

Zero Waste: The Spiral Pattern Cutting Technique

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Keywords: Zero waste, spiral, pattern cutting

The production and consumption of fashion is escalating which generates a proportional increase in the use of resources, particularly textiles (Niinimäki, 2013). This relationship aligns with Dame Ellen MacArthur's concept that in order to build economic, societal, and natural assets, we need to amend the way that we produce and consume clothing (The Business of Fashion and McKinsey & Company, 2017). During traditional garment production, the "cut and sew" method is used. This method yields approximately a 15% fabric waste (Gugnani, 2012). Moving forward, social responsible concerns will be at the forefront of innovation in the fashion industry (The Business of Fashion and McKinsey & Company, 2017). Zero waste garments are produced eliminating fabric off-cuts (Aakko, 2013). It is essential that the initial pattern development stage be considered during the design process instead of a separate stage succeeding it (Rissanen, 2016). It is through the zero waste pattern design layout and cutting that a significant sustainability impact can occur by eliminating fabric waste during pre-production.

Through history, different cultures incorporated zero waste methods in their traditional garments. Due to the scarcity of raw materials and the time consumption of producing the yarns and fabrics, textiles were valued. Examples include the Japanese kimono and Chinese trousers (Tilke, 1956). Contemporary designers are developing various and unique pattern design techniques that incorporate zero waste or minimal waste as a part of their sustainable design practices. Designer, Holly Quillen, used the Planned Chaos approach when designing her *Trapeze Sleeveless Tunic*. The technique is a combination of flat pattern cutting with draping. (Rissanen T. 2016 p 94-95) Designer, Sanah Sharma, utilizes the spiral in one of her pattern cutting techniques. Even though, this cutting technique developed from a spiral reduces the amount of fabric needed to develop a garment (Shama 2015), the corners remaining after cutting out her spiral pattern produces fabric off-cuts.

The spiral pattern cutting technique incorporates both the Planned Chaos and spiral cutting methods. A unique double spiral pattern was developed resembling a yin-yang (a linked double spiral) cut apart, but leaving the square edges attached to the bottom areas of each spiral (See *Diagram 1*). Using the same basic pattern to create various complete garments to include skirts, dresses, and tops. Preliminary design decisions were made, as the fabric was being draped and wound around the half-scale form. Similar to the Planned Chaos approach, there was no other preconceived concept for the design outcome prior to the draping of the separated spirals onto the half-scale form. The natural curves of the spiral drape to parts of the wearer's body creating

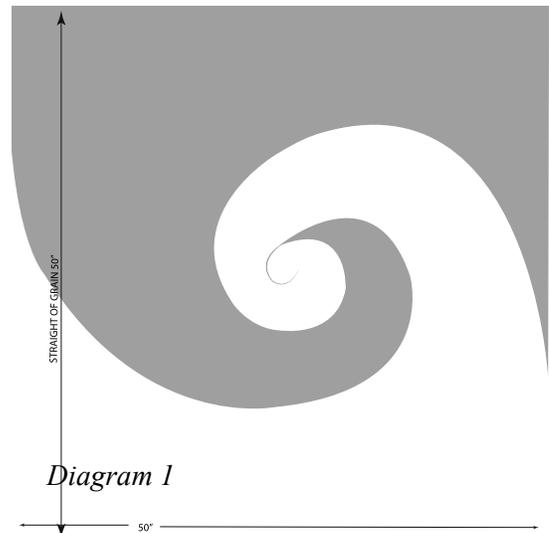
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Sustainability in Fashion: Regent's University London & ITAA Joint Conference Proceedings

a pleasing aesthetics and fit in a responsible way.

The outcome of zero waste garments created by incorporating the spiral pattern are unique, creative, and unconventional, while addressing the form, fit, and function of the body. This pattern enables the designer to deviate from conventional design methods by bringing the pattern into the design process to develop a zero waste garment. The spiral pattern technique is a successful and innovative strategy to address the increasing textile waste in the fashion industry. Further experimentation using the spiral to inspire and create zero waste garments will continue. With increasing pre-production textile waste concerns in the fashion industry, the spiral pattern technique is a successful strategy. It is increasingly important for designers to explore and incorporate innovative sustainable design practices into their work.



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