



Unique Compression Method for Evaluating Pillow Comfort

Application Report

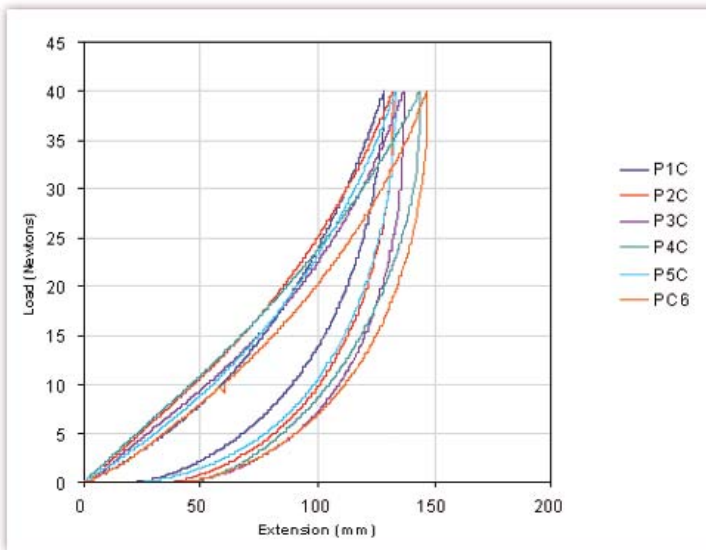
Introduction

Evaluation of a pillow's comfort or firmness has historically relied on surveys completed by employees or customers' feedback. In an attempt to quantify these measures of comfort, one pillow manufacturer delivered several pillow specimens to Instron® to explore testing configurations that could produce repeatable data to correlate with that generated from the customer and employee surveys. Because of the size of the pillows, a traditional mechanical test frame could not be used.

Test Configuration

An In-Spec™ 2200 benchtop portable tester with a custom stand, a 250 N load cell, and a 4-inch diameter compression platen, shown in Figure 1, was configured to carry out these tests. The tests were run at 20 in/min until a 9 lb load was reached at three different positions on the top of the pillow, as shown in Figure 2. A 9 lb load was selected because the value represents the weight of the average human head. Load versus extension data was used to evaluate firmness at different locations on the pillow and between pillow types.

Results



▲ Figure 3:
Load vs. extension for the center region of the pillow.

	P1C	P2C	P3C	P4C	P5C	P6C
Max Load (lb)	8.99	8.99	8.99	8.99	8.99	8.99
Extension at Max Load (in)	5.06	5.21	5.40	5.67	5.26	5.78

▲ Table 1:
Results for center region.



▲ Figure 1:
Customized test configuration for evaluating pillow comfort using the In-Spec 2200.

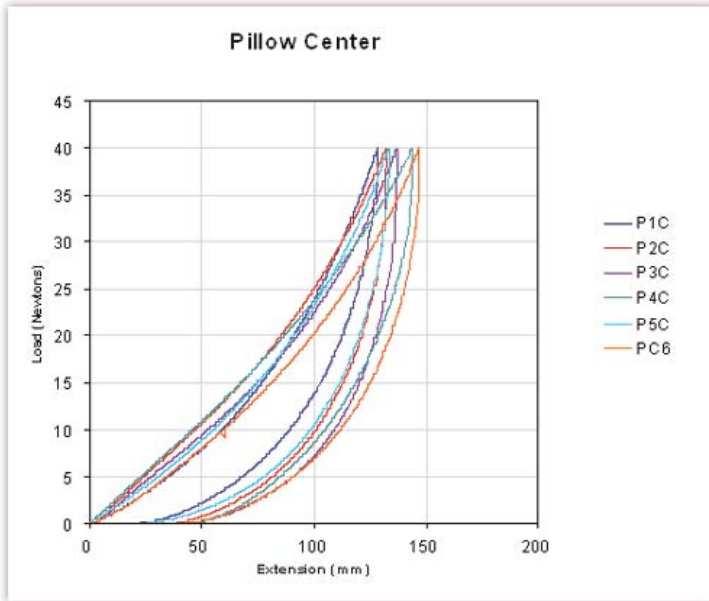


▲ Figure 2:
Test Locations.

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Results



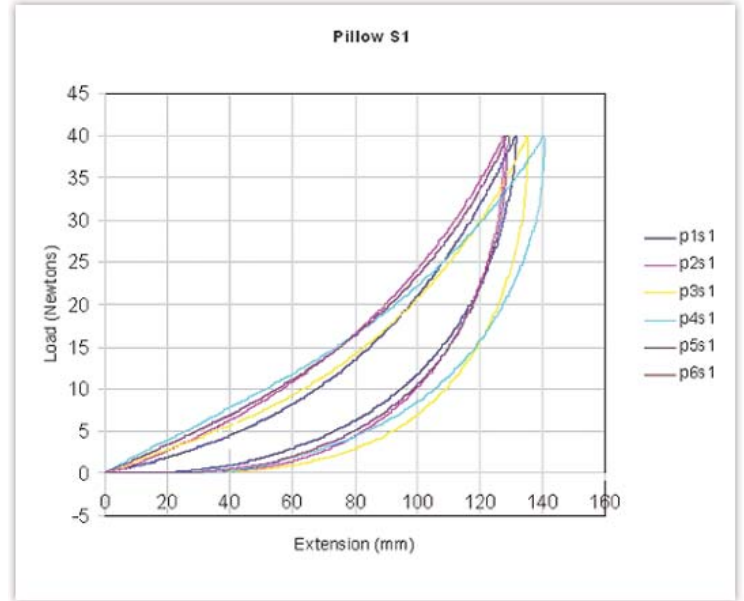
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Figure 4:
Load vs. extension for the S1 region of the pillow.

	P1S1	P2S1	P3S1	P4S1	P5S1	P6S1
Max Load (lb)	8.987	8.99	8.995	8.984	8.979	8.992
Extension at Max Load (in)	5.177	5.032	5.33	5.538	5.035	5.077

▲
Table 2:
Results for S1 region.

Conclusions

This test configuration was able to differentiate between pillows and locations on the pillow. Future testing will be required to correlate comfort levels with the data.



▲
Figure 5:
Load vs. extension for the S2 region of the pillow.

	P1S2	P2S2	P3S2	P4S2	P5S2	P6S2
Max Load (lb)	9.006	8.984	8.983	8.99	8.992	8.99
Extension at Max Load (in)	4.893	4.787	5.483	5.069	5.157	4.856

▲
Table 3:
Results for S2 region.



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