible characteristics when compared to those of FiberTite under UL 214 test criteria.</p>

For more information, go to www.fibertite.com.

