



Downproof vs. Thread Count Comparison

Thread count is the most common metric for describing fabric. Typical thread counts for a cotton downproof-fabric range from 230 to 400 threads per square inch. Synthetic downproof-fabric thread counts can vary considerably.

Can Thread Count Predict Downproofness?

Thread count is sometimes used to predict a fabric's downproofness. IDFL data suggest there is **NO** correlation to justify this. Using IDFL data, the plot (below) shows the fairly loose correlation between thread count and downproofness (rotating box). The line represents the threshold of passing/failing downproof. As depicted by Chart 1, even fabrics with high thread count fail downproof testing.

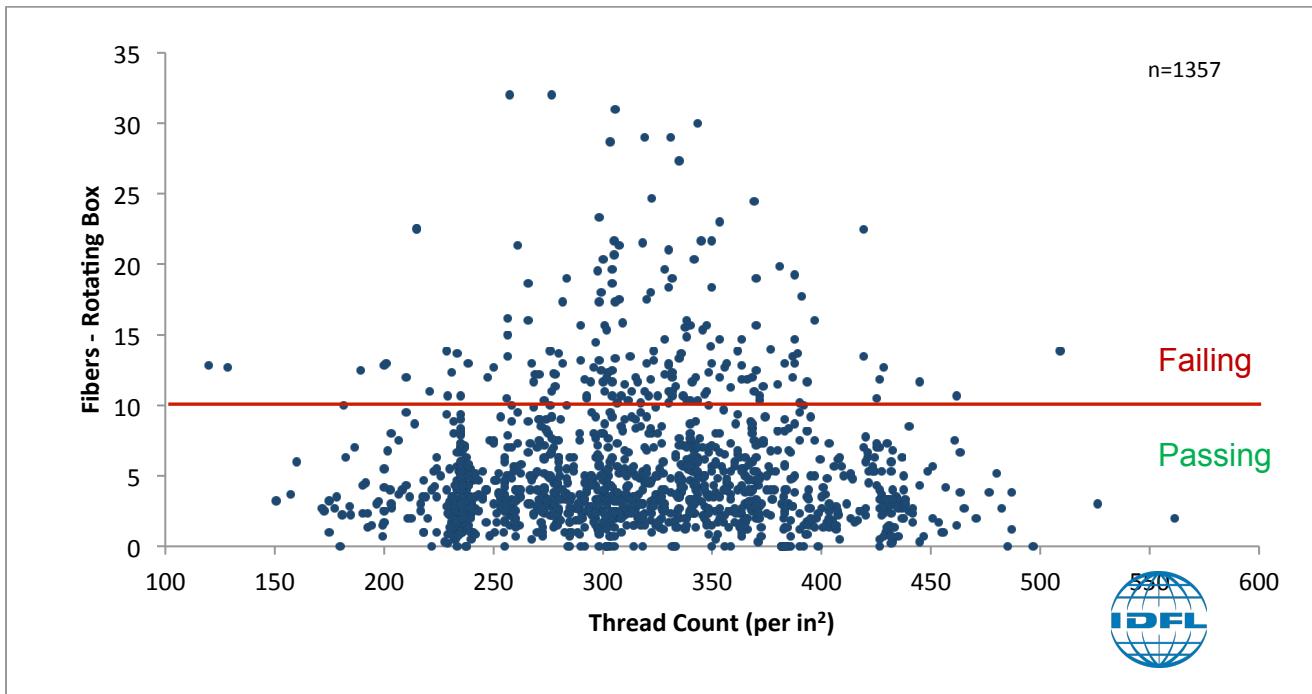


Chart 1. Plot shows passing and failing downproof fabrics with associating thread count. (Data was averaged to aid visualization)

In addition, to evaluate the correlation between downproofness and thread count, we use the **Pearson Correlation Coefficient (r) – see equation below. When there is a perfect correlation between downproofness and thread count, the coefficient downproof should be equal to 1 or -1. Using data from past IDFL samples, the coefficient was equal to 0.015.

IDFL LABORATORY AND INSTITUTE

www.idfl.com

Certified Laboratory: IDFB • EDFA Member: AATCC • ADFC • ASTM • CFDIA • DAC • EDFA • IABFLO • TFEA

IDFL

1455 South 1100 East
Salt Lake City, UT 84105 USA
Tel: +1 801 467 7611
Fax: +1 801 467 7711
info@idfl.com

IDFL EUROPE

Bahnhofstr. 42
8500 Frauenfeld SWITZERLAND
Tel: +41 52 765 1574
Fax: +41 52 770 1574
europe@idfl.com

IDFL CHINA

Tonghui Mid-Road 118, Xiaoshan
Hangzhou, Zhejiang 311208 CHINA
Tel: +86 571 8273 6561
Fax: +86 571 8389 9179
china@idfl.com

IDFL TAIPEI

3F/4F., No. 163, Sec. 2, Wenhua Rd.
Banqiao, New Taipei City 22047 TAIWAN
Tel: +886 2 2259 1178
Fax: +886 2 2252 0738
taiwan@idfl.com



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Also analyzed was the frequency of thread count values for failing downproof samples. For any sample that was failing downproof testing (e.g. result > 10 fibers) the corresponding thread count was identified. This was then charted on a histogram showing the frequency of thread counts for fabrics which failed downproof testing (see Chart 2).

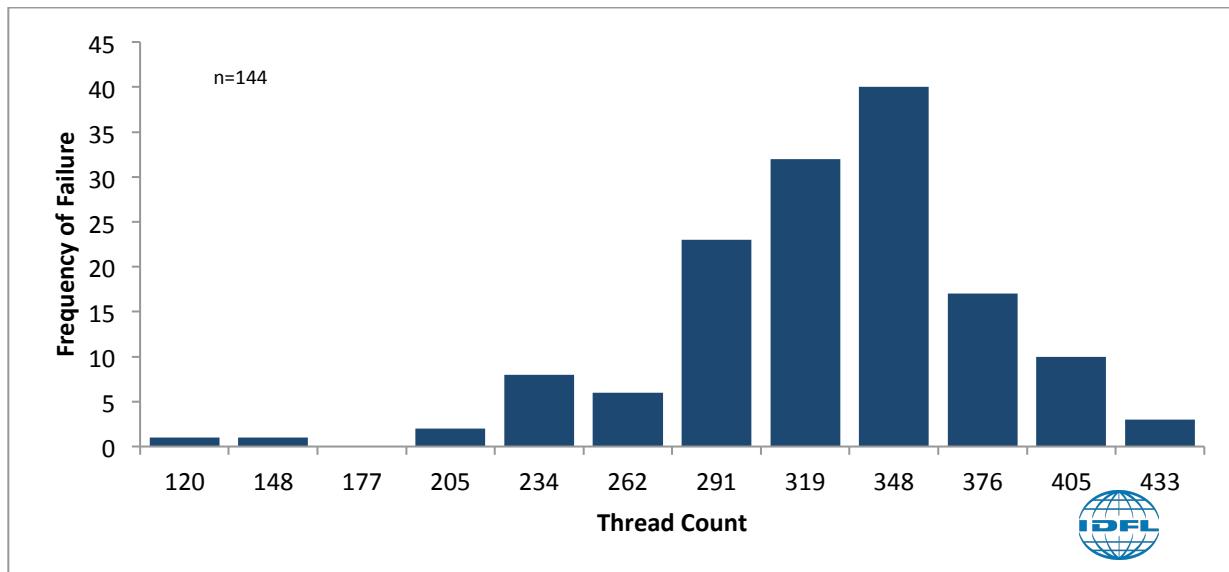


Chart 2. Histogram of thread counts of fabrics which failed downproof testing.

It seems counterintuitive that a fabric with such a high thread count can fail downproofness, but this shows that thread count isn't always a good predictor of downproofness.

Other Reasons for Lack of Correlation

Thread count, though certainly a factor of downproofness, is not a predictor of downproofness because there are many other factors that come into play. Some of these factors include:

<ol style="list-style-type: none">1. Style of Weave2. Fiber Content3. Calendering4. Fabric Treatments5. Stitching	<ol style="list-style-type: none">6. Fabric Weight7. Effects of Laundering8. Yarn Size9. Testing Product vs. Finished Product10. Packing Methods
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Recommendation

Thread count is not a good predictor of downproofness. In order to assure the most accurate information, it is recommended to test both a fabric's downproofness and thread count.

****Pearson Correlation Coefficient (r)**

$$r = \frac{\sum_{i=1}^n (X_i - \bar{X})(Y_i - \bar{Y})}{(n - 1)S_x S_y}$$

X_i = variable

\bar{X} = Mean value of all X variables

Y_i = variable

\bar{Y} = Mean value of all Y variables

S_x = Standard deviation of all X variables

S_y = Standard deviation of all Y variables

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