

## 3M™ Nextel™ Sewing Thread

3M™ Nextel™ Sewing Threads are a combination of Nextel Ceramic Fibers and rayon fibers. The rayon fibers impart resiliency and abrasion resistance to the threads to improve sewability.

The rayon is heat fugitive, i.e., the fibers decompose at temperatures above approximately 572°F (300°C). The amount of rayon in the thread is about 5% by weight.

### 3M™ Nextel™ Sewing Thread 312 – Typical Properties

		Style AT-21*		Style AT-30	
Diameter		0.019 inch	0,48 mm	0.028 inch	0,71 mm
Approximate Yield		1570 yd/lb	3160 m/kg	810 yd/lb	1630 m/kg
Breaking Strength	With Sizing	27 lb	12,2 kg	47 lb	21,3 kg
	Heat Cleaned	10 lb	4,5 kg	15 lb	6,8 kg
Knot Strength	With Sizing	5 lb	2,3 kg	14 lb	6,4 kg
	Heat Cleaned	3 lb	1,4 kg	8 lb	3,6 kg
Seam Strength	With Sizing	40 lb/in	7,1 kg/cm	TBD	TBD
	Heat Cleaned	18 lb/in	3,2 kg/cm		

### 3M™ Nextel™ Sewing Thread 440 – Typical Properties

		Style BT-30	
Diameter		0.029 inch	0,74 mm
Approximate Yield		710 yd/lb	1430 m/kg
Breaking Strength	With Sizing	44 lb	20,0 kg
	Heat Cleaned	25 lb	11,3 kg
Knot Strength	With Sizing	6 lb	2,7 kg
	Heat Cleaned	6 lb	2,7 kg
Seam Strength	With Sizing	TBD	TBD
	Heat Cleaned		

#### Test Methods:

- 1) Yield – ASTM D578
- 2) Thread Diameter – ASTM D578, Sec. 14 [except 3/8 inch diameter presser foot, 2 psi pressure].
- 3) Breaking Strength – ASTM D2256
- 4) Knot Strength – ASTM D2256
- 5) Seam Strength – 4 inch sample width, 4.5 stitches per inch, Type 301 lockstitch; 0.2 inch/minute crosshead rate; 2.5 inch jaw separation

\*Non-standard item; available by special order.

## 3M™ Sewing Thread

3M Sewing Threads are manufactured from high temperature continuous glass fiber. Laboratory testing has shown the product to maintain strength at temperatures up to 1400°F (760°C). The sewing thread is coated with PTFE to improve sewability. This coating

decomposes at elevated temperatures. 3M Sewing Threads, Style GT, can be used on most shuttle bobbin and rotary hook industrial sewing machines which have the capability of handling large threads of 0.023 inch (0,058 cm) diameter.

### 3M™ Sewing Thread – Typical Properties

		Style GT-15		Style GT-23	
Diameter		0.017 in	0,43 mm	0.022 in	0,56 mm
Approximate Yield		2080 yd/lb	4190 m/kg	1260 yd/lb	2540 m/kg
Breaking Strength	With Sizing	30 lb	14,0 kg	47 lb	21,3 kg
	Heat Cleaned	16 lb	7,3 kg	27 lb	12,2 kg
Knot Strength	With Sizing	12 lb	5,4 kg	19 lb	8,6 kg
	Heat Cleaned	8 lb	3,6 kg	14 lb	6,4 kg
Seam Strength	With Sizing	70 lb/in	12,5 kg/cm	117 lb/in	20,9 kg/cm
	Heat Cleaned	19 lb/in	3,4 kg/cm	26 lb/in	4,6 kg/cm

# 3M™ Nextel™ Sewing Thread and 3M™ Sewing Thread

## Machine Sewing Instructions

3M™ Nextel™ Sewing Threads 312 and 440 are machine sewable threads used for fabricating high temperature sewn parts. The following should assist you in machine setup.

### Recommended Sewing Machines

Singer, 7 Class 31, 33, 34, 97-10 Adler, 7 Class 104, 105, 204, 205 Consew, 733R.

The above are all shuttle bobbin machines capable of handling very large threads without machine modification. Large rotary hook machines have been used to sew Nextel Materials, but they are not recommended. They require modification, and the rotary hook action can cause damage to the thread and reduce seam strengths.

### Thread Lubrication

These Nextel Sewing Threads are precoated with an organic lubricant and need no soaking or further lubrication on the machine. Adding lubricants such as silicone, PTFE, or soap may damage the high temperature properties of the thread.

Note: The coating on Nextel Sewing Thread 312 and 440 may decompose to hazardous by-products when heated. Heat Processing to remove coatings must be done with local exhaust ventilation, e.g., a hood which provides a minimum capture velocity of 150 feet (45,72 m) per minute. See our Heat Cleaning Instructions and our Health and Safety Bulletin for more information.

## Machine Set up and Operation

### Needle, Size 21-30

A size 26 is the preferred needle size for Style BT-30. This size allows the thread to pass through the needle eye and slot with a minimum of damage.

### Thread Tension

Upper (needle side) tension should be measured after the tension device just before the take-up arm. For most fabric-to-fabric sewing this tension should be 0,4 to 0,7 kg. A setting of 0,6 kg is recommended as a starting point.

The lower (bobbin side) tension should be measured coming out of the thread plate. For most fabric-to-fabric sewing, this tension should be 0,4 to 0,7 kg. A setting of 0,4 kg is recommended as a starting point.

### Preferred Stitch

Federal Standard Stitch Type 301 lock is recommended. Using this stitch type with an unbalanced bobbin tension, which allows the bobbin thread and stitch junction to remain on the bobbin side of the fabric surface, is suggested for fabric-to-fabric sewing. When quilting or sewing multiple layer parts, a buried stitch may be desired.

### Stitch Length

3.7 to 7.0 stitches per inch (1.5 – 2.8 stiches per cm) is recommended. More stitches per inch may damage both thread and fabric and result in an excessive number of thread breaks.

### Foot Pressure

The standard medium-range adjustment on the pressure foot assembly on 7-class machines for fabric-to-fabric sewing is usually sufficient. If the pressure is too low, slipping will occur and a short stitch length and abrasion to the fabric will be noticed. An overly high foot pressure will crush and break the fibers in the Nextel Fabric.

When sewing multiple layers or quilted parts, pressure on the foot may need adjusting depending on the part requirements.

#### Speed

If the above recommendations for machine, type, tensions, needle size and adjustments are followed, an operating speed of 550 stitches per minute should be attained. Slower speeds may be necessary if the thread is being sewn through many layers of fabric or thick blankets. Also, during initial machine setup, slower

speeds will be required while adjusting tensions.

#### Deburring

All nicks, burrs, and sharp edges must be removed from the thread guides, tension devices, spring arm, take-up arm, needle guide, needle eye, throat plate, feed dog and hook. Any of these parts which show a worn groove must be replaced. Emery cord and emery paper may be used for this work.