Dry Friction Product Specifications*

CLUTCHTEX® P-7

Description

100% KEVLAR® fiber composite material is a non-molded and non-asbestos, textile-reinforced polymer for industrial clutch and brake applications. Offers uniquely high wear resistance and low opposing surface wear. Available bonded to carrier plates in thicknesses as required (often laminated over a cork-nitrile substrate), or as a flexible laminate up to 10 mm (3/8") thick.

Physical and mechanical properties

Composition	100% long KEVLAR® fibers and proprietary polymer binders. Includes no metal, no abrasives, no cotton, and no fillers.
Density	0.91 g/cu. cm (0.033 lb./cu.in.)
Thermal conductivity	Extremely low
Shock resistance	Excellent (does not crack, or break)
Lubricant contaminant resistance	Does not degrade
Abrasiveness	Non-abrasive to opposing iron, steel, and copper surfaces

Operating conditions

Static pressure	Up to 6900 kPa (1,000 p.s.i.), (or as limited by substrate)
Dynamic pressure	140 - 3100 kPa (20-450 p.s.i.)
Temperature	Ambient to 315° C (600° F)
Surface speed	Static to 40 m/s (8,000 ft./min.)
Opposing surface	Machined and unfractured surface required, no fine finishing necessary

Surface speed, temperature, and pressure are interdependent energy parameters. Values represent typical conditions and are not the ultimate limits of the material. Burnish time to achieve full mating surface contact can be three to five times that of conventional materials.

Approximate dry friction properties (after extended burnish)

Wear rate	1/5 to 1/10 that of asbestos materials 1/2 to 1/3 that of sintered bronze materials
Dynamic coefficient of friction	0.36 μ ± 0.1 in the 95 - 345° C range (200° F - 650° F) Approximately 25% higher than molded asbestos, glass - fibered, and graphitic materials
Static to dynamic ratio	1.05
Fade	Significant fade to 260° C (500° F), accelerating at 370° C (700° F)

*All values shown are approximations derived from a variety of tests and field applications. No warranty or implied liability assumed herein. Friction values shown are for guide purposes only, as actual values can deviate with individual design and operating conditions.

Patented. Developed and manufactured exclusively by:

Tribco, Inc., 18901 Cranwood Parkway
Cleveland, Ohio 44128 USA
216-486-2000, Fax 216-486-2099, www.tribco.com

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Wet Friction Product Specifications*

CLUTCHTEX® P-7

Description

100% KEVLAR® fiber composite material is a non-molded and non-paper, textile-reinforced polymer containing no asbestos. Offers improved performance for all wet clutch and brake applications, featuring dramatically higher energy threshold to failure. Available bonded to carrier plates.

Physical and mechanical properties

Composition	100% long KEVLAR® fibers and proprietary polymerbinders feature higher temperature resistance than phenolics. Includes no metal, no abrasives, no cotton, and no fillers.
Density	0.88 g/cu. cm (0.032 lb./cu.in.)
Shock resistance	Excellent (does not crack, chip, or break)
Abrasiveness	Non-abrasive to opposing surfaces
Porosity	Unique "open, continuous-pore" structure (Characteristic of proprietary textile-reinforced composite production process)

Operating conditions

Static pressure	As limited by bond and carrier plate
Dynamic pressure	140 - 2760 kPa (20-400 p.s.i.) Upper limit not yet determined
Oil Bath Temperature	Ambient to 150° C (300° F) in automatic transmission fluid Ambient to 205° C (400° F) in silicone oil
Lubricant/Coolant	No known limitations. Resists ethylene glycol.
Opposing surface	No fine finishing required, runs against steel, iron, stainless steel, copper, hard aluminum.

Surface speed, temperature, and pressure are interdependent energy parameters. Values represent typical conditions and are not the ultimate limits of the material. Burnish time to achieve full mating surface contact can be three to five times that of conventional materials.

Approximate wet friction properties in automatic transmission fluid (after extended burnish)

Wear rate	1/2 to 1/5 that of organics and paper, 1/2 to 1/3 that of sintered bronze materials
Dynamic coefficient of friction	0.10 to 0.15 μ in the 23 - 290 W/sq. cm range (0.2 - 2.5 HP/sq. in.) Approximately 10% higher than paper, maintaining coefficient beyond the energy limits of sintered bronze.
Static to dynamic ratio	1.05 - 1.15

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