

Analysis of the Results of Bustier Production Using Inserted Boning, Sewn Boning, and Steel Boning

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Abstract: A bustier plays a crucial role in supporting the body, enhancing its shape, and enhancing aesthetics, especially when worn with a kebaya or evening gown. This study aims to analyze the results of bustier production using three different types of boning, such as needle-inserted boning, sewn-in boning, and steel boning, to determine the most optimal type of boning. The method used is Research and Development (R&D), encompassing data collection, product design, validation, testing, and product revision. This study found that the bustier with inserted boning achieved fairly good results with an average score of 3.00, which equates to 75.00% and falls into the “acceptable” category, while the bustier with sewn-in boning demonstrated the most optimal results. Based on validation testing by two expert validators, this product received an average score of 3.64 out of a total of 4, with a 90.91% acceptability rate, which falls into the “highly acceptable” category. The bustier with steel boning received an average score of 2.82, or 70.45%, which also falls into the “acceptable” category. Steel boning is not yet widely available, so its availability should be confirmed before production begins. Installing both sewn boning and steel boning requires precision. Therefore, it is recommended that you first practice structural sewing techniques.

Keywords: Bustier Production; Needle-Inserted Boning; Research And Development; Sewn-In Boning; Steel Boning.

1. Introduction

The evolution of the fashion world is closely tied to various clothing needs, including those of women. This is because clothing serves not only as protection but also reflects one's identity, considering comfort, appeal, and elegance. Fashion designs that constantly evolve over time, along with growing awareness of styles, drive the need for knowledge regarding fashion terminology, clothing components, and all their variations. One example of women's clothing is the kebaya, which serves as Indonesia's national costume. To complement a kebaya made from sheer fabrics such as brocade, lace, and organdy.

The bustier is a key element in the history of fashion that has undergone significant evolution over time. Originally, the bustier served as undergarment designed to provide support for the bust and shape a woman's figure. Over time, its function evolved, and the bustier began to be worn as part of more stylish and trendy outerwear. The bustier has transcended its original function as undergarment and has become a symbol of style, elegance, and feminine strength.

“Lingrie” refers to a bustier, a type of undergarment that combines a bra and a camisole, designed to cinch the waist and hug the ribs to make the body appear more proportionate (Putri, D. R. O., 2020). A bustier can be defined as a top or undergarment specifically designed to provide support and enhance the shape of a woman's bust. Generally, bustiers feature a rigid structure in the chest area to create a lifting effect and hold the bust more effectively than a regular bra. They typically include small boning or reinforced panels to shape and support the upper body, often extending down to the waist. This garment is usually worn to create a slimmer, more supportive silhouette and is often worn under tight-fitting clothing or as undergarments under evening gowns or wedding dresses.

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Bustier boning serves to maintain the shape of garments, particularly in items such as bustiers, corsets, or evening gowns. Bustier boning plays a crucial role in preserving the garment's form, especially for items like bustiers, corsets, or evening gowns. Without bustier boning, these types of garments tend to lose their structure and are unable to optimally support the wearer's body shape. Without boning, these garments usually lack structure and cannot fully support the wearer's body shape. Currently, there are various types of boning available for making bustiers, including sewn-in boning, insertable boning, and steel boning. Nowadays, there are various types of boning available for making bustiers, including sewn boning, needle-sewn boning, and steel boning.

All three have significant differences in terms of material, installation technique, flexibility, strength, and comfort when worn. These three types differ significantly in terms of material, installation method, flexibility, strength, and comfort when worn. Each type of boning has distinct characteristics that affect comfort, the final shape of the bustier, durability, and the efficiency of the manufacturing process. Each type of boning has unique properties that affect comfort, the final shape of the bustier, durability, and the efficiency of the manufacturing process. Therefore, the selection of boning cannot be done haphazardly but must consider the design, the bustier's primary material, and the wearer's needs.

The selection of the type of boning must be done carefully, considering the design, the main material of the bustier, and the user's needs. In both the academic and industrial sectors, understanding the advantages and disadvantages of each type of boning is crucial for ensuring a high-quality and functional final product. Boning is a key component in bustier construction because it provides structure, supports the body's shape, and enhances the garment's aesthetic appeal and comfort. Wholes are an essential part of bustier production, serving to provide structural support, maintain the body's shape, and enhance the garment's aesthetics and comfort.

There are three types of boning commonly used in the fashion industry: sewn-in boning, stitched-in boning, and steel boning. Sewn-in boning is made from thin plastic strips or fabric that are sewn directly into the fabric of the garment, providing a lightweight, flexible, and comfortable shape. Sewn boning is made from small pieces of plastic or fabric sewn into the fabric layers, providing a lightweight, flexible, and comfortable shape. Steel boning is made from strong steels like steel and provides stronger support for body areas such as the waist and bust. Steel boning is also used to provide maximum support, particularly in undergarments like corsets or bustiers that require additional stability.

In the fashion industry, a deep understanding of the different types of boning is essential, particularly when creating structured garments such as bustiers. In the fashion industry, it is crucial to have a thorough understanding of the different types of boning, especially when creating garments with a structured design like bustier. Selecting the right type of boning not only affects the garment's final shape and durability but also the wearer's comfort. Errors in boning selection can result in a bustier that is too stiff, uncomfortable, or even fails to contour the body optimally. Therefore, this study was conducted to analyze the results of using these three types of boning to determine which is most suitable for bustier production, in terms of shape, comfort, structure, and aesthetics.

This study was conducted to evaluate the results of producing three types of boning to determine which is most suitable for making bustiers, in terms of shape, comfort, structure, and aesthetics. Through a systematic research approach, the researcher hopes to make a scientific and practical contribution to fashion designers, particularly in improving the quality of structure-based apparel products. Through a well-planned research approach, the researcher hopes to provide scientific and practical contributions to fashion designers, particularly in improving the quality of structure-based apparel products. The results of this study are expected to serve as a reference in the selection of garment support materials, as well as to encourage innovation in effective and efficient bustier manufacturing techniques.

2. Literature Review

A bustier is a shapewear garment designed to contour the upper body, particularly the bust and waist (B. Alben & Andal, 2023). This garment combines the features of a bra and a corset without shoulder straps, creating a more flattering silhouette. As fashion has evolved, the bustier has transformed from undergarment to an essential element in various clothing designs, such as kebayas, evening gowns, and other formal attire. A bustier can be defined as an upper-body garment designed to provide shape, support, and comfort to the bust and waist areas (Butik & Ayub, 2024). Over time, the bustier has evolved to serve not only as

undergarment but also as a fashion item with aesthetic value that can shape the body's silhouette to suit the wearer's needs.

A bustier is a type of garment worn close to the body, either as underwear or outerwear. It is a combination of a bra and a corset without shoulder straps, designed to shape the bust and waist, creating a slimmer silhouette with a fuller-looking bust. (Ukuran et al., 2020). A bustier serve as a shapewear garment that provides structure and support to the upper body, particularly the bust and waist. It is designed to create a more proportionate silhouette, enhance one's appearance, and provide a body-shaping effect without compromising the wearer's comfort. As fashion has evolved, the bustier has also come to be worn as an outer garment with aesthetic and decorative functions (Istanti et al., 2025)

In bustier construction, boning is used as a supportive element that helps keep the garment's shape firm and proportionate. This material helps create a defined silhouette while enhancing the garment's structural stability when worn (Agniafrisca, 2026). Baleen served as a structural material in clothing, used to shape and maintain the silhouette of 16th-century aristocratic garments. Its strength, lightness, and flexibility made baleen more effective than earlier structural materials, contributing to the development of more structured and elegant clothing (Bendall, 2022). A bustier has several key characteristics that distinguish it from other types of clothing. First, a bustier function as a body-shaping garment that provides support for the bust while cinching the waist to create a slimmer silhouette. Second, bustier features supportive structures, such as boning or underwires, which help maintain the garment's shape and enhance its body-shaping effect. Third, a bustier can be made in various lengths, ranging from those that cover only the bust area to those that extend to the waist or hips, depending on design needs and intended use. (Istanti et al., 2025)

As noted by (Yujuan & Ruslana, 2024) the evolution of the bustier reflects a shift in function from the traditional corset, which focused strictly on body shaping, toward modern garments that prioritize a balance between shaping, comfort, health, and aesthetics. This development is supported by innovations in materials, construction technology, and increasingly flexible designs, so that the bustier serves not only as body-supporting apparel but also as a multifunctional fashion element suited to the needs of modern women.

In the process of making a bustier, several key considerations include design planning, selecting appropriate materials, using a support system (boning), attaching the cups, determining the openings, and applying draping techniques (D. I. Alben & Andal, 2020). Other factors must also be considered to ensure the final product meets quality standards. First, the placement of the princess seams must be precise to create a proportional body silhouette and support the bustier's structure. Second, the size of the bra cups or padding must be adjusted to the wearer's body shape and size. Third, the choice of thread color should harmonize with the main fabric to produce an aesthetically pleasing and neat appearance. Additionally, the quality of machine stitching must be ensured to guarantee that every seam is strong, even, and does not cause defects in the garment. The width of the underwire channel must be made to size so that the underwire fits properly and maintains the bustier's shape. The length of the underwire also requires attention; it should be slightly shorter than the channel to prevent it from piercing or damaging the fabric when worn. (Hanim et al., 2023)

The importance of support structures (boning) in shaping the body's silhouette and enhancing the comfort of a bustier. A research study (Istanti et al., 2025). provides a theoretical foundation that the selection of materials, support structures, and sizing are key factors in the success of a bustier. Additionally, according to (Education et al., n.d.) the comfort of a bustier is determined by how well the garment's construction fits the wearer's body shape. A comfortable bustier is characterized by a proper fit in the chest, torso, waist, and hip areas; it shapes the body silhouette proportionally, provides good breast support, has a smooth surface without wrinkles, and allows for freedom of movement without causing a feeling of tightness or discomfort.

The process of making a bustier involves a series of steps, starting with fabric selection, body measurements, pattern making, and fabric cutting, through to the garment construction process via sewing. Next, supportive components such as boning, bra cups, zippers, and lining are attached to create a sturdy structure and ensure comfort during wear (Khoiron et al., 2024). As stated by (Wenhui et al., 1882), the fit of a bustier is determined by the accuracy of body measurement data, the distribution of garment pressure across various body parts, the effectiveness of silhouette shaping, and the level of comfort experienced by the wearer. Therefore, sizing selection should not only focus on aesthetic aspects but must also consider ergonomic and comfort factors to ensure optimal body-shaping functionality.

3. Method

The method applied in this study is Research and Development (R&D). According to (Nusantara et al., 2023), Research and Development (R&D) is a method or process for creating new products or improving and enhancing existing ones, and is also used to test the effectiveness of those products. Several techniques applied during the research include descriptive methods, and the following are the steps in Research and Development (R&D) research.

The data analysis used in this study is descriptive analysis. According to (Ilmiah, 2024) qualitative descriptive analysis is used to interpret data in depth in order to uncover and explain research phenomena based on facts discovered during the data collection process. All collected data is then described in full and organized in a structured manner so that it can be understood by others. Data collection requires precision and accuracy; however, if there are different sources of information, the information obtained may also differ.

4. Results and Discussion

This study was conducted to evaluate the results of bustier production using three different types of boning including inserted boning, sewn-in boning, and steel boning, each of which has unique characteristics. The evaluation was carried out through a series of production processes, expert validation, and user trials. This study employs a Research and Development (R&D) approach involving several stages, from design creation to validation and testing. These processes are outlined as follows:

Product Design

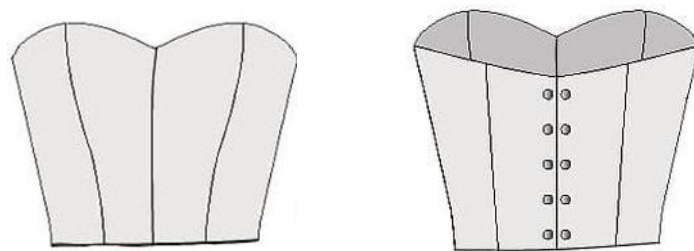


Figure 1. Initial Product Design.

4.1. Product Manufacturing

The production of a bustier begins with the pattern-making process using a Myneke pattern, followed by pattern grading according to the validated bustier design. Once the pattern is ready, production proceeds by preparing the main bridal satin fabric, M10 lining, as well as the appropriate types of interlining and boning, including needle-punched boning, sewn-in boning, and steel boning. The bustier is sewn in stages, starting with the joining of the main fabric and lining, the installation of boning according to the respective techniques, the addition of a bra cup on the inside, and the completion of the back section consisting of a tongue and lace-up holes. This process requires precision, especially during the installation of sewn boning and steel boning. The final product is refined through the finishing stage, followed by a fitting test to evaluate the comfort, shape, and aesthetics of each type of boning.

4.2. Product Testing

In the next phase of this study, the products were tested directly on models to determine the results of the three types of boning, this testing also served to assess the feasibility of the designs created using these three types of boning. The evaluation results for each type of bustier are presented in the following table:

Table 1. Product Test Results

Type of Balein	Total Score	Jumlah Skor	Number of Scores	Average Score	Category
<i>Inserted Boning</i>	33	11	3,00	75,00%	Feasible
<i>Sewn Boning</i>	40	11	3,64	90,91%	Highly Feasible
<i>Steel Boning</i>	31	11	2,82	70,45%	Feasible

4.3. Product Revision

Based on the results of inspections and testing, improvements were made: the lining material was changed from Kufner to M10/cecak fabric. Main fabric: changed from Maxmara satin to bridal satin. Adjustments were made to the shape of the bustier and the position of the boning to make it more ergonomic. The revised bustier was then tested on users, with the following results: Sewn boning was the most comfortable, with a snug fit and lightweight feel. Stitched boning was lightweight but lacked firm support. Steel boning was sturdy but lacked flexibility. Below are images of the wear-test results:

Table 2. Wear Test Results

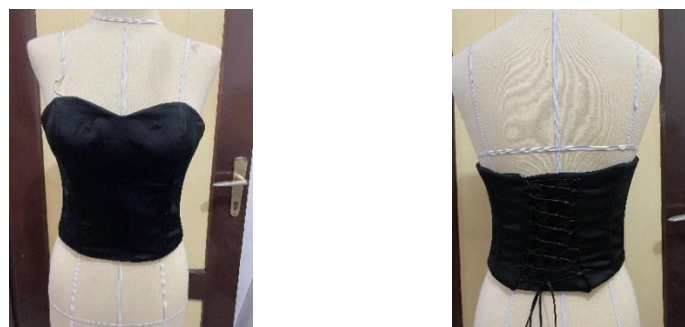
1. Bustier with inserted boning



2. Bustier with sew-in boning



3. Bustier with steel boning



Results

The final product of this study comprises three bustiers constructed using different types of boning: inserted boning, sew-in boning, and steel boning. Each piece underwent a comprehensive process encompassing design, construction, expert validation, revision, and wear testing to evaluate its structural quality, comfort, and aesthetics. The evaluation results indicate that sew-in boning delivers the best overall performance compared to the other two types. The bustier with sew-in boning provides a sturdy yet flexible structure, allowing it to contour smoothly to the body while ensuring comfort during wear. Furthermore, the finished garment exhibits a neater and more proportional appearance, offering optimal support to the bust and torso areas.

This product received an average score of 3.64 with a suitability percentage of 90.91% and falls into the “highly suitable” category. The bustier with inserted boning features a good construction and feels lightweight when worn. However, the boning’s ability to maintain the bustier’s shape is still inferior to that of sewn-in boning. This product received an average

score of 3.00 with a suitability percentage of 75.00% and falls into the “suitable” category. Meanwhile, the bustier with steel boning has a high level of sturdiness and can provide strong structural support. However, the stiffer nature of the material results in reduced flexibility and comfort. This product received an average score of 2.82 with a suitability percentage of 70.45% and falls into the “acceptable” category.

Based on the overall results of the validation and wear-testing, the bustier with sewn boning was rated as the best product because it successfully balanced comfort, structural strength, aesthetics, and functionality. These findings indicate that the choice of boning type is a key factor in determining the final quality of a bustier and can serve as a reference for practitioners and the fashion industry in the development of structured garments. This study is also consistent with previous research conducted (Rias, 2020) The study shows that boning serves as a structural element that helps shape and refine the construction of camisoles and bustiers. Proper placement of boning can enhance the wearer’s comfort, maintain the garment’s shape, and enhance its aesthetic appeal.

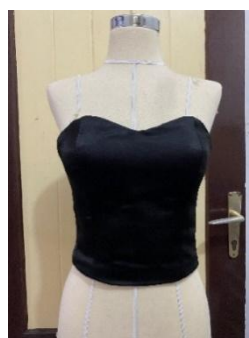


Figure 2. Initial Product Design

5. Conclusions

This study shows that the type of boning used affects the quality of the bustier in terms of structure, comfort, and aesthetics. The validation results show that the bustier with sewn boning received the highest score of 90.91%, falling into the “highly suitable” category, making it the most optimal type of boning to use. The bustier with stitched boning received a suitability score of 75.00% and falls into the “suitable” category, while the bustier with steel boning received a suitability score of 70.45% and falls into the “suitable” category.

The results of this study are also consistent with the research conducted by Amanda (Penelitian, 2024) The quality of a bustier can be influenced by the use of the appropriate type of boning, thereby ensuring optimal results. This study aims to evaluate the quality of bustiers made using three types of boning: sewn-in boning, stitched boning, and steel boning, to determine which type is most effective in terms of structure, comfort, and aesthetics. The results show that sewn boning performs best with a suitability rating of 90.91% (highly suitable), as it produces a sturdy structure, is comfortable to wear, flexibly conforms to the body’s shape, and has a neater appearance. These findings confirm that the choice of boning type affects the final quality of the bustier, and sewn boning is recommended as the best option for making bustiers that prioritize comfort, function, and aesthetic value.

Wear test results show that sewn boning provides a more defined shape, is comfortable to wear, lightweight, and conforms well to the body’s contours. Through the Research and Development (R&D) process, improvements in design, material selection, and boning installation techniques can result in higher quality bustiers that meet user needs. Therefore, sewn boning is recommended as the best alternative for creating bustiers that prioritize comfort, structure, and aesthetic value.

Author Contributions **Author 1** contributed to the conceptualization of the study, data collection, product development, experimental procedures, data analysis, and drafting of the initial manuscript. **Author 2** contributed to the design of the research methodology, supervision, product validation, analysis of research results, manuscript revision, and finalization of the article for publication. All authors have read and approved the final published version of the manuscript.

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Data Availability Statement Data supporting these findings are available from the corresponding author and can be obtained upon reasonable request.

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Conflicts of Interest The authors declare that there are no conflicts of interest regarding the research, writing, or publication of this article.

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