



## Preservation and Conservation (PAC) Programme Frequently Asked Questions

### Paper conservation by using Japanese paper, washi

Prepared by PAC Japan

#### Q: What is *washi*?

A: *Washi*, or Japanese paper, can be made from the fibre of *kozo* (paper mulberry family), *mitsumata* (daphne family), or *gampi* (daphne family), but the most commonly used material is *kozo*. The traditional papermaking process for *kozo* starts by steaming bundles of *kozo* bark to remove the outer dark layer and often the intermediate green layer. The white inner bark is cooked in a mild alkaline solution such as wood ash or soda ash to remove lignin and other impurities. Strong alkali such as caustic soda were not traditionally used during this process. Next, the fibre is beaten by hand until it is fine enough to be dispersed in water with a small amount of a dispersion agent, *neri*, a mucilaginous substance from *tororo-aoi* (abelmoschus manihot) plants. Finally, the paper maker dips a flexible Japanese papermaking mould in the vat of fibres and water to form sheets of paper using a technique called *nagashizuki*.

Washi has been manufactured and used in Japan from more than 1000 years. In 2014, three kinds of washi were added to UNESCO's Representative List of the Intangible Cultural Heritage of Humanity: *sekishu-banshi*, *hon-minoshi*, and *hosokawa-shi*.

Nowadays there is no clear definition of what can or can't be called washi. It can be manufactured by machine or by hand, using a flexible Japanese mould or a fixed paper mould, with or without chemicals. Some kinds of washi contain imported *kozo* or wood pulp fibres.

#### Q: Why is washi widely used in conservation of library materials?

A: Washi made from traditional methods using traditional materials contains few impurities, is neutral or alkaline, slow to deteriorate, and suitable for long-term preservation. In addition, *kozo* fibres are about 1 cm in length, which makes washi strong and flexible and therefore a natural choice to repair rare materials. Very thin washi is nearly transparent, so even when pasted on the surface of a page, the text below remains readable. For conservation repairs starch paste is generally used to adhere washi as it can be removed cleanly simply by adding moisture, thereby returning the document to its pre-repair state if necessary. Washi comes in a wide range of types and thickness that can be used for a variety of repairs.

We do recommend completing a training in this technique before using washi for conservation of library materials.

**Q: What kind of washi should be used to repair library materials?**

A: It is important to take the manufacturing process and raw materials of washi into account, as the quality and characteristics of washi vary depending on them. Next, be sure to select washi that is well suited to the document in terms of quality, flexibility, thickness, colour, and texture. See A9 and article nos.1, 2, and 3 from A10 for additional information.

**Q: Where is washi manufactured?**

A: There are more than sixty washi-producing areas in Japan. Production facilities vary from small workshops where paper is made by hand to large factories that produce machine-made paper.

**Q: What kinds of Japanese paper are there?**

A: Many brands of washi are named after the area where they are produced, such as *ishikawa-shi*, *usumino-shi*, or *hosokawa-shi*. Ultra-thin washi is called *tengujo-shi*. Although sheet sizes vary considerably, 60 cm by 90 cm is the most common size, and some kinds of machine-made paper are shipped in roll form.

Traditionally, the thickness of washi is given using a Japanese unit of weight called a *monme*, which equals 3.75 grams. Recently, however, thicknesses are given as grams per square meter.

**Q: What are some typical uses of washi in mending library materials?**

A: There are many different uses for washi as seen below. Each of these repairs would require selecting a sheet of washi that is best suited to the application.

- Mending torn pages using wheat starch paste and washi
- Repairing a missing portion of a page by attaching a piece washi of the same shape and thickness.
- Reattaching separated pages or covers using washi as a hinge.
- Lining the back of a page with a sheet of washi to make it stronger.
- Repairing a page by leaf-casting using the raw materials for washi.

**Q: What kinds of documents are suitable for repair using washi?**

A: Although the condition of the document in question is the most important factor, washi is suitable for repairing almost any kind of library material. Excellent quality kozo fibre-based washi has can be used to mend machine made papers, Western hand-made papers, brittle papers, manuscripts, drawings and all types of paper-based materials. In libraries, washi is also used to repair cloth or leather book covers. For example, if a page with text is torn repairs can be made using extremely light weight washi tissue such as *tengujo-shi*. In bindings, washi has been used to reattach the

boards to books. So, washi is used in variety of ways to conserve many different kinds of library materials.

**Q: Can I repair documents using washi even if I am not a conservator?**

A: The National Diet Library provides training courses for librarians on how to repair minor damages using washi. Please see the link to the course materials in A10. It is not advised to repair library material with washi without training, and complex conservation treatments using washi should only be undertaken by trained conservators.

Also, please pay attention to the following points when you use washi.

- Bear in mind the manufacturing processes and raw materials of the washi.
- Choose a type and thickness that matches the document to be repaired. See article nos. 1, 2, and 3 from A10 for additional information.
- Wheat starch paste is the recommended adhesive.
- Apply wheat starch paste of a suitable consistency and quantity.
- Allow repairs to dry completely by pressing them between boards and weights before performing any further work.

We recommend that you consult with a conservation specialist for the repair of rare books, severely deteriorated or damaged document, or other materials that require special handling.

**Q: Where can I get washi?**

A In addition to vendors in Japan, many vendors of preservation supplies worldwide now sell washi. You can easily find a vendor and place an order online. We strongly recommend that you deal only with reliable, proven vendors of preservation supplies. There are many kinds of washi available, produced with different manufacturing processes and raw materials. Always bear in mind factors such raw materials, production area, handmade or machine-made, thickness, colour, and texture when selecting washi for a particular purpose or document. Whenever possible, request a sample set from a vendor and make a selection after comparing a variety of selections.

**Q: What resources are available for learning more about washi and paper conservation using washi?**

A:

**Resources for learning more about Japanese paper**

1. "Japanese paper in action!: Conservation treatment using *Washi* (1)". *National Diet Library Newsletter*. No.203, December 2015.  
[http://dl.ndl.go.jp/view/download/digidepo\\_11045360\\_po\\_NDL-Newsletter203\\_20306.pdf?contentNo=1&alternativeNo=](http://dl.ndl.go.jp/view/download/digidepo_11045360_po_NDL-Newsletter203_20306.pdf?contentNo=1&alternativeNo=)

2. "Japanese paper in action!: Conservation treatment using *Washi* (2)". *National Diet Library Newsletter*. No.204, February 2016.  
[http://www.ndl.go.jp/en/publication/ndl\\_newsletter/204/20407.html](http://www.ndl.go.jp/en/publication/ndl_newsletter/204/20407.html)
3. Mizumura, Kubo and Moriki. "Japanese paper: History, development and use in Western paper conservation," in *Adapt & Evolve 2015. East Asian Materials and Techniques in Western Conservation. Proceedings from the International Conference of the Icon Book & Paper Group, London 8-10 April 2015*, 43-59.  
[https://icon.org.uk/system/files/public/Publications/AandE15/4-ae15\\_mizumura\\_43-59.pdf](https://icon.org.uk/system/files/public/Publications/AandE15/4-ae15_mizumura_43-59.pdf)  
You can find more conference papers and other information on Japanese paper at the website of the "Book & Paper" group, Institute of Conservation (ICON) (UK).  
<https://icon.org.uk/groups/book-paper>
4. Masuda. "World-wide Spread of Conservation Using Japanese Paper," in ICA International Congress 2016, Seoul 5-10 September 2016.  
[http://www.archives.go.jp/english/news/pdf/ica2016\\_04.pdf](http://www.archives.go.jp/english/news/pdf/ica2016_04.pdf)
5. Song, Minah. "Evaluation of Conservation Quality Eastern Papers Regarding Materials and Process" in *Adapt & Evolve 2015. East Asian Materials and Techniques in Western Conservation. Proceedings from the International Conference of the Icon Book & Paper Group, London 8-10 April 2015*, 137-48.  
[https://icon.org.uk/system/files/public/Publications/AandE15/13-ae15\\_song\\_137-148.pdf](https://icon.org.uk/system/files/public/Publications/AandE15/13-ae15_song_137-148.pdf)

#### **Resources for learning more about document conservation using washi**

6. Conservation of Paper Materials: Minor Repair, National Diet Library  
<http://www.ndl.go.jp/en/preservation/manual/index.html>  
The National Diet Library provides manuals and video clips of a training course on minor repairs of library materials using Japanese paper both in Japanese and English.
7. AIC conservation WIKI "Book & Paper" group, AIC American Institute of Conservation(US)  
[https://www.conservation-wiki.com/wiki/Book\\_%26\\_Paper](https://www.conservation-wiki.com/wiki/Book_%26_Paper)
8. "Book & Paper" group, Institute of Conservation (ICON) (UK).  
<https://icon.org.uk/groups/book-paper>
9. ICCROM International Centre for the Study of the Preservation and Restoration of Cultural Property (Italy). "Japanese Paper Conservation"  
<https://www.iccrom.org/>
10. Tokyo National Research Institute for Cultural Properties (TNRICP) (Japan). Japan Center for International Cooperation in Conservation  
<http://www.tobunken.go.jp/~kokusen/en/index.html>

ICCROM and the TNRICP have jointly been organizing the International Course on Conservation of Japanese Paper every year since 1972