Guid to Weaving with Silk
Silk is amazing, luscious, shining, beautiful. Silk yarn comes in a huge variety of forms, and the resulting woven textiles can range from a tissue-fine fabric you can read through to tough, heavy fabrics suited to wall hangings, rugs, and coats. Silk can be an investment, so it’s good to be an educated buyer when shopping for silk yarn. Although there are hundreds of different silk yarn names and brands, they can be divided into two main categories—reeled silk and spun silk.

THE REEL DEAL

Reeled silk (also called nett silk, thrown silk, filament silk, pure silk, or paat silk) is made of long, single fibers unwound from cocoons. The cocoon fibers are of immense length (a good Grade 1A bombyx silk cocoon should have around 1,500 yards of unbroken fiber) and are wound together into a filament that can be combined, twisted, and plied to make a variety of smooth, shiny yarns. Structurally, most silk filament yarns fall into one of three types:

- **Tram** is a singles yarn composed of one or more filaments loosely twisted together, giving the yarn maximum shine but minimum strength. Tram is used for weft in a lot of fabrics as well as for specialty applications like brocade and embroidery.
- **Organzine** is a family of balanced-plied yarns ranging from two plies to three plies or more and including multilevel yarn structures such as cabling. Organzine is the workhorse of the silk world—everything from weaving warp to sewing thread is made of organzine. Depending on the degree of twist, organzine yarns can be very glossy or more pearly; the more tightly twisted versions are stronger, stiffer, and more matte in finish, while the less-twisted yarns are softer, limper, and more shiny.
- **Crepe** yarn is tightly twisted and typically overplied, so that it crinkles up in the fabric. Crepe yarns tend to have a matte finish and are somewhat elastic. They are used in making a variety of traditional fabrics such as crepe de chine and crepe georgette. Handweavers use crepe yarns for a variety of special effects.

The vast majority of filament silk yarns are thrown—this word is used specially...
for the process of twisting filament yarn, to differentiate it from spinning. Spinning involves drafting out fibers and twisting, whereas throwing is simply adding twist.

SPUN AND PROCESSED
After the best cocoons have been reeled, the lower-quality cocoons, pierced cocoons (that have been allowed to hatch for breeding stock) and any waste or damaged cocoons from the reeling process, are all degummed, opened out, carded and combed, made into sliver, and spun. Because the fibers are very long, the silk is typically cut to a consistent length during the combing process. The longer the silk staples, the smoother and glossier the yarn and the higher the price. But if the silk will be blended with wool, cotton, or another fiber, it is often cut to match the other fiber’s staple length to facilitate spinning.

The best spun silks can be very difficult to differentiate from reeled silks; they are made from very long, even fibers and are processed carefully to avoid or remove fuzz or lumps. Often these finer silks are gassed—passed at high speed past a series of small flames—to burn off any hairy spots and make the yarn lustrous and smooth. After the best and longest fibers have been removed, the shorter fibers are used to make lower-grade yarns. At the end of this process are bits of fiber called noil, which are exceptionally short and lumpy and may even contain bits of insect. Silk noil fiber is spun into the yarn of the same name and used to weave a silk noil fabric that is fairly matte and drapey, useful for more casual garments.

BY THE NUMBERS
When shopping for silk yarn, it’s also useful to understand the system of weights and measures. Reeled silk is counted by a unit called denier (pronounced “DEN-yer” or “den-YAY,” the French pronunciation). A denier is an old French coin that looks like a thin dime. To determine the weight of a yarn, a merchant would measure 80 skeins of yarn 120 aunes long (an aune is an arm’s-length measure, similar to a yard), put it on the scale, and drop coins into the other side until it balanced. The modern version uses metric measurements; 1 modern denier equals 1 gram per 9,000 meters. Fine sewing silk is in the neighborhood of 100 to 200 denier. Buttonhole twist is usually around 1,000. Reeled silk carpet warp can be 2,000 or more.

GUM VARIATIONS
Silk cocoons are made of two proteins. Fibroin is the long, shiny fiber, and sericin is the protein gum that binds the cocoon together. Sericin is often called sticky, but it’s really only sticky in the way

Reeled silk on the left (NS-18K from Habu) and spun silk on the right (30/2 silk from Mint Fabrics, India). Note the smooth texture of the reeled silk vs. the fuzzy surface of the spun silk.
that starch is: If you get it wet, and then let it dry, it tends to bind together, but once dry, it’s not tacky to the touch. Silk yarn with the gum on it tends to be wiry and tough, yellowish or ecru in color, and less shiny. Silk gum is essential to the reeling process and is left on the yarn through many of the twisting processes and sometimes even through the weaving because it acts like sizing, holding the yarn together and protecting it against shredding and abrasion.

Most silk yarns are degummed; the gum has been removed, typically by simmering in an alkaline solution such as sodium carbonate (washing soda, soda ash) and detergent, although degumming can also be done with enzymes. Degumming leaves the silk softer, shinier, and more supple. Degumming is a progressive process, and some yarns and fabrics are used with some or all of the natural gum left intact. For example, organza fabric is made from silk that is not degummed, giving it a stiff, crisp hand and a translucency that disappears if the gum is removed.

**RAW SILK**

The term “raw silk” means several different things, depending on the context and whom you ask. If you tell someone in the silk industry you want to buy 2 tons of raw silk, they will assume you want reeled filament in the gum, ready to be twisted into yarns. If you ask for raw silk at a dressmaker’s, you typically get silk noil or possibly one of the wild silks. If you ask an interior designer, they’re likely to give you slubby douppioni (silk made from double cocoons and flawed cocoons), perfect for draperies and cushions. To me, as a silk worker, “raw” means the same thing it does if I’m referring to beef or broccoli: It hasn’t been cooked. Silk that has been reeled from the cocoons and made into filament is raw—stiff and wiry with the natural gum intact. After doubling, twisting, redoubling, and plying, it’s still raw. The gum left in place protects the fibers from abrasion during processing.

**AVOIDING “THAT SMELL”**

Silk yarns, specifically spun silk yarns, have a well-deserved reputation for stinkiness that is particularly noticeable when the yarns become wet or warm, for example, when the fabric is washed or when the wearer perspires. Many people assume the smell comes from the silk gum, but sericin actually has a bright, dry, grassy smell that’s not unpleasant. The fishy smell comes from waste from the reeling process—spent cocoons, bad or flawed cocoons, snarled threads, carrier rod waste, dead bugs in the spent cocoons, etc., all of which go into the bin to await the spinning process. Much of this waste is wet, and it can ferment.

If a silk factory is very hygienic, changes the bins every day, and passes the waste on to the spinning process quickly, the silk has very little smell. If they wait a few days . . . it really, really stinks. If you find a silk source where the yarn is stinky, you may want to avoid that source in the future. On the other hand, if the silk has a slight chemical or kerosene-like smell, that’s likely a side effect of the dye processes, and it may wash out or diminish over time.

**SOME FINAL TIPS**

Silk fiber is washable, but often the techniques used to give it color, sheen, and texture are not. If you intend to wash a silk garment or textile, I recommend caution with the colors—many dyers overload silk yarn with color, never expecting it to be washed. The same is true of commercial silk fabrics. Fabrics can also be treated with rollers or other techniques to improve the surface sheen or texture, but these changes often won’t survive water and the fabric may pucker, shrink, or change texture upon washing. In those cases, dry cleaning is recommended.

Both reeled and spun silk are pleasant to weave with, and give a fantastic sheen and drape to woven fabrics. Please do give silk yarns, and especially reeled silks, a try—they need a little special care in the working, but the dazzling beautiful results are worth it!
There's nothing else like silk. Its characteristic luster comes from its unique structure. Silk fiber, viewed under a microscope, is a long triangular prism. Its three smooth sides give silk its excellent light reflectivity and its soft hand, and when several filaments are twisted together, they create a number of facets that reflect light—similar to the way diamonds are cut to give maximum brightness.

SILK IS GOOD FOR SKIN

Silk, in its pure state, is also hygienic and nonallergenic. Silk is a protein fiber whose amino acid composition is close to that of the human skin. (However, silk passes through various treatments during its processing, some of which may introduce elements that could cause skin irritation.) Silk can absorb up to 30% of its weight in moisture without feeling damp, making it comfortable to wear next to the skin, and silk breathes, making it a good material for both summer and winter.

TIPS AND TRICKS FOR WASHING SILK

Although you may be accustomed to buying silk clothing labeled “Dry Clean Only,” you can wash silk. After all, silk has been in use for over five thousand years and the modern-day dry-cleaning process didn't begin until the mid-eighteenth century. Washing silk requires a bit of care but is not difficult.

One reason silk manufacturers recommend dry cleaning is that silk can lose its characteristic sheen with incorrect washing. Silk fibers are sensitive to abrasion, which can occur when the silk rubs against itself or other, rougher fabrics or against a metal washing machine drum. An abraded silk fiber will appear whitish or as though sprinkled with powdered sugar because the outer layer of the silk, which provides the light reflectiv-
When you wash silk, use a lot of lukewarm water (70°–90°F) in proportion to the silk. If the silk is floating freely in the water, it will be less likely to rub against itself or other surfaces, minimizing damage due to abrasion.

Washing can also affect the drape of silk. How many of us have washed a luxurious silk blouse or scarf only to be horrified by the stiff fabric that emerged from the wash? Well, fear not. Your silk fabric is not ruined. Here's an easy fix that I learned from Treenway Silks' founder, Karen Selk.

**Step 1:** When the silk is slightly damp, move the piece around in your hands for a few minutes. This will bring up the sheen and minimize the stiffness when the silk is completely dry.

**Step 2:** Take your dry silk item and whack it against the back of a chair a couple of times. Feel how soft your silk is again? It's that easy!

Here's what just happened. Even on degummed silk, there is a bit of residual sericin (water-soluble proteins that glue the cocoon together), and these proteins stiffen when the wet silk dries. Whacking softens the sericin, restoring the luster and hand of the silk. With use and washing, the residual sericin will come out of the silk over time and less finishing will be needed.

Here's a checklist for successful silk washing:

- Wash silk alone. (Do not combine it with other fabrics.)
- Use warm water (70°–90°F).
- Use a high ratio of water to silk.
- Use a mild, liquid detergent such as original blue Dawn or a gentle shampoo.
- While wet, swoosh gently. Do not rub the silk against itself, squeeze it into a tight ball, or wring it.
- Add a splash of white vinegar to the second-to-last rinse water. This returns the silk to the slightly acidic state it prefers. The last rinse should be straight water.
- Gently squeeze out excess water.
- Dry flat or line-dry over a padded line.
- Handle the silk for several minutes while slightly damp.
- Whack the silk against a smooth surface to soften its hand and restore the luster.

**SEIZE THE SILK**

With its illustrious history and its lovely properties, silk is undeniably a luxury. But it is also strong and meant to be worn and woven. How many times have I heard variations of "I'm saving my silk for a special project," or "I'm waiting until I'm good enough to use my silk?" Silk is strong enough to hold up to constant wearing, and you really are a good enough weaver to use silk now. There's a silk yarn and a silk project to fit every budget, and you'll never learn to weave with it until you try. How many of us have gone to an estate sale and found a weaver's treasured silk stash being sold for pennies on the dollar? So don't wait. Seize the day, seize the silk, and let the pleasure begin.

**RESOURCES**


Ombré Silk Shawl

SUSAN E. HORTON

Although I have been weaving for almost twenty years, only last year did I try a rigid-heddle loom. I was certain it wasn’t for me, but now I’m a firm believer that it’s a valuable tool in a weaver’s repertoire. This silk shawl worked up beautifully on a rigid-heddle loom, and using direct warping eliminated the need for a cross and all the other time-consuming aspects of traditional warping. Weaving on a rigid-heddle loom also let me weave anywhere. This shawl was woven partly on my terrace with a glass of wine on the table next to me.

When I started this project, I wanted a striped shawl that was interesting and brought out the contrast between the bouclé and smooth yarns. I turned to a new book in my library, *Color and Texture in Weaving* by Margo Selby. The ombré stripe caught my eye as a way to create drama when worn and simplicity in the warping. Knowing that I would be doing direct warping, I designed my stripes to work mainly in even numbers.

Sampling showed that just twisting a fringe was going to leave me with ragged edges, so I decided to use the knotted hemstitch (see Resources) to tighten them up. This hemstitch is simple, easy to learn, and quick to do.

Although the literature steers you away from using bouclé in the warp on a rigid-heddle loom, I found that it worked well in an 8-dent heddle. If I did find the occasional thread getting caught, a quick smoothing out with my fingers solved the problem. Bouclé is strong, but the ends do require some careful handling. I found sharp scissors helped avoid pulling the bouclé apart when cutting. I used Fray Check on the ends during the fringe twisting process, and I placed the fringe twister clips a little further up on the fringe than I normally do to avoid fraying the ends. After tying the knots and washing the shawl, I pulled lightly on every bouclé end to release the bouclé ply and stretch it out before trimming.

Weaving this shawl was a joy. It was simple to warp, simpler to weave, and it gave me the opportunity to try a new technique and a new design, and to problem-solve.

RESOURCES

RIGID-HEDDLE OR 2-SHAFT

1. Either direct warp or wind 160 warp threads 3 3/8 yd (about 113") long and warp your loom, using the color sequence indicated in Figure 1, the warp color order.

2. Leaving a tail of weft 3–4 times the width of the warp on the right side of the loom (or the left side if you are left-handed), begin by weaving 2" with the purple silk weft. Thread the tail onto a tapestry needle, tie a knot around the selvedge thread, then make a knotted hemstitch hem (see Resources), knotting pairs of warp threads across the width and including the selvedge threads in the first pair. After knotting the last thread, leave the tail to be incorporated into the fringe.
Continue weaving, following the weft color order chart in Figure 2. When you have completed the last weft pick, cut the weft, leaving a tail 3–4 times the width of the warp, and knot the ends as described in Step 2.

Remove fabric from the loom. Cut fringe to 7½" using sharp scissors. Apply a drop of Fray Check on the bouclé warp ends ½" from the cut end. Allow to dry, then make twisted fringe by twisting two groups of the paired knotted threads tightly in the same direction. Tie a knot at the end and let go for a cabled fringe. Include the weft tails in the edge fringes. The bouclé stretches more than the 2/5 silk during the twisting process, so the ends will not be even in those groups that contain both bouclé and 2/5 silk. Tie the knots to be parallel to each other across the width.

Handwash in cool water, blot out excess water in a large towel, and hang over a rod to dry. Steam-press lightly if needed, being careful not to crush the bouclé. Pull lightly on each bouclé end to untwist it and stretch it out. Trim the fringe ends ½" from the knot.