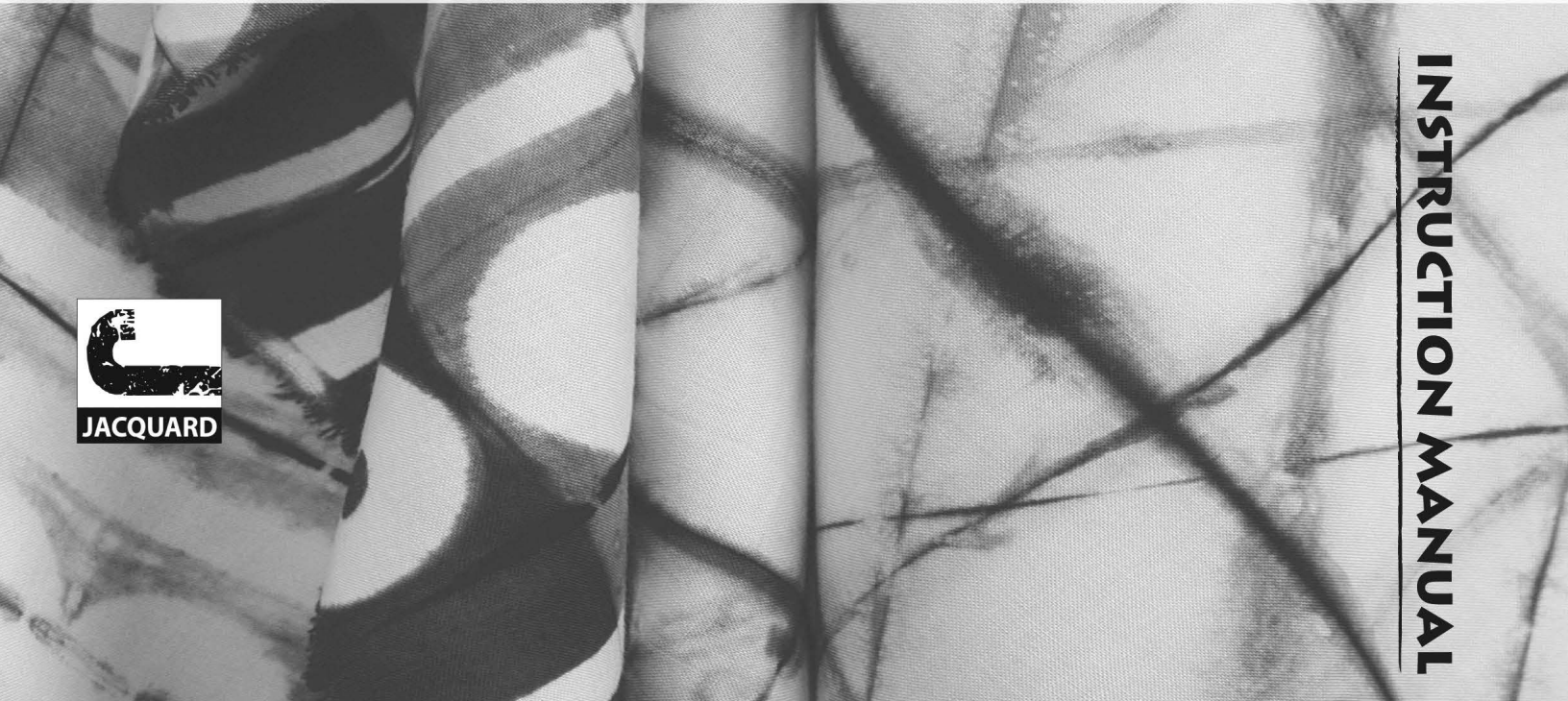
INDIGO DYE KIT

Natural Dye Method



JACQUARD

INSTRUCTION MANUAL

Indigo, Magical Indigo!

Indigo is one of the oldest dyes used for coloring fabrics and the one still used today to color blue jeans. Indigo dye comes from a plant. The beautiful blue dye is made from the leaves of the plant through a process of fermentation. Indigo is grown in subtropical climates including some southern states of the United States. Throughout history indigo was revered and sought after as a valuable commodity. Fabrics dyed with indigo were not only used for fashions but also for religious rituals and to distinguish social or political status. The procedure of dyeing with indigo has changed little throughout time. This distinctive blue dye still provides one of the most wondrous and rewarding dyeing experiences available to any dyer.

Dyeing with indigo is unique compared to other dyes. In its natural state, indigo is insoluble in water. Therefore it must go through a process where it is 'reduced' and put into a liquid state with the oxygen removed. Although recipes for dye vats vary, all are based on reducing the indigo into a water-soluble form. In the 'reduced' state the indigo dye liquid is a yellow green color and in this form the indigo will be able to penetrate the fibers of the fabric. When the fabric is removed from the dye vat it is initially this same yellow green color, but begins to turn blue as the oxygen in the air reacts with the indigo. As the indigo oxidizes it becomes trapped within the fibers, making the dye permanent. The indigo dye in this kit is 60% reduced. Traditionally, indigo would be pasted up with some denatured alcohol and heated to get it to dissolve into water. Jacquard's Pre-Reduced Indigo easily mixes with water and therefore makes setting up an indigo vat practically effortless.

History

Indigo has been used for dyeing cloth throughout history in many cultures. For many centuries it had been used primarily in those climates where it could be grown, such as in India, Indonesia, Japan, China, Egypt, Africa, Central and South America. Indigo has a newer, but quite interesting history in Europe where it became a valuable trade item and in the

United States where slaves were used in the cultivation and processing of indigo in the south. Quite an extensive history of indigo can be found on any one of these geographical areas or topics.

Early examples of indigo have been found in manuscripts and tombs from many cultures. There is evidence of indigo dyed cloth found with Egyptian mummies going back 5,000 years. It has also been found in archeological ruins from Peru, Guatemala, China, Japan and Africa. Most of these cultures developed a tied resist technique to create patterns with their indigo dyeing and each has their own unique characteristics.

India is credited for being the oldest center of indigo dyeing where indigo was first domesticated. The Indian indigo industry was described by explorer Marco Polo in his travels in the latter part of the 13th century. India was the primary source of indigo for most of Europe, where the climate was not suitable for growing it. Prior to the opening of trade routes, most of Europe used woad, a plant from the mustard family, to achieve a blue dye. Woad, however, was inferior in quality to indigo and as indigo gained in popularity, woad farmers and industrialists (called the Woadites) felt they had to protect their livelihood. Indigo was outlawed for a time in England, Germany and France around the end of the 16th century. Indigo was very expensive as it had to go by caravan land routes through Arab traders. It was not a viable trade item from India until the sea routes were opened. With the demand for indigo high in the 16th century, the Dutch and British East India Companies imported large quantities of it and the growing of indigo in India began on a large scale. In the late 1700's the British established large plantations in India for the commercial cultivation and production of indigo. Other British and European colonies established indigo plantations in South America, Jamaica, South Carolina and the Virgin Islands to help keep up with demand.

In Japan, indigo became important for dyeing cotton when silk was outlawed in the Edo period (1603-1868). Indigo dyes cotton particularly well and other dyes available at that time did not. The Japanese have taken indigo dyeing into an art form of their own. The Japanese patterns of tied and paste resists are highly refined, detailed and complex.

In Western Africa there are many tribes that use indigo in their own way. In Hausa, the specialty is a shiny almost black indigo cloth. The fabric is overloaded with dye and then beaten for a burnished effect. This cloth is highly prized and used as turbans by the Tuareg nomads of the Sahara Desert. African tied resist patterning is often characterized by larger motifs some imbued with spiritual significance.

Indigo was grown in the Americas long before the Europeans estab-

lished their plantations. The French introduced indigo into Louisiana where for a while it was the number one export. Native Americans who were enslaved were the earliest workers on the indigo plantations and many of them died. It was thought that diseases were caused by indigo processing and that African slaves would not be susceptible to such disease. It is also possible that African slaves were brought to the south because of their knowledge of indigo production as few Europeans had experience with it. After several years of indigo crop infestations at the end of the 18th century, farmers in the south turned to sugar, cotton and tobacco.

Eliza Lucas Pinckney is credited with cultivating indigo in South Carolina. She shared her knowledge with many other farmers and greatly contributed to that state's leading economy in the mid-1700's. Around this time indigo was also the main export crop from British East Florida and was also grown in Georgia and other southern states. Indigo became the dye for the blue coats of the American Revolution. When the paper currency of the colonies became worthless, cubes of indigo replaced money.

In 1897, Johann van Baeyer from Germany, developed a synthetic indigo for which he won the Nobel Prize for chemistry in 1905. The synthetic indigo could be produced in a lab with a consistent quality and a price that was competitive with natural indigo. Within 10 years the production of natural indigo had dropped 90 percent. While maintaining all the characteristics of natural indigo, today most of the world's indigo is synthetic.

Instructions

Before you start, gather all of the items required and prepare a work area. In addition to the kit, you will need:

- 5 gal/18.93 L plastic bucket with lid
- Stirring stick long enough to reach the bottom of the container without having to submerge your hands
- Water
- Natural fabrics or yarn

Other items helpful to have on hand are:

- a shallow pan to place your fabric in while oxidizing
- a piece of plastic for the floor covering the area where you will have the indigo vat.

NOTE: Remember, never use utensils that have been used for dyeing for food preparation.

Setting up the indigo vat:

1. Fill a 5 gal/18.93 L bucket with 4 gal/15.14 L warm tap water.
2. Empty the Pre-reduced Indigo Dye packet into the water. Stir.
3. While stirring, slowly empty the Soda Ash and reducing agent (Sodium Hydrosulfite) packets into the water.
4. Gently, but thoroughly stir the vat in a one direction circular motion. Once the vat is well mixed slow down and reverse the direction of the stirring as you drag the stir stick along the outer edge of the vat before slowly removing it. Cover the vat with a lid and allow it to settle for at least 15 minutes to 1/2 hour. For best results, wait one hour.

5. After the vat has settled, remove the lid. The top of the dye bath may be covered with thin blue skin (rather than the traditional foamy 'flower'). Wearing gloves, gently move it to the side. The dye bath should be a clear yellow or yellow-green color under the flower. If it's not, wait another 1/2 hour and check again.

Dyeing:

1. Fold, tie or bind your garment or fiber. (See "Pattern Ideas" on pages 7-11.)
2. Thoroughly wet or soak your fabric in water.
3. When you are ready to begin dyeing remove the cover from the vat. If there is a layer of thin blue skin on top, then gently move it to the side while wearing gloves.
4. Squeeze excess water and air out of your fabric.
5. While still squeezing your fabric, slowly submerge your piece into the dye vat. Once submerged gently manipulate the piece to ensure that the dye will penetrate the unbound parts evenly. You may work the piece in the vat underneath the surface for one to several minutes in this way. Do not drop the fabric in the vat and let it sink to the bottom. There will be residue that has settled on the bottom of the vat and you don't want to stir that up while you are dyeing. The residue can cause spots on your dyed piece.

6. When you are ready to take the fabric out of the vat, squeeze it just below the surface as you slowly remove it from the vat. You want to prevent splashing as this introduces oxygen back into the vat. The fabric will be the same yellow green of the vat. Slowly, the fabric will begin to turn blue as the oxygen in the air contacts it. Place the cover over the container.

7. Set aside the fabric to allow the piece to completely oxidize. You may want to turn the piece and open up any areas that you want to turn blue. Let oxidize for about 20 minutes.
8. Once the item has oxidized you can either repeat steps 4 - 7 to achieve darker shades of blue or you can rinse excess indigo from the piece, untie, and wash with a mild detergent and warm water.
9. When you've finished your dyeing session, use your stir stick to gently stir the vat, as before, in a circular motion. Place lid back onto vat and let settle for at least an hour before using the vat again. The vat will keep for several days and you will be able to dye several times.
10. When you are ready to dispose of the vat, empty contents down the drain. Clean up bucket and utensils with a powdered cleanser or soap.

A little more helpful information:

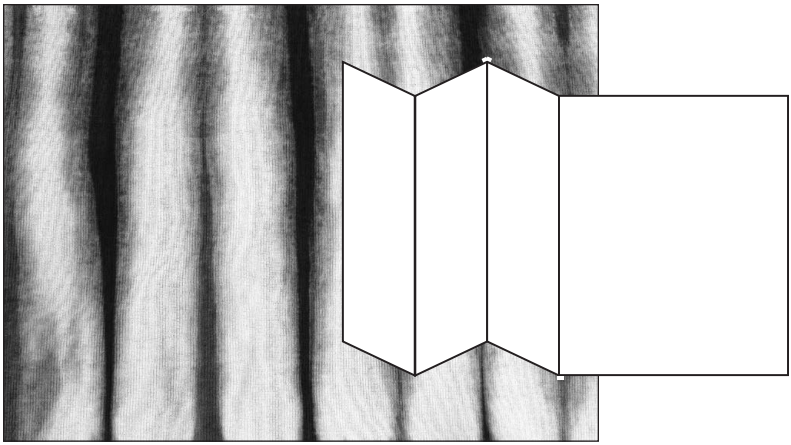
- The general idea in keeping an indigo vat is that you want to keep the vat as oxygen free as possible. That is why not splashing and squeezing excess air from the fabric is important.
- Store the vat in an area where the temperature will remain between 68-85° F / 20-29° C, a comfortable room temperature. Keep out of reach of children and animals. Always store with the lid on the container.
- Keep in mind that the color is much darker when wet.

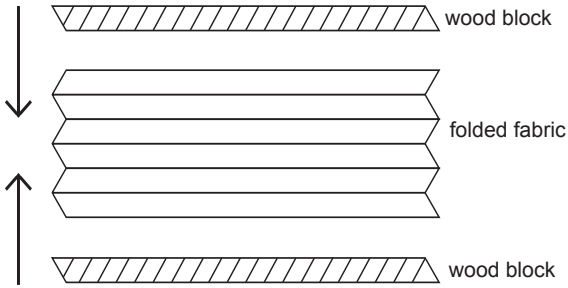
Pattern ideas

One of the most exciting things about dyeing with indigo is that it is easy to get great resist patterns on fabric. Here are some ideas to get you started.

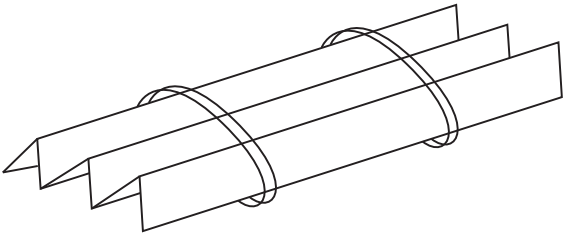
Basic accordion fold:

One of the easiest folds, which can produce endless results, is the accordion fold. This simple back and forth fold, when clamped with your wood blocks and rubber bands, will give you an endless variety of patterns.



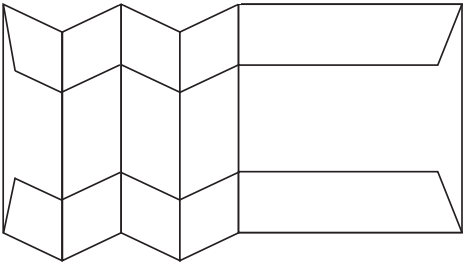


For another effect, just use the rubber bands around the folded fabric. Here are some other variations on the accordion fold.

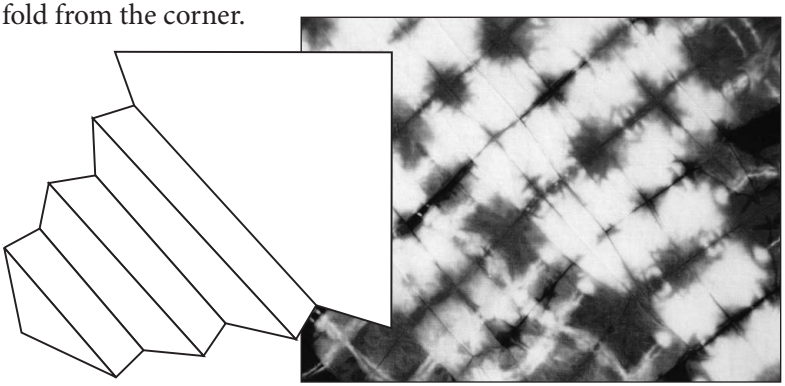


a.) Fold into thirds...

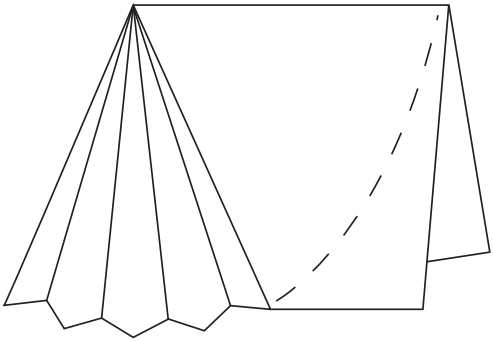
...and then do an accordion fold.



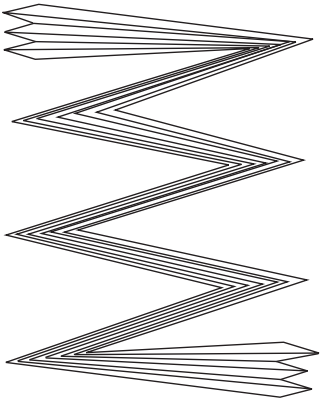
b.) Start the accordion fold from the corner.

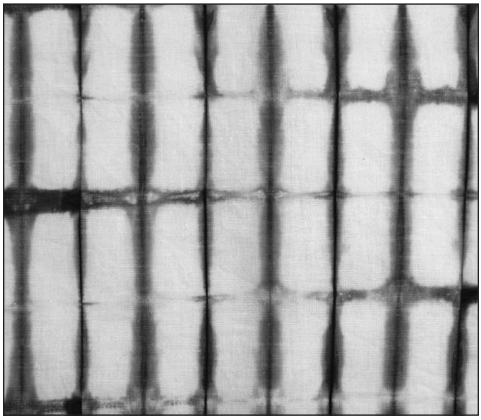


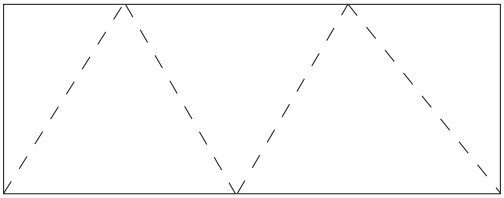
c.) Pivot the folding from a specific point, as in making a fan.



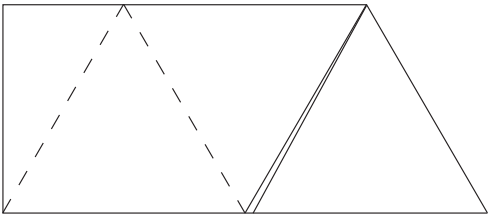
d.) After accordion folding into a strip, fold the strip back and forth.



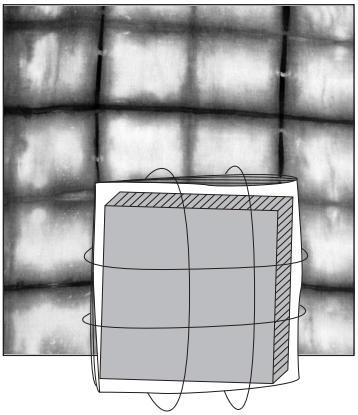


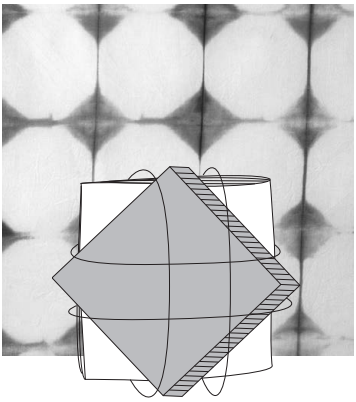


e.) After accordion folding into a strip, fold fabric into triangles as in a flag fold.



f.) Place your wood block at different angles to your folded fabric piece. Just a slight variation can give you a completely different pattern.

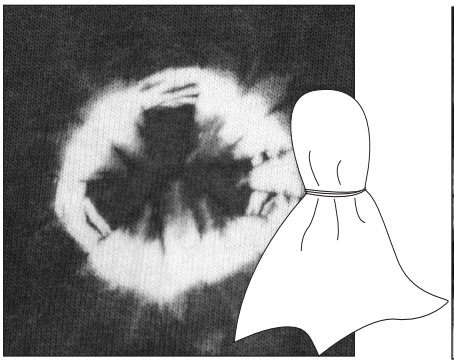


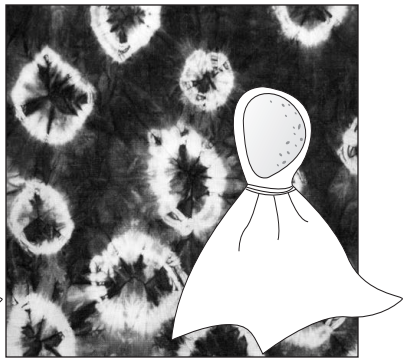


Experiment with other objects to clamp with such as washers, clothes-pins, or paper clips. Some of these common household items can give you very interesting patterns. You can also fold in one direction, dye, rinse, fold in another direction, and dye again. This will give you layers of pattern and increasingly complex ones.

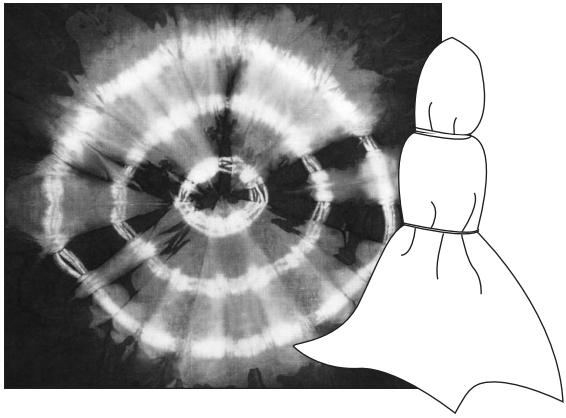
Circles or Spots:

One of the most common pattern motifs is a circle or spot of any size. This is done by simply pulling up the fabric at a point and putting a rubber band around it. This can be done in a variety of ways. A small pebble, bean or popcorn can be placed in the tip of the fabric and the bind placed just under it.

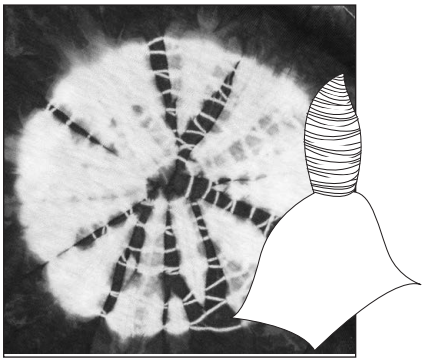


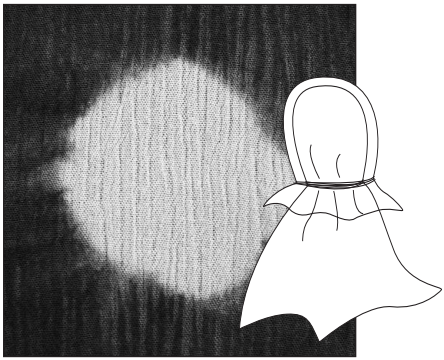


a.) For concentric circles, place more than one rubber band on the pulled up area.



b.) To make a whiter spot or polka dot, cover the area with the binding or use a piece of plastic wrap to cap the tip area.





These are just a few ideas to get you going. As you dye with indigo you will come up with many great ideas of your own. Some other things you might want to try:

- Over dye colored, printed or patterned fabrics.
- Combine more than one pattern on a single piece.
- Tie up some skeins of yarn and dye.
- Tie up parts of a piece and put in a plastic bag to either keep white or save parts that you like. This is a great way to make borders.
- Stitch fabric with a running stitch, pull up and tie to make lines.
- Wrap fabric around a plastic pipe, wrap string around it and scrunch it down.

Resources

Miller, Dorothy. *Indigo From Seed to Dye*. Santa Cruz, CA: Indigo Press, 1984.

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Pettit, Florence H. *America's Indigo Blues. Resist-printed and Dyed Textiles of the Eighteenth Century.* New York, NY: Hastings House, 1974.

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http://bell.lib.umn.edu/Products/Indigo.html

http://www.plantcultures.org/plants/indigo_history.html

Jacquard Products
Rupert, Gibbon & Spider, Inc.
PO Box 425
Healdsburg, CA USA
1.800.442.0455
www.jacquardproducts.com

WARNING!! This kit contains dye powder, sodium carbonate and sodium hydrosulfite. May be harmful if misused. Read instructions and cautions on individual containers carefully. Not to be used by children except under adult supervision. Conforms to ASTM D-4236.
KEEP OUT OF REACH OF CHILDREN.