

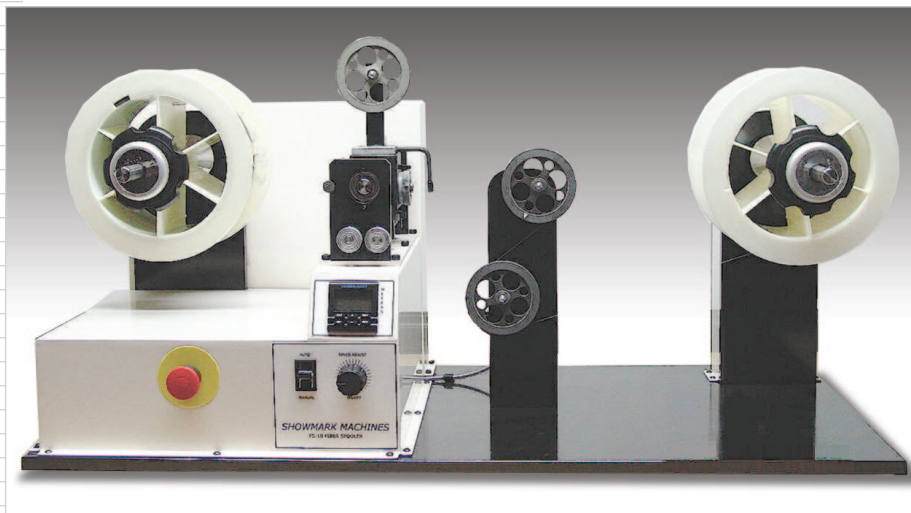
FS-10

Showmark General Purpose Fiber Optic And Fine Wire Spoolers



The FS-10 winds up saving money and increasing productivity.

The Showmark FS-10 general-purpose respooler has been designed to meet the needs of big and small companies. It's inexpensive and flexible enough so that just about anyone can optimize their in house rewinding operations. It's automatic – unlike manual rewinders, your valuable employees can perform other productive tasks while wire is being spooled. The FS-10 is even smaller than other respoolers! Its convenient tabletop size saves valuable floor space.



You can also adjust the traversing rate and total traversing width with easy adjustment dials. Tension is set using a mechanical friction clutch.

Smooth operator.

Extremely low friction guide wheels direct the fiber from the supply to the take-up side. Along the way, an automatic traversing wheel moves the fiber back and forth to evenly layer it across the take-up spool. Length is directly tracked by the guide wheels; and a digital read-

Easy does it.

The FS-10 is a versatile yet easy-to-use tabletop system for automatically re-spooling fiber or wire from a supply spool to a take-up spool. No tools are required, and almost any size supply and take-up spools can be attached in seconds with the universal hub system.

Just flip a switch.

In Automatic mode, simply enter a desired length, up to 100 kilometers, into the digital display. The FS-10 smoothly accelerates up to the set speed and stops automatically at the set length.

In Manual mode, all you have to do is dial in a spooling speed and the FS-10 will accelerate up to the desired rate. The digital display provides a "real time" update of the spooled length. When finished, simply turn the speed down to zero.

out continuously displays the current length with .1-meter resolution.

The FS-10 is available with a number of optional enhancements.

- Electronic Open-Loop Tension Control (0-500 gram settable range)
- Electronic Closed-Loop Tension Control (0-100g, 0-200g, or 0-500gram ranges)
- Tension Display (Calibrated In Grams Or Ounces)
- English Units Length Display
- Custom Shaft Sizes To Accommodate Special Spools
- RS485 Computer Interface
- CE Marked Versions Are Available

Other custom modifications can be made upon request.

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FS-10

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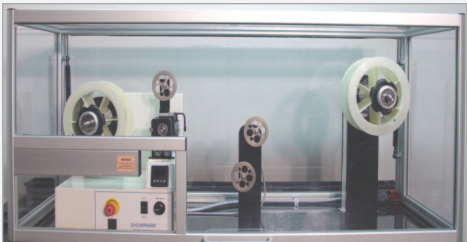


No tools are required to mount a variety of spool types and sizes with our Universal Hub System. Simply grasp the inner ring with one hand and unlock the outer ring by twisting it.



The standard FS-10 can accommodate most take-up and supply spools up to 400 mm in diameter. Modifications can be made to allow for application-specific take-up spools.

The Showmark FS-10 with the CE option can be exported to European Union Countries.



Choose AUTO or MANUAL, dial in a SPEED and enter an Automatic Length Setting of up to 100 kilometers. The LCD readout displays current length with 0.1-meter resolution.



Additional specifications.

- Maximum Winding Speed:**200 meters / minute
- Winding Pitch:**Adjustable Between Approximately 200 microns – 2mm (Other Ranges Available)
- Power Input:**115VAC @ 60Hz (Optional 230VAC @ 50Hz)
- Length Accuracy:**+/- 5mm**
- Maximum Traversing Range:**125mm (other ranges available)
- Weight:**31.7Kg (70 Pounds)
- Dimensions Of Standard Machine:**1060mm (L) X 560mm (D) X 381mm(H)
41.7in X 22.0in X 15.0in
- Length Display Resolution:**1/10 meter (English Calibration Available)
- Minimum Fiber Bending Radius:**35mm

** Length Accuracy is +/- 5 mm while spooling at all speeds. Final stopping accuracy in AUTO Mode can be affected by high speeds. Please consult Showmark for details.



FS-20

Showmark Precision Fiber Optic and Fine Wire Spoolers



The FS-20 winds up combining speed and accuracy.

The FS-20 was originally developed as a state-of-the-art machine to wind fiber optic wire coils for EDFAs (Erbium Doped Fiber Amplifiers). Since then, the FS-20 has been enhanced to provide superior respooling functions for a wide range of applications using fiber optic wire as well as conventional fine wire.

Some examples include winding fiber optic gyros (FOG's), fiber delay coils, fiber ring resonators, and magnet wire coils. The FS-20 performs equally well with other high-gauge conventional wires and filaments. To accommodate individual

requirements, you can specify the size of your takeup shaft, usually at no additional cost.



Permanently mounted collapsible spools that produce coils of fiber or wire have been used with the FS-20.



Close-up of FS-20 Keypad

Take control.

The FS-20 series of respoolers provide a precise and fast method of winding fiber optic wire and other fine filaments onto application-specific take-up spools. Total length, width, speed and tension are accurately controlled to exacting specifications. Depending on the model selected, either a two or three axis servo control system regulates the winding process.

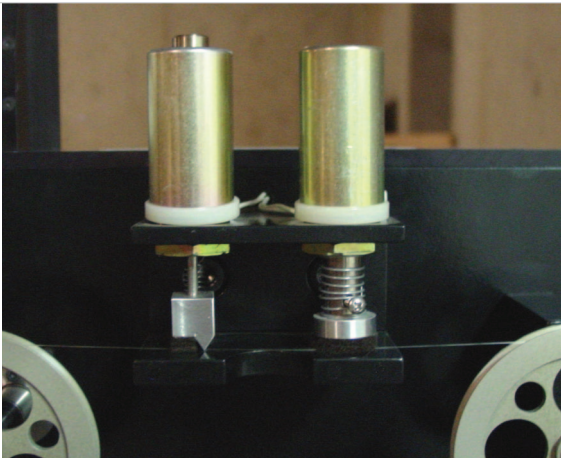
An easy-to-use operator interface makes setup quick and painless. The interface conveniently displays a report of all setup parameters for review before startup.

During operation, the 2-line backlit display shows the current length versus the target length. All settings can be stored when the machine is turned off and automatically recalled when power is reapplied. For both safety and convenience, the operator is able to pause motion at any time.

The FS-20 also includes an integral Electronic Clamp and Cleave System as a standard feature. This system assures repeatable final length and aids in the removal of the finished coils or spools.

FS-20

Showmark Precision Fiber Optic And Fine Wire Spoolers

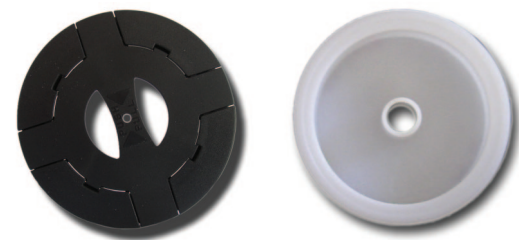


An electronic Clamp and Cleave Head comes standard on all FS-20 models used with fiber optic wire. It assures repeatable fiber length while helping to increase production.

If networking or PC-based control is preferred, an RS232 or Ethernet communication port can be provided in lieu of the operator interface. Showmark will provide any needed assistance in creating a PC-based interface in either a LabVIEW or Visual Basic environment.

2 choices – many features.

The FS-20 is offered in two configurations – with or without a high precision Traversing Wire Guide. For more precise applications, the optional guide assures an even distribution of wire across the take-up spool. A closed-loop, linear servo actuator with 5-micron resolution drives the wire guide. The standard stroke is 30mm but a 50mm stroke is also available.



Pictured are “bobbin” type spools that are reused or ultimately become part of a device or system.

The FS-20 comes with an impressive number of standard features.

- Servo Control Of Supply And Take-Up Axes
- Length Control Via Direct Tracking Encoder
- Closed Loop Tension Control Within 5 Grams (Range 30-500 grams)
- Keypad Interface For Entry Of Length, Winding Speed, Winding Width, And Tension.(Interface Also Provides Manual Control Of Clamps And Cutter.)
- 2-Line Display Showing Set Up Report And Progress During Winding
- Electronic Fiber Clamp
- Electronic Fiber Cutter
- An Optional RS-232 Interface And Networking Are Available. Other custom modifications can be made upon request.

Additional specifications.

Winding Speed: .1 – 40 Meters/Minute

Power Input: 115VAC @ 60Hz

Minimum Fiber Bending Radius: 35mm

Traversing Range: (FS-230 Only) 0 – 30 mm
Standard (Optional 50mm)

Dimensions (Inches): 24(W) X 22(H) X 14.25(D) –
Height Includes The Operator Interface



CUSTOM

Showmark Custom Spoolers



Just about anything you can make, we can wind.

Showmark designs winding machines that work with more than just fiber optic wire. We have designed machines to work with fine wire, wax filament, wide vinyl strip, plastic tubing, jacketed cable, and other materials.

Equally important, we will design a machine that dovetails with your specific manufacturing process. For example, we have created machines that integrate with coating processes and other in-line manufacturing processes, proof testing, and the final take-up at the end of wire manufacturing processes.

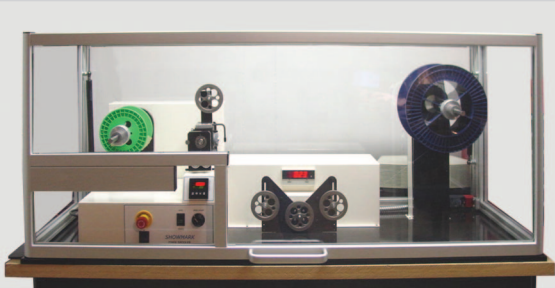


- **FINE WIRE**
- **WAX FILAMENT**
- **WIDE VINYL STRIP**
- **PLASTIC TUBING**
- **JACKETED CABLE**
- **AND OTHER MATERIALS.**

This custom Showmark machine was developed for winding delicate strands of wax onto very large spools. The machine is capable of a winding pitch below 100 microns. Another custom attribute is the industrialized control enclosure Showmark built to prevent intrusion by splashing chemicals used in the customer's manufacturing process.

CUSTOM

Showmark Custom Spoolers



This fine filament spooler includes closed-loop tension control with a calibrated tension display. It was prepared for the European market and includes CE-mark.

Just ask.

Do you have a unique situation? Chances are we can build a cost-effective solution that meets your exact needs. We can incorporate:

- **Special Sized Shafts** –
for extra large or small spools.
- **Custom Traverses** – Extra long or short, DC, stepper, or servomotor driven.
- **Extra Large Sheaves** – to allow a large bending radius or large gage wire.
- **Custom Tension Control Systems** – Open loop using mechanical or electrical clutches and brakes. Closed-loop using dancer arms or tension transducers in conjunction with servomotors, electronic brakes, or magnetic clutches.
- **Custom Controls** – Pushbutton, touchscreen, or computer interfacing.



This fiber optic wire spooler was custom built to perform in a customer's coating process. It accommodates oversize spools that are 300mm long and 1 meter in circumference. Using a closed-loop speed control system, the fiber travels very slowly and steadily; and the guide rollers were custom made to provide absolutely straight travel with little or no vibration. Finally, the machine's frame was custom designed to accommodate special coating equipment supplied by the customer.



SPOOLING

Showmark Spooling Services

Everything will wind up just the way you want it.

Do you have a job that needs quick turnaround? Are you understaffed at the moment? Is this year's budget a concern? Take advantage of Showmark spooling services. We use our own top-quality machines to produce precision spools and coils for many fiber optic and fine wire applications. We can also provide simple respooling services for all types of fine filaments.

Showmark General Purpose Respooling

- For Manufacturers needing to divide a bulk spool into smaller spools for distribution throughout their facilities.
- For Distributors and Manufacturers of fiber optic wire and fine wire needing to send a specified length of material to a customer. As an added convenience, we can drop-ship directly to your customer.



EDFA's

Showmark can provide coils and spools for Erbium Doped Fiber Amplifier production. Our winding machines will accommodate just about any application-specific spool onto the take-up shaft. We can also provide assistance in designing custom spools and mandrels. All coils are efficiently wound with excellent control over length and tension, and crossover is kept to a minimum.

FOG's

Showmark can provide "pre-winds" for your Fiber Optic Gyro production. Our facility can make straight level wound coils as well as symmetrically wound "Center Coils" per your specifications.



Showmark does the job right.

- **Quality service.**
- **Quick turnaround.**
- **Competitive pricing.**
- **Premium packing materials.**

