



## Konnyaku Starch

*Konnyaku* starch, processed from the tuberous root of the devil's tongue plant, is often used in Japan as a food. It has also been used for centuries to coat papers, especially for use in the making of *kamiko* paper clothing. Paper treated with *konnyaku*, called *momigami* (kneaded paper) or *kyoseishi* (strong paper) is made stronger and more flexible and abrasion resistant than untreated paper. Because the paper's pores are coated it also becomes wind and water resistant as well as having improved heat retention while still remaining breathable. In paper kimono, *kamiko* has often outlasted the silk that line it. *Kyoseishi* and *momigami* have also been used to create practical items, such as bags and wallets that might otherwise have been made from cloth or leather.



Konnyaku starch makes papers durable for function items normally made from fabric.

The preparation of *konnyaku* isn't rocket science. Various recipes for starch to water ratios exist, and all of them work, so it should be noted that it's unlikely you can go completely wrong. Because prepared *konnyaku* can only be kept for a limited time (approx. 1 week refrigerated) it's best to prepare smaller amounts. We use 1/2 teaspoon *konnyaku* starch to 1 cup water. For a smaller amount of paper, you might begin with 1/4 t starch and 1/2 c water. Dry starch can be kept indefinitely.

### Materials

- *konnyaku* starch
- water
- measuring cup
- stirring spoon or stick
- wide brush (2" or wider) with moderately springy bristles
- smooth, washable work surface, or table cover
- washi (pure *kozo* is best)

### Starch preparation

Sprinkle 1/2 teaspoon of *konnyaku* starch into 1 cup room temperature water. Stir constantly for approximately 20-30 minutes to prevent lumps from forming. After the mixture begins to thicken, stir it periodically until the particles are completely dissolved and the paste is smooth; this can take between 3-5 hours.

The *konnyaku* paste is ready to use when it is thick and smooth. The paste may be diluted by adding small amounts of water if the paper being treated is delicate: experimentation will tell you how much to thin the solution. The amount of paper you can coat depends on the weight of the paper (heavier paper takes up more *konnyaku*) but on average you should be able to coat 4 sheets (24x36") that are around 30g in weight.

Using the stiff wide brush apply the *konnyaku* paste to both sides of the paper. If the paper is thin, 25g or less, you may only need to coat one side of the sheet as the *konnyaku* will soak through. Avoid building a heavy sticky coating: better to apply more than one thin coat. Fold the corners of the sheet into the centre and crumple the sheet into a loose ball. Place this aside on the plastic and continue to do more sheets in the same manner. Then, taking the balls one at a time squeeze and crumple them carefully. Open it up and rub it against itself, paper to paper, all over. Lay it flat to dry, stretching it out gently.

If using *konnyaku* to pretreat paper for dyeing, the paste may be diluted, and the crumpling omitted. The paper may also be crumpled once it has dried; this is especially useful when coating thinner papers that may be too delicate when wet.