

Technical Data Sheet

Spun Para-Aramid Yarn

1. Product Description

This technical data sheet outlines the typical properties and specifications for high-performance spun yarn composed of 100% para-aramid staple fibers. This yarn is renowned for its exceptional strength-to-weight ratio, high tenacity, and outstanding thermal and cut resistance. It is designed for demanding applications where safety, durability, and performance are critical.

2. Key Performance Characteristics

- **Inherent Flame & Heat Resistance:** The yarn is inherently flame-resistant (FR) and will not melt, drip, or support combustion in air. It carbonizes and decomposes at very high temperatures (approx. $>450^{\circ}\text{C}$ / 842°F).
- **Exceptional Strength & Tenacity:** Delivers one of the highest strength-to-weight ratios of any commercial fiber, making it ideal for reinforcement and ballistic protection.
- **Superior Cut & Abrasion Resistance:** The yarn's high modulus and tenacity provide excellent protection against cuts, slashes, and abrasion, forming the basis for high-performance protective gloves and apparel.
- **Good Chemical Resistance:** Shows high resistance to a wide range of organic solvents, fuels, and lubricants. However, it can be degraded by strong acids, strong alkalis, and certain bleaches.
- **Dimensional Stability:** Exhibits very low creep and low elongation at break, ensuring materials hold their shape under significant load.
- **UV Sensitivity:** Para-aramid fibers are sensitive to prolonged exposure to ultraviolet (UV) light and can degrade. The yarn should be stored away from direct sunlight and is often used in applications where it is coated, jacketed, or otherwise protected from UV radiation.

3. Typical Physical & Mechanical Properties

The properties below represent typical values for a standard para-aramid spun yarn and may vary based on specific yarn count, ply, and manufacturing processes.

Property	Typical Value	Test Method (Example)
Fiber Content	100% Para-Aramid Staple Fiber	-
Yarn Construction	Ring Spun	-
Color	Natural Yellow / Gold	Visual
Tenacity	8.0 - 12.0 g/den (grams/denier)	ASTM D2256
Elongation at Break	3.0% - 5.0%	ASTM D2256
Limiting Oxygen Index (LOI)	> 28%	ASTM D2863 / ISO 4589
Decomposition Temperature	> 450°C (> 842°F)	TGA (Thermogravimetric Analysis)
Continuous Use Temperature	~ 180°C (356°F)	-
Moisture Regain	3.5% - 4.5%	ASTM D2495
Chemical Resistance	Good (Solvents), Poor (Strong Acids/Alkalis)	-

4. Standard Product Range

Spun para-aramid yarns are available in a wide range of counts (linear density) and plies. The table below provides common examples. Custom specifications are often available upon request.

- **Ne:** English Cotton Count
- **dtex:** Decitex (grams per 10,000 meters)
- **TPM:** Twists Per Meter

Yarn Count (Ne)	Ply	Approx. dtex	Twist (TPM)	Twist Direction	Min. Breaking Strength (N)
Ne 18/1	1-Ply	328	480 ± 20	Z	~30 N
Ne 18/2	2-Ply	656	400 ± 20	S	~58 N
Ne 20/1	1-Ply	295	500 ± 20	Z	~26 N
Ne 20/2	2-Ply	590	420 ± 20	S	~50 N
Ne 20/3	3-Ply	885	420 ± 20	S	~74 N
Ne 30/1	1-Ply	197	600 ± 30	Z	~17 N
Ne 30/2	2-Ply	394	520 ± 30	S	~33 N

Yarn Count (Ne)	Ply	Approx. dtex	Twist (TPM)	Twist Direction	Min. Breaking Strength (N)
Ne 40/1	1-Ply	148	700 ± 30	Z	~12 N
Ne 40/2	2-Ply	296	610 ± 30	S	~23 N

5. Common Applications

This yarn is engineered for use in:

- **Protective Apparel:** Cut-resistant gloves (EN 388 / ANSI rated), sleeves, aprons, and chaps.
- **FR Garments:** Firefighter turnout gear, military combat uniforms, racing suits, and industrial FR workwear.
- **Industrial Applications:** High-temperature gaskets, packing, filtration media, and industrial sewing threads.
- **Reinforcement:** Used in composites, belting, and as a reinforcement in hoses and plastics.
- **Ballistics (less common for spun):** While filament yarn is primary, spun components can be used in soft armor liners.

6. Packaging & Storage

- **Packaging:** Typically supplied on cardboard or plastic cones, with each cone weighing between 1.5 kg and 2.5 kg (3.3 lbs - 5.5 lbs). Cones are individually sealed in UV-protective bags and packed in labeled cartons.
- **Storage:** Store in a cool, dry place. **Crucially, packaging must protect the yarn from all sources of UV light (sunlight, fluorescent lighting) to prevent degradation.**

7. Disclaimer

The information provided in this technical data sheet is based on typical data and is believed to be reliable. However, it is provided for guidance only and does not constitute a specification or warranty. End-users must conduct their own testing to determine the suitability of the product for their specific application. The supplier assumes no liability for any loss or damage arising from the use of this information. Specifications are subject to change without notice.