Kevlar Thread Buying Guide

**About Kevlar Thread**  Kevlar™ thread (also called Para-Aramid) is one of the strongest and most heat resistant commercial threads. It is about 2½ times stronger than nylon and polyester, has very little stretch, does not melt, and at 800°F. This makes it a great choice for high stress applications including sewing seams on heavy duty clothing, belts, harnesses and bags, reinforcing plastics, and other fibers, and even providing high-temperature controls for airplanes and rockets. To put Kevlar thread in perspective, here is a side-by-side comparison of Kevlar and three other middleweight (Size 92) threads:

<table>
<thead>
<tr>
<th></th>
<th>Kevlar</th>
<th>Nylon</th>
<th>Polyester</th>
<th>Nomex</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tensile strength</td>
<td>30 Lbs.</td>
<td>15 Lbs.</td>
<td>15 Lbs.</td>
<td>9 Lbs.</td>
</tr>
<tr>
<td>Stretch before breaking</td>
<td>2%</td>
<td>26%</td>
<td>26%</td>
<td>N/A</td>
</tr>
<tr>
<td>Heat decomposition</td>
<td>800°F</td>
<td>485°F</td>
<td>485°F</td>
<td>700°F</td>
</tr>
</tbody>
</table>

**Kevlar Properties**  Kevlar thread is stronger, more heat resistant, less stretchy, durable than most other threads. It is usually a very small part of material content. This means that using Kevlar thread with materials that do not have it is a waste and could be dangerous.

**Decomposition**  Kevlar begins to decompose (turn to ash) at about 800°F (426°C). Much higher nylon or polyester.

**Melting**  Kevlar thread does not melt. This is important in fire retardant gear.

**Stretchiness**  Kevlar thread stretches about 2% before it breaks. For example, a 100 foot piece of Kevlar would be 102 feet long just before it breaks. If you sew stretchy fabrics with Kevlar the seams will pucker.

**Acids and alkalis**  Good resistance to dilute acids and bases. Degraded by strong mineral acids a lesser extent, by strong mineral bases. This is important when Kevlar thread is in a laboratory setting.

**Bleaching and solvents**  Should not be bleached. Excellent solvent resistance. This matters when Kevlar gear is reused.

**Mildew, aging, and sunlight**  Excellent resistance to mildew and aging. Prolonged exposure to sunlight can cause deterioration. Polyester thread works just as well in some cases.

**Abrasion**  Good abrasion resistance.

**Alternatives To Kevlar Thread**  Kevlar thread is super-strong, fire retardant, and very little stretch. But, it is only a ugly yellow and is very expensive. Here are alternatives to Kevlar that might be better suited to your needs.

- **Nylon** and **Polyester Thread**  - Use a heavier weight nylon or polyester thread instead of a lighter weight Kevlar. For example, a Size 138 nylon or polyester thread has about the same strength as a Size 69 Kevlar thread, costs about 80% less, and comes in colors. But, it is twice as thick, not fire retardant, and has 25% elasticity.

- **Fire Retardant Sewing Thread**  - Spun Kevlar and spun Nomex threads have the same fire retardance as Kevlar thread and are available in many colors. This type of thread is the usually the best choice for sewing seams and attaching emblems and logos. These threads look and feel like cotton because they are made by wrapping cotton around a Kevlar or Nomex filament core

- **Fire Retardant Embroidery Thread**  - Use Nomex embroidery thread to embroider logos and emblems for fire retardant gear. The thread looks like top-quality, 40 weight, polyester embroidery thread, but it is just as fire retardant as Kevlar thread. It is not strong enough to sew seams or attach emblems. It is very expensive and should only be used when fire retardance is essential.

- **Filament Nomex Thread**  - This thread has about the same fire retardance as filament Kevlar but only 1/3 of its strength. It has a smooth, shiny feel. We are discontinuing this thread because reliable supplies are not reliable because of government priorities.

**Color**  Nobody buys filament Kevlar thread for its color. It normally comes a color called Natu and cannot be dyed after it is manufactured. Usually, color is not a problem because it takes to strength and heat resistance in most applications.

There is some black filament Kevlar on the market. But, we do not normally stock it because we found a reliable source and there are alternatives.

**Color**  is very important when it comes to fire retardant garments, turnout gear, and racing suits. We have a great selection of yellow, green, red, blue, and black.
spun Kevlar and Nomex™ on our [Fire Retardant Thread](http://www.thethreadexchange.com/miva/merchant.mvc?Screen=CTGY&Store_Code=TTE&Category_Code=kevlar-thread-information) page. Spun threads have a single Kevlar or Nomex filament wrapped in cotton. This allows dyeing, retains the thread's fire retardant properties, but sacrifices thread strength. W Nomex Fire Retardant Embroidery Thread for names and logos.

**Sizes**—With Kevlar thread, a higher size number means a thicker thread. As size increases diameter, strength, nee stitch visibility, and sewing machine requirements increase while yards per pound decrease. Let's see how this affects representative sizes:

<table>
<thead>
<tr>
<th>Size</th>
<th>Diameter increases</th>
<th>Strength increases</th>
<th>Needle size increases</th>
<th>Stitch visibility increases</th>
<th>Sewing machine requirements increase</th>
<th>Yards per pound decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td>69</td>
<td>0.0081 Inches</td>
<td>23 Lbs</td>
<td>16 to 18</td>
<td>Low</td>
<td>Home</td>
<td>6,700 Yards</td>
</tr>
<tr>
<td>138</td>
<td>0.0140 Inches</td>
<td>45 Lbs</td>
<td>20 to 22</td>
<td>Medium</td>
<td>Commercial</td>
<td>3,350 Yards</td>
</tr>
<tr>
<td>346</td>
<td>0.0255 Inches</td>
<td>135 Lbs</td>
<td>26 to 28</td>
<td>Very High</td>
<td>Heavy Duty</td>
<td>1,050 Yards</td>
</tr>
</tbody>
</table>

**Size Selection Guide** In most sewing applications thread is the least expensive material. This means that it is often excepted (i.e., better for the thread to break than for the fabric to rip. It also means that fabric and leather thickness and the most important factor in selecting the right size. Simply put, thread size should normally increase as material th strength increase. There are two other considerations:

- Most home sewing machines cannot handle threads heavier than Size 69. In these cases use double stitchin stitches to add strength.
- Sometimes "look" is important. Using a heavier thread makes stitches stand out from the fabric or leather.

Size selection works differently in reinforcing, wrapping, hanging, and whipping applications. Here, the other materi as strong as Kevlar and the strength of the thread is often key. There are exceptions such as threading Kevlar thro-hole.

Take availability into consideration when there is an ongoing need. We regularly stock Kevlar thread in ten sizes ar best to keep them in stock. We also have thread in sizes that we do not regularly stock and sell them at lower price we will probably not have them when our current supply runs out.

**Kevlar Terminology**—We use several "technical" terms to describe our Kevlar thread. Understanding these terms because they affect how you can use the thread.

- **Bonded / Soft**
  - Bonded means that the thread has a coating that reduces heat at the tip of the needle and prevents unraveling. Soft means that the thread does not have this coating. Bonding is important for machine sewing in Sizes 69 and higher. It does not matte the thread is used for hand sewing and reinforcing. Bonding may interfere with adhesives used in some wrapping and whipping applications. If so, it can be remo with alcohol.

- **Monocord**
  - Monocord means that the thread is made with a single ply (like fishing line) and has no coating similar to bonding. This gives the thread a flat, ribbon-like shape and makes it usable in double-needle machines. Many of our lighter weight threads use this construction.

- **Left twist / Right twist**
  - When threads have more than one ply the plies are twisted to the left or the right. Here we say otherwise our thread is left twist. This is because single-needle machines in the U.S. market require left twist or monocord thread. Use right twist thread with double-needle machines and some machines designed for Asian markets. Twist does not matter in hand sewing and non-sewing applications.

- **Loose twist / No twist / and Yarn**
  - These kinds of threads are frizzy and almost impossible to put through a needle. Consider them for non-sewing applications such as wrapping and hanging.

**How to Save**—We love selling Kevlar thread. But, it costs about five times more than nylon or polyester. Here are a few ways to save:

- **Do you really need Kevlar?** Kevlar seems to have a cult following and customers buy it when less expensive polyester will do the job. Please, ask yourself or ask us if you really need Kevlar thread.

- **Buy what you need** Our junior spools in 1 to 4 Ounces, coils, and thread packs are a great value for specific jobs and hobbyists. They generally ship 1st Class to U.S. addresses so shipping costs are low compared to the price you paid to obtain the thread.

- **Choose lighter weights** You get more yards per ounce with lighter weight thread. But, make sure that the thread is thick enough for the job you need. We can ship lighter weights to Asian markets. Twist does not matter in hand sewing and non-sewing applications.

- **Consider non-standard sizes and closeouts** These threads sell at a 25% to 50% discount compared to our regular thread. Our featured Tex 105 and Tex 300 Kevlar thread is on par with our standard sizes. But, we cannot provide certificates of conformance (CERTS) and will probably not restock them in the future. Our closeouts are old sells at very low prices, but is not recommended for machine sewing.

**Nominal Weights**—Industry norms allow Kevlar thread spool weights to vary by ±10% from the stated nominal weig follow this practice, but have biased our standards so that customers receive slightly more thread than less thread . In table below is a show to this tolerance. When spool weights fall within these tolerances we do not charge or give refunds for underages.

<table>
<thead>
<tr>
<th>Nominal Weight</th>
<th>Spool Minimum</th>
<th>Spool Maximum</th>
<th>Nominal Weight</th>
<th>Spool Minimum</th>
<th>Spool Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.0 Oz</td>
<td>2.6 Oz</td>
<td>4.5 Oz</td>
<td>8.0 Oz</td>
<td>8.0 Oz</td>
<td>10.5</td>
</tr>
<tr>
<td>4.0 Oz</td>
<td>4.6 Oz</td>
<td>5.9 Oz</td>
<td>12.0 Oz</td>
<td>10.6 Oz</td>
<td>15.5</td>
</tr>
<tr>
<td>6.0 Oz</td>
<td>6.0 Oz</td>
<td>7.9 Oz</td>
<td>16.0 Oz</td>
<td>15.6 Oz</td>
<td>19.9</td>
</tr>
</tbody>
</table>

**Certificates of Compliance** We can email manufacturer's CERTS for our 16 Ounce standard size Kevlar. We can...
CERTS for any non-standard size or closeout thread.

CERTS apply to specific batch / lots. We wind our smaller spools from the 16 Oz standard size spools and do not keep lot information for these spools. We can send a "representative" CERT for these spools that applies in a general way to the thread purchased. Please call if you must have batch / lot traceable CERTS on small spools and are willing to pay a $2 a spool up-charge.

**No Medical Devices** Our Kevlar thread is clean in the ordinary sense. But, it is not sterile and using it in any medical device could put lives at risk. We will not knowingly sell Kevlar thread for use in medical devices.

**Kevlar Specifications** Here are specifications for our standard size Kevlar thread

<table>
<thead>
<tr>
<th>Size</th>
<th>15</th>
<th>23</th>
<th>46</th>
<th>69</th>
<th>92</th>
<th>138</th>
<th>207</th>
<th>346</th>
<th>41</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tex</td>
<td>16</td>
<td>21</td>
<td>40</td>
<td>60</td>
<td>80</td>
<td>120</td>
<td>210</td>
<td>350</td>
<td>50</td>
</tr>
<tr>
<td>Military</td>
<td>00</td>
<td>AA</td>
<td>B</td>
<td>E</td>
<td>F</td>
<td>FF</td>
<td>3-Cord</td>
<td>5-Cord</td>
<td>6-Cord</td>
</tr>
</tbody>
</table>

**U.S.**

- Tensile Strength (Lbs.): 4, 6, 14, 23, 30, 45, 64, 135, 1.5
- Yards Per Pound: 28,000, 25,000, 10,000, 6,700, 5,000, 3,350, 2,100, 1,050, 90
- Diameter (Inches): 0.004, 0.006, 0.008, 0.010, 0.011, 0.014, 0.018, 0.026, 0.028

**Metric**

- Tensile Strength (Kg): 1.8, 2.7, 6.3, 10.4, 13.6, 20.3, 29.0, 61.2, 79
- Diameter (MM): 0.10, 0.15, 0.21, 0.25, 0.29, 0.36, 0.46, 0.65, 0.79

More Choices

Kevlar

- Size 15
- Size 23
- Size 46
- Size 69
- Size 92
- Size 138
- Size 207
- Size 346
- Size 415

Fire Retardant Products

- All Kevlar
- Kevlar Specials
- Sewing Thread
- Embroidery Thread
- Nomex Thread

The Thread Exchange
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