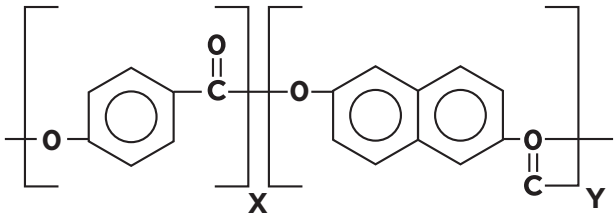
Vectran™

Enhance • Transform • Discover

LIQUID CRYSTAL POLYMER FIBER TECHNOLOGY

kuraray

Vectran™



MECHANICAL PROPERTIES OF Vectran™ FILAMENT YARN (AVERAGE)

	HT			UM		
	GPa	g/ denier	ksi	GPa	g/ denier	ksi
Break Strength	3.2	25.9	465	3	24.4	440
Initial Modulus	75	600	10,760	103	838	15,020
Elongation at Break, %	3.8			2.8		

FLEX FATIGUE

FATIGUE TESTING OF COATED FABRICS

Fabric	Tenacity Loss at Failure Location 100 Cycles, %	Failure Location
Vectran™	0.8	Away from Fatigued Crease
Aramid	22.9	At Crease

FLEX FATIGUE RESULTS ON 1500D YARN

Yarn	Cycles-to-Failure
Vectran™ T97	115,113
Aramid 1	5,114
Aramid 2	40,666
Aramid 3	1,383
PBO	23,821

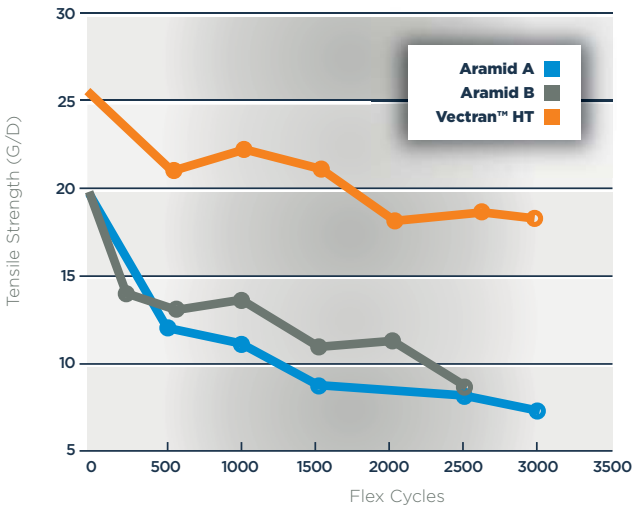
Test Conditions: Tinius Olsen tester, ASTM D2176-97a, modified for yarn, 2 kg weight

FLEX FATIGUE RESULTS ON 2 MM CORDS

2mm Cord	Cycles-to-Failure
Vectran™ T117	41,909
Aramid 1	2,115
Aramid 2	14,963
Aramid 3	8,143
PBO	25,158

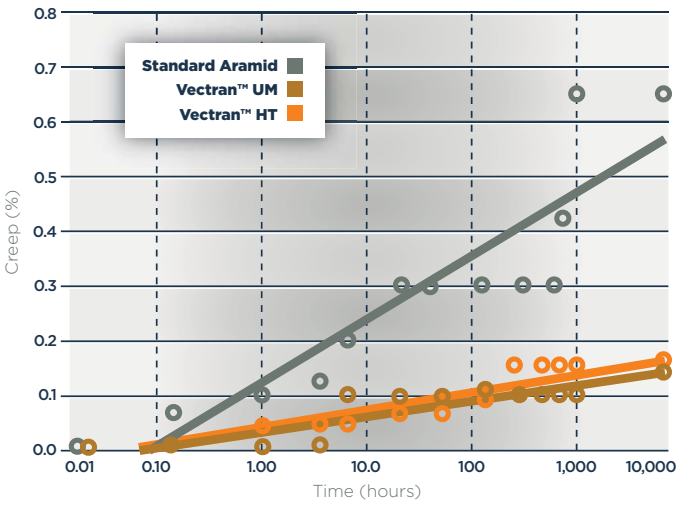
Construction: Parallel core/extruded jacket. Test Conditions: 45 mm dia pulley, 45 kg test load, 58 cycles/min, 5 tests/sample on cyclic test machine

FLEX FATIGUE RESULTS ON 1500D YARN

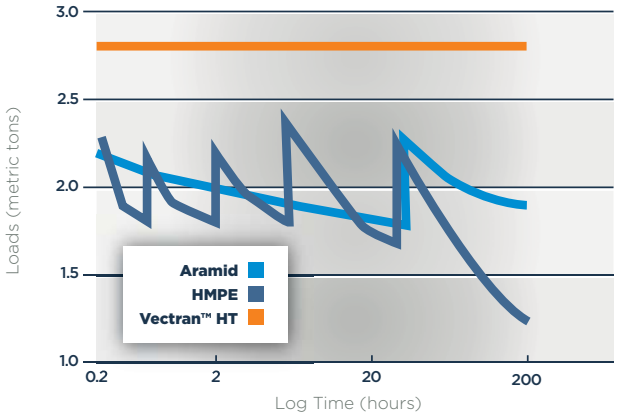


CREEP AND STRESS RELAXATION

CREEP BEHAVIOR AT AMBIENT TEMPERATURE (30% OF BREAK LOAD)

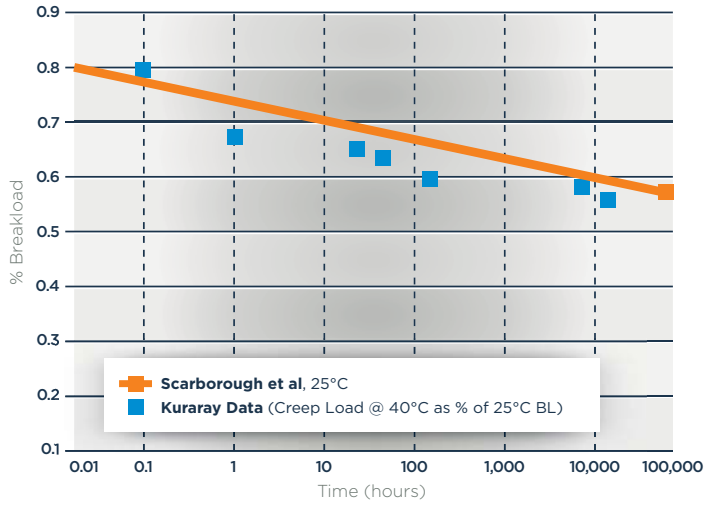


STRESS RELAXATION (13 MM DIA WIRELAY ROPE)



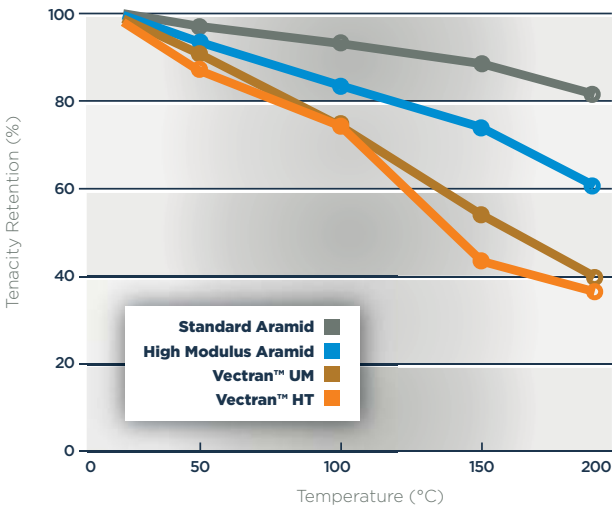
Whitehill Manufacturing Corporation
WMCJETS/JETSTRAN I-A VEC $^{1}/_{2}$" Rope

CREEP RUPTURE

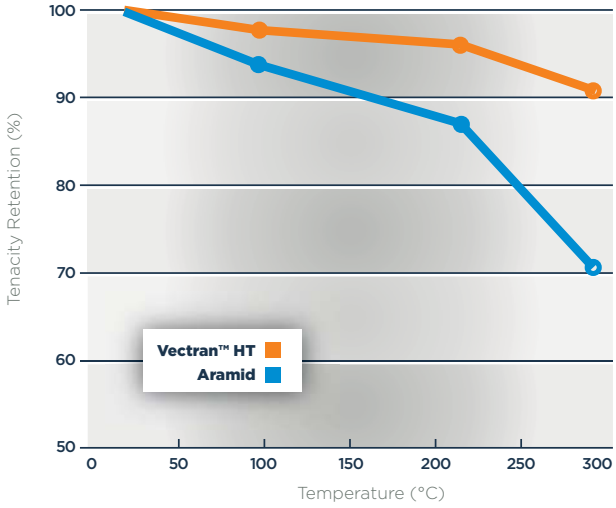


THERMAL PROPERTIES

AT HIGH TEMPERATURE

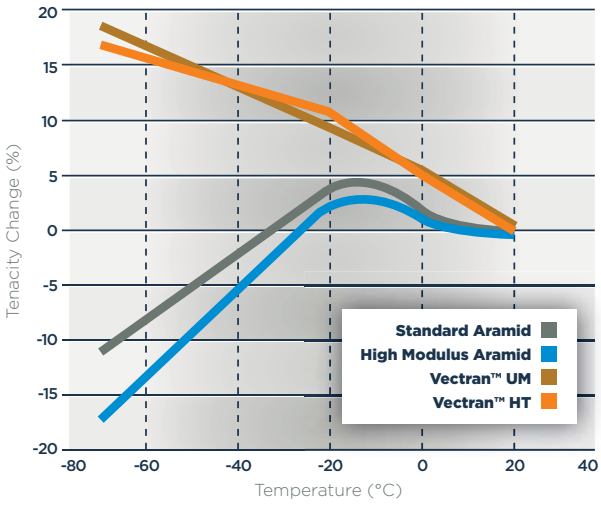


AFTER THERMAL EXPOSURE



24-hour exposure then tested at 25°C

AT LOW TEMPERATURE

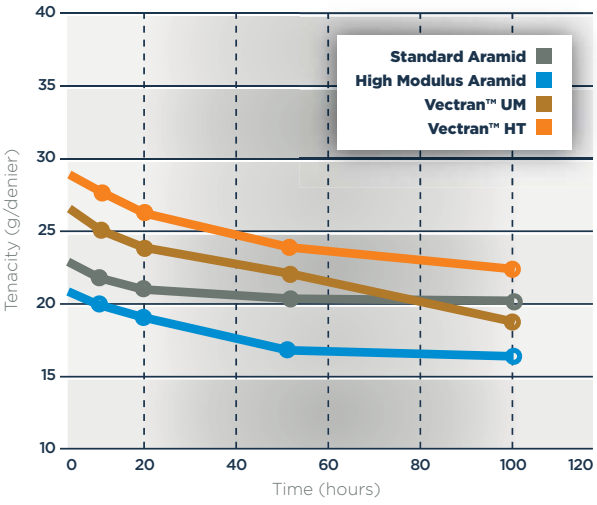


EQUILIBRIUM MOISTURE REGAIN

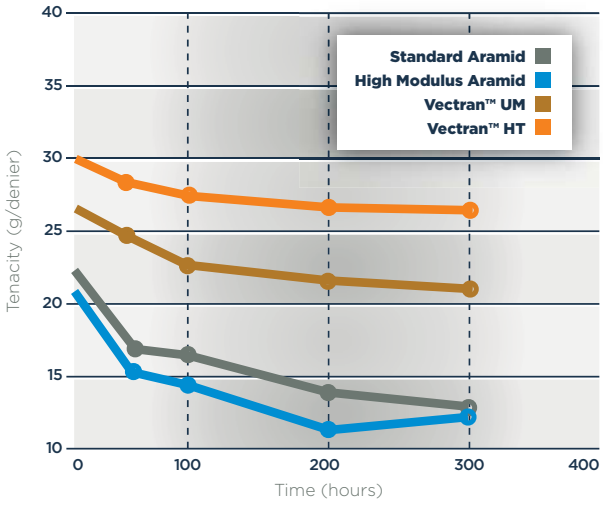
Tempe-rature (°C)	Relative Humidity (%)	Vectran™		Aramid (PPT)	
		HT	UM	Standard	High Modulus
20	65	<0.1	<0.1	4.2	4.1
20	80	<0.1	<0.1	4.8	4.8
20	90	<0.1	<0.1	5.4	5.5

ABRASION

CYCLIC THERMAL LOADING

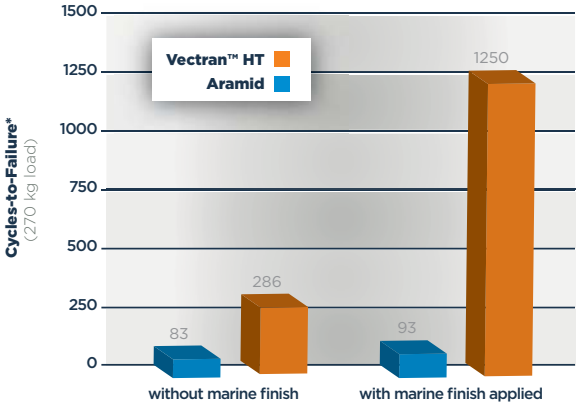


Tested at 25°C, after exposure to 120°C steam



Tested at 25°C, after exposure at 250°C

ABRASION AT LOW TEMPERATURE

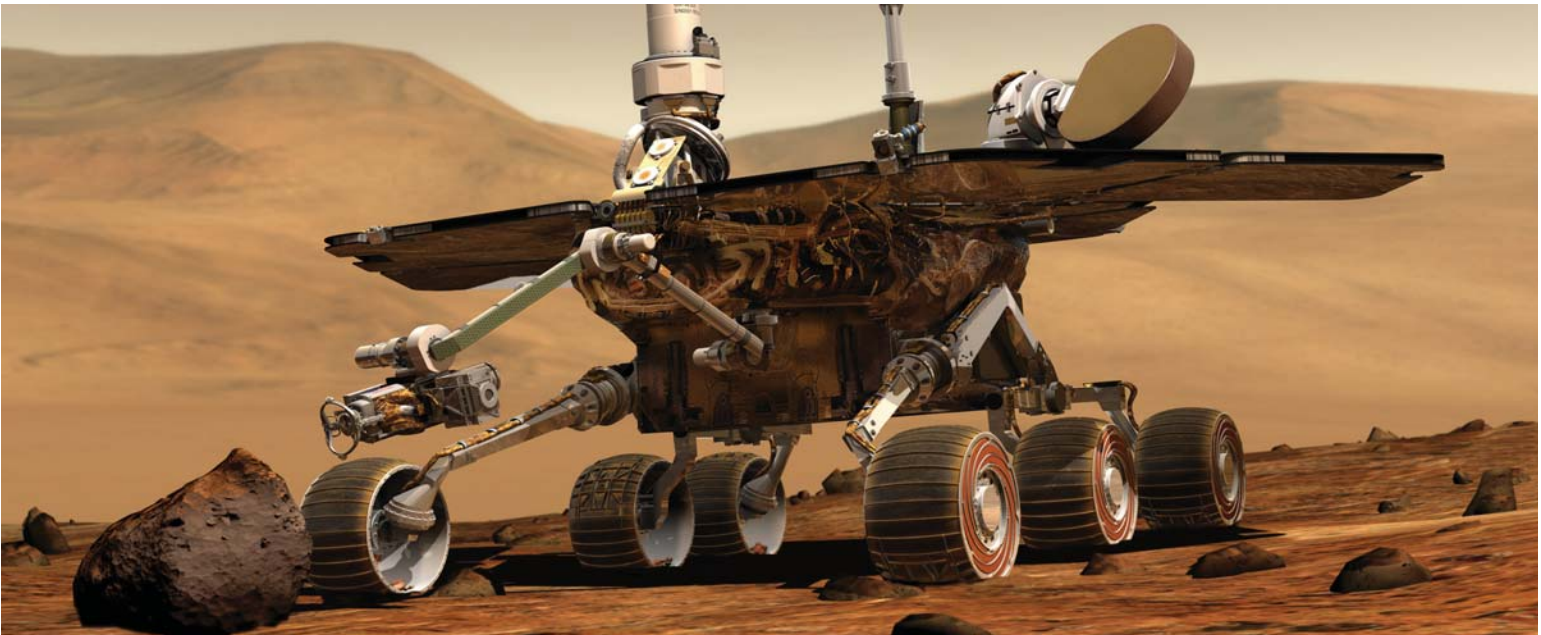


* Eight-strand plain braid, 64x1500 denier threadlines. All tests dry

COMPARATIVE TESTING OF YARN-ON-YARN ABRASION RESISTANCE

Yarn	Average Cycles-to-Failure	
	Dry	Wet
Vectran™ T97, 1500D	16,672	21,924
Aramid 1, 1500D	1,178	705
Aramid 2, 1500D	1,773	759
Aramid 3, 1500D	974	486
PBO, 1500D	2,153	-
HMPE, 1500D	8,518	23,619

Test Method CI-1503: 1.5 wraps, 500g load, 66 cycles/min, no twist.



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