Dōsa (Sizing) for Paper

This kit contains 8oz of glue and 4oz of alum, enough to make one gallon of dōsa using the Yoshida formula (see page 2). If you wish to change the amounts, or use one of the other formulas compiled by Bill Paden, we recommend using a scale so your measurements are exact. A postal scale or food scale will work well. The name and address for a company that can supply a metric scale are given at the bottom of page 2.

Please note, on the dōsa formulas given on page 2, the second set of numbers in each category are based on using one gallon of water, so you can easily compare the Azechi, Robertson and Colyer formulas to Yoshida's.

Mr. Paden's directions on how to size paper are given on page 1. In addition, what follows are some hints or alternative ways to size *washi* (source unknown, from a handout used by Elaine Chandler, the previous owner of McClain's) that may also be useful to you:

A) Lay the paper on a large, flat, non-porous surface such as glass or Formica.

B) Use a large brush—the wider the brush, the better.

C) Apply the dōsa to the first sheet of paper, place the second sheet on top of the first sheet, and apply the dōsa again. Continue until all the paper is sized. In this manner the paper will become sized on both sides and any missed spots will be dampened from the bottom. Allow to dry in the stack for 30 to 45 minutes until the paper has absorbed the sizing water evenly. Do not allow the stack to stand longer than 1 hour, or the papers will adhere to one another. Gently peel apart and hang or lay flat to dry.
(Note: This differs from Mr. Paden's directions quite a bit. His directions say to apply the dōsa to one side of the paper and allow the paper to dry 10 minutes before stacking. After 10 minutes it might be a good idea to feel the paper and make sure it is no longer sticky. If it feels sticky, allow more drying time so the papers do not become glued together in the stack.)

D) If the paper wrinkles while applying the sizing, pick up one corner, lifting toward the center, and brush outward from the center toward the corner. Do this with each of the corners, and you should be able to brush out the wrinkles.

E) Print on top, or on the side that was brushed with sizing.

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Washi must be sized uniformly on both sides before it is used for printing. In its natural state, washi is quite absorbent and color printed on it tends to bleed. A size of hide glue, alum and water is needed to make the washi fibers stronger and less absorbent. The proportions of the *dōsa* formula vary according to the type of washi, the kind of printing techniques used and also the season when the sizing is done. The longer you size the washi before printing on it, the better. Six months to a year will help the washi mature. Also, dōsa can be kept refrigerated for many months without spoiling.

Dōsa Ingredients and Implements

1) Glue	Use the best nikawa or rabbit skin glue available. The better the glue the better the size
2) Alum	Can be purchased in powder or crystal form at chemical firms
3) Water	Distilled water is best, but not a necessity unless your local water is bad
4) Brush	A wide, soft-haired (rabbit or sheep) dōsa bake is best
5) Double-Boiler	One small container set in another that is filled with water will do

Dōsa Preparation

1) Break up the glue, if not already in granular form, by wrapping in a cloth rag and beating with a hammer on a hard surface.
2) Fill pot with the correct amount of water (see the Formulas on page 2) and put in the glue. Let soak until each piece of glue has absorbed all the water it can. During the first two hours or so, stir the mixture so the pieces of glue do not stick together. Let stand overnight. If the glue is in large pieces, let stand another 12 hours.
3) Place glue pot in the double-boiler. Melt glue, stirring constantly. DO NOT BOIL glue; it will lose strength.
4) Dissolve alum in a small amount of hot water. Add to glue.
5) Strain the mixture through cotton cloth or a nylon stocking.

Dōsa Application (The more washi sized at one time, the better. Accuracy, consistency and speed come with repetition.)

1) Lay paper on clean table top.
2) Load brush with warm dōsa. Keep dōsa just warm enough to flow throughout operation.
3) Start applying the dōsa at the upper left hand corner with a swift, sure motion across the face of the washi. Then, from right to left, move the brush down and progressively slow the speed of each stroke until one side is uniformly sized. See dōsa application diagram on page 2. Let washi dry on any available flat, clean area – the floor, a table, etc. After about 10 minutes, the washi can be stacked even though it is not completely dry. When thoroughly dry, do the other side.

Warning!

Too Strong Dōsa: **will prevent the color from penetrating into the fibers of the washi and washi will glisten**

Too Weak Dōsa: **the print will stick to the block and/or the color will bleed**

Dōsa Formulas Compared

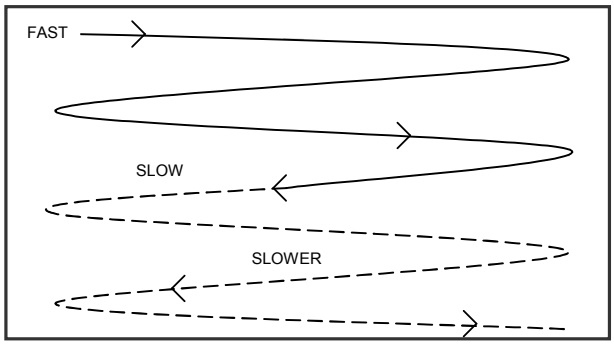
	WATER	GLUE *(SANZENBON)*	ALUM *(MYOBAN)*
YOSHIDA	1 gallon (3.8 liters) summer less water; winter, more	8oz	3 – 4 oz
AZECHI	1 liter (0.95 gallons)	1.5oz	1 pinch
	3.8 x 1 liter = l gallon	= 5.7oz	= 0.25oz
ROBERTSON	180cc (6oz)	3.75 grams	0.8 to 1.12 grams cold to warm weather
	21.33 x 180cc = 1 gallon	= 2.8oz	= 0.8oz
COLYER	5 cups (1000cc) (Japanese cups = 7oz/200cc)	2 sticks nikawa (0.5oz) dissolved	2 teaspoons (1/3 oz)
	3.8 x 5 cups = 1 gallon	= 2oz	= 2oz
KARHU	See next table for complete breakdown		

Karhu Dōsa Formula: 10 Quarts Breakdown by Bill Paden

ORIGINAL FORMULA: 2 TO 1 RATIO				
WATER	GLUE		ALUM	
	Summer	Winter	Summer	Winter
10 quarts	280g (10oz)	240g (8.5oz)	140g (5oz)	120g (4.25oz)
5 quarts	140g (5oz)	120g (4.25oz)	70g (2.5oz)	60g (2.15oz)
2 quarts	56g (2oz)	48g (1.7oz)	28g (0.99oz)	24g (0.85oz)
1 quart	28g (0.99oz)	24g (0.85oz)	14g (0.5oz)	12g (0.42oz)

WEAK SOLUTION FORMULA FOR RESIZING: 1 TO 1 RATIO				
WATER	GLUE		ALUM	
	Summer	Winter	Summer	Winter
2 quarts	28g (0.99oz)	24g (0.85oz)	14g (0.5oz)	12g (0.42oz)
1 quart	14g (0.5oz)	12g (0.42oz)	7g (0.25oz)	6g (0.21oz)

Dōsa Application Diagram



Note Regarding Weak Solution Dōsa:
Once in awhile the dōsa on already sized washi will not be strong enough. You'll discover that when there is the slightest bit of sticking to the block or evidence of bleeding. (Of course, bleeding and/or sticking can also be caused by overly dampening the washi or by keeping the washi on the block too long.) When symptoms of under sizing occur, resize the face (only) of the washi with the WEAK SOLUTION.
Wm. Paden

Metric Scale: COUNTERBALANCE, Model #CB500
Recommended for small measurements. Compact, easy to use, easy to store, and accurate. $24.95 +s/h.
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