



The Package

Distance Learning Course 1
Core Bra Pattern Cutting and Grading



Continuing professional development studies

This certifies that

.....
has successfully completed the training
programme for

Core Bra Pattern Cutting and Grading
.....

Signed

Date



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David Morris IA Technical

I joined this industry nearly 50 years ago when I became a student at Leicester Polytechnic on a course called Foundation Garment, Lingerie and Swimwear Design.

Three years later I graduated and joined Triumph International as a lingerie designer.

I worked as a technical designer for the next 30 years in a number of international companies.

In 1996 I became a lecturer in Contour Design at the De Montfort University in the UK.

I retired last year from the university but continued as a consultant to our industry.

I publish IA Technical, a magazine that specialises in the technical content of our industry, I deliver technical training courses in the UK and overseas and I manage a number of small private label lingerie start-up companies



Distance Learning Course 1

Core Bra Pattern Cutting and Grading

2. Introduction

This document is a synopsis of the Distance learning course content and should give you an overview of my teaching style.

Intimate Apparel and Swim technical design is now a dynamic subject, this wasn't the case 20 years ago but now 3 months leave would disadvantage most technicians. Our industry is very fragmented, in the early days of the 20C. it would have been part of the outerwear industry with owners who thought they would divert their production to underwear, the technology was new, there were no textbooks, so most companies staff taught themselves. These companies followed fashion trends and we now see the outcome in current ranges of intimates but there are still no textbooks, and most brands consider their techniques confidential and would never discuss them with rivals.

This state of affairs is not very useful when we need to teach and research the subject so discovering the myriad of different practice across the international industry has become my main focus.

Introducing Distance Learning Packages is an attempt to offer overseas students an opportunity to study the changing knowledge base that Intimates product development demands. If you looked at the content of this package in 12 months time some of it would be familiar, but the area of most change will be the fabrics, components and construction techniques that will dominate future designs.

One of the major changes in the Intimates job market in Europe is the increase of Garment Technologists positions within retail buying teams to lead the move to product development with suppliers rather than purely product selection.

Below is a copy of the training requirements from a large European Lingerie Brand in 2014

It discovers the job responsibilities of the Intimates Garment Technician and the relationship with their overseas supplier.

- Product and fit evaluation with a model using Company lingerie samples
- Basic lingerie merchandising from a technical perspective
- Develop an awareness and understanding of lingerie products
- Classifying lingerie product correctly
- An overview of Product data management
- Understanding lingerie manufacture and suppliers to ensure service and support
- Production methods, Size ratios, lead times
- QA procedure, buying visits, production reservations
- Lingerie garment lead times



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Core Bra Pattern Cutting and Grading

2a. Fabrics

Rigids/ Stretch fabrics/Laces and embroideries

Key Issues

Fabric selection

Despite the fact we are a young industry compared to outerwear, over the 100 odd years we have tried to make lingerie from most types of fabrics. What you now see in commercial bras are as good technically as you can find, apart from new research developments.

Anything outside of this core range of fabrics must be viewed with commercial suspicion.

So on those occasions when a retail buyer demands lingerie to match her best selling blouses, it will end in a stream of RTM's.(Return to Manufacturer)

I recently discussed with a designer her new range of lingerie in chiffon, when I asked if she had done a burst test on the seams she looked puzzled. Also be aware that lingerie has far more components than outerwear and they all have to colour match, and that dark dyes stiffen fabrics.

What is the Difference between Lace and Embroidery?

Most consumers confuse embroidery and lace, the look is similar, but the techniques are totally different. Lace is produced in one piece like a fabric. Embroidery is a beautiful design stitched on a background, often tulle in lingerie or any other material.

In comparison to lace, embroidery can be realised in more colours and with more 3D effects than lace. The designer can play with the repetition of the design or leave blank spaces for visual effects. The creativity is nearly unlimited in embroidery.



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2b. Components

Wires/Narrow elastics/Wire casing/ Tapes/Threads

Bra Wire Technology

If you are designing or manufacturing wired bras of any description never underestimate the importance of the choice of wire.

To the initiate they appear to be a pair of curved metal wires, shaped to a profile that represents the female breast root and to the accountant they equal about 4% of the manufacturing cost of a bra.

To a bra specialist they represent total success or total failure of any new wired bra design. Their selection is the first decision of the design technician, they control fabric choice, narrow elastic choice, but more importantly the ultimate sales success of the bra design.

Why is the choice of the wire so important?

If you are serious about your customer satisfaction you will have investigated the market for your new design. From that research it is easy to discover that every woman's bodyshape is unique.

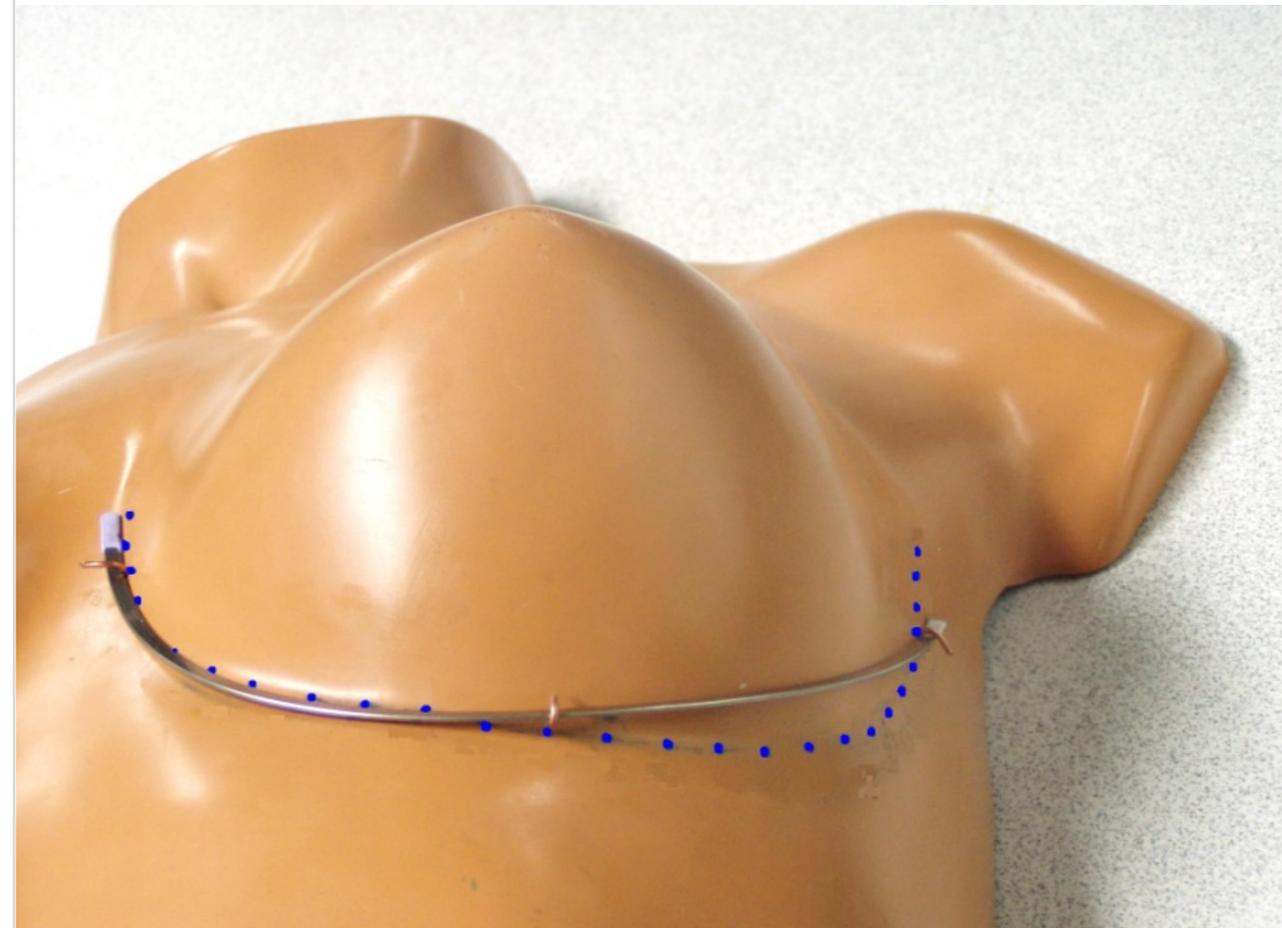
Therefore you cannot please every woman's fit ideal.

So the first conclusion that you should reach is that your bra style cannot be everything to everybody, it will always be a compromise.

The trick is to design a bra that has a degree of flexibility in its fit and the wire is the 'keystone'.

Whoever is your 'house model' or first fit will be the representative of your customer so choose wisely.

Also since comfort is rated the most important aspect of numerous bra fit surveys the wire has an important task to fulfill in that area.



The amount of pressure required to spring the flat steel wire to an approximate fit around the breast root depends on the thickness of the wire and its flexibility.

A very firm wire will not 'spring' to shape and will result in a very 'made to measure' fit that will not suit a mass market.

A very soft wire will easily distort under the wing pressure and give no support to the cup shape.



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2c. Pattern Drafting Tools

Get a ream of A3 White Printing paper for drafting



Mechanical pencil 0.5mm + 2H leads



Compass



Bendy Ruler



Flexi Curve



General purpose scissors

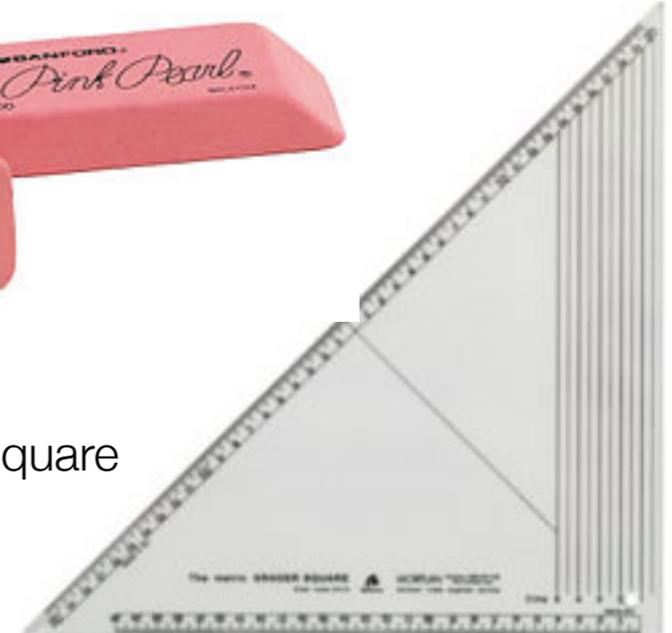
Tracing Wheel



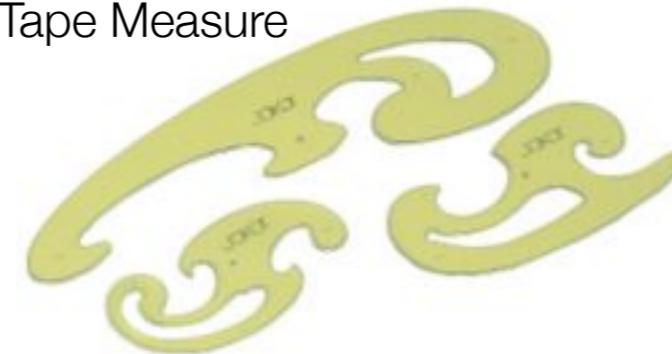
Eraser



Set Square



Tape Measure



French Curve (Discard small shapes)



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3. Basic Bra engineering

Core bra sizes are generally recognised as

Band sizes 32-38

Cup sizes A-D

Recognising a good bra

We all spend a great deal of time looking at different bra styles but how do we value them?

Most bras are displayed, either by photograph or on hangers and probably the first thoughts are 'hanger appeal'

Good quality bras are not 'light' they have the VW door clunk. They should have a super smooth and tactile inners, no rough nylon linings, scratchy lace, thin wire casings, shallow plush finish to narrow elastics and H&E tapes, they all give away poor quality lingerie features. But the first examinations of a GB£10 bra and a GB£25 bra aren't immediately obvious,

The key issues to consider;

Fabric choice

Styling/shape/function

Wires if used

Components

Construction

Fitting

Styling/shape/function

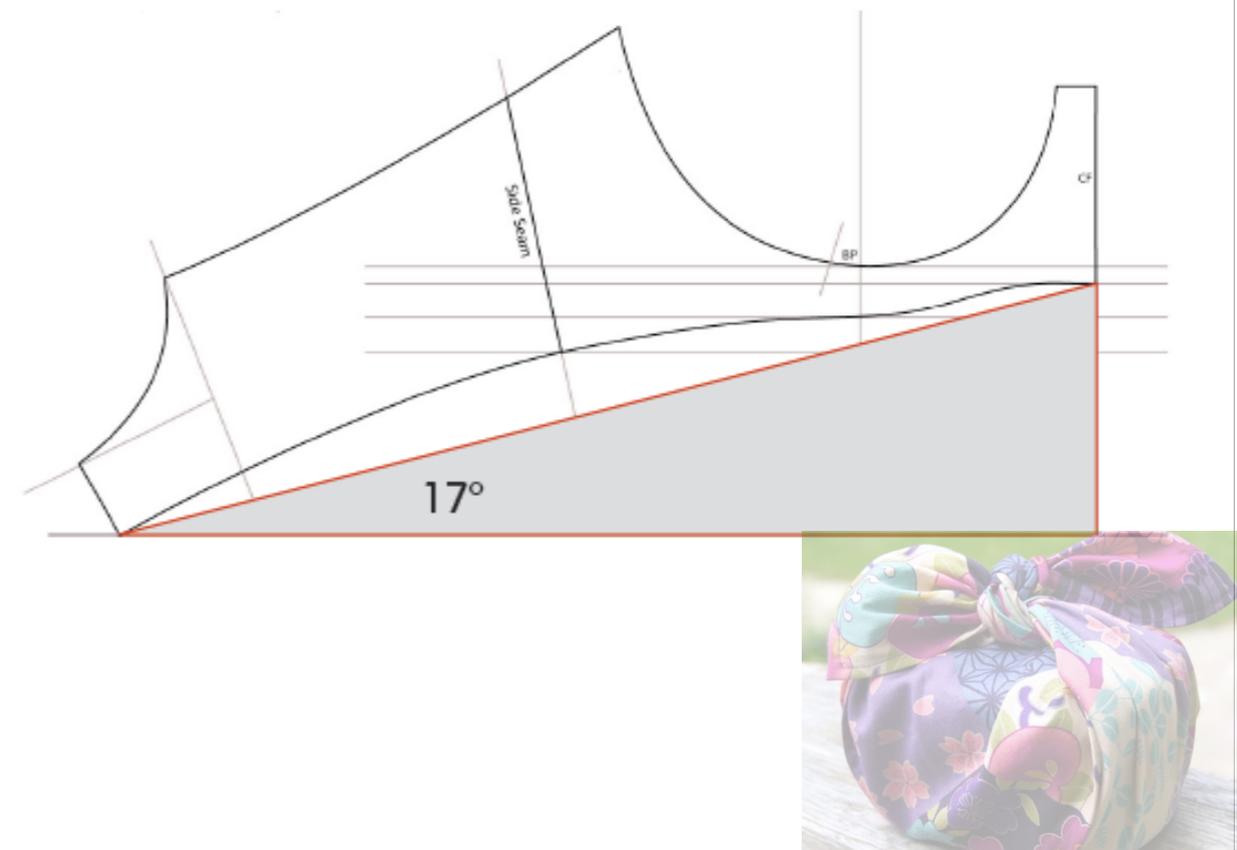
Hanger appeal has to do with 3D shape, a lifeless mass on the hanger has none

Lay the bra flat on a table, taking into consideration the function of the style and the materials that it is made of, assess the underband shape, this is the key to its fit outcome.

It should not smile at you, a convex shape is very unusual. Unless its a strapless bra or a very stretchy non support bra it shouldn't be flat across its underband.

Most core bra underband shapes that fit well 'frown', and have a concave shape, that molds around the ribcage.

Assuming its a 34B sample check the cup and band measurements, 63/64 cm underhand length and 190mm over bust and 85mm point of bust to wire depth. Different styles and fabrics will distort these numbers slightly but always logically.



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4. 34B Basic Body Anatomy

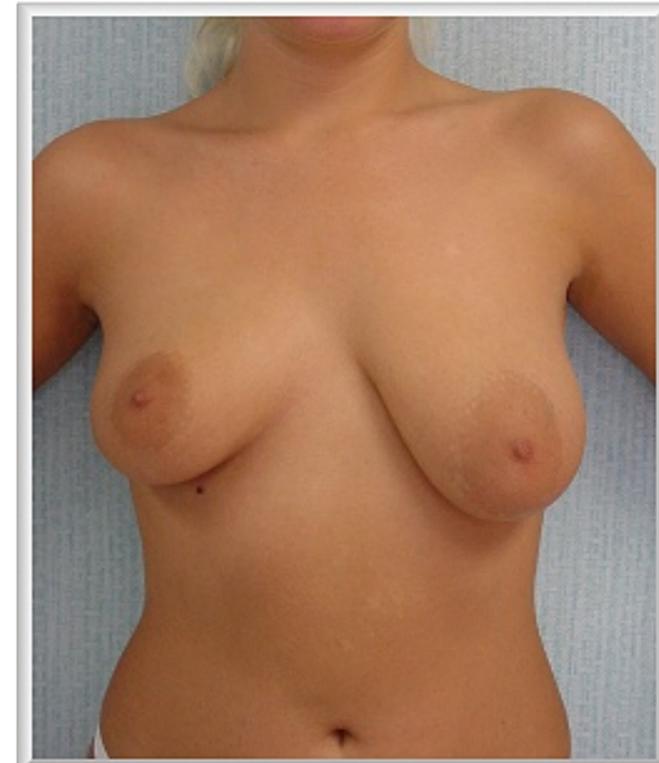
The international Intimates industry has been using the 34” B cup size as their sample size for Core fit lingerie for 50+ years. Some European countries convert it to a metric version 75cm from the rib cage measurement of the fit model, (Germany and Japan) and others use 90cm from the overbust measurement of the fit model, (France and Spain).

To complicate this standard, America’s version is a 34A, Australia & New Zealand call it a 12A. In Italy it is a 2B.



If you use the simple measuring formula of Underband and Overbust measurement, all the body shapes above would measure 34B / 75B / 90B

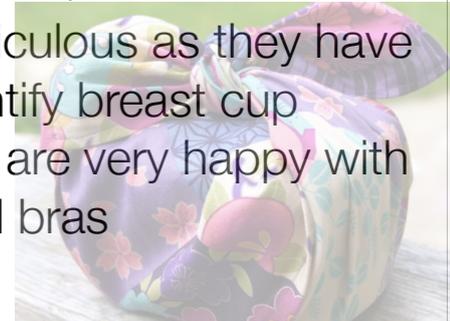
Its not difficult to recognise that they have very different breast shapes and across back measurements so they will fit any 34B bra in very different ways.



Fact

1. Every women’s breast volume and shape is as unique as their fingerprint
2. Breast and band size can change daily, breast volume due to hormonal activity and band size by hydration

For our Retail industry to declare that 70% of women are wearing the wrong sized bra is ridiculous as they have no scientific research to identify breast cup measurements and many women are very happy with their “ wrong” sized bras



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5. Overview of styles of soft bras



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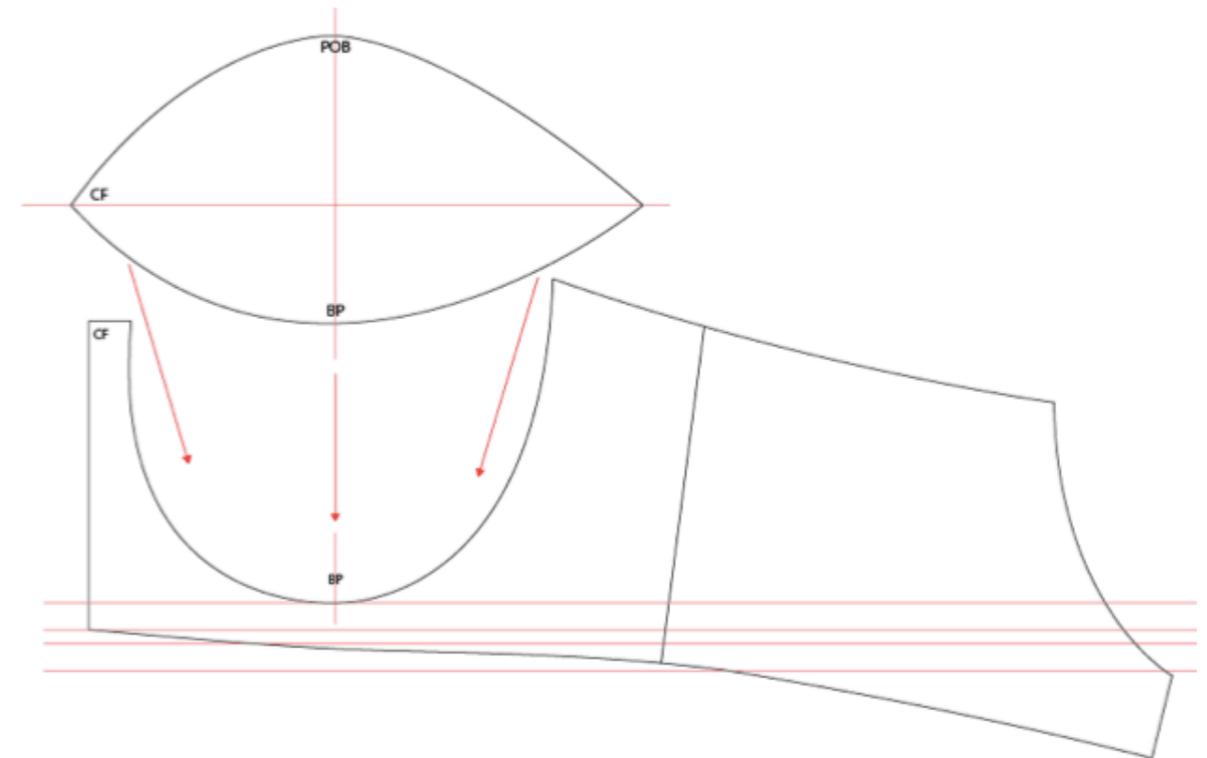
Core Bra Pattern Cutting and Grading

6. 34B Soft Bra Draft

The underpinning knowledge that is required to draft all soft bra patterns is contained in this section. This basic 34B bra block will be used to construct a series of bra styles in the future. The profile of each pattern has a sympathy to the natural body shape and the measurement specifications relate to key breast and body measurements.



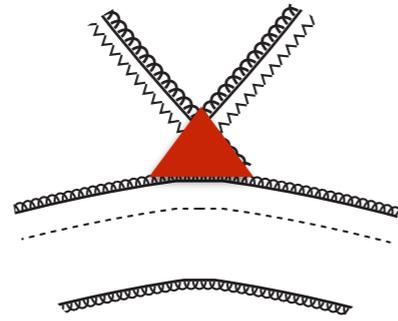
Balancing the Bottom Cup into the Cradle



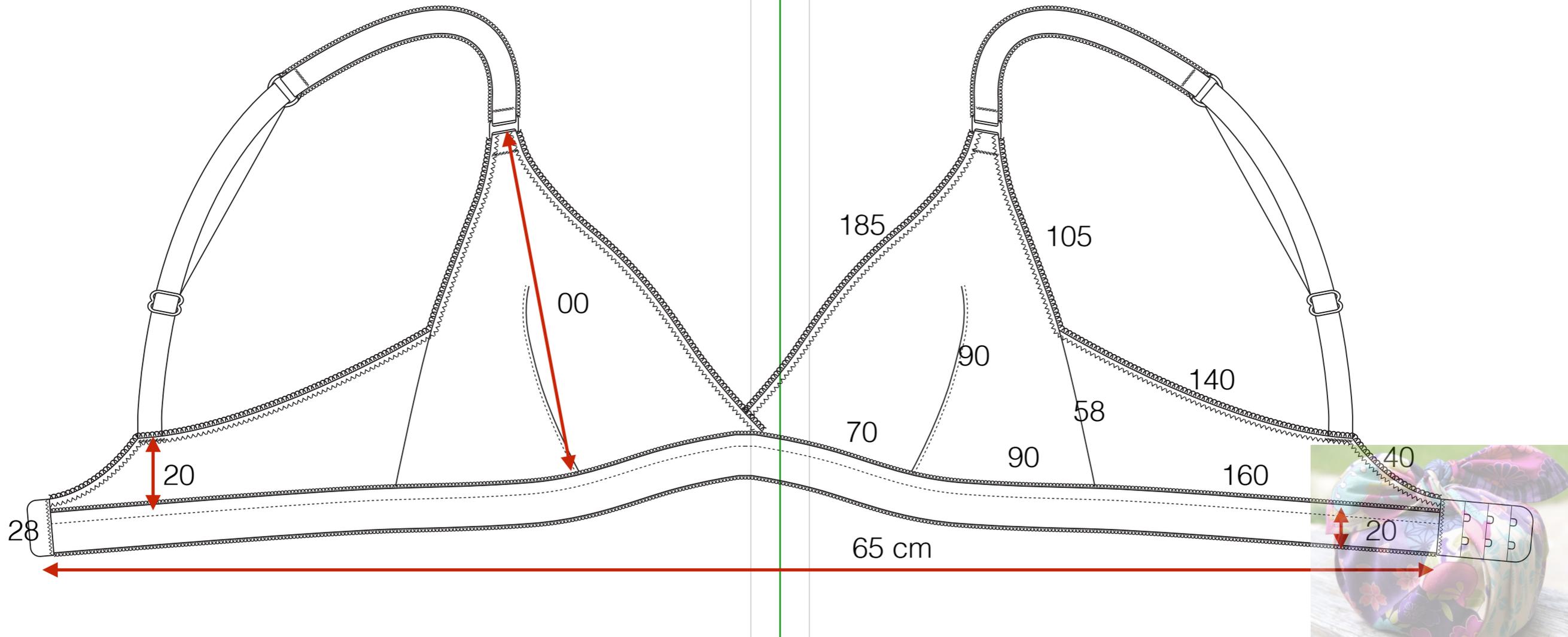
Match the Balance Point of the bottom cup to the BP of the cradle and measure in round the bottom cup into the cradle



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7. Project Draft Level 1 Soft bra style

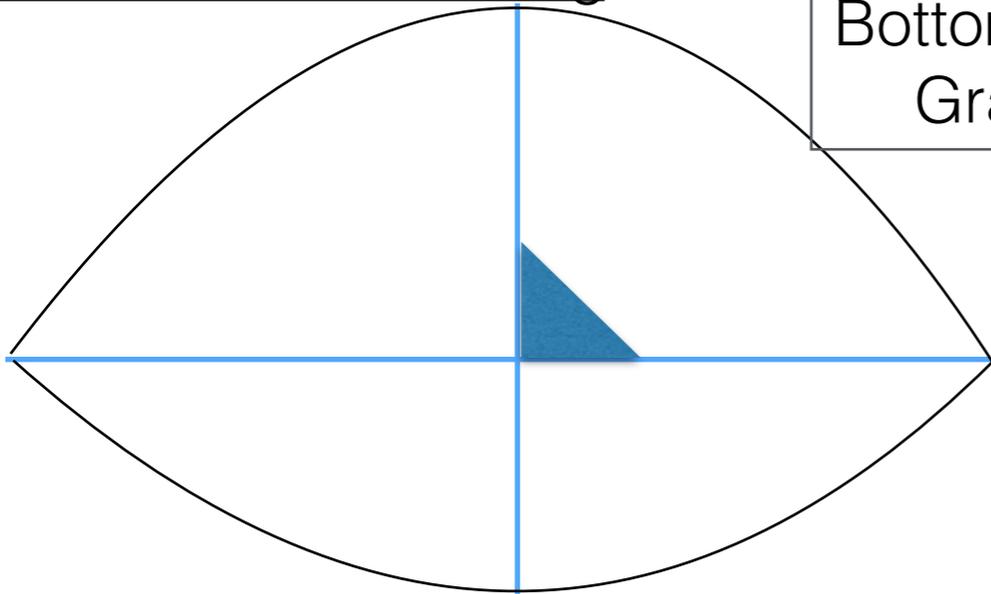


15mm Crossover

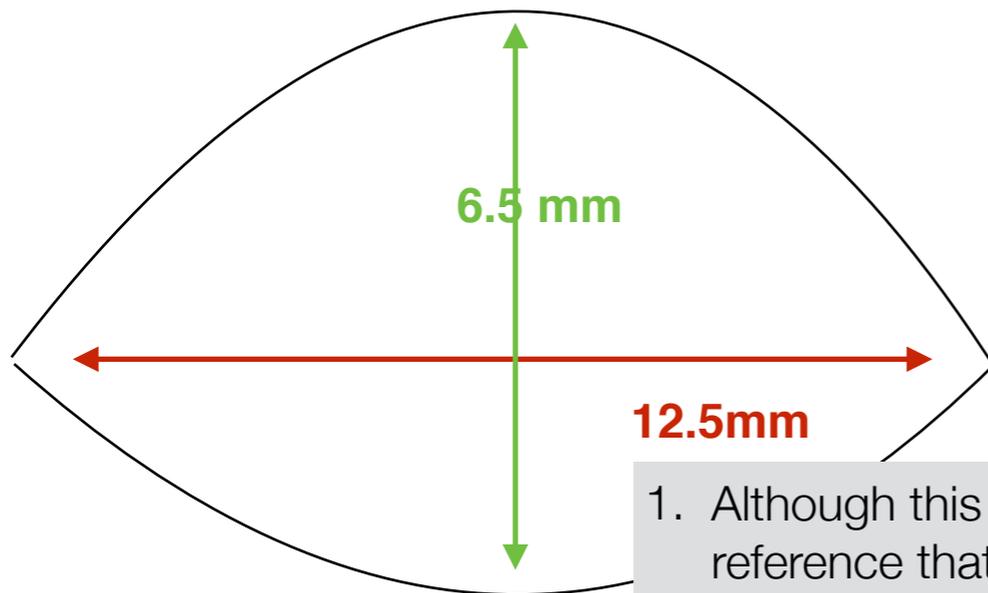


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8. Level1 Basic Grading

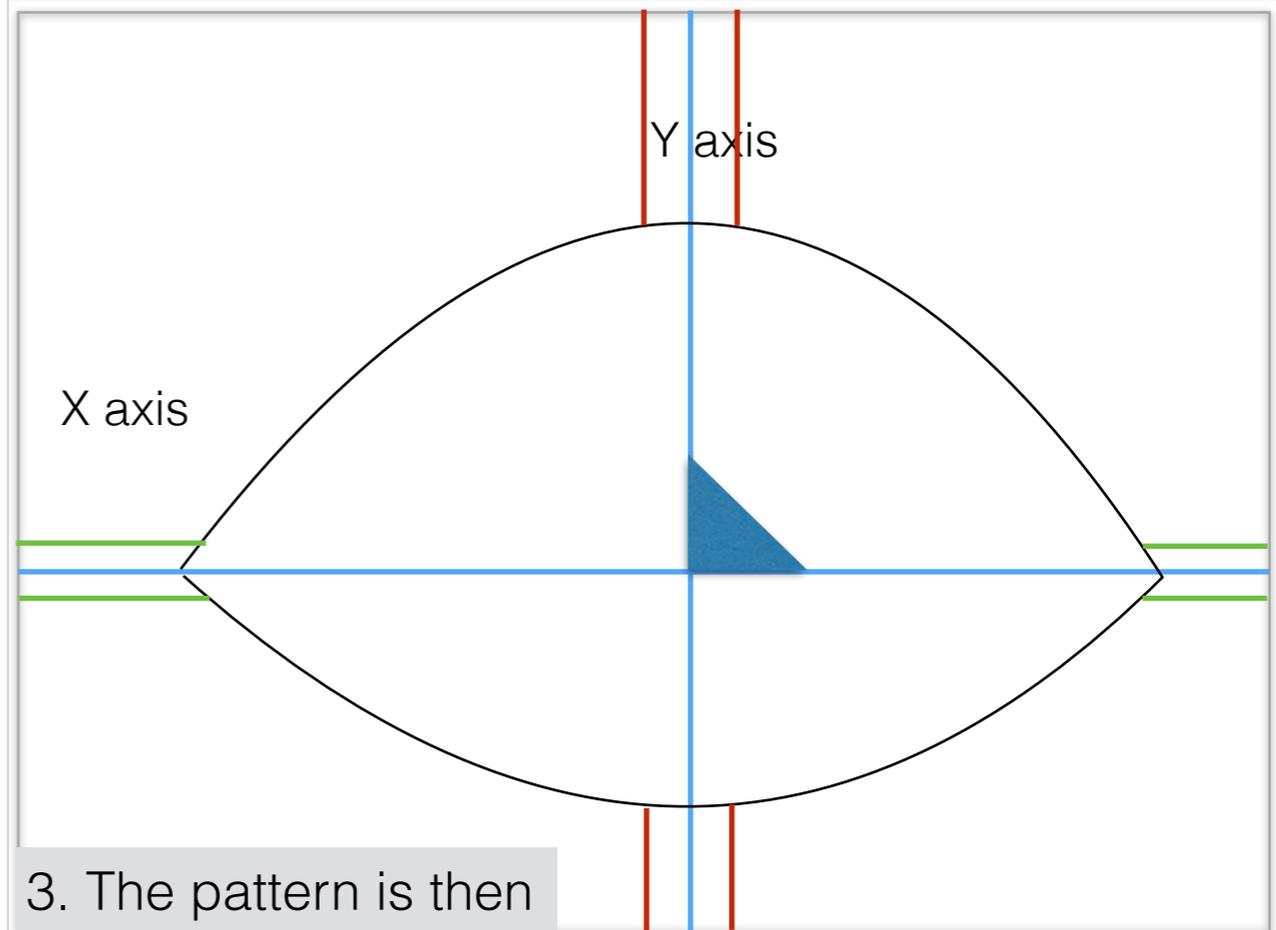
Bottom Cup
Grade



1. The classic grade for this bottom cup is **12.5mm in the width (X axis)** and **6.5mm in the height (Y axis)**, it must be symmetrical grade to the top cup



1. Although this industry has a historical guide frame of reference that it pays lip service to, there is no proven, published size data that explains or offers best practice to control our size grading practice.



3. The pattern is then shifted to align with the **red** and **green guide** lines



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9. Overview of styles of wired bras

Molded T shirt bra



Molded plunge push-up bra



Long Line Bra



Flexi wired Sports Bra



Full support



Non pad minimiser bra



Balcony Bra



Non-padded



Molded Muli-way



Bralette



Stick-on Bra



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10. 34B Wired Bra Block

From my early days as a commercial bra designer I was very aware of the importance of basing new bra pattern developments on a block pattern and more importantly being able to draft the bra block from scratch.

It has taken many years of refinement to complete the bra block that follows in this article.

This block pattern's measurements relate to the body measurements of a commercial 34B body shape and has a start point of a 34B wire that matches a typical breast root of that size.

This block then becomes the template to launch any area of development of bra style from a simple wired fashion bra to a complex plus fit style with the largest cup size.

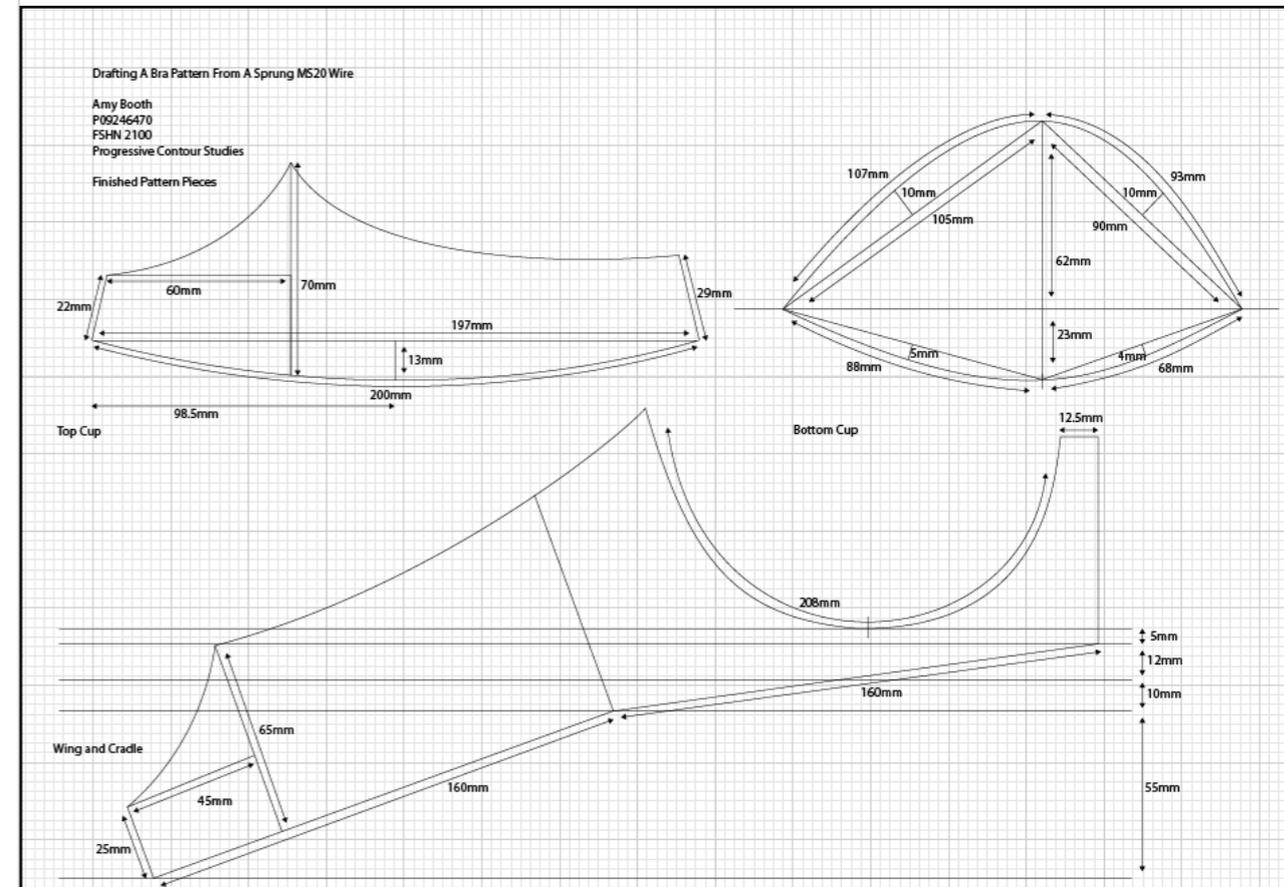
It succeeds across the widest of selection of bra styles because of 2 factors.

1. It has a number of body landmark positions, the centre front position, the point of bust, the breast root, the side seam position and the centre back which are common to the body shape that relates to all bra styles.

2. The shape of the Bottom cup and the cradle and wing have been modified numerous times to finally give a block which is sympathetic to the wearers body shape but I have no doubt that new modifications will always follow.

I don't want this block to become yours, I want you to draft it, sample it, understand how it fits, and then modify it to your situation.

Then it becomes your block.



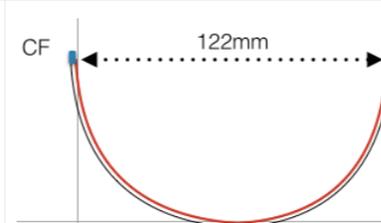
The Basic 34B Wired Block

Not drawn to scale



This 34B wired bra block is the start point for drafting any style of bra which has a cradle seam which follows the **breast root**.

This cradle shape is developed from the sprung profile of the 34B wire



The recommended wire is the M&S 34B wire, MS20 which has a width of 122mm and a length of 195mm

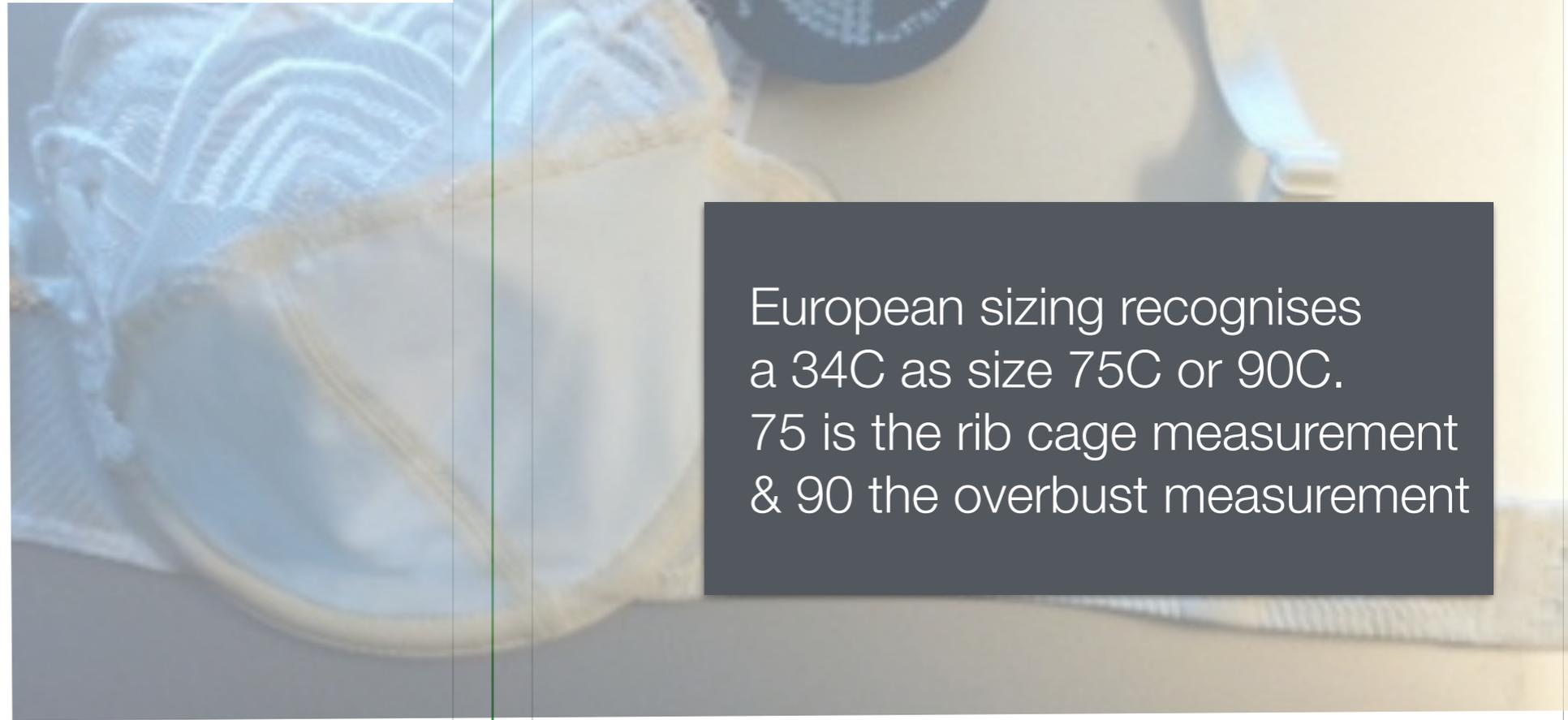
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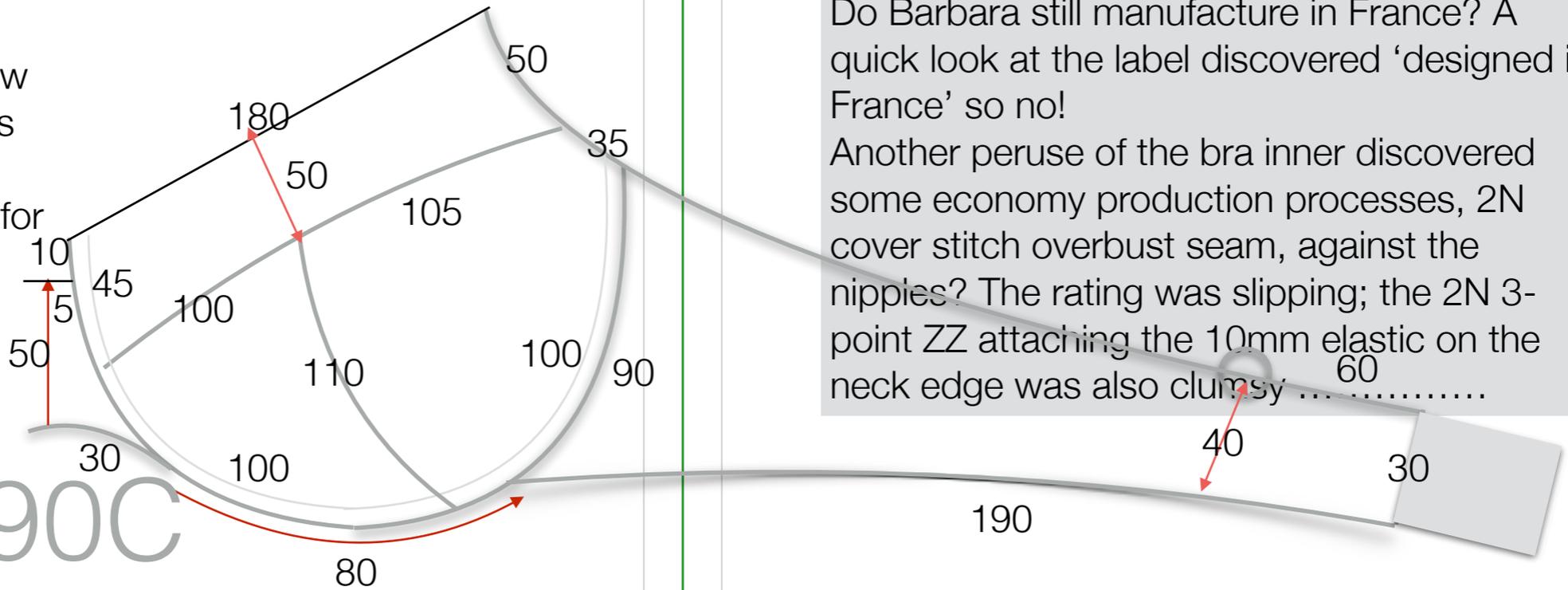
11. Project Draft Level 2 Wired Bra style

barbara Brand
Whilst I am researching Intimate apparel I often buy reduced price lingerie from Designer outlets. I look for interesting chic labels and on this occasion a wired cut and sew bra from the French label barbara drew my attention.

The RRP. was £73 so I expect to be impressed but being a male shopping in a female world I am curious how my inspection process compares to that of a female who is buying for their wardrobe.



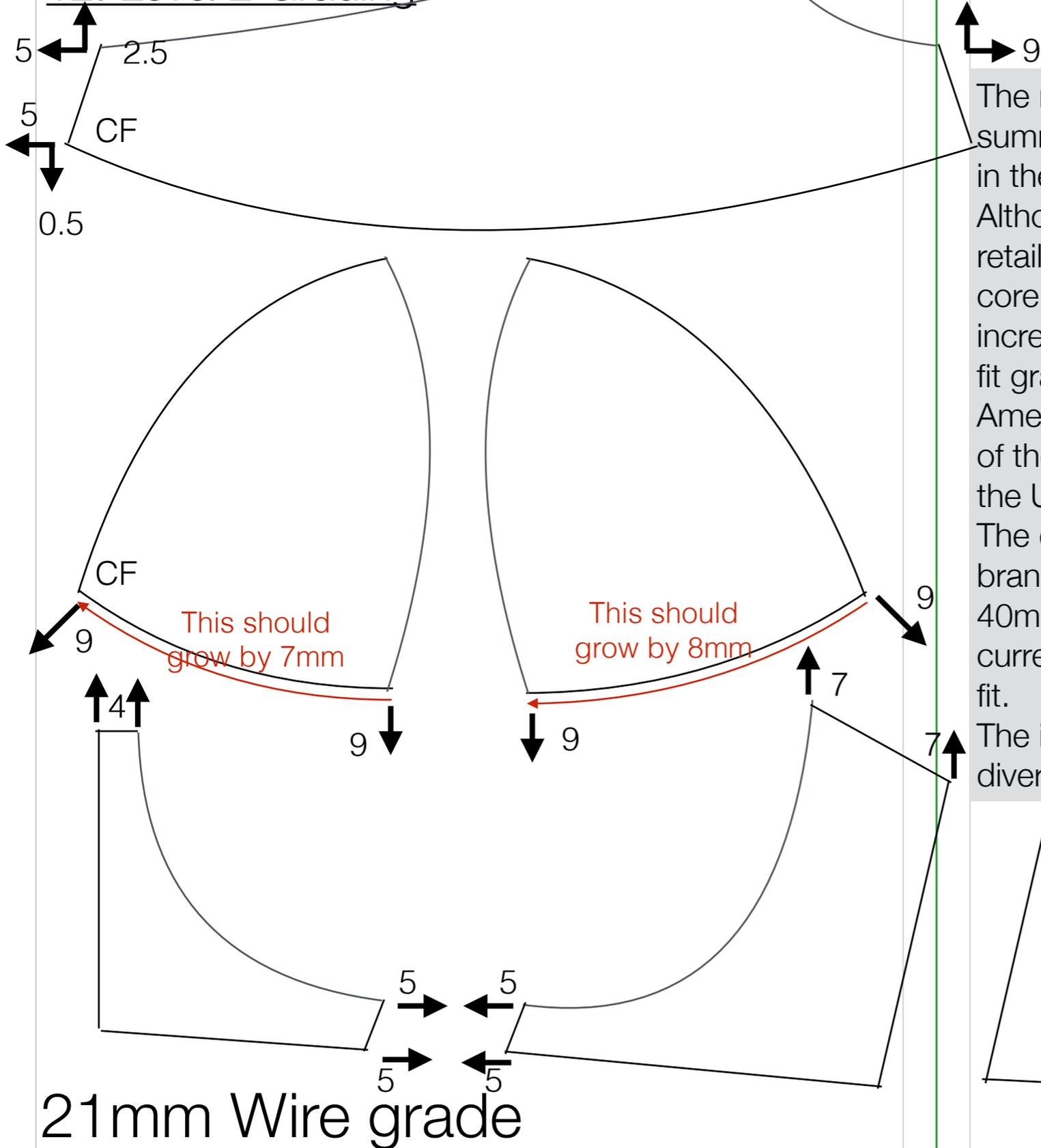
European sizing recognises a 34C as size 75C or 90C. 75 is the rib cage measurement & 90 the overbust measurement



Do Barbara still manufacture in France? A quick look at the label discovered 'designed in France' so no!

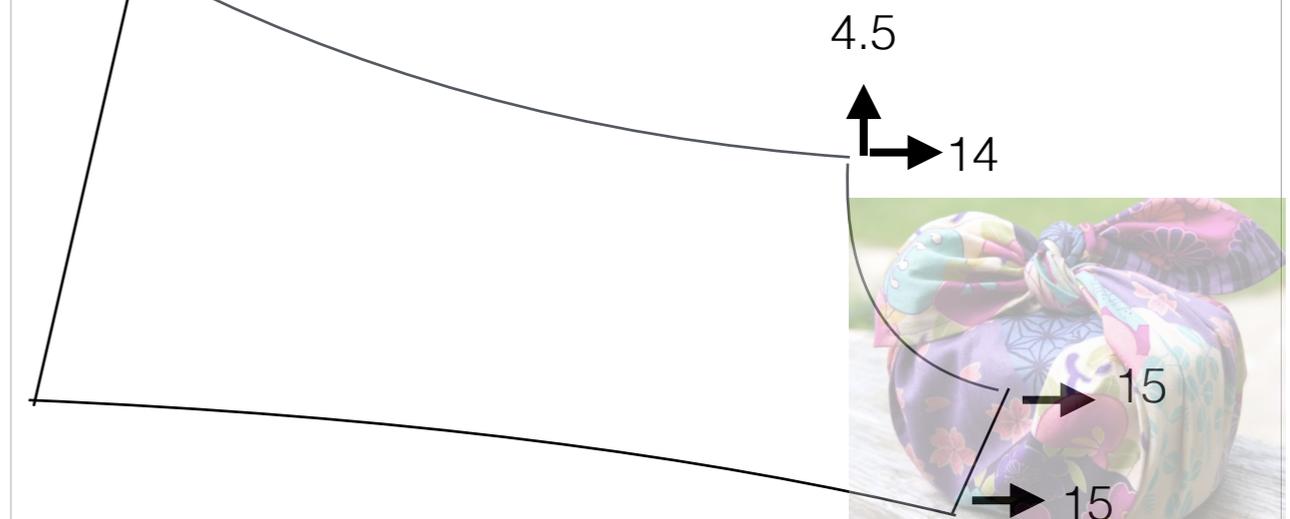
Another peruse of the bra inner discovered some economy production processes, 2N cover stitch overbust seam, against the nipples? The rating was slipping; the 2N 3-point ZZ attaching the 10mm elastic on the neck edge was also clumsy ...

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12. Level 2 Grading



Example of a UK wired 3 part cup bra grade 34B to 36B

The results of the questionnaire that was sent out this summer are showing that there is still a massive difference in the grading practice across international companies. Although technical pattern graders that are servicing the UK retail are predominately using 50mm (2") band grading, the core (32/34/36/38 A-D) cup grading increments have increased to numbers that would have been used for plus fit grading a few years ago. American companies have also been increasing the volume of their cup grades but not to the same increment values as the UK. The diverse approach of most of the French 'designer' brands have always offered a massive contrast with their 40mm band grading and 15mm wire specifications and currently they are showing no move away from the style of fit. The information that this research has underlined how diverse the world market of bra fit remains.



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13. Bra Fitting

There are a large number of bra retailers that follow the rather dated bra-fitting formulas such as the +4" to rib cage equals the bra size method or have devised custom measuring tapes and devices. Bra fitting is a blend of art and science, and knowing what a good fit should look like.



Stage 6
If the wire is not resting along the root, hold the apex of the bra firmly with one hand, and use the other hand to nudge the wire from underneath upwards into the root.

Stage 7
Using your middle fingers to feel the tension of the band from the centre back to the pressure of the wire where it sits on the ribcage.



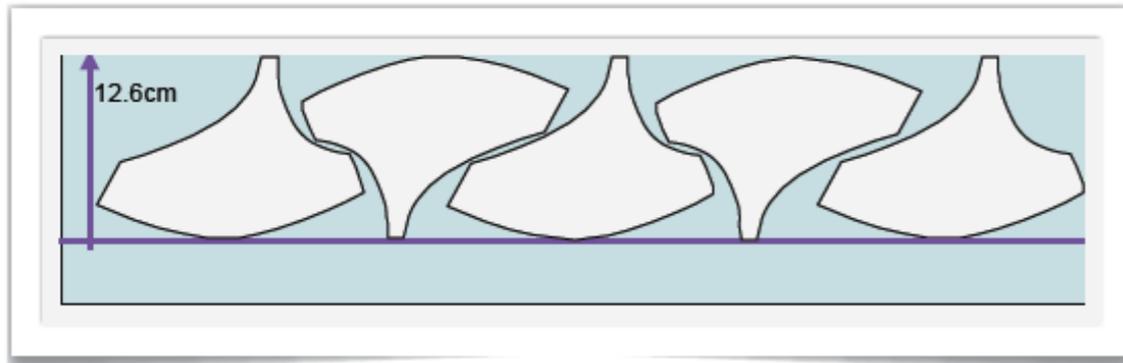
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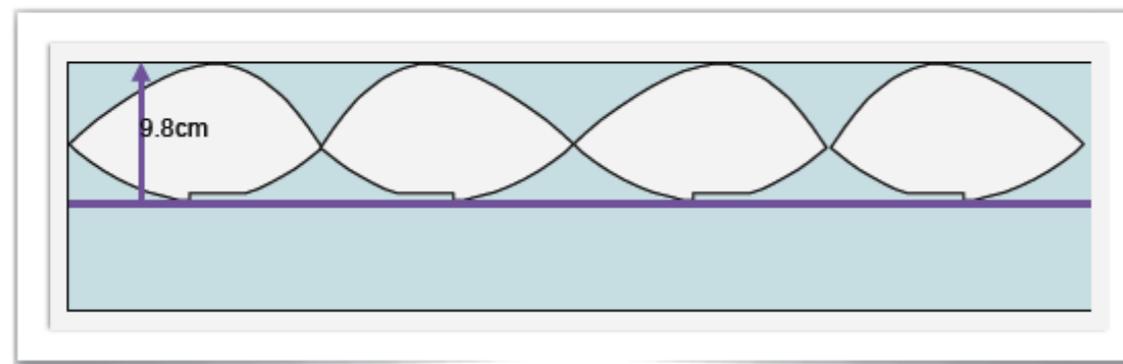
14. Basic Technical Packs

Base Size lay plan (36D/38D)

"Avoid using the 34B for a sample lay plan costing. Use at least the 36D or even 38D as the current size ratio of orders are tending to be larger than ever before."
(Industry quote)



The method of producing a sample base size lay plan is to mark in each pattern piece across the width of its fabric. Make sure the pattern is on its straight grain and marked in as a pair. Butt the patterns up as tightly as possible to reduce the waste and then rule off the depth of fabric used. Divide the number of pairs of patterns into the amount of fabric used and this will give the amount of fabric used for 1 bra section. If the layout does not give a set of complete pairs, for this base size lay plan, discard the odd pattern



Repeat the process for each pattern in their appropriate materials

Product Data Management / Technical Pack.

If you don't define the specifications of your product, how can you complain when it is delivered faulty?

Over the past 25 years most core brands have given all the technical development of their product to manufacturers offshore. The only positive outcome of this was the development of sophisticated PDM's or Technical Specification Packs.

Product data management is the use of a software package to track and control information related to an Intimate Apparel product. The data involves the technical specifications of the product, specifications for manufacture and development, and the types of materials that will be required to produce goods. The use of product data management allows a company to track the various costs associated with the creation and launch of a product. Product data management is part of product lifecycle management.

In the early days of offshore production most brands would send a basic technical pack that would have consisted of;

1. A sealed sample, one of two identical samples that represented the final approved construction, one is held by the customer and second by the factory.
2. A Production order with a delivery date.
3. A graded set of patterns
4. A Fabric and component list with details of fabric usage and colour swatches.
5. The Method of Garment manufacture



IA Technical Intimate Apparel and Swimwear Distance learning courses

As a distance learning student, you understand how the flexibility of learning can be integrated into your lifestyle and career path. Setting both short- and long-term goals gives you the impetus to create the life that you want and the career that you will enjoy.

Distance learning students must take a far more active role in learning and accessing information than traditional students in face-to-face classrooms. Rather than simply sitting through a class and jotting notes, you must take the initiative to download and read course materials.

You may need to ask questions via email, skype or facetime

If you are simply rushing through without thinking, you will not retain the information.

We suggest writing down what you discover in a notebook and referring back to it each time you start a new learning session.

Organisation is key to distance learning success! We recommend keeping a physical binder with sections such as Week 1, Week 2, as it allows you to pick up and go at any moment.

Regards

Dave

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