

Title: Primaries in Square

Denise Green, Cornell University

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Measurements: Waist: 28" Bust: 34" Hip: 36"

*Primaries in Square* is a dress and cloak ensemble that uses simple shapes and minimal-waste pattern cutting to sustainably celebrate the productive tension between control and chaos. The primaries -- blue, yellow and red -- were created using *Indigofera tinctoria* (indigo), *Curcuma longa* (turmeric), and *Rubia tinctorum* (common madder) and applied to silk charmeuse and dupioni (both 19mm), with the latter two dyes applied to silk mordanted with aluminum potassium sulfate at 6% owf. The design pays homage to complex simplicity by using primary colors derived from plants and applying colors to simple shapes like squares and rectangles. Stream of consciousness surface design was created through batik "action painting" and combined with mokume shibori, a more controlled stitched resist technique. Surface design techniques disrupt basic shapes and colors to add aesthetic complexity and to conceptually remind us of the water used and often abused in textile production.

As apparel designers, we often begin design construction by cutting pattern pieces from rectangular fabric. Likewise, we often create specific colors using some combination of primary colors. *Primaries in Square* is an experiment in retaining the "starting points"—that is, the rectangular shapes and the primary colors. By using rectangles, this design minimizes wasted fabric and by using primaries from natural sources, we are forced to reconsider certain assumptions about natural dyes as "drab." The luxurious drape of silk charmeuse forces the rectangular shape to take on the movement and silhouette of the human body animating the garment. The dress is made of rectangular pieces of silk dupioni cut on grain, which creates a tubular, yet flattering, color-blocked silhouette.

Natural dyeing has been practiced for thousands of years in civilizations across the world and until the late 19<sup>th</sup> century was the primary means of coloring textiles. While synthetic dyes successfully supplanted natural dyes in the mid-19<sup>th</sup> century, today's designers and consumers are concerned by the potential hazards of synthetic dyes, both in terms of environment and human health (Haar et al. 2013; Siva 2007); therefore, natural dyeing is an ancient practice with exciting new possibilities in the modern world. *Primaries in Square* uses resist dyeing techniques to celebrate the tension: between certainty and disorder and between ancient and modern techniques. My design process began with designing and coloring textiles. Silk was used for a number of reasons: first, it is a protein fiber and takes natural dyes particularly well. Colors appear vibrant on silk in part because of the shape of the fiber and its ability to refract light. Secondly, silk is a natural fiber and biodegradable. Third, sericulture and silk manufacture have a relatively minimal environmental impact as compared to other natural and man-made fibers (Slater 2003: 29). For these reasons—both aesthetic and environmental—a 19mm silk dupioni and 19mm silk charmeuse were used. Indigo is a substantive dye, while turmeric and madder are both non-substantive, which means that they require a metallic mordant to create an affinity between fiber and dye. The process began with a warm wash cycle of fabrics using Synthrapol, a pH neutral detergent. The fabric was hung to dry, and the dry weight was later recorded. The textiles were then mordanted with a bath of 6% owf aluminum potassium sulfate. Batik wax was prepared using a 50/50 combination of paraffin and beeswax and applied to the textiles. Because the wax could melt off in a hot dye bath, the turmeric and madder baths both remained cold, while the indigo bath was heated only as high as 80 degrees Celsius. Dye baths were prepared as follows: (1) turmeric: 30% owf, room temperature dye bath, two-hour immersion; (2) common madder: 50% owf, room temperature dye bath, 24-hour immersion; (3) 20-quart indigo vat using 50g of indigo and reduced using thiourea dioxide.

Once dyed with indigo, wax was removed using iron, newsprint and finally the remainder boiled out of the textile. The silk charmeuse cloak was then hemmed with a rectangular piece of silk dupioni which had been dyed with turmeric, stitched using the mokume shibori technique, and then overdyed with madder. This rectangular piece of fabric was doubled over and connected to the indigo-dyed action painting using a French seams. The entire cloak was bound using a turmeric-dyed silk charmeuse bias binding, and cuffs created for the cloak using simple sewing tacks. The hem of the cloak is intended to touch the ground, over time gathering visible memories of the earth which supported the production of the textile and dyes. The dress was created from silk dupioni dyed with turmeric and indigo and created using a flat pattern. The dress is made entirely using French seams, so no raw edges are visible.

In order to explore the conceptual tension between control and chaos, I employed a technique called “action painting” using batik wax. Abstract Expressionists, like Jackson Pollock, Willem de Kooning and Philip Guston, are most commonly associated with this painting technique, which is also sometimes referred to as “gestural abstraction.” The idea is to allow the subconscious to emerge through embodied painting. In other words, feeling and emotion are conveyed through the action of applying (in this case, flinging) wax onto the textile, or paint onto a canvas. By action-painting onto an extremely controlled shape—a shape which later loses its control once animated by the body—the design comes to life and evokes an emotional response. It conceptually and aesthetically conveys the delicate fluidity of water—that is, the natural resource most tragically contaminated by synthetic dye practices (Slater 2007). The design reminds us of the water we abuse in an effort to achieve beautiful, vibrant color. The tensions between production and degradation, control and chaos, aesthetic beauty and the ugly underbelly of industrial practice are explored in the design process, research and the final garment, *Primaries in Square*.

*Primaries in Square* is an experiment in design that is sustainable by minimizing fabric waste, using natural dyes (and the least toxic mordant possible: aluminum potassium sulfate, see Haar et al. 2013), and improving the health of the wearer by using natural dyes like turmeric, which is known for antibacterial efficacy (Ghoreishian et al. 2013; Cooney 2011). The potentially healing and protective potency of naturally dyed textiles makes them an important area of design research to pursue. If skin is the largest organ in the human body and most frequently in contact with textiles, we have responsibility as designers of sustainable futures to create fashions with both human and environmental health and wellness in mind. The design emerges from this inspiration, and the desire to create beautifully vibrant colors from natural sources.

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