Winifred Aldrich

Fabrics and Pattern Cutting

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PART FOUR: FABRICS AND COMPLEX CUTTING

Fabrics and Pattern Cutting

Fabric, Form and Flat Pattern Cutting – an updated and simplified 3rd edition

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Introduction

The aim of this book is to help fashion and textile students understand the vital part that fabrics play in creating the shape of a design. The excessive information in the earlier edition of this book may have deterred many students, yet it is vital that they gain this skill early in their studies. Therefore this book has simplified, re-organised and updated information from the previous editions.

New developments have taken place in the use of generic (basic chemical source) fibres and also in the technical engineering of the structure of existing fibres. This has produced many new fabrics that have a very different appearance and handle. Designers need to gain a 'fabric sense' and an ability to use it creatively.

There is no substitute for working directly on the dress stand for analysing how fabric works with a human body form. Working in this way offers more opportunity for creating new dimensions of cut. However, most designers working in mass production have the difficult task of translating 3D mental images into 2D pattern shapes. It can take years of experiencing success and failure to do this effectively, and the appearance of new fabrics continually challenges the designer's skill. Knowledge of how fabrics will behave is essential in the speculative cutting of new garment shapes.

Fabric technology is not covered in depth in this book, but it offers an introduction to the technology and an overview of fabric sources and ranges. It also directs students to where further information can be found. Tests are used in industry for fabric properties, comparisons between similar fabrics, or their performance in specific conditions.

However, this book isolates five major characteristics that determine a garment’s shape. These are:

weight thickness drape shear stretch

This book shows how they determine the shape of a garment from the simplest wrap to a complex tailored suit.

This book is arranged so that students can use basic principles to work from simple shapes to complex cutting. The flat pattern cutting techniques include direct measurements, working on flat grid drafts and the adaptation of both ‘flat’ blocks and ‘form’ body shaped blocks.

Specific Information

Although this book can be used alone, where specific detailed methods are needed, cross references to *Metric Pattern Cutting* can be made. This book describes how different types of blocks have been developed from simple flat geometric shapes. All the designs are shown on one model, size 10, 175 cm (5ft 9 in) height. The same fashion model was used for the photographic figure images and for the drawings. In order to ensure consistency, a size 10 stand was constructed with the extended back neck to waist measurement of the model. Chapter 13 provides basic images of the model poses and the stand for students to use as templates for technical illustrations.

The pattern diagrams in the book are the actual patterns used to create the garments. They were adapted from the basic size 10 block, with the extended back neck to waist measurements of the model. The blocks given in Chapter 14 have the standard back neck to waist measurement.

The designs were all made up as unfinished garment toiles working directly in the original fabric. Colour and printed textile design have been deliberately ignored in order to see the garment form clearly. It has been a tradition in workrooms to work on initial shapes in cream, white or beige fabrics; it reduces the distractions, and the style lines or modification lines become more apparent. This book will illustrate some forms in black and some in white or beige; this is to provide a reference for students for comparing shapes in opposing tones.

The depth of research into fabric characteristics that has formed the basis for this book is described in Appendix 1.

Creating the Blocks Manually, Using CAD and the Internet

Most colleges now have access to CAD programs and different size printers. Three methods of obtaining full size blocks from the diagrams shown in the book are explained fully in Chapter 14.

Method 1 A block can be scaled up by copying the shape onto 5 cm squared paper and using the squares as reference points.

Method 2 A block page can be scanned into a CAD program (e.g. photoshop), then scaled up and printed to an A0 printer (or to an A4 or A3 printer in sections).

Method 3 The full size blocks can be accessed as a PDF file from the publisher's Website. This file can be loaded into a software program or taken directly to an A0 printer in a college or CAD bureau.

Garment Design and the Selection of Fabrics

Design and Shape

Designers can select the mood, the colours and the technical fitness of a fabric, but to complete the image of the range they have also to design and construct the garment shape. The intuitive understanding of the concepts of the ‘handle’ and ‘drape’ of a fabric, and the shape that it will create, is crucial in the creation of a range. This book is an attempt to help students to develop this skill at an early stage in their pattern cutting studies.

Selecting Fabrics

Designers select fabrics for their ranges as much as twelve months before the garments reach the stores, although this time length is reducing. The fibre and fabric producers aiming at the fashion market have to take note of the prediction companies who try to capture the future mood of the customer. A designer’s initial fabric selection is usually influenced by fashion and fabric magazines, prediction companies and fabric fairs. Two major fabric fairs, *Premier Vision* and *Interstoff*, show spring and autumn collections. Some years ago, designers were restricted to buying their fabrics from producers’ existing ranges; but today, particularly where large orders are at stake, designers often work with the fabric producers to develop fabric ranges, particularly print design. The fabric shows are a vital point of contact between designers and producers; producers gain knowledge of the performance of their previous products and of future requirements.

Buying from fabric swatches is difficult. Small sample lengths may be available, but many producers no longer hold large fabric stocks, but produce to order and require orders of 500–1000 metres. This is a problem for small companies producing limited ranges. The basic information usually given on a fabric swatch is:

Quality or Design number ………… Width ……………

Composition ……………… Weight ……………

Information such as the finish or other qualities such as thermal, windproof and organic, may also be listed. Further technical information, for example dimensional stability during wear or laundering conditions, can be gained from the large fabric suppliers who will supply care labels on the purchase of the fabric. Getting information from smaller suppliers can be difficult or time consuming.

Designers working in particular product areas will usually select their fabrics from specific manufacturers, but fashion fairs are a means of seeing the latest fabrics. As fabrics become more scientifically based and yarn structures more complex, designers can find themselves overwhelmed by the mass of technical information.

Technology and Fashion

Flexibility and high profile marketing has a greater significance today. Response to new trends and customer needs is now essential; fibre producers now have sophisticated promotions of their products, and the speed of communication through the Internet accelerates the demand for a quick response. The problem facing the fibre and fabric manufacturers is the balance between the infinite opportunities that fibre engineering offers and the ability to produce them commercially. Other pressures include the timing of fashion and consumer demands and the growing concerns around ecology.

Competition from man-made fibre development has led to new efforts to 'improve' the qualities of natural fibres, by fibre engineering, fabric finishing and blending with other natural or man-made fibres. The greatest change that has taken place in the textile industry is the reduction in woven fabric production and the increase in knitted fabric production. The competitive pricing and the stretch characteristics of knitting structures make these fabrics very attractive to the middle to low cost retailing area. The finishes that are available to the cloth manufacturer can produce fabrics whose appearance has little relationship to the loom state. Some finishes are applied to garments after they are made up. The changes of shape that occur have to be taken into account when the garment patterns are constructed.

Cloth manufacturers strive to produce novel fabrics to tempt customers; some fabrics are released before they are fully tested, or they may fail in unforeseen conditions. Designers need to be assured that the fabric will perform in specific conditions and need to be aware of any technical limitations.

The technical information that is available is often not useful or not presented in a way that can be easily understood by a designer/pattern cutter. Technical testing is aimed at 'fit for purpose' comparisons of fabrics; it is often done within narrow limits for quality control purposes or for staged improvements of a fabric. Successful cooperation between technologists and designers does occur and long term directions do proceed alongside the turbulent fashion switches of mood that many technologists find perplexing. Many fabrics take years of development, and the process is often an act of faith by research teams as they struggle with the difficulties of production.

The world of laboratories and technologists is a great distance away from the world of fashion prediction books and the show business environment of trade fabric fairs. The prediction companies do not see many of these activities as a part of their remit, leaving a gap in the middle ground. Designers in smaller companies outside the large manufacturing groups and without immediate access to technical assistance have to operate in this middle ground. The environment at trade fairs is frenetic; building a fashion range requires a speed of fashion reaction that can involve switches of ‘fancy’ and changes of focus. Bombarded with new fabrics, the designer has to work with intuition and knowledge. The ‘technically correct’ fabric is not a commercial choice unless it responds to the current mood or reflects the aesthetic style of the range.

PART ONE: FABRIC CHARACTERISTICS AND BODY SHAPE

Chapter 1

Fabric Characteristics and Garment Shapes

Fabric characteristics
Fabric characteristics and garment toiles
Fabric characteristics and body shapes

Fabric Characteristics and Garment Shapes

FABRIC CHARACTERISTICS

The Background

This book has been revised to help students and designers make intuitive decisions when handling and comparing fabric ranges. Its aim is to help them identify the fabric characteristics that effect the final shape of a garment. It explains how they can determine the cut of the garment pattern.

This does not mean that technology is not important. Chapter 12 offers a basic overview of the main processes used in producing fabric. It is essential that all clothing design students understand a fabric's fibre, structure, finish and technical performance, and also how to access the necessary technical information. However, this is not a book on textile technology, it is about the relationship of fabric to pattern cutting.

The visual appearance of any garment is directly affected by the characteristics of the fabric in which it is made. Selecting the correct fabric for a design is difficult when working with the infinite variety of fabrics used in the textile industry. Some computer programs are used to realise three dimensional (3D) models of fabric on virtual models. However, the selection of a fabric by a designer usually comes at a much earlier stage in the creation of a range. Computer programs at this stage are more useful for decisions such as colour and pattern. Determining the suitability of a fabric for the ***shape*** of a design at the concept stage still relies on human discrimination.

Flat pattern cutting is successful when a designer's intuitive knowledge can generate a 3D mental image that is a *visual sense* of the shape that will be created when a flat pattern is cut in a particular fabric. To illustrate this point, the photographs opposite show a circle of two different fabrics:

viscose jersey cut at two different lengths

cotton twill cut at two different lengths

They illustrate two important points:

1. When the circle of the same fabric is cut at a different length, it will produce a different shape.

2. Different fabrics produce different shapes.

Working in small scale Some courses use small scale models for pattern development, but the photographs show the false images of garment shapes created by working in quarter- or half-scale.

Pattern Cutting – Five Fabric Characteristics

As it is obvious that different fabrics will produce different shapes, a way to assess them is required. The pattern cutting method or block chosen for creating a style should start with an analysis of the fabric. When the ranges of fabrics were limited, methods of cut were predictable; however, a new approach is required to assess the very different fabrics available today.

The five crucial characteristics that should be considered before deciding the method of pattern cutting or the choice of pattern block are:

Weight Thickness Drape Shear Stretch

Simple examples in this book illustrate the changes that a fabric can make to the same pattern shape. More complex examples show how the fabric has a great influence on the choice of cut and sometimes the underlying structures that are required to hold a shape.

The five characteristics are listed in this book on a characteristic scale.

The Fabric Characteristic Scale

Weight	light	medium	heavy
Thickness (visual)	thin	medium	thick
Drape (visual)	high	medium	low
Shear	high	medium	low
Stretch	high	medium	low

Each fabric illustrated in the book is described in these terms. Throughout the book, there are no rules that dictate which fabrics should be used for particular blocks or pattern shapes, but visual examples are given which show what is likely to happen when they are cut in fabrics with different characteristics. This approach to pattern cutting does not dismiss aesthetic qualities (for example, colour or texture) but these, and practical decisions of product type and ‘fit for purpose’, are different parts of the design process.

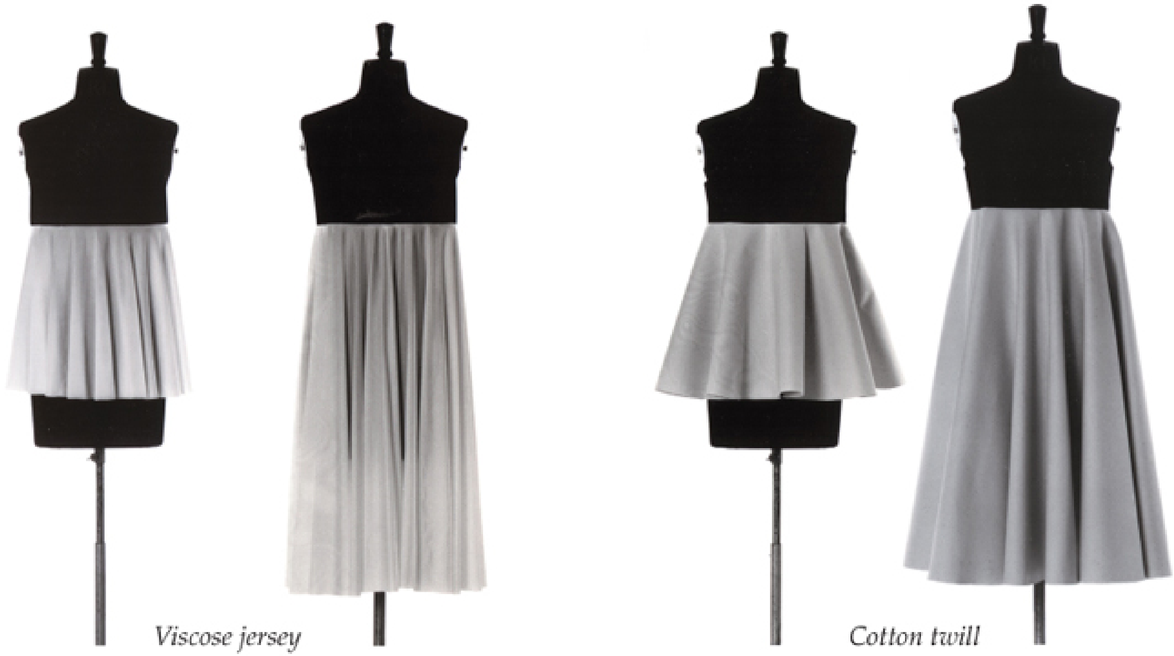
Testing Fabric Characteristics

Chapter 2 describes simple testing methods for fabric characteristics. It is designed so that students can develop a sense of a fabric's character and how it will behave. If students begin to assess fabrics in this way, they should be able intuitively to code a fabric for comparison quite quickly. This helps the process of visualising a fabric's capability to produce certain shapes when selecting fabrics.

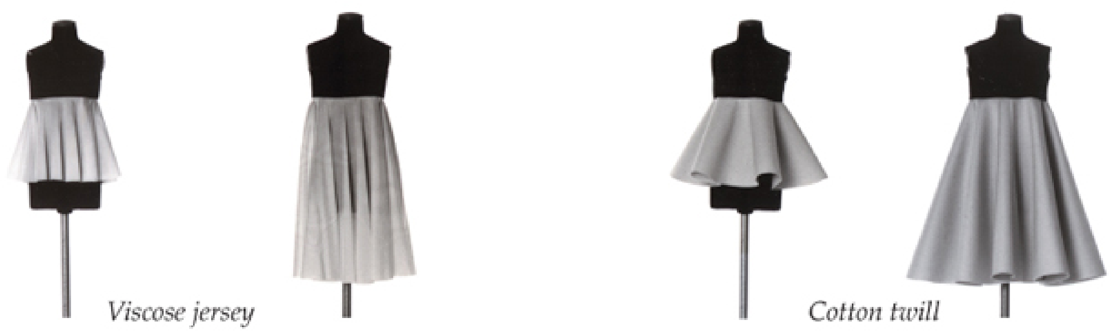
Notes on the Term 'Characteristic'

The term 'characteristic' is used because it is a descriptive term that is useful when making design decisions about a garment's shape. The term 'property' should be used when it refers to a fundamental chemical or biological property.

There are enormous problems in defining and measuring some fabric characteristics. Tests and standards have been devised (see Appendix 2) but they have to be carried out in laboratory conditions. The choice of characteristics, and the methods of testing and measuring them (see Chapter 2), were created to be used solely for the purpose of pattern cutting, in order to identify how a fabric will determine a garment's shape.

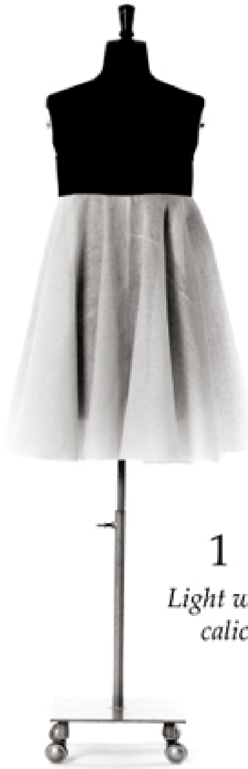


Full-scale model stands

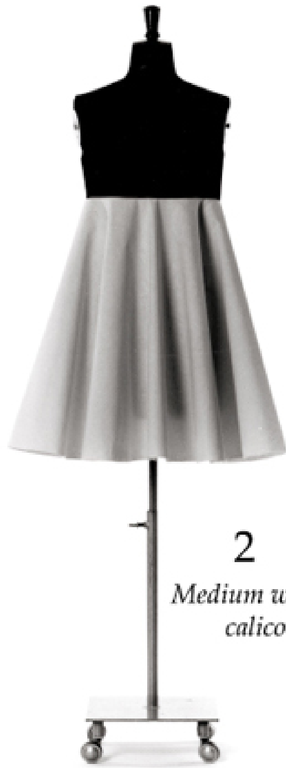


Half-scale model stands

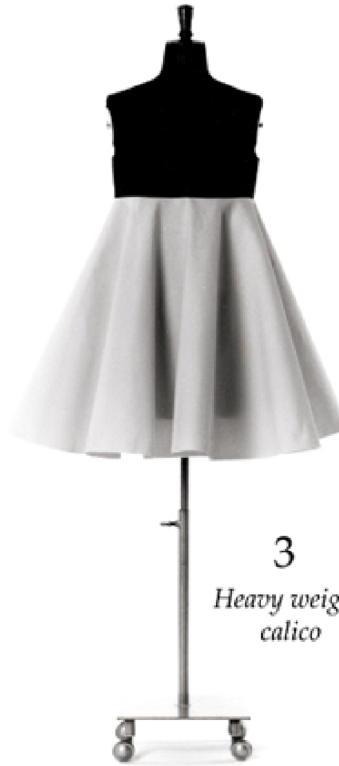
Quarter-scale model stands



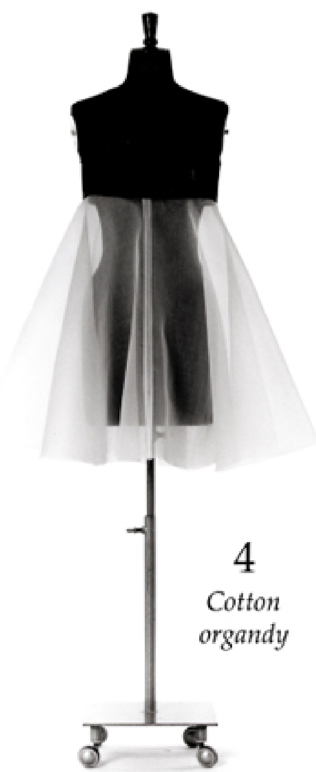
1
Light weight calico



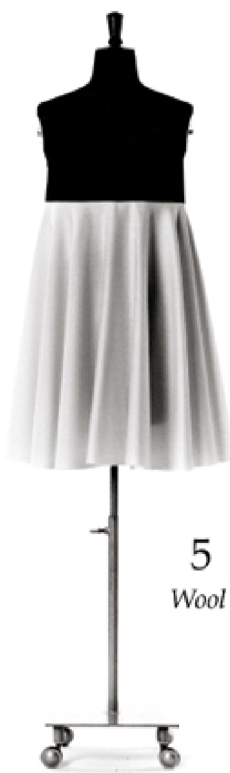
2
Medium weight calico



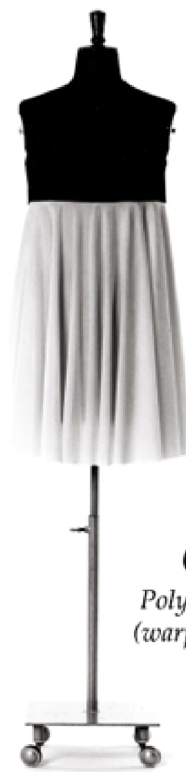
3
Heavy weight calico



4
Cotton organdy



5
Wool



6
Polyamide (warp knit)

FABRIC CHARACTERISTICS AND GARMENT TOILES

Fabric Characteristics

The previous images show that when a circle is cut at the same length in different fabrics (viscose jersey and cotton twill), quite apparent differences in shape will occur. This is because the characteristics of the fabrics are quite different.

Toile Fabrics

Most students use calico, mainly of medium weight, for creating garment toiles. Calico is relatively cheap and the fabric structure is fairly stable. The shapes that are produced are predicable (images 1–3). Because unbleached calico is usually unfinished, its drape or stretch qualities are low (see following table). Therefore, its relationship to many fabrics with drape or stretch characteristics is tenuous.

Images 1–3: Three circles of the same length cut in calico. The lightweight calico is a different weight and thickness, but the characteristics of drape and stretch are the same. The shapes are predictable.

	weight	thickness	drape	shear	stretch
1. lightweight calico	light	thin	low	med.	low
2. medium weight calico	med.	med.	low	med.	low
3. heavyweight calico	med.	med.	low	low	low

The images 4–6 show that if the drape or stretch of the fabric selected for a garment is very different from calico, very different shapes will be made. In this case, alternative cheap fabrics with similar drape or stretch qualities should be sought. Calico should never be used to represent knitted fabrics.

Images 4–6: Three circles of the same length, cut in different fabrics. They illustrate how fabric characteristics, particularly drape, can change the shape of a garment pattern quite dramatically.

	weight	thickness	drape	shear	stretch
4. cotton organdy	light	thin	low	med.	low
5. wool	med.	med.	med.	med.	low
6. polyamide (warp knit)	light	thin	high	low	med.

Constructing a Circle for a Skirt

(Cut in 4 quarter sections).

Take the waist measurement.

To calculate the radius for a circle: divide the waist measurement by 6.28; example: 62 cm (waistline measurement) divided by 6.28 = 9.87 (round up to 9.9 cm).

To Create a Quarter Circle Section:

Square both ways from 1.

1–2 the radius (e.g. 9.9 cm).

1–3 the radius.

Draw a quarter circle from 2–3.

2–4 the length of the skirt (e.g. 60 cm).

3–5 the length of the skirt.

Using a tape measure or a metre stick, mark out the lower edge of the skirt 60 cm from the drawn waistline.