Silk Reeling
A Practical Summary

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Silk reeling is the practice of unraveling the filament from a silk cocoon to yield a thread that can be processed into a very smooth and shiny yarn. The silk yarn can be dyed and made into a wide range of textile products, from sturdy braided cording to beautiful flowing silk veils. This technique has been in practice in China since 2700 BCE and can be easily duplicated today.

There are two basic ways to reel silk; by hand or with a silk reeling machine. Both techniques can yield a similar product, although hand reeling is more labor intensive. The first several steps of both techniques are the same. It starts with sorting and preparing the cocoons.

Due to being natural products, silk cocoons come in various sizes and qualities. All of the cocoons in one reeling batch should be of the same size and quality in order to have the most successful reeling session and yield the most consistent product. Once they are sorted, it is time to count and strip, or defuzz, the cocoons. When a silkworm begins to spin its cocoon, it will begin by laying down several guide lines of short silk filament as a scaffolding for the cocoon. This anchors the cocoon in place and results in a fuzzy outer layer of silk on the outside of the cocoon when it is harvested. This must be removed prior to reeling. Any silk that is removed from the cocoons that is not reeled can be saved. This waste silk can be spun and processed similar to wool.

The prepared cocoons are then briefly placed into boiling water to loosen the gum, or sericin, that holds the cocoon together. Boiling the cocoons does not remove the sericin, but makes it soft enough so that the silk filaments can be pulled away from the cocoon. The very outside of the cocoon contains many short fibers as the silkworm was forming the size and shape of the cocoon itself. These short fibers are not reelable and will bind up the reeling apparatus, so they must be removed by brushing the cocoons vigorously and pulling these filaments away.

At this point it looks like a lot of silk is being removed, however it is necessary to remove all the short filaments in order to find The One True Filament. Once the silkworm has the cocoon secure and in the desired size and shape, it will begin to spin the bulk of the cocoon in one continuous filament. This unbroken filament can be up to a mile long. Aggressive brushing and removal of the short filaments will help to ensure that as many cocoons as possible in the batch are reeling at the same time. It also helps reduce slubs and snags during the reeling process.

For the next step in both hand reeling and mechanical reeling,the silk should be passed through a mechanism called a “croissure”. This is where the gathered filaments from all the cocoons are passed over a spool or pulley and brought back and twisted around itself several times. This helps all of the gathered filaments to be compressed together, which eases handling and helps prevent fraying.

For hand reeling, the filaments are cast onto a towel using an energetic overhand pulling motion. For machine reeling, the compressed filaments are threaded through the machine (in this case a Japanese zakuri), which uses gears and a casting arm to distribute the silk onto a bobbin. The filament is reeled until the majority of the silk has been pulled off, and ideally only the innermost layer of the cocoon is left. Called the cradle, this part of the cocoon is not reelable, but is fine for waste silk.

In both techniques, the silk will still be wet at this stage. If the silk filament is layered upon itself while wet, then subsequently dries, it will reglue itself together and will be impossible to untangle. To prevent this, the thread should be transferred from the towel (for hand reeling) or bobbin (for machine reeling) to an empty bobbin.

It's important at this stage to make sure to lay the topmost thread at an angle on top of the previous threads. If the silk is wound around the bobbin with the threads too parallel to each other, it increases the chance of a topmost thread slipping under lower thread layers, resulting in a terrible tangle. Laying the silk at an angle also helps prevent the threads from gluing themselves together.

Transferring the thread from bobbin to bobbin must be repeated several times until the thread is completely dry. The goal is for the silk to dry while in motion so that it is not under tension when it dries. This is a very important step, as silk shrinks as it dries. Because silk is a very strong fiber, it can seriously warp or break the bobbins if it is allowed to dry while wrapped tightly on the bobbin. Also, storing silk on a bobbin under excessive tension can possibly weaken or fray the thread. Once the thread is dry it can be wound around any type of bobbin or spool that is needed for the next part of the process.

What makes reeled silk different from spun silk is the length of the fiber. Spun silk is processed like wool, with a lot of short fibers being twisted and spun together. With reeled silk, the entire thread is one unbroken fiber. In order to ply the thread into yarn, the silk has a twist put into it using a spinning wheel in a process called throwing. In the throwing process the strength and shine of the final yarn can be controlled by choosing the appropriate amount of twist. A higher twist yarn will be stronger, but not as shiny as a lower twist yarn. Some embroidery floss has no twist at all and is extremely shiny, but it is much more susceptible to snagging and fraying.

The gum will still be in the thread at this point. The sericin makes the thread easier to work with and prevents fraying. Once the yarn has been made into hanks it can be degummed by simmering in a soap solution. After that it can be dyed, or kept white.

A wonderful silk resource for everything from rearing silkworms to detailed silk reeling can be found at wormspit.com. Many thanks to Michael Cook, who runs this website, for his continued help and expertise on this subject.