



# A Study On The Geometric, Durability And Comfort Properties Of Panne Velvet Fabric

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**Abstract :** The selected fabric is Panne Velvet which is 100% Polyester but is able to stretch two ways without any spandex. This also allows the fabric to be 100% wrinkle free and gives an elegant look. This study is taken to evaluate the Geometric, Durability and Comfort properties of Panne Velvet fabric. Five different samples were taken from the same fabric to identify the mean value. The Panne Velvet fabric resulted in medium to low thickness of the fabric, light weight, high Tensile Strength and Tearing Strength. It denotes that the fabric has slight surface fuzziness and/or partially formed pills with grading of Class - 4. The selected fabrics exhibited high drapability and it is performed medium to low Air Permeability.

**Key words :** Panne velvet, Geometric, Durability, Comfort properties.

## INTRODUCTION :

Panne velvet is a type of fabric that has a soft, shiny surface and is typically made from materials like silk, rayon, polyester or synthetic fibres. It's created by pressing the fibres down in one direction, which gives it a distinctive sheen and a smooth, luxurious texture. Historically woven from silk, it can also be made from a variety of fibres, such as cotton, viscose, rayon or synthetic fibres. It is the epitome of luxury. We often see it on the catwalks and it's our first association when we think about evening wear.

## THE OBJECTIVES OF THE STUDY ARE :

- To determine the Thickness of the Panne Velvet fabric.
- To examine the Tensile strength of the Panne Velvet fabric.
- To calculate the Air Permeability of the Panne Velvet fabric.

## EXPERIMENTAL PROCEDURE :

The main objective of this study is to determine the geometric, durability and comfort properties of Panne Velvet fabric. The results were analysed by conducting laboratory tests of the selected Velvet fabric.

## SELECTION OF FABRICS :

The fabrics selected for the study were Panne Velvet Fabric (100% Polyester).

## LABORATORY TESTS :

Laboratory tests were conducted to determine the geometric properties, durability properties and comfort properties.

**GEOMETRIC PROPERTIES****FABRIC THICKNESS:**

The prepared specimen is placed between the anvil and circular presser foot. Gauze was calibrated to zero after adding weight to the pressure foot. Selvedge and crease areas were avoided while testing. A standard pressure of 100 grams per square centimetre is applied to the specimen. When the circular pressure foot presses the specimen, the thickness of the fabric is measured with the help of a micrometre mounted in the tester. Five determinations were done at five different places on the same fabric and tested with and without pressure. The means of all results were calculated. The fabric thickness is expressed in mm. Fabric Thickness in mm = The dial value x 0.01.

**DURABILITY PROPERTIES****TENSILE STRENGTH :**

The specimens are cut to size of 50mm x 200mm and then frayed down in the width equally at both sides to give samples which are exactly 50mm wide. The rate of extension is set to 50mm per minute and the distance between the jaws is set to 200mm. The velvet samples were tested using the Tensile Strength Tester. The speed of the separation of the jaws was kept at 100mm/min. The load at which the velvet fabric breaks was noted.

**COMFORT PROPERTIES****AIR PERMEABILITY :**

The test fabric specimens were preconditioned in a standard atmosphere of 21 degree celsius temperature and 65% of relative humidity for 24 hours according to the ASTM standard practice for conditioning textiles for texting. When cutting specimens, at least equal to the area of the clamping mechanism. Calculate air permeability of individual specimens of SI units as cm<sup>3</sup>/sec/cm<sup>2</sup>. Air Permeability = (Volume / Time ) x 1000cc per second.

**RESULTS AND DISCUSSION :**

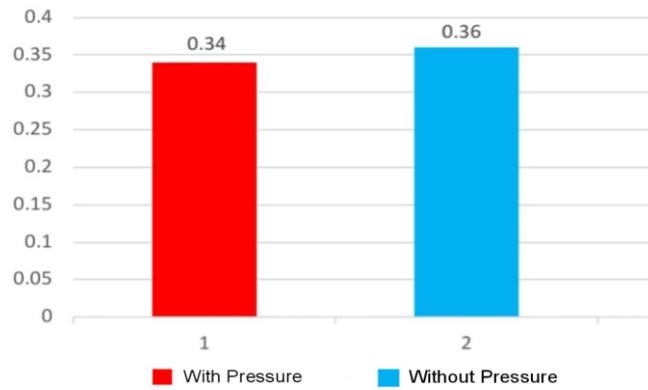
The Identification of fiber, Composition and Weight of the Panne Velvet fabric was examined by Regional Laboratory TEXTILES COMMITTEE and the test report shows that the Panne Velvet fabric was 100% Polyester with knitted and pile yarn and the weight of the fabric was resulted in 119.7GSM.

**FABRIC THICKNESS :**

The fabric thickness is expressed in millimetres. Five different samples were taken from the same fabric and tested with & without pressure, and the mean value is calculated. With applied pressure the value is varied from 0.34mm to 0.36mm and Without pressure the value is varied from 0.35mm to 0.38mm. The average value of each sample was taken. With applied pressure it was noted as 0.34mm and Without pressure it was noted as 0.36mm.

**FABRIC THICKNESS (mm)**

S.No	Sample (Panne Velvet fabric)	With pressure	Mean Value (mm)	Without pressure	Mean Value (mm)
1	A	0.34	<b>0.34 mm</b>	0.35	<b>0.36 mm</b>
2	B	0.34		0.35	
3	C	0.35		0.38	
4	D	0.36		0.36	
5	E	0.35		0.38	

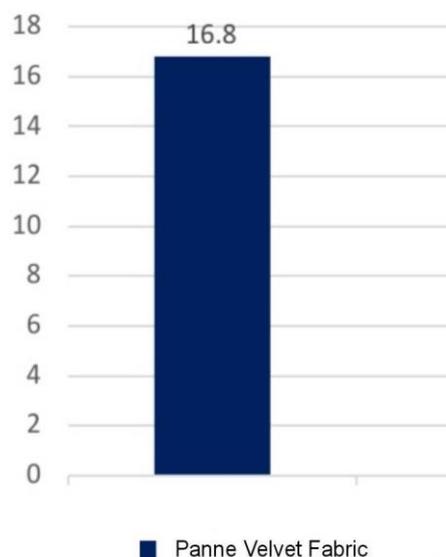


**TENSILE STRENGTH :**

The Tensile Strength is expressed in kilograms and was determined by means of Tensile Testing Machine. Five different samples were taken from the same fabric , and the tensile strength of the fabric varied from 16 to 18 kg . The average value of each sample was taken and it is calculated as 16.8kg.

**TENSILE STRENGTH (kg)**

S.No	Samples (Panne Velvet fabric)	Tensile strength	Mean value (kg)
1	A	16	<b>16.8 kg</b>
2	B	16	
3	C	18	
4	D	17	
5	E	18	

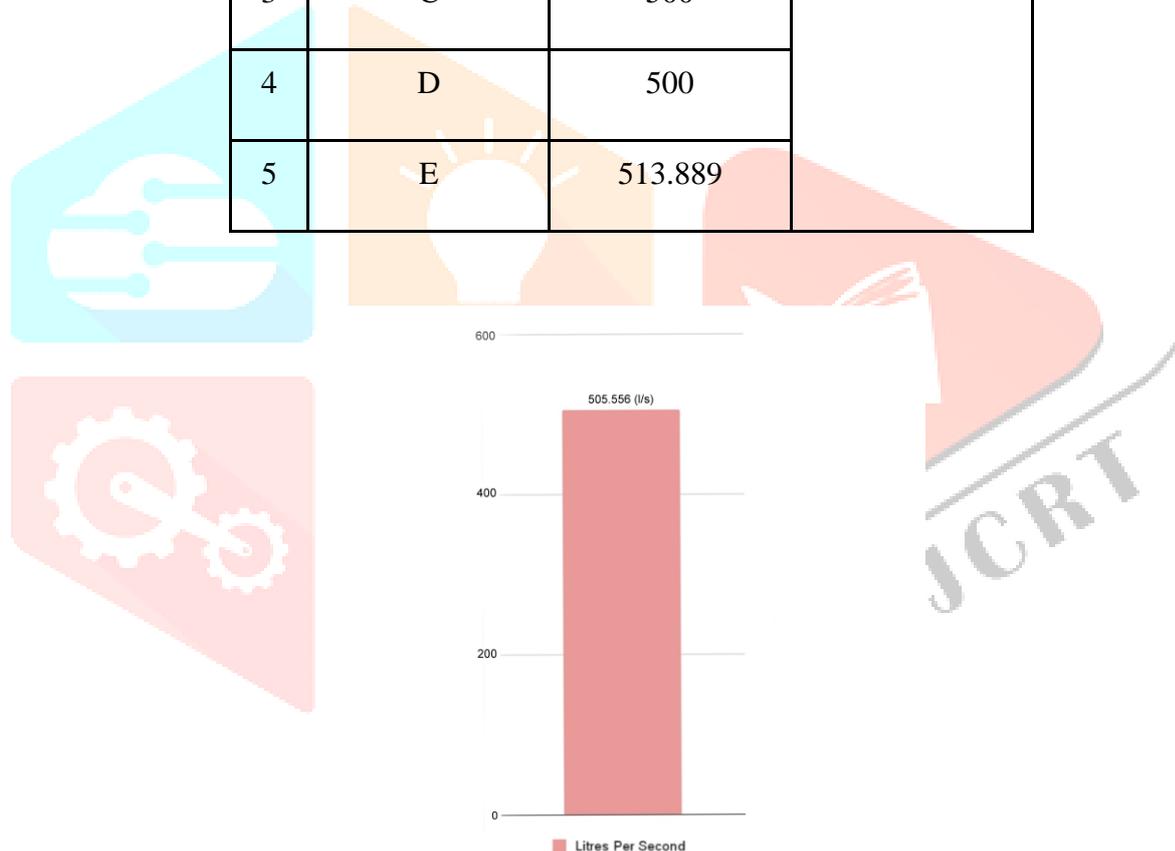


**AIR PERMEABILITY :**

The Air Permeability of the fabric is the volume of air measured in cubic centimetres passed per second through 1cm square fabric at a pressure of 1 cm of water . Five different samples were taken from the same fabric , and the Litres Per Second varied from 500 cc to 513.889 cc per second. The average value of each sample was taken and it is calculated as 505.556 cc per second.

**AIR PERMEABILITY (l/s)**

S.N O	Sample (Panne Velvet fabric)	Litres Per Second (l/s)	Mean Value (l/s)
1	A	500	<b>505.556 (l/s)</b>
2	B	513.889	
3	C	500	
4	D	500	
5	E	513.889	



**SUMMARY :**

The results of the various experiments have been summarised as below:

- The Fabric Thickness of Panne Velvet was analysed and it shows, with pressure as 0.34mm and without pressure as 0.36mm and expressed as medium to less thickness.
- The Panne Velvet fabric exhibited 16.8kg Tensile Strength and it possesses high tensile strength with more resistance to stretching.
- The Panne Velvet fabric shows 505.556 Litres Per Seconds (l/s) and it was performed medium to low Air Permeability.

**CONCLUSION :**

This study is taken to evaluate the Geometric, Durability and Comfort properties of Panne Velvet fabric. Five different samples were taken from the same fabric to identify the mean value. The Panne Velvet fabric exhibited medium to low Fabric Thickness, Light Weight , High Tensile Strength and Tearing Strength. It denotes that the fabric has slight surface fuzziness and/or partially formed pills with grading of Class - 4. The selected fabrics exhibited High Drapability and it is performed medium to low Air Permeability.

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