FDM 3050
17 December 2025

PERFORMANCE TESTING RESULTS AND EVALUATION

Ripley Berg, Autumn Graybill, Sophia Stratheam, Brigitta Vande Lune, Max Veasman

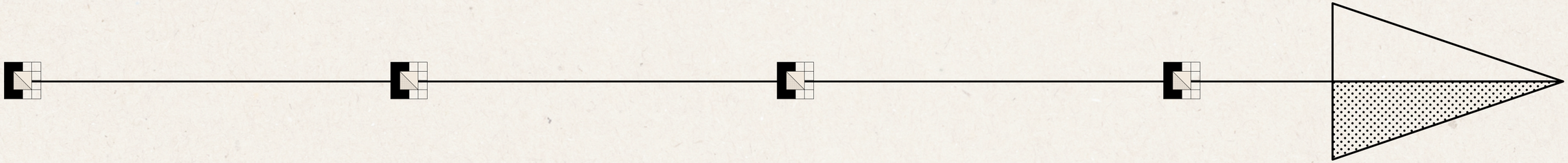
Overview

01	Introduction
02	Target Market and Satisfaction
03	Timeline of Testing
04	Testing Results
05	Conclusion

Target Audience

The target consumer is women in their 20-30's, living on a lower to middle class income, possibly ranging from $49,000-$62,000. Aesthetics the consumer is looking for would be leaning modest, possibly following a business casual dress code. Old Navy is a family focused brand, so it is assumed the customers share similar values when shopping with them. The target consumer does not shop often, usually only out of necessity, and relies on good quality items that last a few seasons, without compromising affordability. Analyzing the brand, Old Navy is known for decent quality denim that is easy to care for, along with a wide range of sizing, furthering their consumer market.

Timeline



Phase 1:
Prepare samples from our Old Navy Jeans

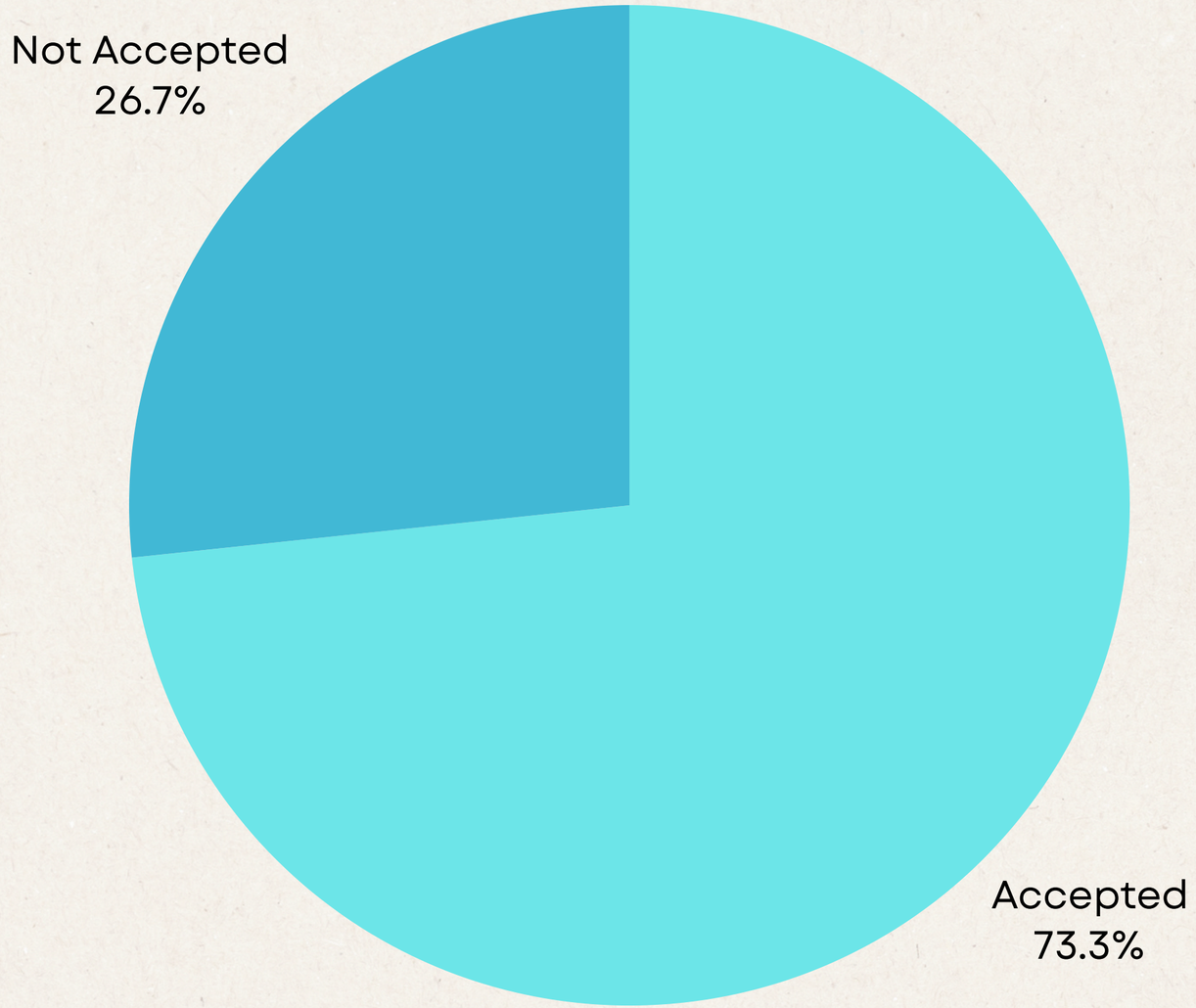
Phase 2:
Identify fiber content, twist and weave

Phase 3:
Testing and recording results

Phase 4:
Create testing sample notebook with results and samples used

Overall Results

With a total of 30 tests, our data concluded that 22 of the results were accepted, with 8 of the results not being accepted.



Abrasion Resistance/Taber (ASTM) 3884

Test: 5 circular fabric samples weighed for their initial weight and then are rotated against sand paper textured disc. After 50-65 cycles the fabric sample is removed and then weighed for its final weight to find the samples mass loss.

Results: **Accepted**

Reasoning: All five samples met our specifications of **losing less than 3% of its mass**. All fabric samples showed strong resistance to the test.
Sample #3 had the most mass loss with 8 grams.
Overall Importance: The overall importance of this test show the fabrics resistance to breaking down overtime, this is an important test particulary for work jeans.

Wrinkle Recovery (AATCC 66)

Test: A fabric sample is wrinkled under a specified weight for a set amount of time, then the weight is removed and the fabric is allowed to recover.

Result: **Accepted**

Reasoning:
Samples are ranked on a scale from 1 to 5, 1 being the most wrinkled and 5 being the least wrinkled. 4/6 of our samples ranked a 3, while the other two ranked a 4. Overall, the results suggest **average to slightly above-average wrinkle recovery** performance across the samples when compared to standards.
Overall importance: These results indicate the fabric demonstrates acceptable wrinkle recovery, making it suitable for general use where moderate wrinkle resistance is sufficient.

Water Impact Penetration (AATCC 42)

Test: Pouring a controlled volume of water onto a taut fabric backed by a pre-weighed blotter, then reweighing the blotter to determine how much water passed through

Result: **Not Accepted**

Reasoning:

All samples absorbed far more than the 20 g pass threshold, with an increase in final blotter weights ranging from 12.87g to 33 g.

Samples #2 and #3 exceeded the fail threshold the most, making the overall result a clear *Not Accepted*.

Average water absorbed was extremely high (20.5 g absorbed), indicating very poor resistance to water impact.

Percentage dry values were negative, confirming that the fabric retained significant moisture rather than repelling it.

Overall Importance: The overall performance shows the denim lacks adequate water resistance, which would affect comfort, drying time, and perceived quality for the consumer.

Flammability (ASTM D6413)

Test: Five warp samples and five weft samples were conditioned and then set aflame in an oxygen-controlled chamber, where we tracked the amount of time there was an **open flame** as well as the **afterglow** time for each specimen

Result: **Not Accepted**

Reasoning: All samples, warp and weft **did not meet the specification** needed of less than or equal to 3.5 seconds. the average open flame time for warp was 1 minute and 3 seconds with an average afterglow time of 4 minutes, and the average open flame time for the Weft samples was 1 minutes and 2 seconds with an average after glow time of 4 minutes and 50 seconds.

Overall importance: These results revealed that the jeans have low resistance to flammability. While these results were somewhat unfavorable, the flammability properties of day-to-day women's jeans are not as essential compared to the importance of flammability resistance for kids wear or workwear.

Drape

Test: 1 large circle cut from our sample jeans was placed on the drapemeter with the front facing upright. Recorded the paper rings intial weight before placing it on the machine. Turned the lights off and traced the shadow on the paper ring. Cut out the traced part of the paper ring and weigh again. Use the drape formula of % Drape = 100 (weight of shadow in grams/weight of paper ring in grams). Repeated the same steps for the back of the fabric.

Results: **Not Accepted**
The front of the fabric was 64.52% - stiff while still meeting specs. The back of fabric was 87.44%, stiff while not meeting specs.

Reasoning: In order for our jeans to meat spec, they would of had to have had a drape coefficent of 70-80%. That allows for a comfortable fit while still being good quality.

Overall Importance: This test is important for the overall comfort of the pair of jeans. A higher drape percentage means a softer fabric.

Conclusion

Our final consensus regarding the Old Navy jeans is accepted, as our customer would be satisfied with the overall performance of the Old Navy Sky-Hi Wide Leg Jeans, specifically the durability performance of the jeans which provided excellent results in breaking strength, seam strength, and pilling resistance.

SOURCES

****THE FOLLOWING LIST OF SOURCES WAS USED IN EITHER OR BOTH THE PRESENTATION AND FINAL ESSAY**

https://www.pantone.com/color-finder/19-4118-tcx

https://www.hunterlab.com/blog/spectrophotometry-in-the-textile-industry-ensuring-color-consistency-in-denim-production/

https://compass.astm.org/content-access?contentCode=ASTM%7CD6554_D6554M-09%7Cen-US

chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.cottoninc.com/wp-content/uploads/2017/12/ISP-1010-Denim-Fabric-Manufacturing.pdf

ChatGpt. (2025). Jeans Specifications. https://chatgpt.com/?utm_source=google&utm_medium=paidsearch_brand&utm_campaign=DEPT_SEM_Google_Brand_Acquisition_NAMER_US_Consumer_CPA_BAU_Mix&utm_term=chatgpt&gad_source=1&gad_campaignid=21714513245&gbraid=0AAAAA-IW-UW26AwxD6IPkUyfRo89Ftn5X&gclid=Cj0KCQjwyIPDBhDBARIsAHJyyVgMEyCeZsjK41APIbDHYlzG4TLrIKUvL_UBYcVh886_iuwjz5P992QaAgYwEALw_wcB

https://copilot.microsoft.com..

JC Penny Pamphlet