THREADUCATION
Workshop
Presented by Phil Freese

High Performance Threads
A&E is one of the world’s foremost manufacturers of sewing thread, embroidery threads, and technical textiles.

A&E was founded in 1891, our 125th Anniversary in 2016!

A&E’s global presence extends from Asia to Europe to the Americas.

A&E is dedicated to providing our customers with the highest quality products and services.
Markets Served

Performance threads specifically designed to optimize sewing & seam quality.

- Jeanswear
- Activewear
- Athletic Apparel
- Childrenswear
- Workwear
- Intimate Apparel
- Tailored Apparel
- Outerwear
- Automotive
- Footwear
- Home Furnishings
- Luggage
- Sporting Goods
- Leather Goods
- Mattresses
- Outdoor Products
You cannot inspect Quality into your products!

Quality must be engineered into the product for the

Best Profitability as well as Customer Satisfaction Possible!
Selecting quality thread is important. Quality thread can help minimize:

- Repaired Seams
- Skipped Stitches
Quality Thread

- Open Seams or Seam Failure
- Seam Puckering
Does it really cost more to use the Right Thread?

What’s the difference
To answer this question, you must first determine how much thread is actually consumed in a garment and what the thread cost is?

A&E has a tool called ANECALC which can help you make this calculation.
## Garment Description

**Polo Golf Shirt**

<table>
<thead>
<tr>
<th>Name of Operation</th>
<th>ISO Stitch</th>
<th>Rows of Stitch</th>
<th>SPI</th>
<th>Seam Length CM</th>
<th>Needle Thread Tex / Type / Color</th>
<th>Bobbin Thread Tex / Type / Color</th>
<th>Looper / Cover Thread Tex / Type / Color</th>
<th>Total Metres / Oper.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attach Placket</td>
<td>301 Lockstitch</td>
<td>2</td>
<td>10</td>
<td>20</td>
<td>0.59</td>
<td>T-27 Perma Spun</td>
<td>T-27 Perma Spun</td>
<td>1.16</td>
</tr>
<tr>
<td>Topstitch Placket</td>
<td>301 Lockstitch</td>
<td>1</td>
<td>10</td>
<td>41</td>
<td>0.59</td>
<td>T-27 Perma Spun</td>
<td>T-27 Perma Spun</td>
<td>1.16</td>
</tr>
<tr>
<td>Box Placket</td>
<td>301 Lockstitch</td>
<td>1</td>
<td>10</td>
<td>8</td>
<td>0.11</td>
<td>T-27 Perma Spun</td>
<td>T-27 Perma Spun</td>
<td>0.22</td>
</tr>
<tr>
<td>Attach ribbed knit cuff to sleeve</td>
<td>514 Four Thd Overedge</td>
<td>1</td>
<td>10</td>
<td>75</td>
<td>3.41</td>
<td>T-27 Perma Spun</td>
<td>T-27 Perma Spun</td>
<td>10.23</td>
</tr>
<tr>
<td>Join Shoulders</td>
<td>514 Four Thd Overedge</td>
<td>1</td>
<td>10</td>
<td>48</td>
<td>2.20</td>
<td>T-27 Perma Spun</td>
<td>T-27 Perma Spun</td>
<td>6.59</td>
</tr>
<tr>
<td>Topstitch Shoulder Seam</td>
<td>301 Lockstitch</td>
<td>1</td>
<td>10</td>
<td>48</td>
<td>0.71</td>
<td>T-27 Perma Spun</td>
<td>T-27 Perma Spun</td>
<td>1.38</td>
</tr>
<tr>
<td>Set Collar</td>
<td>514 Four Thd Overedge</td>
<td>1</td>
<td>10</td>
<td>46</td>
<td>2.08</td>
<td>T-27 Perma Spun</td>
<td>T-27 Perma Spun</td>
<td>6.24</td>
</tr>
<tr>
<td>Topstitch Collar Tape</td>
<td>301 Lockstitch</td>
<td>1</td>
<td>10</td>
<td>91</td>
<td>1.34</td>
<td>T-27 Perma Spun</td>
<td>T-27 Perma Spun</td>
<td>2.32</td>
</tr>
<tr>
<td>Set Sleeves</td>
<td>514 Four Thd Overedge</td>
<td>1</td>
<td>10</td>
<td>127</td>
<td>5.78</td>
<td>T-27 Perma Spun</td>
<td>T-27 Perma Spun</td>
<td>17.33</td>
</tr>
<tr>
<td>Topstitch Sleeve Set Seams</td>
<td>301 Lockstitch</td>
<td>1</td>
<td>10</td>
<td>127</td>
<td>1.86</td>
<td>T-27 Perma Spun</td>
<td>T-27 Perma Spun</td>
<td>3.64</td>
</tr>
<tr>
<td>Close Sleeves &amp; Side seam</td>
<td>514 Four Thd Overedge</td>
<td>1</td>
<td>10</td>
<td>188</td>
<td>7.63</td>
<td>T-27 Perma Spun</td>
<td>T-27 Perma Spun</td>
<td>22.88</td>
</tr>
<tr>
<td>Hem Bottom</td>
<td>406 (6.4mm) 2 Ndl Btm Cov</td>
<td>1</td>
<td>10</td>
<td>102</td>
<td>6.28</td>
<td>T-27 Perma Spun</td>
<td>T-27 Perma Spun</td>
<td>7.67</td>
</tr>
<tr>
<td>Hem Side Vents</td>
<td>301 Lockstitch</td>
<td>1</td>
<td>10</td>
<td>20</td>
<td>0.30</td>
<td>T-27 Perma Spun</td>
<td>T-27 Perma Spun</td>
<td>0.58</td>
</tr>
<tr>
<td>Buttonhole Placket</td>
<td>BH 12 - 13mm</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>1.18</td>
<td>T-27 Perma Spun</td>
<td>T-27 Perma Spun</td>
<td>1.69</td>
</tr>
<tr>
<td>Buttonsew Placket</td>
<td>BS 4 hole</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>0.54</td>
<td>T-27 Perma Spun</td>
<td>T-27 Perma Spun</td>
<td>0.54</td>
</tr>
</tbody>
</table>

**SUBTOTALS**                             |             |                |      |                | 34.59                           | 0.79                              | 70.95                          | 111.32              |
Typical Thread Prices per Garment

Using the Good- Better- Best methodology, price examples ($ USD) for comparative purposes:

<table>
<thead>
<tr>
<th>Garment</th>
<th>Meters Per Garment</th>
<th>GOOD</th>
<th>BETTER</th>
<th>BEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slack</td>
<td>174</td>
<td>$.12 US</td>
<td>$.16 US</td>
<td>$.19 US</td>
</tr>
<tr>
<td>Men's Jean</td>
<td>199</td>
<td>$.20 US</td>
<td>$.28 US</td>
<td>$.35 US</td>
</tr>
<tr>
<td>Ladies Jean</td>
<td>215</td>
<td>$.19 US</td>
<td>$.27 US</td>
<td>$.34 US</td>
</tr>
<tr>
<td>Suit Coat</td>
<td>160</td>
<td>$.06 US</td>
<td>$.10 US</td>
<td>$.18 US</td>
</tr>
<tr>
<td>Dress Shirt - LS</td>
<td>152</td>
<td>$.10 US</td>
<td>$.16 US</td>
<td>$.19 US</td>
</tr>
<tr>
<td>Knit Polo Shirt</td>
<td>121</td>
<td>$.05 US</td>
<td>$.08 US</td>
<td>$.13 US</td>
</tr>
<tr>
<td>Tee Shirt</td>
<td>53</td>
<td>$.02 US</td>
<td>$.03 US</td>
<td>$.03 US</td>
</tr>
<tr>
<td>Knit Brief</td>
<td>62</td>
<td>$.02 US</td>
<td>$.04 US</td>
<td>$.05 US</td>
</tr>
<tr>
<td>Blouse</td>
<td>112</td>
<td>$.08 US</td>
<td>$.12 US</td>
<td>$.14 US</td>
</tr>
<tr>
<td>Dress</td>
<td>129</td>
<td>$.09 US</td>
<td>$.14 US</td>
<td>$.16 US</td>
</tr>
<tr>
<td>Panty</td>
<td>57</td>
<td>$.02 US</td>
<td>$.03 US</td>
<td>$.05 US</td>
</tr>
<tr>
<td>Bra</td>
<td>58</td>
<td>$.02 US</td>
<td>$.05 US</td>
<td>$.07 US</td>
</tr>
</tbody>
</table>

Price examples are for comparative purposes only. For actual pricing please contact your A&E Representative.
Thread only makes up a small percent of the cost of the garment.

But, it is responsible for at least 50% of the seam performance & appearance.
Does it really cost more to use the Right Thread? Absolutely NOT!

A High Quality Sewing Thread Will:

- Reduce sewing interruptions such as thread breaks and skipped stitches
- Reduce repairs
- Improve productivity
- Reduce payback time on equipment
- Lower overhead
- Improve Quality
- Reduce Production Lead Times
- Improve Your Profitability
- Improve Your Brand Recognition/ Company Name
- Lower Your Carbon Footprint
Selecting the Right Thread to Optimize Seam Quality

How to select the right thread type and size for the garment.
Selecting the right thread

Begins with 3 questions:
1) Which fiber type should be used?
2) Which construction type is best?
3) Which thread size is appropriate?
Selecting the right thread

### A&E Apparel Thread Selection Chart - By Physical Properties

<table>
<thead>
<tr>
<th>Apparel Threads</th>
<th>Tenacity (Strength)</th>
<th>Elongation (Stretch)</th>
<th>Heat Resistance</th>
<th>Durability</th>
<th>Color Fastness</th>
<th>Chemical Resistance</th>
<th>Abrasion Resistance</th>
<th>Soft Hand</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poly Wrap Poly Core</td>
<td>Excellent</td>
<td>Very Good</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Very Good</td>
<td>Fair</td>
<td></td>
</tr>
<tr>
<td>Cotton Wrap Poly Core</td>
<td>Very Good</td>
<td>Very Good</td>
<td>Excellent</td>
<td>Good</td>
<td>Very Good</td>
<td>Very Good</td>
<td>Very Good</td>
<td>Fair</td>
<td></td>
</tr>
<tr>
<td>Air Entangled Poly</td>
<td>Very Good</td>
<td>Good</td>
<td>Very Good</td>
<td>Excellent</td>
<td>Very Good</td>
<td>Fair</td>
<td>Good</td>
<td></td>
<td>Magic</td>
</tr>
<tr>
<td>Textured Polyester</td>
<td>Good</td>
<td>Excellent</td>
<td>Very Good</td>
<td>Excellent</td>
<td>Fair</td>
<td>Excellent</td>
<td>Good</td>
<td>Wildcat</td>
<td>Plus</td>
</tr>
<tr>
<td>Textured Nylon</td>
<td>Good</td>
<td>Excellent</td>
<td>Very Good</td>
<td>Very Good</td>
<td>Fair</td>
<td>Excellent</td>
<td>Good</td>
<td>Best</td>
<td>Stretch</td>
</tr>
<tr>
<td>Spun Poly</td>
<td>Good</td>
<td>Very Good</td>
<td>Very Good</td>
<td>Good</td>
<td>Excellent</td>
<td>Good</td>
<td>Very Good</td>
<td>Fair</td>
<td>Perma Spun</td>
</tr>
<tr>
<td>Spun Cotton</td>
<td>Fair</td>
<td>Fair</td>
<td>Excellent</td>
<td>Fair</td>
<td>Fair</td>
<td>Poor</td>
<td>Very Good</td>
<td>Fair</td>
<td>Anecot</td>
</tr>
</tbody>
</table>

**A&E Brands**
- Perma Core®, Perma Core®NWT, Perma Core®Ultimate
- D-Core®, D-Core® NWT, Design-A-Core®
- Magic®, Signature®Plus
- Wildcat Plus®, Tex Kool®, IntimaSoft®
- Best Stretch®
- Perma Spun®, Excell®, Spun Kool®
- Anecot®, Anecot Plus®, Anecot X-tra®
Thread fiber type is broken down into 2 classifications with some similar characteristics.

**Cellulosic**
- Cotton
- Rayon
- Others

**Synthetic**
- Polyester
- Nylon
- Aramids
Cotton

- Spun Cotton
- Long Staple Spun
- Cotton Gimp
- Organic Cotton

- The most common natural sewing thread available
- Used in garment dye applications where you want the thread to take on the same color as the body fabric.
- Will wash down as 100% Cotton fabrics do
- Can be damaged by abrasion during the dye cycle and finishing processes or enzyme wash.
Cotton is used as a wrapper in our Cotton Wrapped Poly Core thread.

- Combines the aesthetics of Cotton with the strength, durability and sewability of a polyester continuous filament core.
- Will “wash down” or “fade” with the fabric.
- D-Core® RFD is designed for improved sewability, better dye pick up and will perform much better than 100% cotton thread in its ability to withstand the dyeing and finishing process.
Rayon

- Rayon Embroidery
- Multi Color RE
- Variegated RE

- Rayon, once used as a fiber for construction thread, is now used exclusively for decorative applications like embroidery.
- Rayon has a very high sheen, but may possess poor color fastness.
- Rayon is designated as an artificial fiber (not synthetic), as it is technically a regenerated cellulose.
- Rayon has a low wet-modulus, meaning it loses strength when wet.
Cellulosic Summary

- Cotton
- Rayon
- Others

- Includes fibers such as Cotton, Rayon, Lyocell, and others.

- Typical Characteristics of Cellulosic fibers include:
  
  Lower tenacity: 2.5 - 3.5 gpd
  Lower elongation: 3 to 5% at break
  Good heat resistance: does not melt
  Durability: Fair
  Moisture Regain: 5 - 8%
Polyester

- Spun Poly
- Texturized Poly
- Air Entangled Poly
- Continuous Filament
- Poly Wrap Poly Core

- The most common fiber type for apparel sewing thread.
- Has earned its position for versatility, durability, color fastness, chemical & UV resistance and overall performance.
- Available is a variety of constructions to meet application demands, including staple spun, air entangled, textured, continuous filament, and core spun, where a staple polyester wrap covers a continuous filament core.
Nylon

- Texturized Nylon
- Continuous Filament Nylon

- Used in textured filament and continuous filament form.
- Textured Nylon is used in certain activewear, intimate apparel and underwear applications where it’s softness and bulk deliver comfort against the skin.
- Primary applications are footwear and non-apparel end uses.
- Leather goods, luggage and automotive applications benefit from Nylon’s superior abrasion resistance.
Polyester, Nylon, Aramids, PBT are included in this classification. Principal characteristics of the most common include:

<table>
<thead>
<tr>
<th></th>
<th>Polyester</th>
<th>Nylon</th>
</tr>
</thead>
<tbody>
<tr>
<td>High tenacity (gpd)</td>
<td>7.9</td>
<td>8.5</td>
</tr>
<tr>
<td>High elongation (%)</td>
<td>15-23</td>
<td>20 - 30</td>
</tr>
<tr>
<td>Melt Point</td>
<td>252°</td>
<td>252°</td>
</tr>
<tr>
<td>Color Fastness/ Chemical Resistance</td>
<td>Very Good</td>
<td>Good to Very</td>
</tr>
<tr>
<td>Chemical Resistance</td>
<td>Very Good</td>
<td>Good</td>
</tr>
<tr>
<td>Abrasion Resistance</td>
<td>Good</td>
<td>Very Good</td>
</tr>
<tr>
<td>Moisture Regain</td>
<td>0.5%</td>
<td>4%</td>
</tr>
</tbody>
</table>
Fiber types are used in two forms to produce sewing thread.

Continuous

Staple
Fiber Forms Characteristics

Staple Spun Yarn

- Fibrous Surface, Soft Hand
- Refracts light - low sheen
- Superior Frictional Characteristics
- Lower Cost

Continuous

- Smooth Surface, Uniformity
- High tenacity
Which Thread Construction?

- There are 7 thread construction types.
- Construction dictates the appearance, application and characteristics of the thread.
- Each construction has attributes suited for certain applications.

Core Spun

Spun

Textured

Air Entangled

Monofilament

Multifilament

Monocord
Core Spun

Construction Attributes

- Core threads are made by wrapping a staple polyester or cotton wrapper around a continuous filament bundle of polyester fibers during spinning, and then plying these yarns into a sewing thread.

- Use core threads for the toughest sewing applications like denim to the finest sewing of light weight shirts and fine blouses. Core threads help to ensure the best sewability on multi directional sewing equipment and the ability to stand up to the toughest finishing operations. Available in a wide range of global colors.
Superior sewability and fewer sewing interruptions contributes to higher quality garments and lower sewing costs.

- Reduced seam failures and broken stitches on denim.
- Helps minimize seam puckering on Shirts, Blouses, Jackets, Pants
- Fewer open seams on stretch knit garments
Spun threads are made from polyester, cotton, or aramid staple fibers which are spun into singles yarns and then two or more of these yarns are plied to make a sewing thread.

Applications include everything from opening price point t-shirts, pants, knit tops, and dresses as well as other types of apparel. Available in a wide range of global colors. Cotton is used for garment overdye products.
Spun

Common Applications

- Good sewability on all types of sewing machines
- Good seam performance
- Ideal for loopers or serging on inside seams
- Less expensive than corespun threads

Womenswear

Kidswear

Garment Dyed Products
How can you identify Core versus Spun?

Un-twist the thread and separate out a singles yarn.

Un-twist the singles yarn. If the thread falls apart, it is a Spun thread construction.

If the thread will not fall apart but maintains its strength, then it is a Corespun thread construction.
Textured threads are made from continuous filaments of polyester or nylon which have been stretched, textured and then heat set to insure proper bulk retention.

Textured threads are ideal for overedge, chainstitch, and coverstitch operations on knits & wovens. Available in a wide range of global colors.

Texturized Nylon is sometimes referred to as Wooly or Fluff Nylon.

Texturized Polyester, Micro Denier Texturized Polyester and Texturized Nylon
### Construction Attributes

<table>
<thead>
<tr>
<th>A&amp;E Brand</th>
<th>Construction</th>
<th>Bulk</th>
<th>Softness</th>
<th>Price</th>
<th>Colors</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>AneSoft</em></td>
<td>Micro-denier Poly</td>
<td>Low</td>
<td>Best</td>
<td>Med.</td>
<td>Limited</td>
</tr>
<tr>
<td><em>Best Stretch</em></td>
<td>Nylon</td>
<td>Best</td>
<td>V.Good</td>
<td>Highest</td>
<td>Limited</td>
</tr>
</tbody>
</table>

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Textured

Common Applications

- High Bulk for excellent seam coverage.
- Softest in next-to-skin applications
- Very Good Seam Elasticity
- Good aesthetics in coverstitch applications

Tees & Underwear
Casual & Yoga Wear
Athletic Wear & Kidswear
Swimwear
High Performance Wear
Disadvantages

- Poor ply security - not recommended for lockstitch machines
- High Sheen Appearance
## Selecting the Right Thread - Apparel

<table>
<thead>
<tr>
<th>APPAREL THREADS</th>
<th>Denim</th>
<th>Woven Bottoms</th>
<th>Woven Tops</th>
<th>Knit Activewear</th>
<th>Knitwear - Performance</th>
<th>Intimates</th>
<th>Knit Underwear</th>
<th>Overdye Programs</th>
<th>Workwear &amp; Uniforms</th>
<th>Outerwear</th>
<th>A&amp;E Brands</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poly Wrap Poly Core</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Perma Core®, PCore®NWT, PCore®Ultimate</td>
</tr>
<tr>
<td>Cotton Wrap Poly Core</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>D-Core®, D-Core® NWT, Design-A-Core®</td>
</tr>
<tr>
<td>Air Entangled Poly</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Magic®, Signature® Plus</td>
</tr>
<tr>
<td>Textured Polyester</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Wildcat Plus®, Tex Kool®, IntimaSoft®</td>
</tr>
<tr>
<td>Textured Nylon</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Best Stretch®</td>
</tr>
<tr>
<td>Spun Poly</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Perma Spun®, Excell®, Spun Kool®</td>
</tr>
<tr>
<td>Spun Cotton</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>Anecot®, Anecot Plus®, Anecot X-tra®</td>
</tr>
</tbody>
</table>
Multifilament

**Construction Attributes**

- Are made from continuous filaments of polyester or nylon which are twisted together into a cohesive bundle and then plied to make the thread. Twisted Multifilament threads are available either soft or with an additional bond for better ply security and abrasion resistance.

- They are extremely strong for their size and used in applications that include accessories, automobile upholstery, furniture, mattress, luggage & footwear.

**Continuous Filament Nylon**

**Continuous Filament Polyester**
**Multifilament**

- **Leather Footwear & Work boots**
- **Specialty Sportswear**

**Common Applications**

- **Leather Goods**
- **Athletic Footwear**
  - Exceptionally strong for their size (high tenacity)
  - Very uniform
  - Very Durable to abrasion
  - Twisted Sewn-in Appearance
Monocord

Construction Attributes

- Made from continuous filaments of nylon or polyester that have been slightly twisted, dyed and then bonded into a ribbon-like monocord thread construction.

- A&Es high performance continuous filament monocord threads are extremely strong for their size and are used in applications that include accessories, outdoor products, automobile upholstery, furniture, mattress, luggage & footwear. They are very flat & ribbon like contributing to excellent abrasion resistance. Excellent blind stitch thread and bobbin thread.

Monocord Nylon   Monocord Polyester
Monocord

Common Applications

Automotive

Outdoor Products

Footwear

Accessories

Furniture & Mattress

- Flat & Ribbon like providing a low seam profile & high loop strength
- More comfortable - Less irritating
- Very good abrasion resistance
- Excellent Bobbin thread - more yardage
Non-Apparel Thread Products

- Automotive
- Furniture
- Leather Goods
- Home Furnishings
- Hospital Products
- Mattress
- Outdoor Products
- Sporting Goods
- Protective Harnesses
- Web Slings/Tie Downs
Thread Selection Made Easy

Industrial Sewing Thread
A&E is one of the world’s foremost manufacturers of industrial sewing thread. We are dedicated to providing our customers with a complete range of premium sewing threads, produced worldwide in a sustainable and ethical manner and available right where our customers need them.  Learn more...
Does it really cost more to use the Right Thread? **Absolutely NOT!**
A High Quality Sewing Thread Will;

- Reduce sewing interruptions/ thread breaks
- Improve productivity
- Reduce repairs
- Reduce payback time on equipment
- Lower overhead
- Improve Quality
- Reduce Production Lead Times
- Improve Your Profitability
- Improve Your Brand Recognition/ Company Name
Thank you!

Questions?

Phillip Freese
Technical Director GRS
American & Efird LLC.
Phil.freese@amefird.com