

Zero-Waste Sports Apparel for Bossaball Athletes

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Contextual review and concept statement

Production waste is a substantial issue in the apparel industry (Brown, 2021). It is estimated that 15 to 20 percent of the fabric used in all apparel manufacturing ends-up as landfill from the cutting room floor (Edge Fashion Intelligence, n.d.). This sport uniform for Bossaball was developed through a new zero-waste design approach, where a standard roll of 45” wide four-way stretch fabric was cut in parallelogram pattern panels to construct a uniform top, short and protective sleeves (Figure 1. Process of pre-cut strips and zero-waste paneling.).

Bossaball is a relatively new sport, established in Spain (2005). It is a ball game between two teams, combining elements of volleyball, soccer, and gymnastics (Bossaball Music and Sports, n.d.). Despite the unique movements and environment used, there is no apparel specifically designed for the sport.

Currently, bossaball players wear traditional T-shirts and shorts (Lamti, 2021). It is played on an inflatable court featuring a trampoline on each side of the net (Readmikenow, 2016). The bossaball governing body implements sustainability as a part of the culture, where the inflatable courts are converted into unique merchandise items such as backpacks and bags for fans to purchase (Bossaball Music and Sports, n.d.). Because of the sports’ current practices, it is poised to advance the sustainable aspects of the competition uniform.

Aesthetic properties and visual impact

The zero-waste approach developed utilizes parallelogram panels to maximize material usage. The method nets an asymmetrical aesthetic that is unique to the uniform and sport. The panels are cut from four-way stretch recycled polyester/spandex jersey knit and recycled polyester/spandex mesh knit fabrics that are printed to distinguish team colors (Figure 2. Colorway samples.).

Process, technique, and execution

The uniform was created by establishing base flat patterns for the top, short and sleeves. With those patterns, parallelogram panels were drafted. The widths of the parallelograms were

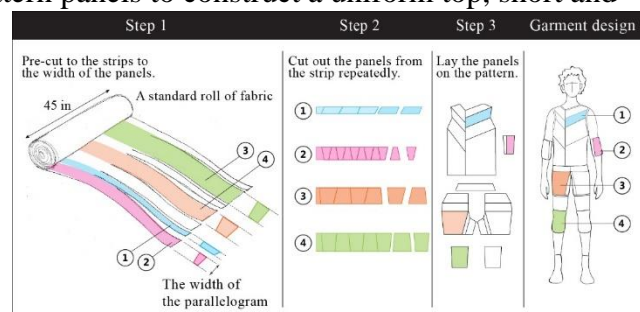


Figure 1. Process of pre-cut strips and zero-waste paneling

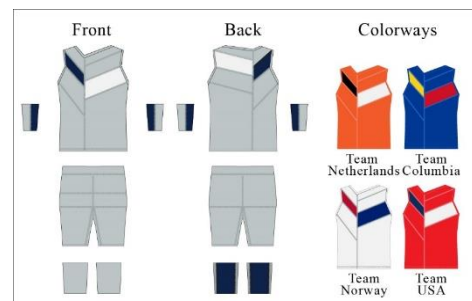


Figure 2. Colorway samples

determined by neck/armhole shapes and body size. The fabrics used for the uniform – four-way stretch recycled polyester/spandex mesh knit and polyester/spandex jersey knit were chosen for their lightweight, durability, and moisture-wicking benefits. Four rounds of prototypes were made to finesse the neckline/armholes shapes and overall fit. Based on athlete feedback, a 3D printed trim was created to hold the uniform top down into the short while jumping (Figure 3. Top security trim.). Elbow and knee sleeves were also added to protect the players from the hot court when diving for the ball.

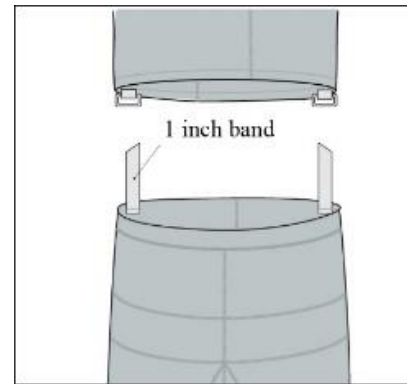


Figure 3. Top security trim

Cohesion

The bossaball uniform was created with a sustainability focus, to provide better mobility and thermoregulation for players. Bossaball players are required to have extreme mobility for using the trampoline and performing acrobatic maneuvers. Mobility was addressed by using lightweight four-way stretch knit materials that have spandex, and the neckline and armholes were self-trimmed with heat transfer film for chafe-resistance. For thermoregulation, sweat zones were identified from a body perspiration map (Smith, 2012). To provide maximum heat dissipation and breathability, recycled polyester/spandex mesh knit was placed in the sweat zones. Ideally for production, the parallelogram panels could be ultrasonically welding for a smooth transition between panels, however flat seams were used for this design.

Significance, rationale, and contribution

Bossaball is a new sport that is rapidly gaining popularity in Europe and Latin America (Bossaball Music and Sports, n.d.). This project's purpose was to design apparel specifically for bossaball players that meet their mobility and thermoregulation needs, while building upon sustainability practices already used by the sport's governing body.

Originality and innovation

Traditionally, zero-waste apparel utilizes two methods. The first is to create a garment from pre-consumer cut-off scrap. With this method, the garment is a patchwork of random fabric, but the design, functionality and production are limited due to the availability of cut-off scraps. The second method uses a jigsaw puzzle pattern layout, but this method results in garments with bulky, loose silhouettes that have an unappealing or sloppy appearance.

The new zero-waste approach uses a standard roll of 45" sportswear fabric and pre-cuts it to the width of the pattern panels. The panels are designed to be parallelograms, and they are laid out alternatively and cut out from the strip repeatedly without any fabric waste. The cut panels are then sewn together with flat seams to construct the garment (Figure 1. Process of pre-cut strips and zero-waste paneling.). Waste will only be produced when a strip of fabric does not have enough length for the panel to be cut out at the end of the fabric roll. Future work with this approach can look at grading of other sizes and uniforms for other sports.

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