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Fabric and Garment Drape Measurement - Part 1

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Abstract

This paper aims to make a comprehensive review of measurement methods developed for evaluating fabric and garment drape. Drapemeters used for evaluating drapeability since Pierce's bending length tester are reviewed. Parameters proposed for measuring drapeability are also considered. The authors propose that using flat fabric methods does not accurately reflect the drape of fabrics when worn. The paper is a pre-cursor to a new image analysis technique which will be reported in Part 2.

Keywords: Fabric; Drape; Parameter; Drapemeter

1 Introduction

Fabric drape is the ability of a fabric (circular specimen of known size) to deform when suspended under its own weight in specified conditions [1-3]. Fabric drape along with lustre, colour, texture, etc. defines fabric and garment appearance.

Drape is normally subjectively evaluated by textile and apparel workers in the design and manufacturing industry. Due to the limitations of individuals' assessments, from the lack of reproducibility to inconsistent agreement between assessors etc, researchers have worked on interpreting drape quantitatively. To measure this quality, it is important to find a reliable, efficient and accurate method to reflect fabric real drape characteristics properly. Different studies have been carried out concerning the development of drapemeters to make the measurement process easier, more accurate, less dependent on operator skills and to find a satisfactory presentation for drape and proposing alternative fabric drape parameters (which was sometimes a result of drapemeter development). Moreover, the development of dynamic drapemeters enabled researchers to study dynamic drape behaviour similar to the human body motion.

2 Drapemeters

Measurement of fabric drape started with Pierce in 1930. He developed objective tests for measuring fabric bending length which was proposed as a measure of fabric draping quality [4].

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Bellinson set a drape tester (called Drapeometer) at the M. I. T. Textile Research Laboratory (see Fig. 1 and Fig. 2). A fabric specimen was attached to the edge of a horizontal circular disc movable vertically and supported on a column to be suspended vertically. The specimen width equals the semi-circumference of the disc. A circle of diameter equals the supporting disc and concentric with it is drawn on the base of the tester. A straight line tangent to this circle is drawn. The departure of a fabric lower edge from the drawn circle identifies fabrics drapeability. The low drapeable the fabric was, the nearer its edge to the straight line was. The drape length could be measured by shortening the samples height progressively and determine its length making a definite degree of departure from the straight line. The greater the drape length the more flexible the material would be. The radius curvature of the sample and its variation along sample tested length was also used to compare between fabrics drapeability. It had negative relation with fabric drapeability [5, 6].

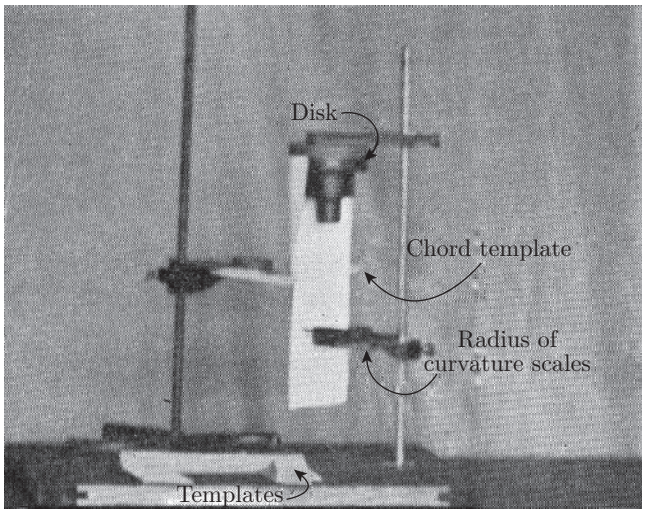

Fig. 1: Drapeometer developed by Bellinson [6]

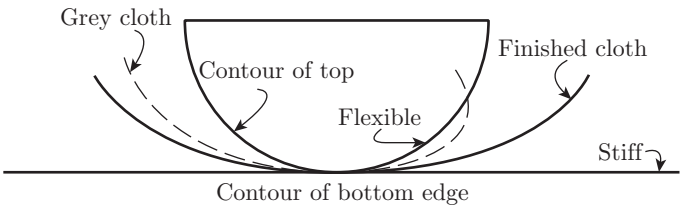

Fig. 2: Top view of the Drapeometer showing different fabrics measured [6]

Fabric drape was not clearly determined by those tests based on two-dimensional distortion of sample tested, as they measured bending properties rather than drape.

2.1 Static Drape Testers

Monoplanar drapemeters were not reliable testers for fabric drape measurement. Consequently, a three-dimensional distortion apparatus was introduced by the Fabric Research Laboratories in Massachusetts. This tester measured drape quantitatively in a way which shows its significant anisotropic properties [7].