

Overview Through a proprietary process, Samson engineering has significantly advanced the surface characteristics of traditional high-modulus polyethylene (HMPE) ropes. This technology increases the coefficient of friction (CoF) and enhances abrasion resistance, which are important considerations in certain applications. Samson incorporated this technology into the development of DPX™ fiber.

DPX™ is a unique blend of HMPE and polyester that provides a “prefuzzed” appearance, which wears and grips better than other HMPE fiber. The patented use of this unique fiber has resulted in four Samson products: Turbo-DPX™, Quantum-8™, Quantum-12™ and Quantum-X™.

Better Grip—Higher CoF

Coefficient of Friction (CoF) is measured based on the principle shown in Fig. 1. Experimental results show that DPX™ has a higher CoF than polyurethane coated HMPE, as shown in Fig. 2.

The combination of the high COF materials and the additional unique “fuzzed” surface provides better grip between the fiber and the substrate. The increased COF allows for the use of HMPE lines in applications where 100% HMPE ropes were previously limited, such as working on capstans and H-bitts.

Best Abrasion Resistance

Fig. 3 compares abrasion resistance of different synthetic fibers with uncoated polyester. DPX has the highest abrasion resistance tested per Samson standard testing procedure.

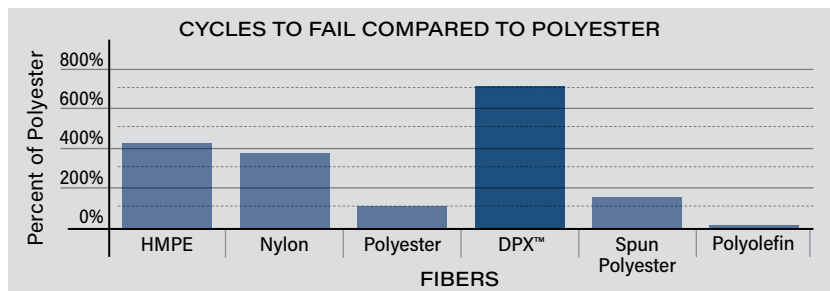
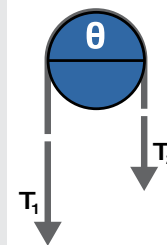


FIGURE 3 Abrasion Resistance Comparison

PATENTS

- [1] Gilmore, J., et al. “Wrapped yarns for use in ropes having predetermined surface characteristics.” United States Patent 7,134,267. November 14, 2006.
- [2] Gilmore, J., et al. “Wrapped yarns for use in ropes having predetermined surface characteristics.” United States Patent 7,367,176. May 6, 2008.
- [3] Gilmore, J., et al. “Wrapped yarns for use in ropes having predetermined surface characteristics.” United States Patent 7,735,308. June 15, 2010.



The relationship of coefficient of friction with its contact surface can be expressed as:

$$T_1 / T_2 = e^{(\mu\theta)}$$

μ = coefficient of friction

WHERE:

T_1 = tension applied on one side of the surface

T_2 = tension resulting on the opposite side of the surface

e = 2.718

θ = wrap angle, in radians

μ = coefficient of friction

The rope is wrapped around a capstan and tension is applied to one side of the drum. The tension is increased slowly until the rope begins to slip on the drum. When the rope slips, the tension being applied (T_1) and the resulting tension on the opposite side of the drum (T_2) are recorded to calculate CoF denoted as μ .

FIGURE 1 CoF measurements

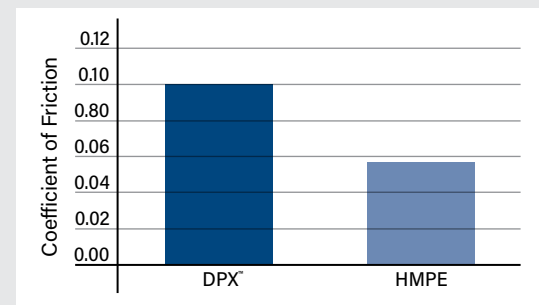


FIGURE 2 CoF Comparison: DPX™ vs. HMPE