

Estimating Thread Consumption

It is important to know the amount of thread consumed in a sewn product so you can: 1) estimate the number of cones needed; and 2) calculate the cost of the thread needed to manufacture the finished product. Thread consumption can be determined in several ways. To calculate the amount of thread in a seam, you can:

- Measure the actual amount of thread consumed in a specific length of seam.
- Calculate the thread consumption by using mathematical stitch formulas based on the thickness of the seam and the number of stitches per inch.
- Calculate the thread consumption using A&E's **ANECALC** spreadsheets.

Measuring Actual Thread Consumed

A specified length of the seam, for example 3 inches, is measured and then the thread is removed by carefully unraveling the stitch. You can then calculate the amount of thread consumed in one inch and multiply this factor times the total length of the seam measured in inches.

Example:

- Length of seam is 42 inches or 1.17 yards.
- Stitch and seam construction: 401 SSa-1.
- Specified length of thread removed from a seam equals 3 inches.
- Needle thread removed = 9 inches
- Loper thread removed = 8 inches

Calculation:

- Needle thread factor = $9 \div 3 = 3$ inches of needle thread per inch of seam.
- Loper thread factor = $8 \div 3 = 2.67$ inches of looper thread per inch of seam.
- Total needle thread consumed = factor $3 \times 1.17\text{yds} = 3.51$ yds
- Total looper thread consumed = factor $2.67 \times 1.17\text{yds} = 3.12$ yds
- Total Thread = $3.51 + 3.12 = 6.63$ yards per seam.
- Generally a 10 to 15% waste factor is added due to chaining-off, thread breaks, repairs, etc.
- If a waste factor of 15% is selected then:
 - $6.63 \text{ yards/seam} \times 1.15 = 7.62$ yards/seam including 15% waste factor.

Obviously you must do this for each seam to determine the total amount of thread consumed in the finished product.

Thread Consumption Formulas

Union Special Machine Company published a “Thread Consumption Booklet” that consists of a number of thread consumption formulas for various stitch types based on the stitch length and thickness of the seam. These mathematically derived consumption factors can be multiplied times the length of the seam to estimate the combined amount of top and bottom thread. On some overedge and coverstitch types it is necessary to also know the seam width or needle spacing to properly calculate the amount of thread consumed.

Example:

Stitch and seam: 401 SSa-1

Stitches per inch: 8

Thickness of the seam: .075 inches (measured with a micrometer)

Length of the seam: 42 inches or 1.17 yds.

Union Special 401 Chainstitch Chart

SEAM THICKNESS	8 SPI
.055	4.88
.060	4.96
.065	5.04
.070	5.12
.075	5.20

Consumption based on the mathematical equation – $C = 4 + 2ts$
 $C = 4 + 2(.075 \times 8) = 5.20$
 t = thickness of the seam
 s = stitches per inch

1.17 yds X **5.20** = 6.08 yds / seam.
 6.08 yds/seam X 1.15 = 7.00 yds per seam including a 15% waste factor.

ESTIMATING THREAD CONSUMPTION USING *ANECALC*

A&E’s ***ANECALC*** thread consumption and costing tool was develop using the Union Special thread consumption formulas. To use this tool effectively, you should do the following:

1. Select the correct ***ANECALC*** spreadsheet before you begin your analysis. For apparel, you can choose from the following spreadsheets:
 - a. Light Weight Fabrics yards or metres
 - b. Medium Weight Fabrics yards or metres
 - c. Heavy Weight Fabrics yards or metres

2. Make a sequence of sewing operations and for each operation, determine the stitch type, the number of rows of stitch, the SPI, and the length of the seam.
3. Last, decide on what thread size and type you are currently using or you are thinking about using.

Obviously the factors that can effect thread consumption include the thickness of the fabric, the stitch type being used, the number of rows of stitch in a seam, the SPI and the length of the seam.

A&E's **ANECALC** spreadsheets do the rest. See the example below for a simple Tee Shirt.

American & Efird Thread Consumption Calculator - Light Wt. Fabrics

ANE CALC
Avg. Seam Thickness: mm

Fill in the information highlighted in 'yellow'

Garment Description:
Men's Tee Shirt
Size: Large

Cost Per Garment = US \$

Ok to change (ie, Topstitching)	Thread Description (ex. Tex Size / Brand / Ctr)	=	Copy & Paste from column "M" to Column "O"
Thread #1	T-21 Perma Spun	=	T-21 Perma Spun
		=	
		=	
		=	
		=	

Oper #	Name of Operation	ISO Stitch	Rows of Stitch	SPI	Seam Length Inches	Needle Thread Yards	Needle Thread Tex / Type / Color	Bobbin Thread Yards	Bobbin Thread Tex / Type / Color	Looper Thread Yards	Looper / Cover Thread Tex / Type / Color	Total Yards / Oper.
1	Join Shoulders	504 1/8 1 Ndl Overedge	1	10	11	0.91	T-21 Perma Spun			2.73	T-21 Perma Spun	3.64
2	Set Collarette	503 1/8 2Thd Serge	1	10	19	2.57	T-21 Perma Spun			2.10	T-21 Perma Spun	4.67
3	Tape Shoulder & Neck	401 Chainstitch	2	10	21	1.75	T-21 Perma Spun			2.63	T-21 Perma Spun	4.38
4	Hem Sleeves	406 1/4 Btm Cover	1	10	30	5.19	T-21 Perma Spun			6.35	T-21 Perma Spun	11.54
5	Close Sleeve	504 1/8 1 Ndl Overedge	1	10	12	0.98	T-21 Perma Spun			2.93	T-21 Perma Spun	3.90
6	Set Sleeves	504 1/8 1 Ndl Overedge	1	10	44	3.64	T-21 Perma Spun			10.92	T-21 Perma Spun	14.56
7	Hem Bottom	406 1/4 Btm Cover	1	10	40	6.97	T-21 Perma Spun			8.52	T-21 Perma Spun	15.49
SUBTOTALS						22.01				36.18		58.19
Percent Waste										5.82		64.01
Total Yards/Garment Consumed											58.19	
Yds/Garment - Waste											5.82	
Total w Waste											64.01	

ANECALC THREAD COST ANALYSIS

Copy & Paste Thread SKU's From Above	TOTAL YARDS	Put-Up (6000Yds)	Price	Thread Price Per Yard	Thread Price Per Garment	Program Sz (units)
1 T-21 Perma Spun	64.01	4000	\$ 1.32	\$ 0.00033	\$ 0.02112	10,000
2						# of Cones needed
3						160.0

Total Yds/Garment w Waste: Currency: Per Garment:

Prices are for comparative purpose only. Contact your A&E Representative for your exact prices.

ANECALC spreadsheets have Tabs with Help Guides and well as ISO4915 Stitch Identification Charts.

Notice that the bottom part of the spreadsheet allows you to calculate the thread cost per garment as well as the number of cones required for a particular Program Size.

Another benefit of this tool, is that you can have multiple thread types used on the same spreadsheet. **ANECALC** will easily allow you to see what the total thread consumption is by SKU.

Blank **ANECALC** spreadsheets are available on A&E's website at www.amefird.com. We also have basic spreadsheets, as well as spreadsheets for Knits that include a Cover-thread column if the cover-thread is different from the looper thread being sewn.

How accurate is **ANECALC** in estimating the thread consumption for a sewn product? It has been our Technical Support Team's experience that **ANECALC** is accurate to 2 to 3% of the actual thread consumed using method #1 describe above and is much faster to do.

AVERAGE THREAD CONSUMPTION TOTALS BY GARMENT

The following is a list of sewn products and thread consumption totals based on thread consumption reports conducted by our Technical Service Department. These thread consumption figures include a 10% waste factor and are based on a typical garment construction.

Product Sewn	Total Yds/Garment	Product Sewn	Total Yds/Garment
<u>Men's</u>		<u>Boy's</u>	
Slack	250	Jeans	168
Jean	223	Pants	183
Jean Short	160	Jacket	175
Work Pants	200	Dress Shirt	94
Suit Coat	114	Knit Shirt	46
Dress Shirt – long sleeve	106	Baseball Cap	44
Work Shirt	171		
Knit Polo Shirt	135		
Fleece Sweat Shirt	262		
Tee Shirt	64		
Tank Top	38		
Knit Brief	52		
<u>Women's</u>		<u>Girl's</u>	
Lined Coat	246	Blouse	73
Blazer	153	Dress	118
Dress	141	Swim Suit	65
Skirt	192		
Blouse	122		
Pants	162		
Jeans	250		
Shorts	151		
Robe	300		
Night Gown	135		
Panties	62		
Bra	63		

A&E has an excellent Technical Service Team to assist with any questions you may have concerning how to use **ANECALC**. Contact your local A&E Sales representative if you need any assistance.