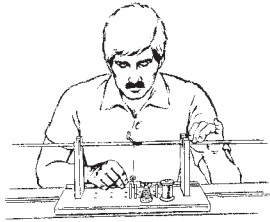


Step-by-Step Rod Building

A fully illustrated guide to building your own fishing rod.



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The Steps to Building a Rod

There are only a few basic steps to rod building. It requires nothing more than assembly of the handle parts on the blank along with wrapping and finishing of the guides. The materials and tools are simple and easily obtained.

The steps for rod building are:

1. Designing your rod.
2. Gathering components, supplies and tools.
3. Determining the spine of the rod blank.
4. Building a handle.
5. Installing the tiptop.
6. Wrapping the guides.
7. Trimming and decorative wrapping.
8. Applying the finish.

Examine these steps and you will see that rod building is easy. It does take time and care. If this is your first rod, you may wish to practice your wrapping techniques before beginning work on your actual rod project.

Designing Your Rod

Fishing rods vary widely, based on the type of rod and its intended use.

- Heavy, powerful rods often have long handles for increased leverage in fighting fish.
- Long rods are used for long distance casting.
- Lighter rods are used for throwing small lightweight baits.
- Some casting rods and big game rods feature handles which are manufactured as complete units and need no assembly, while most other rods feature built-on handles of cork or synthetic foam material. Casting rods usually have trigger reel seats lacking on spinning rods.

When designing your rod you can either pattern it after a tried and proven design, modify it slightly or if you have already built several rods, you may wish to design one from scratch selecting appropriate components and assembling them in your own style. Merrick Tackle offers free professional help when you are ready to attempt a first custom design.

Gathering Rod Components, Supplies and Tools

Rod components and component supplies used to craft a custom rod are all available from Merrick Tackle. Browse through our catalog or check out our website at www.merricktackle.com for all the newest and most innovative components available, many of which are exclusively distributed by Merrick Tackle.

Rod components include:

1. Rod blank.
2. Handle assembly (reel seat, grip material, butt cap).
3. Guides and tip top.

To learn more about rod building components, closely examine existing rods and call and chat with our expert rod builders at Merrick Tackle. When purchasing your components you can request our professionals to the position the guides on the blank for you. Since technology and materials change rapidly you can rely on Merrick to supply you with the latest information. If you have questions don't hesitate to call or stop by our warehouse, we welcome such calls and always have state-of-the-art equipment set up for demonstration purposes.

Supplies needed for assembly include:

1. Reel seat bushing material—cork bushings, masking tape, etc.
2. Epoxy glue—for gluing reel seats, handles, cork rings, etc.
3. Tip top adhesives—for installing tip tops.
4. Thread—for wrapping guides.

5. Finishes--for protecting thread wrappings.

Other supplies include:

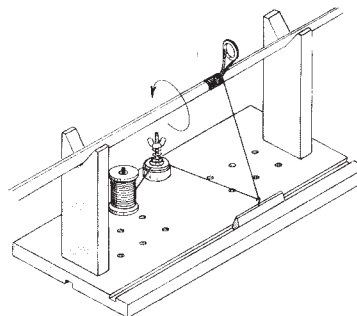
1. Sandpaper for shaping handles (coarse—50 to 80 grit, medium—100 to 150 grit, fine—220 to 320 grit).
2. Masking tape—general purpose for taping guides, building reel seat bushings, etc.
3. Mixing cups and stirrers for mixing epoxy finishes and glues
4. Solvents for clean-up.
5. Paper towels for clean-up.
6. Adding machine tape for tracing of existing rods.
7. Brushes for application of glues and epoxy finishes.
8. Aluminum foil, a good surface for mixing epoxies.

Tools include:

1. Files—triangular, half-round, flat and rat-tail.
2. C-clamp for cork ring application.
3. Rulers and tapes for measuring.
4. Disposable lighter for heating hot melt glues.
5. X-acto knife for cutting thread at end of wrap.
6. Fingernail clipper (Trim brand) for trimming thread.
7. Pliers—small general use or needle nose for installing tip tops.
8. Pen, pencil and china marker for marking blanks and record keeping.

Optional—Consider a simple, inexpensive hand wrapper. Merrick carries HW1's for the beginner.

If you've assembled all your components and supplies, it's get down to the fun part; building the rod!

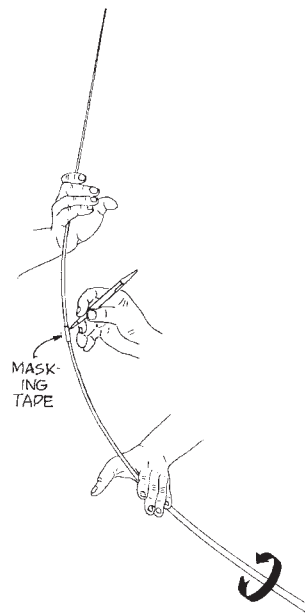


Determining the Spine of the Rod Blank

Almost all manufactured rod blanks are tubular and hollow. These tubular rods have a stiff side called the spine, which must be located to position the guides and reel seat on the blank properly for optimal performance. Solid glass rods also have a spine which must be determined.

To locate the spine, place the butt of the rod blank on a smooth surface. Support the rod near the tip with the open palm of one hand so that the rod is resting at about a 30 to 45 degree angle to horizontal. Using the other hand, apply a downward pressure to the rod blank to bend it slightly. At the same time, roll the butt of the blank on the smooth surface.

As you do this, the rod will jump into a pronounced curve. The inside of the curve is the spine. Mark the inside of the curve. Many experts believe that it is most important to determine the spine on big game rods and fly rods, for more info on why--get the unabridged version, item # D10. Generally a rod will perform best when the guides and reel seat are aligned on the blank so that the rod will bend easier toward the fish. This means the spine will be down. Such alignment will give you a little more power on the cast. Where hookset is the main consideration (as in worm rods), a variation is called for: the spine should be "up" to add power to the hookset. Also, having the spine up makes fly rods perform better.



Building Fishing Rod Handles

Handle assemblies vary widely on fishing rods, based on the type of rod and its use. Spinning rods have a rear grip below and a fore grip above the reel seat. Casting rods have similar handles, except that the reel seat has a trigger for gripping the rod during casting. Most fly rods do not have a rear grip, and the reel seat is placed at the butt end of the rod blank. Some casting and salt water trolling rods have separately manufactured handle assemblies that are glued to the rod blank using a ferrule or collet.

Grip length will vary with the rod and type of use. Grips can be made of cork or synthetic foam, but cork imparts a quality look, performance and feel that cannot be matched by other materials. On the other hand, synthetic foams are easier to install. They will absorb more punishment and are appropriate where heavy abrasive use is involved, such as in rods being rubbed on boat rails or rod holders.

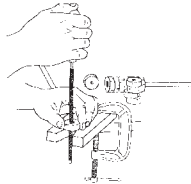
A good method for designing a handle is to attach the reel that you will use with the rod on a reel seat and slide the reel/reel seat combination up and down the rod until it feels comfortable for you. This helps locate

the best reel position for proper balance casting and fighting fish in relation to the rod design, function and performance. Hold the rod as you would when casting, retrieving and fighting fish to check this reel seat location.

Cork Handle Construction

The following supplies available from Merrick Tackle will help you get the job done:

- Razor Wands available in different diameters and grits. (#RWM-F)
- Flex Coat™ Rod Builder's Epoxy Glue (#G4)
- Cork Clamp (#R24)



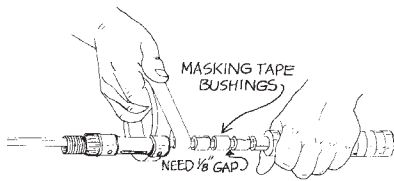
1. To build a cork handle, begin by reaming cork rings with an eight inch round bastard wood file or a razor wand. The rings must be reamed out individually to fit snugly on the blank. Since blanks are tapered, each reamed ring must be checked for a specific position, and kept in order until gluing. You may want to number each ring.

2. Once you have completed reaming cork rings for the fore and rear grips, you are ready to begin assembly of the rings for the rear grip.

Use glue such as Flex Coat Rod Builders Epoxy Glue Measure and mix thoroughly. Take each cork ring and slide it on the blank. Just before pushing it into place, coat the blank and facing cork surfaces with a thin layer of epoxy glue. Push the cork rings together.

3. Use a cork clamp to clamp the cork rings of the rear grip while the epoxy cures.

4. The blank above the rear grip must be built up or shimmed for installation of the reel seat. You can purchase Flexcoat arbors or make your own bushings. To do so wrap the masking tape evenly and smoothly

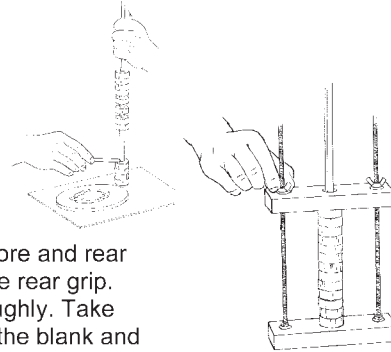


around the rod to the inside diameter of the reel seat, leaving small 1/8 to 1/4 inch gaps between the bushings for epoxy glue. When using masking tape, it is important to realize that the tape is used only as a spacer. The attachment of the reel seat must have a strong bond of epoxy glue extending from the blank to the reel seat. Note: Do not glue the reel seat until you have reamed out the cork rings for the foregrip, using the same techniques previously described for making the rear grip.

5. Glue the reel seat, putting plenty of epoxy in the gaps of the tape bushings. At this point, it is important to adjust the reel seat so that the hoods which hold the reel feet are in line with the intended positions for the guides. After the reel seat is installed, glue and clamp the foregrip cork rings in exactly the same manner as you previously did the rear grip. 6. One method for shaping a rod handle is to use hand tools. To avoid damage during this operation, protect the blank and the reel seat with a layer of masking tape. Begin initial shaping of the cork grips with a half-round file. Be sure to remove an equal amount of cork from all sides of the cork grip to keep the grip centered on the rod blank. 7. Cut down the rear cork to fit the butt cap.

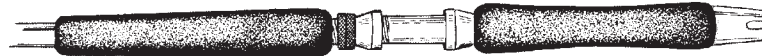
8. Use sand paper for final shaping and finishing of the cork handles. Remove the protective masking tape.

9. Glue the butt cap in place with epoxy.



Foam Handle Construction

Foam (synthetic) handles can be used in place of cork for both fore and rear grips, are easy to install and rugged in tough use. Foam grips can be purchased either shaped or in straight, unshaped lengths which can be shaped with a lathe using the same methods for shaping a cork handle. For the beginner, as with cork, pre-shaped grips are recommended. Merrick Tackle offers an extensive selection of high quality Mooseskin® brand EVA in a large assortment of colors and shapes.



Foam grips should have a hole slightly smaller than a blank diameter to fit properly. Grips can be trimmed to the exact length you need. This can be done simply by cutting the grip to length with a sharp knife then hand-sanding back to a finished end.

Tips to Consider when Installing Foam Grips

The keys to installing foam handles are heat and lubrication.

- **Heat** comes in the form of hot water. It softens and allows expansion of the grip and conforms the grip to the exact shape of the blank. Boil a pan of water, cut the heat off and drop the grip in for three to five minutes while you are busy lubricating the blank. The grip should be submerged but

not folded or distorted while it is in the hot water. Heat enables a 3/8" bore to fit up to a 1/2" blank, 5/8" up to 7/8" blank. Grips with small bore nearly matching the rod size need not be heated.

- **Lubrication** comes in the form of epoxy glue such as Flex Coat™ Rod Builders Epoxy Glue (Item #G4). The glue also serves as a permanent bond after curing. On very long rods soap and water may be used to lubricate up to the place where the grip is positioned, at which point epoxy must be used. Before you begin installation, carefully mark the position of grips, considering space for the butt, cap and reel seat, and to be sure the grip is the intended length when finished.

Fitting Foam Grips on the Blank

1. Slide the grip down the blank to locate the binding point (where the grip first meets resistance and must be stretched to proceed further down the blank). Mark a point 8 to 12 inches above this point.

This is the starting point for your lubrication.

2. If you are going to warm the blank do so now. Lubricate the rod with epoxy from the binding point established in Step 1 to the other end of the blank.

3. Slide the grip into place, making sure it is positioned properly.

4. Clean up excess epoxy on the grip and the blank with solvent. Alcohol is preferable, but acetone and lacquer thinner work as well.

5. Build up bushings on blank for reel seat and epoxy the reel seat. Make certain you align reel seat with intended position of guides.

6. Install the foregrip in the same manner as the rear grip and clean up the reel seat (and entire rod shaft) carefully.

7. Finally, glue on the butt cap. You may need to build it up. No clamping is necessary in any of the above procedures.

Final Tips on Handles

Remember that these techniques can be used for almost any type of handle, of any length or style, on any rod. The main variations would be:

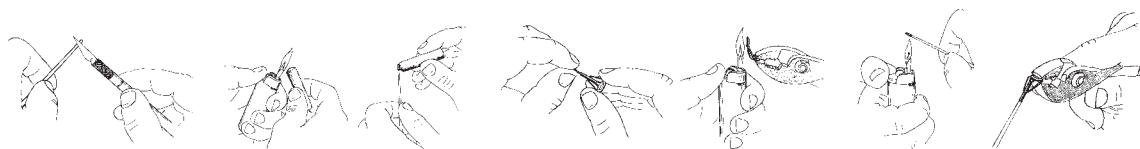
1. Fly rods, in which the reel seat is mounted at the end of the blank with a single grip above it.
2. Casting rods in which a pistol grip is hand shaped for rear grip.
3. Remember that when mounting all reel seats, the hoods must be lined up with the position marked for mounting the guides.

Installation of Guides and Tip Top

When installing the tip top on your blank, use a good hot melt adhesive. This is one that maintains a high strength bond in all temperatures and retains flexibility when cold. Flex Coat™ Thermal Plastic Tip Top Adhesive or equivalent products are ideal. They maintain their bond even under extreme heat conditions, such as closed cars on summer days.

To Install:

1. Scrape the rod clean with your knife back to the length of the tip top, do so with care.
2. Heat the adhesive stick with a lighter. When it becomes molten, coat the scraped area on the blank. When heating stick adhesives, hold the flame near but NOT in contact with the adhesive stick. Use caution with any open flame. Keep away from solvents or other flammables.
3. While the adhesive is still hot, remove and place a small amount of it into the open end of the tip top.
4. Heat both the tip top and the adhesive on the rod tip with your flame, avoiding overheating the blank, especially on small rods. This prevents weakening of the blank.
5. Push the tip top completely onto the rod tip and align with the intended position of the guides and reel seat. To reposition or remove the tip top, just reheat.



Guide Spacing

Guide spacing is best determined by taking measurements from a similar existing rod or basing it on rod building and fishing experience. These tips may help.

1. Most beginning rod builders try to use too many guides.
2. Too many guides result in:
 - Overloading the blank, thereby making it less responsive.
 - Excess friction on line during cast reducing the length of the cast.
3. Too few guides resulting in strain and wear on the line, guides and blank by improper distribution of fishing stresses.
4. To insure proper performance, the guide nearest the reel (stripper guide) should be closer to the reel, on a slow taper rod than the stripper guide on a fast taper rod.
5. The stripper guide on spinning rods should be a little further away from the reel than the stripper guide on a similar casting rod of the same length and action. It makes the line flow smoothly from the spinning reel, but the extra distance is not required on a casting reel. On a casting rod, the closer distance holds the line away from the rod blank, foregrip and your hand when fighting fish.

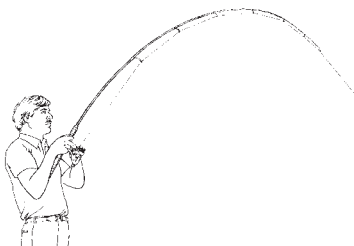
Suggested Guide Spacing

(Additional spacing suggestions can be found both in our catalog and on our website at www.merricktackle.com),

Your specific application will determine minor adjustments to guide spacing recommendations. These charts are meant to give you a starting point.

Rod Description	# of Guides	Distance Measured From Tip Top to Guide in Inches	Length of Rear Grip
5 ft. UL Spinning Lure wt. 1/32-1/4 oz.	5	5-1/2, 11-1/2, 19, 27, 37	2"
7 ft. Spinning Lure wt. 1/4-3/8 oz.	6	5, 11, 18-1/2, 27, 6-1/2, 36-1/2, 48	6-1/2"
9 ft. Spinning Lure wt. 3/8-7/8 oz.	7	6, 13, 21-1/2, 30-3/4, 41, 52-1/2, 66	9"
5-1/2 ft. Bait Casting Lure wt. 1/4-3/4 oz.	5	5-1/2, 12, 19-1/2, 4-1/2, 28, 37-1/2	4-1/2"
7 ft. Bait Casting Lure wt. 1/4-5/8 oz.	6	5-1/2, 12, 19-1/2, 28-1/2, 38-1/4, 50	9"
7 1/2 Fly Rod Line wt. #4	8	4-1/2, 9-1/2, 15-1/2, 22-1/2, 30, 38 1/2, 48 1/4, 59	—
9 ft. Fly Rod Line wt. #8	10	4-1/2, 9-1/2, 15-1/2, 22, 29, 36-1/2, 44-1/2, 54, 65, 76	—
7 ft. Trolling Rod 30 lb. class	5	7, 14, 22-3/8, 32-1/2, 42	14"
11 1/2 ft. Surf Spinning Lure wt. 3-6 oz.	6	8 3/4, 18-3/4, 31, 44-3/4, 61-1/4, 79-1/2	18-1/2"

Here is a way to test your decision on guide spacing:



1. Attach your guides to the blank with masking tape at the positions you have decided on.
2. Put a reel loaded with proper size line on the reel seat.
3. Run the line through the guides and attach it to something solid low on the floor to simulate fishing.
4. Set the drag to a normal setting.
5. Hold the rod as you would when fishing.
6. Pull back and up on the rod to apply pressure.
7. Visually study your guide placement. Does the line appear to equally distribute the stresses? As a rule, what looks good performs well and

vice versa. At this point you may want to make adjustments and go through the procedure again.

8. Once you are satisfied with your guide positions, mark the position of the guide rings with masking tape or china markers.

Prepare guides for wrapping

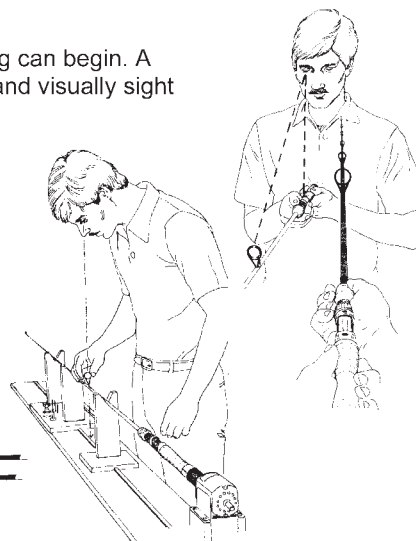
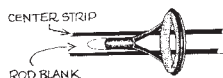
Prepare the guides for wrapping by filing the end of the guide foot to a tapered edge. This provides for a smooth transition of the thread from the blank onto the guide foot. Make sure the guide feet are straight and fit snugly on the blank. Make adjustments as required.

Temporary Guide Attachment

Guides must be temporarily attached and aligned on the blank before wrapping can begin. A popular method is to tape the guides in place with thin strips of masking tape and visually sight down over the rod to check alignment. Here are some methods:

1. Fasten the guides in place with thin strips of masking tape or elastic and visually sight down over the rod. This allows the beginner to reshift the guides until they are aligned perfectly.
2. For the experienced builder Flexcoat™ Guide Foot Adhesive allows alignment and attachment at the same time. The hot melt adhesive has an added advantage that it protects the blank finish and structure from the metal guide foot on rods that do not have an underwrap. This method requires the knowledge and ability to align the guides very accurately.

A preferred means of alignment is to place the rod in a device like a Power Rod Wrapper. While looking straight down the rod, align it with the horizontal center strip below as illustrated.



Trim and Decorative Wrapping

Rod wrapping thread comes in wide range of different size spools, types and colors. Check out www.merricktackle.com to see all the types available. The average rod wrapping job can be done with a hundred yards. Thread comes in two forms: regular untreated and NCP (no color preserver). The NCP thread is treated to resist darkening when finishes are applied. Regular thread must be treated with color preserver before applying the finish, in order to retain their original colors.

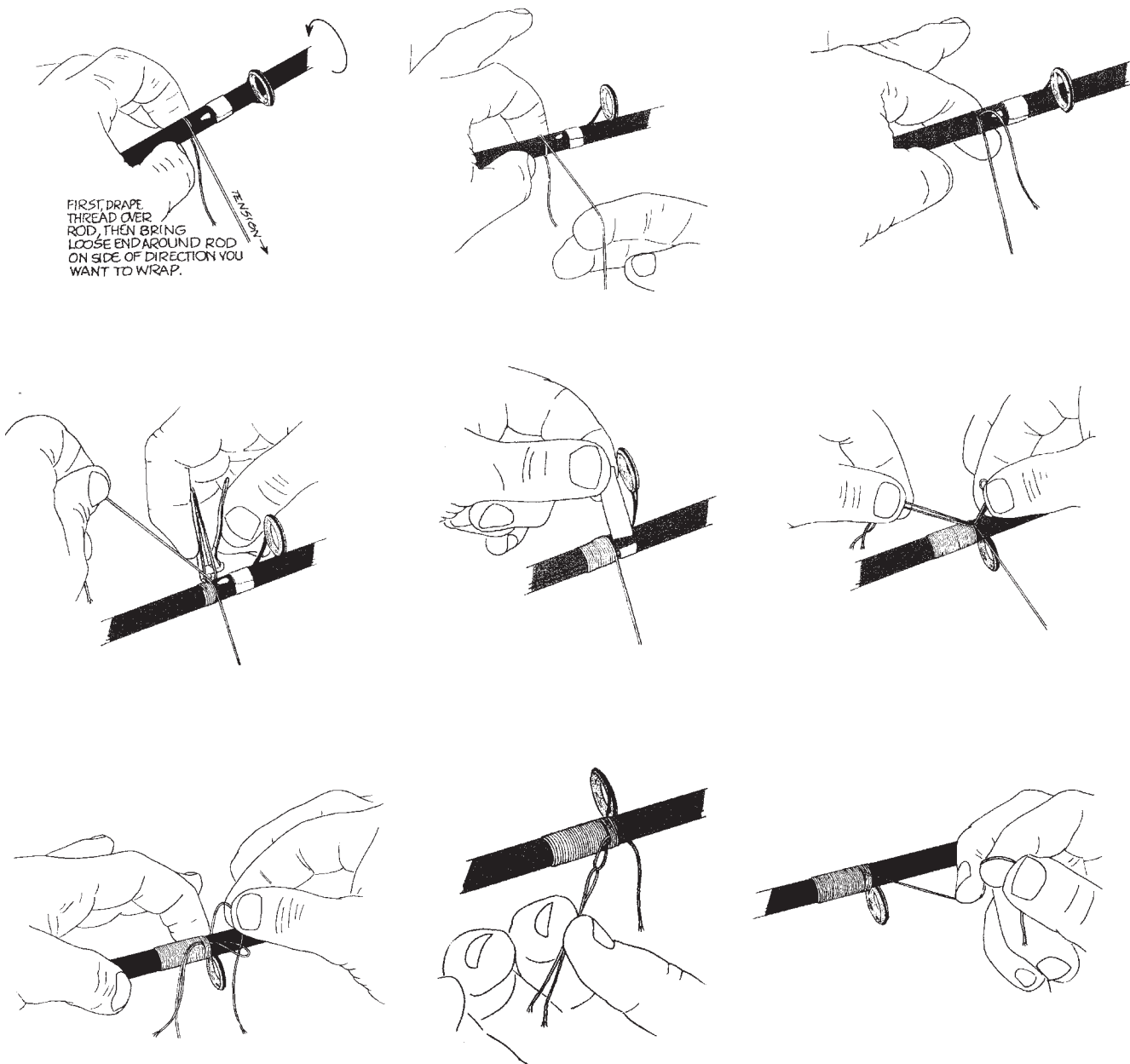
Thread is comes in several different diameters or weights: sizes A (the smallest) through EE (the largest). Size A is used for wraps on light and medium freshwater rods. It is good for underwraps on any rod and is useful for making small decorative tags. Size C is used for heavy freshwater rods and all saltwater rods. It makes a good overwrap on all rods when size A is used as an underwrap. Size D is only slightly larger than C, and is used on heavier rods. Use of C and D makes work on decorative butt wraps proceed faster than with "A". Size E and EE are regarded by most rod builders as too heavy, both in appearance and in affect on rod action, and are not necessary with today's strong, flexible rods.

Wrapping the Guides

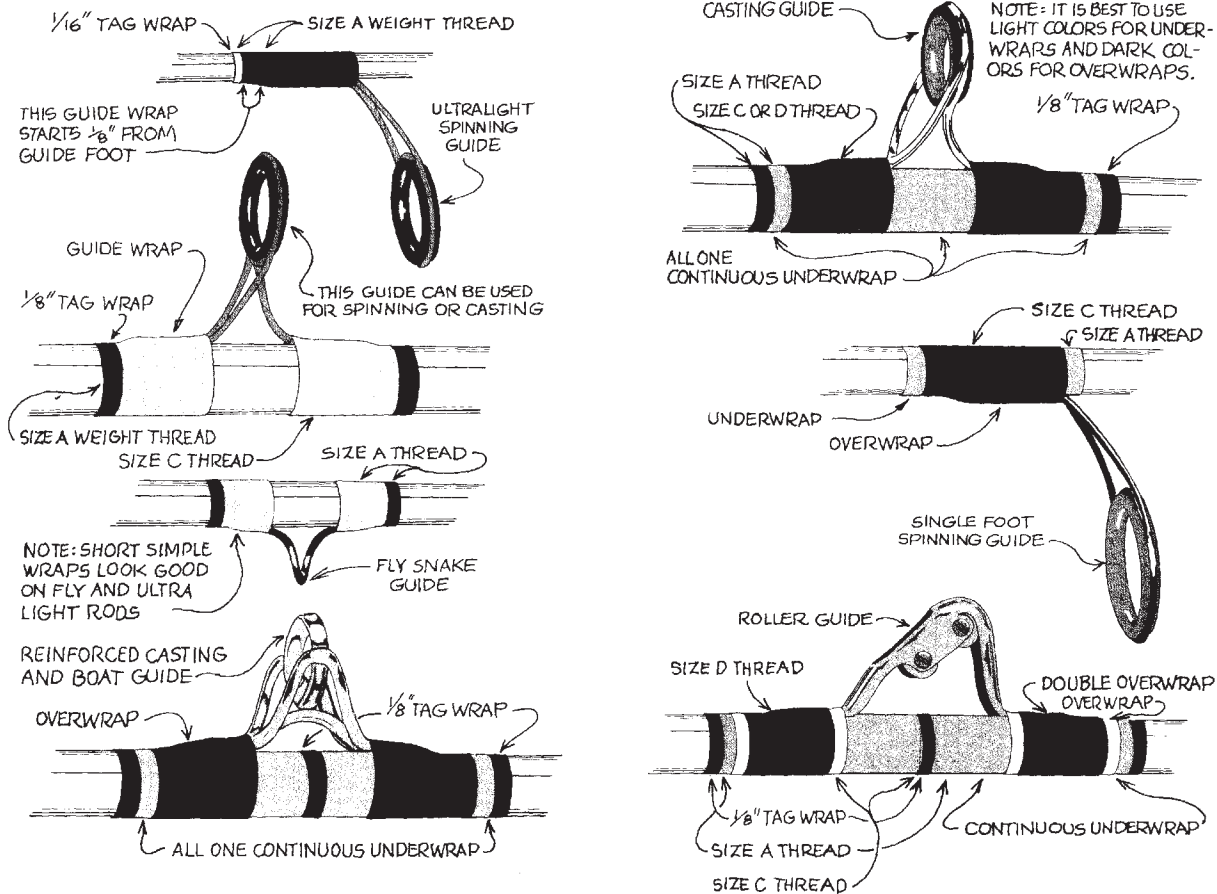
There are several different ways of wrapping guides. One simple way to do this is to place the thread spool in a cup and place the cup behind a chair in which you will sit and wrap. Run the thread up and over the chair seat and sit down on it. Sitting on the thread will maintain constant tension on it while the cup will contain the thread. Rest the rod crosswise on your thighs and wrap the thread over the top of the rod. When wrapping the tip while using this method, rest the rod butt on another chair. There are other methods involving devices which hold tension on the thread while you turn the rod by hand. Motorized power wrappers are also available. In all cases, constant tension of the thread must be maintained, from the start of the wrap to the tie-off of the thread. A note on thread tension: There is no precise measure of the proper amount required, but you need to maintain a good tight wrap while being careful not to break the thread.

1. Begin by wrapping thread around the rod and applying pressure as shown to maintain tension.
2. Cross the thread over itself.
3. Turn rod until thread crosses itself a second time. Release finger pressure; tension will remain. Note how finger rolls down the rod.
4. Continue turning about 6 wraps, maintaining constant tension on the thread. Then closely trim the loose end with a nail clipper.

5. Continue wrapping up onto the guide foot. If the guide foot is temporarily attached with tape, remove the tape after the guide foot is secured with a few wraps.
6. Continue wrapping until 6 to 8 turns from where the wrap will end. At this point lay down a separate loop of thread or monofilament fishing line under the wrap with the loop pointing away from the wrap and on the opposite side of the blank from the guide.
7. Continue turning to the point where you want the wrap to end. Apply pressure to maintain tension and cut the thread.
8. Tuck the loose end of the thread through the loop, maintaining tension with your finger.
9. Pull the loop, which pulls the end of the thread under the wrap to make tie off.
10. Work the thread from side to side to open a slight gap in the wrap.
11. Place X-acto knife on tie off thread in gap and pull thread against blade to cut. Don't saw or slice.
12. Use rounded, polished handle of nail clippers to burnish the thread and close any gaps for perfect rod wrap.
13. Continue all wraps this way and make sure that the wraps on double foot guides are equal on both sides. Aesthetically, guide wraps should become shorter and smaller as the guides progress to the tip top.



Display of Various Rod Wraps



Finishing the Wraps

To protect your rod wraps, you will need a clear, durable protective finish. The best finishes are two-part epoxies such as Flex Coat™ High Build Polymer Rod Wrapping Finish (Stock# F4Y) which remains flexible and protects the wraps throughout the life of the rod. Do not confuse "rod wrapping finish" with "rod wrapping glue," as they perform totally different functions. Also, the terms "epoxy" and "polymer" are completely interchangeable.

1. Before beginning, be certain the Flex Coat A and B resins are at least above 75°.
2. Using syringe, measure equal portions of resin (part A) and hardener (part B). Mix a minimum of 3 cc of each.
3. Combine the two parts into a mixing cup or similar container.
4. Mix thoroughly with a non-porous stirrer. Mixture will at first become cloudy, then clear when mixed about 2 minutes.
5. While rotating the rod, use a small brush to apply the Flex Coat to the rod wraps. Extend the finish slightly over the end of the wrap to completely protect it. Coat all wrappings quickly, working around the rod to apply the finish. Apply a little more finish than needed to allow the finish to soak in. If required, remove excess later when leveling the finish. Let stand a few minutes and then level out the finish with lengthwise brush strokes.
6. For even drying, rotate the rod $\frac{1}{2}$ turns as needed to prevent sagging of the finish. Depending upon the thickness of the finish and the ambient temperature, rotate the rod from 15 minutes to 1 $\frac{1}{2}$ hours. Flex Coat will set to touch in about 6 hours. We recommend a small slow gear motor (one to 30 rpm) can be used to continuously turn the rod. Depending upon the size of rod, use one of three coats of finish. You're done! Go fishing!

STEP BY STEP ROD BUILDING

No.
D10

Flex Coat - For the fully illustrated guide. 50 pages.