

Macchia Spiral Into Zero-Waste Times Two

Colleen Moretz, West Virginia University and Sandra Keiser, Mount Mary University

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Contextual Review and Concept: The design process for *Macchia Spiral Into Zero-Waste Times Two* addresses the fabric waste from apparel manufacturing. The fabric off-cuts, scraps that are left after garments have been cut, have been eliminated (Rissanen, 2013). The traditional “cut and sew” method of garment production, where fabric pieces are cut from patterns and sewn into a garment, yields approximately 15% fabric waste. Zero-waste pattern design addresses this issue by producing garments without fabric off-cuts. The patternmaking stage needs to be an integral part of the design process, rather than a stage that follows it (Rissanen, 2005). This challenge was further expanded by dyeing the fabric to size eliminating any waste in dye usage. The increase in the production and consumption of fashion has resulted in an equally increased use of resources, particularly fabric (Niinimäki, 2013). This design is an example of aesthetic sustainability, a term that describes products that focus on the psychological bond between subject (consumer) and object in a way that continuously adds nourishment to human life (Harper, 2017).

A design series including *Macchia Spiral Into Zero-Waste Times Two* evolved from an exploration of *Sanah Sharma's Planar Flux Hybrid Clothing Technique*. One of Sharma's alternative pattern cutting techniques utilizes a spiral pattern. A pattern developed from a spiral reduces the amount of fabric needed to develop a garment (Sharma 2015), but the corners remaining after the cutting step produce waste. Experimenting with the spiral pattern to develop a sustainable and innovative method to address pre-consumer textile fallout, a double spiral pattern was created that resembles a yin-yang (a linked double spiral) that is cut apart leaving the square edges attached to the bottom areas of each spiral. (See Diagram A & B). This pattern process is an iterative process similar to Timo Rissanen's zero-waste designs (Yen, 2016). This design incorporated two of the double spiral patterns (Diagram A & B) draped on the body form focusing on the fit and garment shape with no prior conceived concept for the design outcome. The only vision for this design was to utilize two of the same basic spiral patterns to create a full garment with zero-waste.

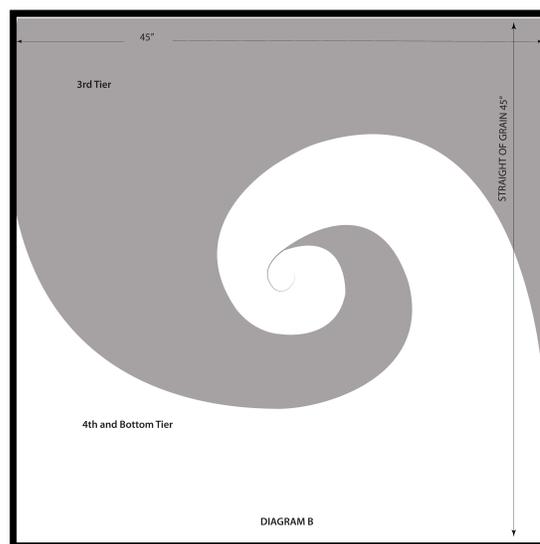
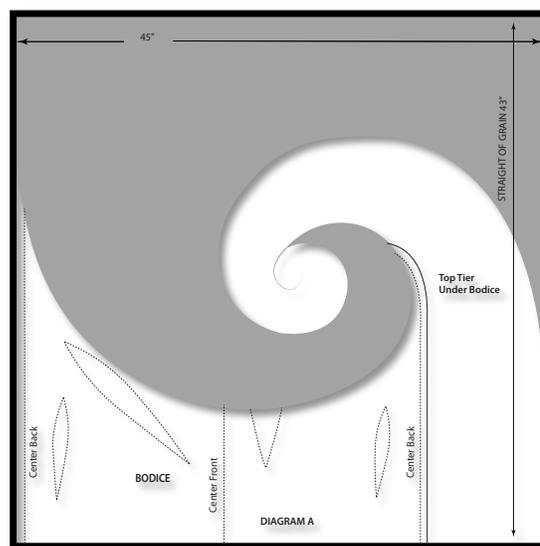
Aesthetic Properties and Visual Impact: This design collaboration was inspired by Dale Chihuly's *Macchia* series as viewed at the Morean Museum in Saint Petersburg FL. The *Macchia* series uses a technique where colored glass chips, called jimmies, are fused onto the exterior layer of glass to create a spotted effect, similar to the effect achieved in shibori honeycomb dyeing (Dale Chihuly website). *Macchia* allows the glass blower to incorporate more color into the finished piece. The honeycomb pattern is achieved by wrapping fabric around a rope and then scrunching the fabric together to form 3D folds before dyeing or discharging. The honeycomb dyeing

technique generally uses two colors; for this design the technique was adapted to incorporate more color. The wrapping of the fabric results in a gradated pattern, which is more distinct on the part of the fabric that is most exposed and fades on the fabric that is closest to the rope. Wrapping the fabric on the diagonal minimizes the faded sections. This gradation of pattern was used to emphasize the center of the spiral and accentuate the angulation of the spirals as they wind around the body. Darts were strategically placed at the waistline to develop an overall compelling and harmonious garment that accentuates the feminine figure.

Process, Technique, and Execution: Honeycomb dyeing was used on two squares of silk broadcloth. The fabric was dyed fuchsia and then wrapped around a piece of rope, 3/8 inch in diameter, before scrunching. Both pieces were submerged in a discharge solution to remove some of the color. Five colors of dye were then painted on to the fabric coil in order to replicate the multi-colored spotted effect of the glass. This process was repeated three times wrapping the fabric in a different direction each time. This repeated processing resulted in some differential shrinkage, which required adjustment to the spiral pattern. Two of the double spiral patterns were cut into muslin to reflect the sizes of the two dyed fabric pieces. Piece #1 was 45" wide by 43" long (see Diagram A) and piece #2 was 45" wide by 45" long (see Diagram B). Preliminary design decisions were made, as the

muslin was being draped and wound around the body form. The final outcome of the garment was not predetermined. A seam was created in piece #1 to form the center back of the bodice to add a zipper. Darts added to the bodice to accentuate the fit of the waist a decorative component. Adjustments were finalized to the drape of the garment once cut into the fabric to best highlight the weight, body, and dyeing variations.

Cohesion: *Macchia Spiral Into Zero-Waste Times Two* effectively addresses the environmental concerns of pre-consumer textile waste while creating an innovative design that speaks to the form and function of the body. Acid and fiber reactive dyes were used to get to the depth of color achieved in Chihuly's glass. These dyes can be safely disposed and are more fast to light and washing,



giving the garment a longer life than what might be achieved with natural dyes.

Design Contribution and Innovation: The outcome of the *Macchia Spiral Into Zero-Waste Times Two* garment was unexpected, inventive, and freeing. The design process of starting with the pattern deviated from the designer's traditional method of starting with a preconceived design and then developing the patterns. The experimentation of the double spiral pattern will continue, creating zero-waste garments.

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