Optinova

PRODUCT BROCHURE

PTFE

Heavy Duty Liner

- High abrasion resistance and anti-friction properties to eliminate “stick-slip”
- Efficiency above 90% even after 1 million cycles with 25lb load
- Tight OD tolerances and ultra-long continuous length
- Custom jacketing available in PVC, PA, PP or PBT
- Lower weight compared to steel
- Transmitting less noise than steel flat wraps
- Compliant with different specifications and requirements from automotive manufacturers

Our tubing is available in different dimensions, sizes and material combinations. We can customize tubing color for your specific needs using different fillers and property-enhancing compounds. Testing is done throughout production to ensure consistent quality standards.

Applications

- Moderate duty cables used in accelerator, clutch, and automatic transmission actuator assemblies.
- Loads up to 25 lbs and difficult routings
- High service temperatures and long life-cycle requirements
- Aircraft, heavy-duty off-road equipment and industrial controls

Dimension examples

ID	ID Tolerance	OD	OD Tolerance
1,82 mm	±0,06 mm	2,70 mm	±0,08 mm
2,10 mm	±0,08 mm	2,80 mm	±0,08 mm
2,46 mm	±0,08 mm	3,12 mm	±0,08 mm
2,50 mm	±0,08 mm	3,05 mm	±0,08 mm
2,80 mm	±0,08 mm	3,60 mm	±0,08 mm
3,20 mm	±0,08 mm	3,80 mm	±0,08 mm
3,68 mm	±0,08 mm	4,39 mm	±0,08 mm

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DATA SHEET

Material properties

Property	Test method	OPTI750	OPTI650	OPTI500	OPTI425
Continuous use temp, °C		200	200	200	200
Tensile strength, MPa (Psi)	ASTM D 638	31-44 (4500-6500)	38.8 (5623)	38.3 (5547)	13.7 (2000)
Elongation, %	ASTM D 638	200-400	313	293	150
Specific gravity, Method A-1	ASTM D792	2.10	2.11	2.06	2.15
Durometer "D", 15 secs	ASTM D 676		55	55	55
Color			Yellow	Brown	Red
Base material		PTFE	PTFE	PTFE	PTFE
Filler		Proprietary Organic	High Temp Polymer	PPS	Glass Spheres
Particle size of filler			90% at < 20 micron*	90% at < 30 micron*	
Dim. capability (ID & OD)	AIAG MSA	Cp 1.786, Cpk 1.675	Cp 2.722, Cpk 2.482	Cp 2.705, Cpk 2.0.6	
Melt point, °C	DSC 20°C/min	PTFE at 327	PTFE at 327, Filler degrades at > 450	PTFE at 327, Filler degrades at > 277	327 ± 10°C
Chemical resistance	Immersion, week 1 at 25°C	Excellent	No effect on mechanical properties		

* Smaller particle size enhances dispersion in the compound for greater homogeneity and less process variation. Chemicals tested are Hydraulic Fluid, Hydrocarbon Solvents, Brake Fluid, Lubricants, Alkaline and Acidic Aqueous solutions.

Test	OPTI750	OPTI650	OPTI500
1,82 mm	±0,06 mm	2,70 mm	±0,08 mm
2,10 mm	±0,08 mm	2,80 mm	±0,08 mm
2,46 mm	±0,08 mm	3,12 mm	±0,08 mm
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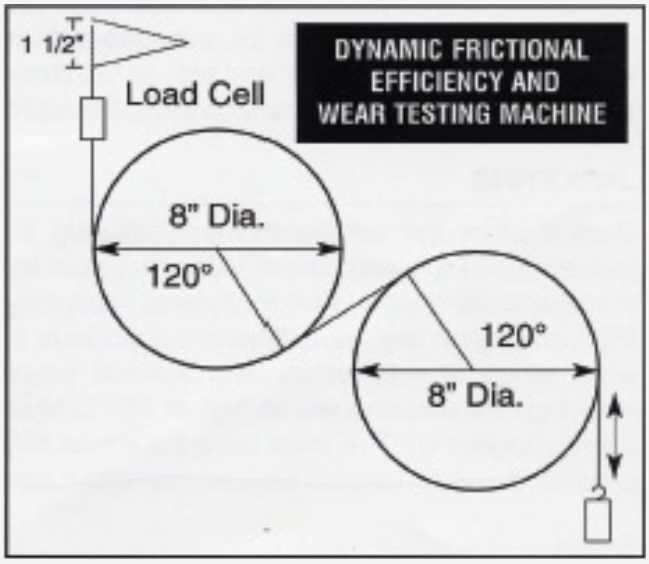
Note: Tested with E-155 Silicone lubricant (Wacker Silicone, Adrian, MT). Machine performs a reciprocating motion. A spring applies 18 Lbs./80N at full extension and 6 Lbs./26.7N in the compression portion of the test cycle. A 25 Lbs./111N weight, shown in the illustration, is used for the heavy-duty test. Typical performance data are not intended for use as design data.



Jacket material properties

Property	Unit	Nylon 6	Nylon 66	Nylon 12	Acetal	PP	PBT
Service temperature	°C	120	135	105	112	115	120
Specific gravity		1.13	1.14	1.07	1.41	0.93	1.31
Tensile strength	MPa (psi)	48 (7 000)	84.4 (12 300)	55 (8 000)	52 (7 429)	37.7 (5 500)	54.9 (8 000)
Elongation at break*	%	225	90	300	45	200	250
Flexural modulus	MPa (psi)	837 (122 000)	2827 (410 000)	565 (82 000)	2 500 (357 150)	1 481 (216 000)	2 263 (330 000)
Water absorption*	%	2.2	2.1	0.7	0.2	< 0.1	0.2
Flame resistance		UL94HB	UL94V2	UL94HB	UL94HB	UL94V2	UL94HB

* Tested at 23°C with 50% relative humidity