Socks Wear Test

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SMHM 3650.001
Socks Wear Test
Abstract

The wear test was performed on the Starter Socks in order to analyze the serviceability and how the socks will perform under normal wear and care conditions. After undergoing the ASTM and AATCC test the data supports the socks are ready for use. The data collected verifies the complete serviceability. The data shows the weak points for the socks revolve around pilling and snagging, which can be expected. However, the stronger points are primary the dimensional stability and stain resistance. In relation to one another, the maintenance portion of the socks outweighs the important of aesthetics. The socks are utilitarian item and maintenance is important; the socks have shown to have excellent stability and stain resistance. Overall the final conclusion is the Starter socks are fully serviceable and will meet the target market needs.

Purpose

The purpose for conducting the wear test was to analyze the properties of the Starter Sock as it performs under regular wearing conditions. The primary reason the socks underwent a wear
test is because the socks need to be tested for the end use. A textile product undergoes a wear test in order to analyze the properties in how it relates to the specified end use of the product. If the textile product (socks) failed to meet the standards of the wear test, then the product would not be considered for distribution because it would not bring any profit to its carriers. The Starter Socks is targeted to men of all ages because the socks vary in sizes. The socks are very accessible to its target market because they are affordable and perform in the desired way. The target market relies on the socks to keep their feet covered and also expect a certain level of comfort. The wear test allows the evaluator to monitor the progression of the socks, as it undergoes wear and care in order to make sure it provides the necessary standards that will meet the target market needs. The wear test allows for the evaluator to examine most aspects of serviceability in how each portion is met by the target market. The test will look at the aspect of durability by wearing the socks for a total of four weeks, with a minimum of 2 hours per wear. Durability looks at how well the socks retain its physical integrity under normal conditions of mechanical stress for a practical amount of time. The other aspects the wear test covers is comfort, aesthetic appeal, and maintenance which gives the evaluator the data needed to considered reliability when the product is distributed to the target market. Serviceability of the socks is important to the consumer because it covers every feature the consumer will be involved with as they use the socks. The manufacturer needs to know the information from the wear test because a faulty sock needs to be fixed and recommendations can be made at fixed at the manufacturer level. Retailers need to know the information from the wear test also because if they stock a sock that does not meet the consumer needs then they will lose money the longer they carry the product. The wear test is important form beginning to end of the sock process. It gives the information needed for the manufacturer to know the product is not defected. The retailer then knows there is nothing
wrong with the product and will stock the product. The consumer can then rely on the image of
the retailer carrying the sock to expect the socks will perform in the manner in which it was
created.

Background

The two categories that will be covered are aesthetics and maintenance. Within each
category two properties will be analyzed; aesthetics will consist of pilling propensity and
snagging propensity. Maintenance will consist of dimensional stability and stain resistance. The
aesthetics of the socks was evaluated on the scale provided by the American Society for Testing
and Materials (ASTM). According to the statement about pilling on the ASTM website, “The
pilling of textile fabrics is a very complex property because it is affected by many factors which
may include type of fiber or blends, fiber dimensions, yarn and fabric construction, fabric
finishing treatments and refurbishing method.” Pilling resistance is an important factor in the
Starter Socks because it greatly affects the appearance of the socks. The socks did appear to
resist pilling very well which greatly affected the appearance. The pilling propensity of the socks
was overall high which means other alternatives in the product composition should be evaluated
to help reduce the amount of pilling. The snagging propensity of the socks was not as high at the
pills. According to the ASTM website on snagging, “The snagging resistance of a specific fabric
varies with individual wearers and general conditions of use. Therefore, it can be expected that
garments of the same fabric will show a fairly wide snagging resistance spectrum after wear and
much greater variation in wear that in replicate fabric specimens subjected to the controlled
laboratory tests.” Because snagging varies on an individual use it is important to use the selected
group size to get an average of snagging propensity to see how the result varies across individual
use. Snagging also affects the aesthetic appeal of the socks, but not as greatly as pilling.
Snagging has the ability to be significantly less because it truly depends on the use of consumers. Maintenance is rated on the American Association of Textile Chemists and Colorists (AATCC). The two main properties as discussed earlier are dimensional stability and stain resistance. According to the AATCC website, “The dimensional changes of garments are subjected to home laundering care procedures are measured using bench marks place on designated areas of the garments.” Dimensional stability with socks is an important factor for the consumers. The evaluator evaluates the change between washes to see if there were any significant changes between wear and care. Socks undergo normal and intense usage which can immensely affect the dimensional stability. If the socks fail to go back to their original state after wear and care then they would be rendered unsuitable for end use. The stain resistance is not as of an important factor because socks are generally inexpensive and easy to care. They also are used to protect the wearer’s feet from dirt and other bacteria so staining is prone to happen. However, it is important for the evaluator to test for staining in order to monitor the change in color to see if the socks retain bacteria in the amount of staining. Maintenance and aesthetics are very important when considering the wear test for socks. Both have significant impact on the end use and if consumers will ultimately use the product.

**Method**

The socks that were tested were made by the Starter Company. They have Dri-Star moisture management technology, arch support, cushioned foot, been engineered to create the ultimate comfort, style and performance, knit-in Starter logo, cushioned cotton comfort, and a durable heel and toe. The socks were made in India and is available at discount retailer Walmart for the low price of $5.50 per 6-pack of socks. The fiber content of the socks consists of 98% polyester and 2% spandex. Each week the socks were machine washed warm with like colors.
Used only non-chlorine bleach when needed; the socks were tumble dried. The evaluator used two different methods to test the socks for information. The methods used were derived from the ASTM and the AATCC. The ASTM (American Society for Testing and Materials) is a large voluntary standards development organization. The ASTM is used a guide for manufacturing and trade in the global economy. The ASTM is used to in this wear test to measure the amount of pilling and snagging and is measured on the scale of five to one; five meaning no signs of pilling or snagging and one meaning severe pilling and snagging. The standards have allowed for products and services safer, and for them to be more cost-effective. The specification of the Starter socks have been made by the guarantee “This Starter product is unconditionally guaranteed against defects in the workmanship and materials…” The socks must meet the specific requirements of the ASTM standards in order to be qualified as acceptable. The ASTM has been used with the scope to ensure it has the requirements met by the consumers for end use. ASTM requires and minimal sample size of five in order to have accurate data. The data is then evaluated from the range of numbers and then the average is found. Once the average is found the evaluator is able to decode the data to see if any patterns emerge and if the socks are up to standards on pilling or snagging. Pilling and snagging were both tested by examining the socks; the test is very subjective to the individual doing the test. Each week the evaluator examined the socks after it had been washed and dried. The AATCC (American Association of Textile Chemists and Colorists) was used to get an accurate read on the amount of staining as well as keep track of the dimensional stability. The AATCC is a not-for-profit professional association for the textile industry. The staining was measured using a Gray Scale by the AATCC which was a tool that allowed the evaluator to compare the experimental sock to the controlled. The test was conducted by holding the test sock and the controlled together against the Gray Scale and then
recorded. The Gray Scale rated from five to one with five meaning there was no staining and one meaning the socks had been stained extremely. Dimensional stability was also measured on weekly basis. The evaluator measured the amount of change each week. The original measurements were taken at the beginning of the wear test as the standard to examine change of the period of the wear test. Dimensional stability is measured by percentage change between each week and each wash. To measure change the evaluator used the previous week measurements and compared them to the new week’s measurements; a formula was then used to get the percentage change that occurred. Each week the evaluator compared data from the sample group in order to record the change between each set of data. Once the sample group has given their own specific information, the average is then taken to give an overall credible read of data. The data is used as an accurate read to be given back to the manufacturer as the green light on production or recommendations will be made to fix the socks. After the test have been conducted the evaluator is able to analyze the data and give recommendations based on his/her findings.

**Analysis of Data**

The evaluator has looked at the different tests that have been conducted: staining, pilling, snagging, and dimensional stability. After careful analysis the evaluator has concluded that overall the Starter Socks have performed in a way that is ready for end use by the target market. The socks were performed very well in the areas of dimensional stability and staining. However, the socks performed on the lower end of pilling and snagging. The evaluator has come to the conclusion that maintenance is a superior aspect than aesthetics, which makes the socks ready for consumers. According to Graph 1 the socks seemed to have withstood staining at a fairly high average. Staining never fell below a 3.0 which is the medium point between the highest and
lowest scale. Because the staining has a good average of a little more than 3.0 it shows the evaluator the socks performs well under everyday wear and care. The evaluator thinks the socks performed the way they did in relation to staining because the fiber content. The socks are 100% synthetic fibers which mean the fabric will have a lower level of absorbency and will have greater color retention. Pilling propensity was a highly subjective test, but the results were cohesive with one another. According to Graph 2 pilling never reached a 5.0 which means every week there was some pilling. The numbers range from the lowest of 1.0 and the highest of 4.0; the evaluator believes the pilling propensity may be low for the socks, but is a fair number for the quality of the socks. The socks are comprised of a knit fabric which leads to higher levels of pilling. Based on the information collected pilling was typically higher in the starting weeks but as wear and care progressed the number of pills decreased. Snagging propensity did not have better take than pilling. Graph 3 shows the data the evaluator collected and the data are as followed: the level of snags reached the lowest level at 1.0 and went as high as 4.0. Snagging is prone in knit fabrics because of the high level of porosity. The snagging test is very subjective, but again there is cohesiveness throughout the data collected. The evaluator thinks the socks have behaved in an appropriate way considering the level of quality. The Starter socks are made at a lower level of quality to keep its product cost effective, thus it makes sense the level of snagging and pilling would be at lower numbers. Dimensional stability overall suggested the socks were dimensional stable and would perform well in the typical wear and care. The evaluator has concluded the socks have a high level of dimensional stability and according to Graph 4 the numbers range from -5.0% to a positive 2.56%. Although the numbers range from a wide selection the evaluator can see the numbers eventually even themselves out leading to almost no change in the length. The width had similar numbers according to Graph 5; numbers
ranged from -5.0% to 7.56%. Again the numbers on the graph look as though they are all over the place but the end result is the socks are dimensionally stable in the width as well as the length. The socks have performed in a suitable way for the consumer and the evaluator has concluded they are ready for the target market. Overall, in the category the socks were tested they have performed the expected way. Because of the knit fabric, it is prone to snagging and pilling which verifies the data showing for a high level of each. Staining was supported by the data because of the synthetic fiber content which leads for better color retention and less absorbency. Considering the end use for socks, the dimensional stability is important and because the data shows excellent stability the evaluator concludes the socks are ready for use. According to the evaluator the socks have met the criteria of serviceability in its product category. The socks will meet the target market needs. The data supports everything the evaluator has concluded, and the final evaluation is that: The socks are ready for consumer consumption and will meet the needs of the target market.

**Recommendations**

Considering the product at hand (socks), the data supports the product meets the criteria of serviceability and does not require and changes in relation to the properties. The Starter Socks performed in the expected manner and does not call for any recommendations on the product level. The evaluator believes the socks could use additional marketing for exposure. Because the socks are distributed in a discount retailer some negative assumptions can be made about the quality. Additional steps may be needed in order to achieve the correct amount of exposure to produce a positive image with the low priced socks. At the moment the marketing does not seem to exist which means the company should use some resources in order to promote the product. The Starter Socks state to give quality at a low price, and the data proves the socks are at least
serviceable. Marketing should not be expensive because the socks are sold at a reasonably low price, but some marketing should exist for positive exposure. According to the evaluator the packing is appropriate for the socks and does not require any recommendations at this time.
# Socks Wear Test

## Wear Test Data

### Starter

#### Daniel Sanchez

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Graph 1

Staining

AATCC Gray Scale Rating

Week 1  Week 2  Week 3  Week 4  Average

Daniel Sanchez
Jimmy Gigliotti
Jorge Guzman
Chris Cordell
Grady Gerguson
Graph 2
Graph 3

Socks Wear Test

ASTM Snagging Rating

Week 1  Week 2  Week 3  Week 4  Average

Daniel Sanchez
Jimmy Gigliotti
Jorge Guzman
Christopher Cordell
Grady Ferguson
Graph 4

Dimensional Stability - Length

Percent Change

Week 1  Week 2  Week 3  Week 4  Average

Daniel Sanchez  Jimmy Gigliotti  Jorge Guzman  Chris Cordell  Grady Gerguson
Dimensional Stability - Width

Week 1  Week 2  Week 3  Week 4  Average

Percent Change

Daniel Sanchez
Jimmy Gigliotti
Jorge Guzman
Christopher Cordell
Grady Ferguson

Graph 5
Reference Page


