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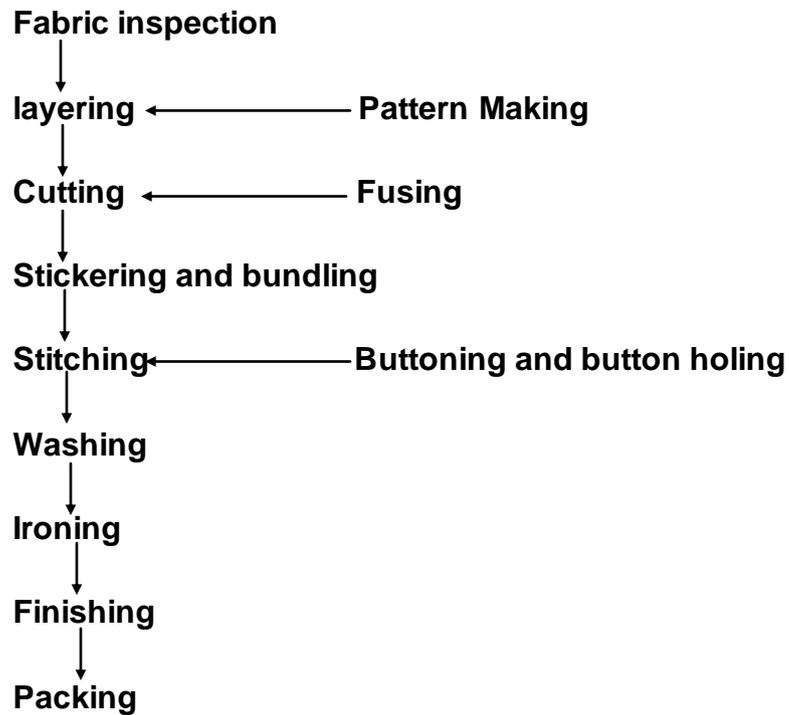
1. Basic Textiles terms

Yarn	Basic raw material for weaving
Type of yarn	Single ply, double ply and multiply
Yarn count	Defines thickness of yarn. Higher the count, finer the yarn
Warp	Lengthwise yarn in the fabric. Pass from weavers beam to cloth roller
Weft (filling)	Widthwise yarn in the fabric. Inserted during picking
Selvedge	Edges of the fabric running lengthwise
Woven Fabric	Woven fabrics are made by using two or more sets of yarn interlaced at right angles to each other.
Knitted Fabric	The knitted fabric is a material with interlaced loops called also knitted fabric (example: knitwears)
Sewing Thread	Thread is a type of yarn used for sewing.

2. CAD (Computer Aided Designs)

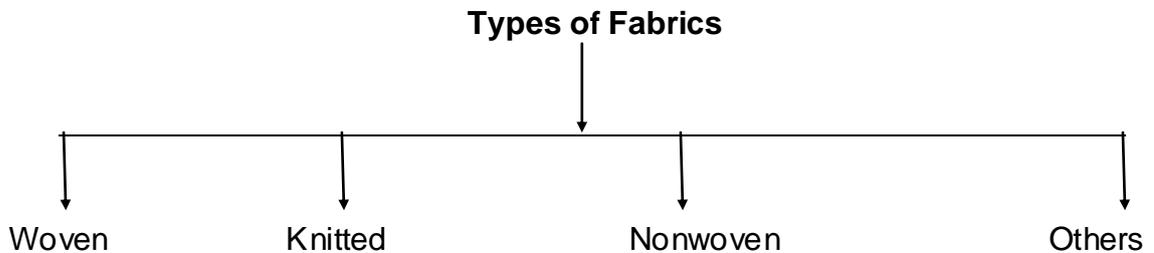
Pattern Design Systems (PDS) have become invaluable tools to the patternmaker, assisting in much of the repetitive tasks associated with patternmaking. PDS systems are capable of storing an incredible amount of data that can be quickly retrieved, tweaked and re-filed. Using a mouse or stylus, patternmakers are able to swiftly add style details and make changes

➤ Sequence of Operations In Garment production



3. Various types of fabric

Fabrics:- Sets of yarns are used for formation of fabric, Fabrics are produced in number of ways which are detailed below:



- Woven Fabric: A woven fabric is composed of two basic series of yarn called warp and weft
- Knitted Fabric: Fabric which are constructed by interlocking a series of loop of one or more yarns by hand or by machine are called knitted Fabrics.
- Non Woven Fabric: It is produced by mixing fibers and making into the form of a thick layer of web of width corresponding to desired width of the fabric.
- Other Fabrics: Braids, Lace, Netting, Felt etc

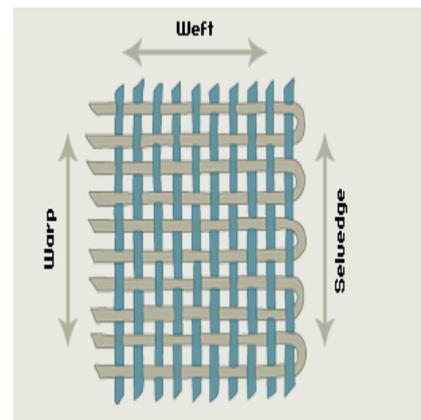
Parts of Woven fabrics:

Body: It is the main portion of the fabric containing the intended fabric design.

Selvedge: It is is the narrow woven edge portion of the fabric parallel to the warp, made with special strong yarns in a closer construction than the body to prevent unraveling.

Face: It is the intended front side of the fabric.

Back: It is the intended back side of the fabric.



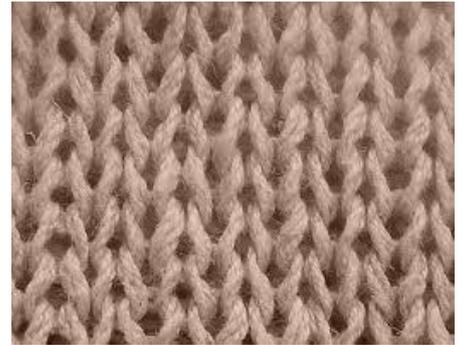
Two base knitted fabric structures

Weft Knitting :

In Weft knitting loops are made in a horizontal way from single yarn

Intermeshing of loops takes place on a course-wise.

Type of weft knit: Plain Jersey Knit , Purl Knit, Rib Knit , Patterned Knits & Double Knits.



Warp Knitting:

In warp knitting loops are made in a vertical way along the length of the fabric from each warp yarn Intermeshing of loops takes place on a Wale-wise.

Type of warp knit: Tri-cot , Rachel knits .

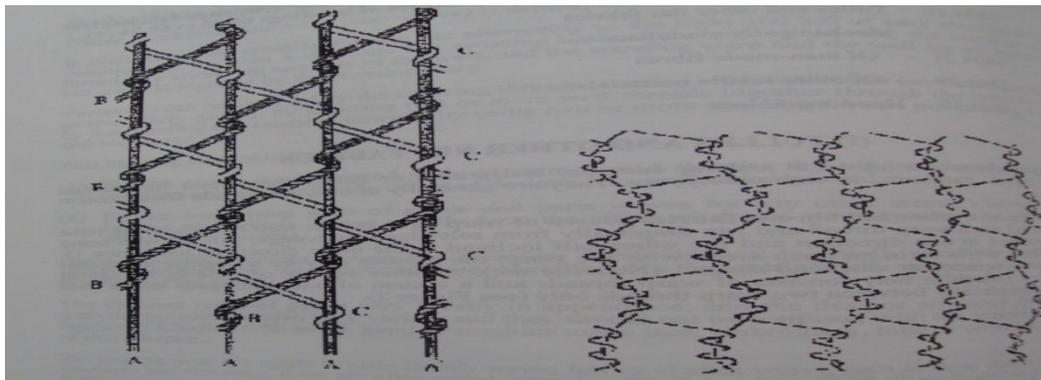


Lace Fabric

Lace is an ornamental or decorative openwork fabric in which design elements formed by the inter twisting of threads are joined either by meshes, usually of regular size & shape, forming an apparent openwork fabric.



Net fabric



It consists of warp threads with weft threads which twist around each warp thread & run diagonally from selvedge to selvedge. Net fabrics have three series of threads parallel warp threads, mesh threads & binding threads.

Categorization of the fabric based on Processing:

Grey Fabric

Bleached Fabrics

Dyed Fabrics

Yarn Dyed Fabrics

Tie and Dye Fabrics

Printed Fabrics

Printed warp Fabrics

Categorization of the fabric based on Pattern:

Plain Fabric

Strips Fabric

Checks Fabric

Figured- Dobby & jacquard Fabric

Embroidered Fabric

Some of the common market terms of the fabric used in Garment Industry

2x2	Fabric in which two fold yarn is used in both directions.
2x1	Fabric having two fold yarn in one direction and single yarn in other direction.
Brocade	Rich heavy fabrics woven on jacquard looms having floral or figured patterns emphasized by contrasting surfaces or colors.
Cambric	A light weight closely woven plain weave fabric usually with a stiff finish for giving weight and appearance.
Canvas	Heavy durable cotton fabric made from coarse, hard twisted yarns.
Chiffon	A transparent sheer fabric of plain weave. Yarns used are highly twisted. Usually has a soft finish.
China Silk	A very soft, extremely light weight silk made in a plain weave. Used mainly for linings. Irregularities of threads, caused by extreme lightness and softness of china silk are the characteristics of the fabric.
Corduroy	A ribbed pile fabric with a high, soft luster. Made with extra warp or weft threads. During weaving, the extra filling yarns form loops or floats over the ground threads. After weaving, the loop threads are cut. Threads are then brushed forming a pile.
Crepe	Wide range of fabrics come under this name like crepe de chine, crepe charmeuse, crepe-back satin etc., they have pebbly texture and made with high twist yarn.
Denim	Traditionally a 3/1 warp – faced twill fabric made from yarn-dyed warp and undyed weft yarn.
Drill	A twill fabric of similar construction to denim but usually piece dyed.

Georgette	A fine light weight, open texture fabric usually in plain weave made from crepe yarns usually two 's' twisted and two 'z' twisted yarns are used in warp and weft.
Flannel	An all wool fabric of woollen type woven in plain weave or single twill. During finishing, surface fibre is developed so that the weave is partially or completely hidden. They are produced in white or in wool dyed mixtures and is soft.
Flannelette	It is a raised cotton fabric made to imitate true flannel.
Long cloth	A fine plain weave closely woven high count fabric.
Muslin	A lightweight, open cloth of plain weave or simple leno weave.
Organdie	A thin, open and translucent fabric with stiff handle made from cotton, woven in plain weave and given special stiff translucent permanent finish.
Poplin	A durable plain weave class of fabrics having warp yarns that are considerably finer than the weft yarns with about or three times as many ends per inch as picks.
Spun Spun	x Fabric in which spun yarns are used in both the direction.
Tafetta	Crisp fabrics with fine, smooth surface usually made in the plain weave, sometimes with a small crosswise rib. Originally made in silk now made in man-made fibres also.
Texturised yarn	Any yarn modified in such a way that its physical and surface properties have been changed.
Voile	A light weight, sheer fabric of plain weave made from fine yarns of substantially more twist.

Introduction to different parts and style of garments

The style of a garment or garment part results from its outline or shape and other identifying characteristics. "A particular style of garment usually refers to the cut of its structural lines in a manner that has become recognized, accepted and named.

Some common styles are mentioned below.

1. Neck line

- Ready-to-wear apparel features a variety of neckline shapes and finishes.
- The neckline edge is cut into the desired shape, and the raw edge of the neckline is finished by any edge treatment such as facing, binding, or banding.



Plain/
Jewel



Keyhole



“V”



Scoop



Sweetheart



Bateau/
Boat



Crew



Halter



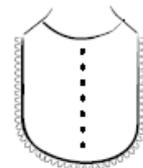
Décolletage



Gathered



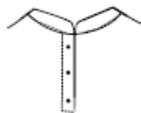
Cowl



Bib



Bow



Henley

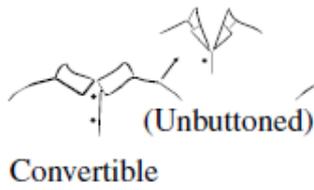


Tab

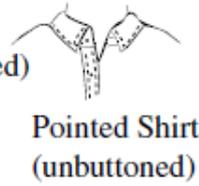


Queen Anne

2. Collars A collar, or any band applied to the garment neckline



Convertible



Pointed Shirt
(unbuttoned)



Polo/Tab



Shawl
has seam at
center back



Stand Up



Edwardian



Ascot



Jabot



Mandarin



Turtleneck



Peter Pan



Portrait



Puritan



Chelsea



Sailor



Cowl



Wing



Peaked Lapels

- There are three basic collar types:

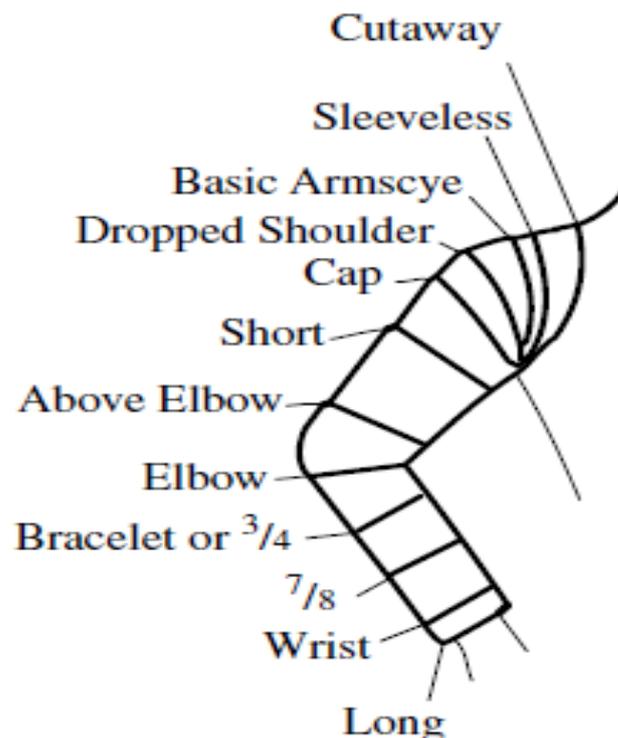
(1) **Flat Collar** - A **flat collar** lies flat or nearly flat against the garment all around the wearer's neck.

(2) **Standing Collar** - A **standing collar** is a band extending straight up from the neckline edge and standing up around the neck

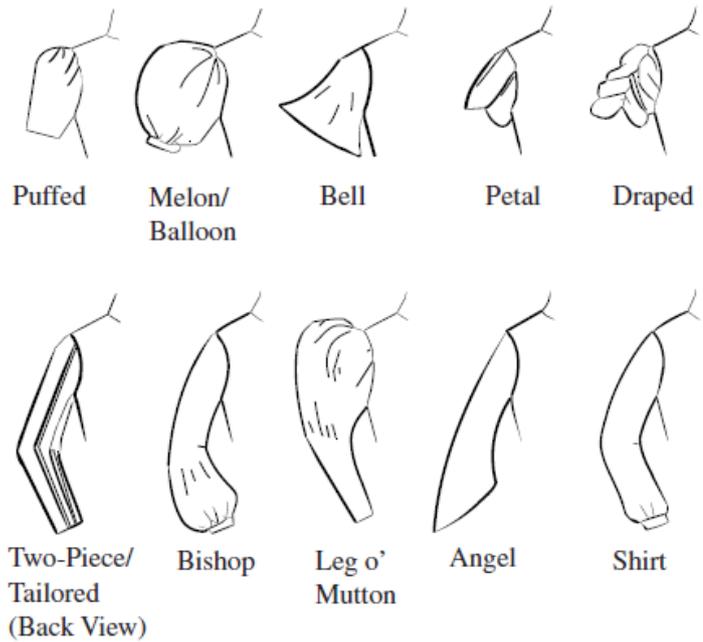
(3) **Rolled Collar (either full-roll or partial roll)** - A **rolled collar** is a band of fabric that rolls fully or partially around the neck. A full-roll collar rolls all the way around the neck; a partial-roll collar rolls at the back of the neck and lies flat or nearly flat at the front of the neck.

Sleeves

A **sleeve** is a covering for the arm that is attached at or near the armhole, or **armscye**, area of the garment. Sleeves are functional in providing modesty, warmth, or protection but are equally important for their contribution to the style of the garment

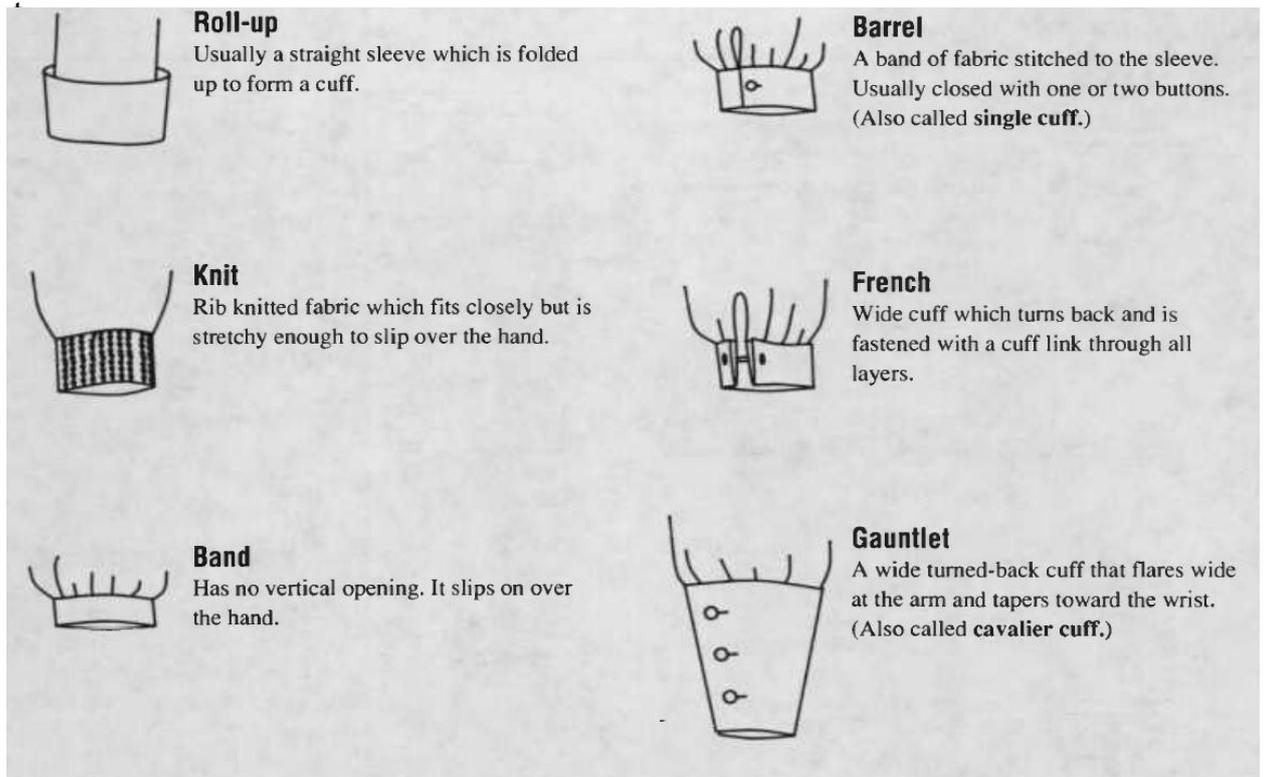


Some of the common Sleeves Styles



3. **Cuffs** Cuffs are the banded or turned-back finishes at the lower edges of sleeve and pant legs

Open-band cuffs have an opening so the wearer can fit the cuff band over



en fasten it to fit snugly. Open-band cuffs include the following types:

1. **Barrel cuff or shirt cuff**, the most common type; it is a straight, open-band cuff style. Long-sleeved shirts and blouses usually feature barrel cuffs. The barrel cuff laps and buttons at the wrist.

2. **Convertible cuff**, an open band that fastens with layers superimposed to resemble a French cuff.

3. **French cuff or double-cuff**, The French cuff is constructed like the barrel cuff but twice as wide. Then the cuff is folded back on itself so the cuff is doubled.

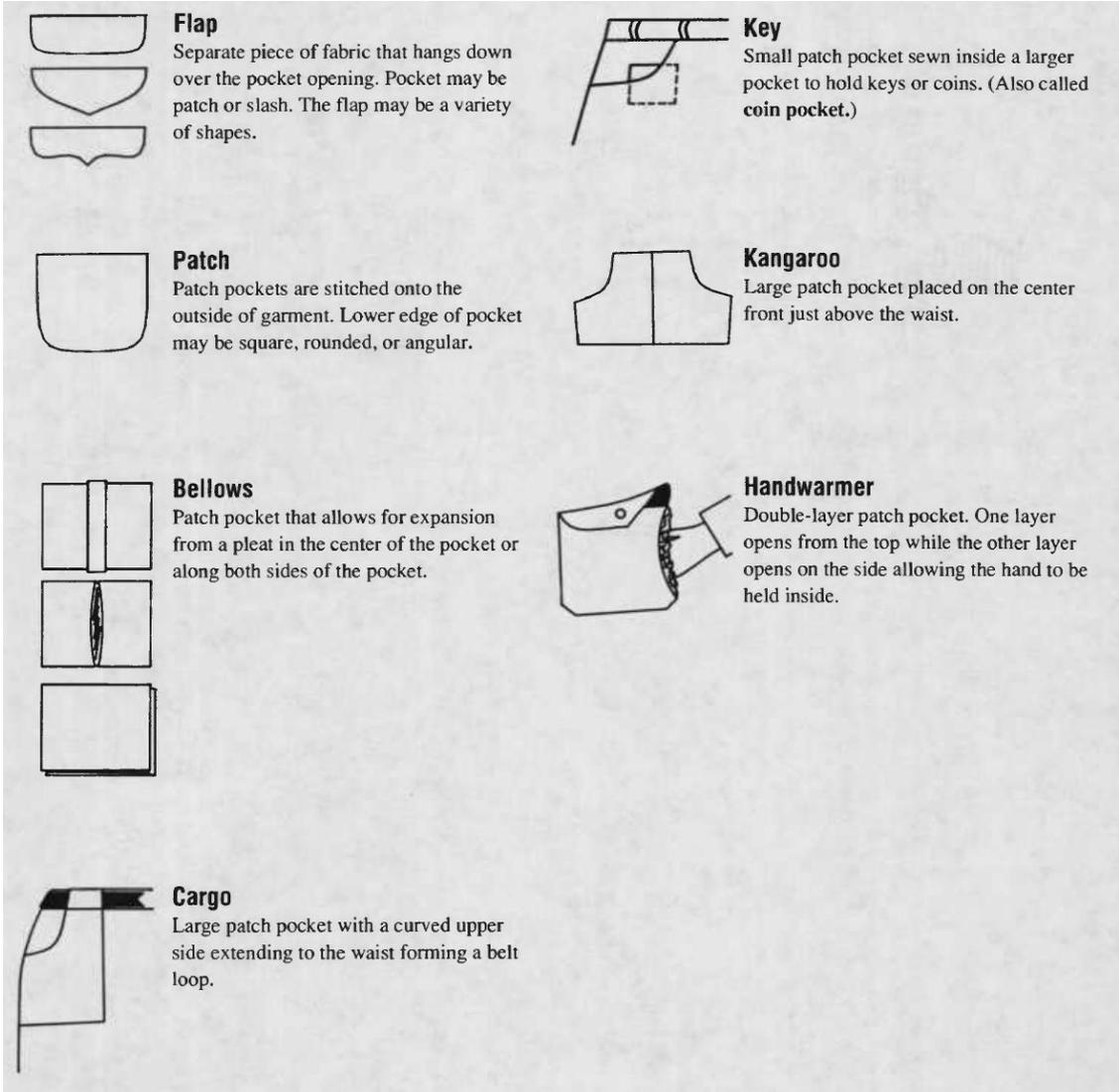
A **closed-band cuff** is an unbroken ring of fabric large enough to fit over the arm. **Turned-back cuffs** on sleeves and cuffed pants are formed by turning back or rolling up the lower portion of the sleeve or pant leg.

4. **Pockets** A pocket is a small pouch or bag sewn onto or into a garment and used to carry small items. The four basic types of pockets are

1. Patch Pockets

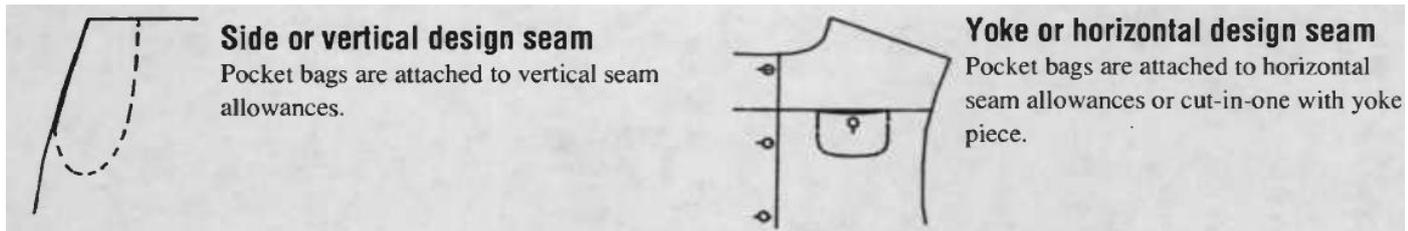
Patch pockets or applied pockets are pieces of fabric attached, like a patch, to the outside of the garment.

Some of the Patch Pockets are



1. **In-seam Pockets** - In-seam pockets are inserted in a seam such as side seam or yoke seam. The pocket hags are attached to the seam allowances and are not visible from the outside.

2. **Slash Pockets**- Slash pockets are made around an opening cut in the



garment.



Bound

A slash pocket with both edges of opening finished with binding. (Also called **buttonhole**, **besom**, **slit**, **slot**, or **double welt pocket**.)



Half-moon

Curved bound pocket used on western shirts. May be reinforced at the ends with embroidered arrows.



Stand

A slash pocket in which the lower edge is finished with a separate piece that stands above the pocket opening. (Also called **breast pocket**.)



Hacking

Slash pocket(s) with flap located at an angle near waist level on jackets or coats.

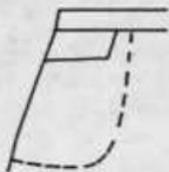


Welt

A slash pocket with the lower opening finished by an upstanding welt which fills the opening.

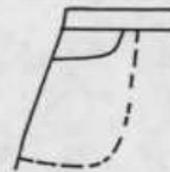
3. Front hip Pockets

Variation of the in-seam pocket in which the garmentfront is shaped and faced by the front pocket bag. The inner pocket bag fills in the cutaway portion of the garment front.



Continental

Front hip pocket formed by two angles from waistline to side seam.

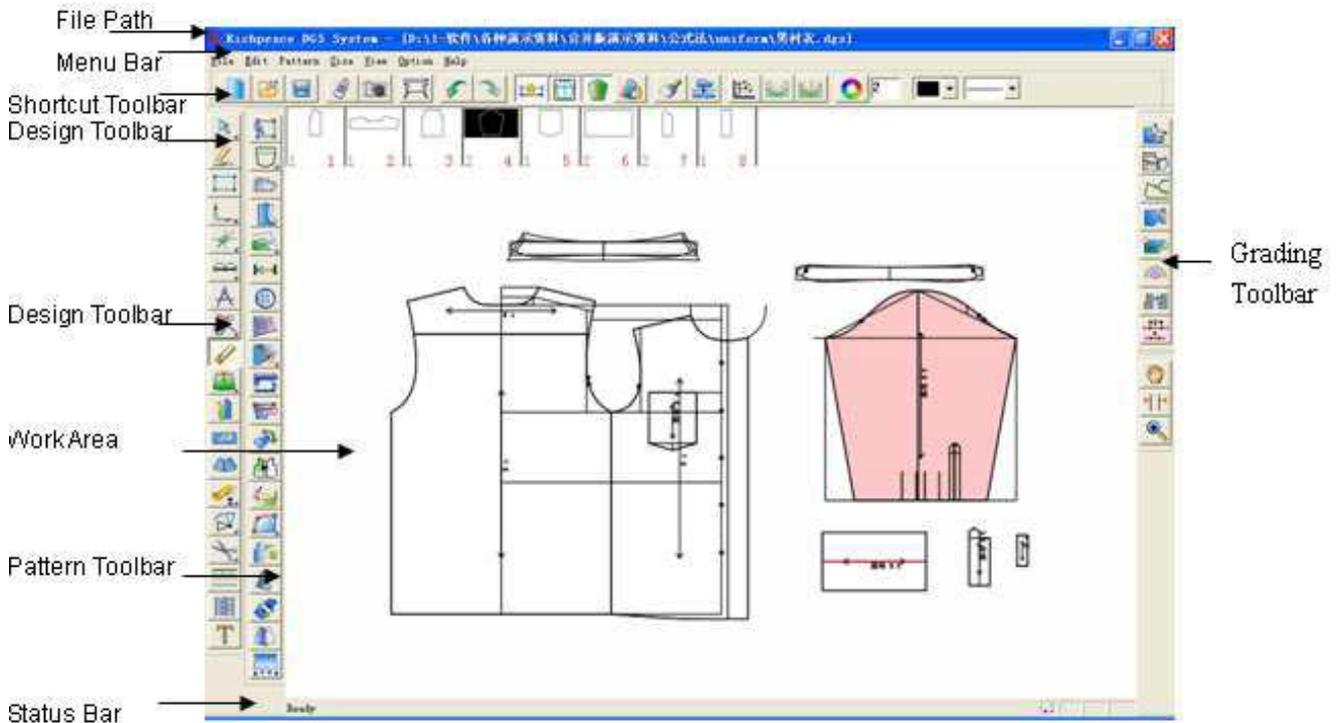


Western

Front hip pocket forms a curve from waistline to side seam.

Understanding of AutoCAD Interface and Basic Tools for Pattern Drafting and Grading

Interface Introduction



Interface is user work house, It is required to understand the Interface, as If you familiar interface, you familiar work environment, Improve work efficiency.

File Path

Show current opened file path.

Menu Bar

It is putting menu command place, And there are various command under each menu. Click menu, You can see a menu list, Cick select one command. Also press and hold Alt and press letter behind menu, You Can select Menu, Press direction button to select object.

Shortcut Toolbar

Some commands in common use are put here in manner of icon.

Pattern list Box

It is a pictorial list of pieces within a design file. The Pattern Listbox shows a small picture of each piece in a design file .You can display the Pattern Listbox location from **【Option】 -- 【System Setup】 -- 【UI Setup】 -- 【Piece Listbox Arrange】** .By dragging a pattern and move , you can adjust its arrangement order of pattern in the Pattern List box. Also you can select pattern with menu, copy or paste pattern.

Ruler Bar

Show used unit.

Design Toolar

Line drawing or modify design line tool is put here.

Pattern Toolar

After using the tool of scissor to create a pattern, the tools in this toolbar can be used to adjust the created patterns. Such as adding darts, notches, drills, etc.

Grading Toolbar

Some tools for grading are put here.

Work Area

It is seems a paper, You can draw design line, Also you can grading、 Plot or show paper border.

Status Bar

The Status Bar is on the bottom of the interface. The status bar displays information of the current tool and the prompts for its operation.

Main functions performed by CAD software

1. Digitizing system
2. Pattern making Process
3. Grading systems
4. Marker making systems
5. Shrinkage Setting System
6. Plotting of Patterns

1. Digitizing System

It is a tool used to convert hand-drawn images or manual Drafted Patterns into a format suitable for computer processing. Images are usually drawn onto a flat surface with a stylus and then appear on a computer monitor or screen. Digitizer can also be used as an input device, receiving information represented in drawings and sending output to a CAD (computer aided design) application and PC-based software like AutoCAD.



Pattern Making Process

METHODS OF PATTERN MAKING BY USING CAD SOFTWARE

There are three way on CAD systems for Pattern designing as mentioned below

Auto design

There are many pattern lib in software, It is easy for modifying part size and order size, Grading automatically, Offer accurate data for calculating material, Also can establish Pattern lib by yourself.

Free design

By drafting the pattern using the software tools, the role of various design tools are mentioned below

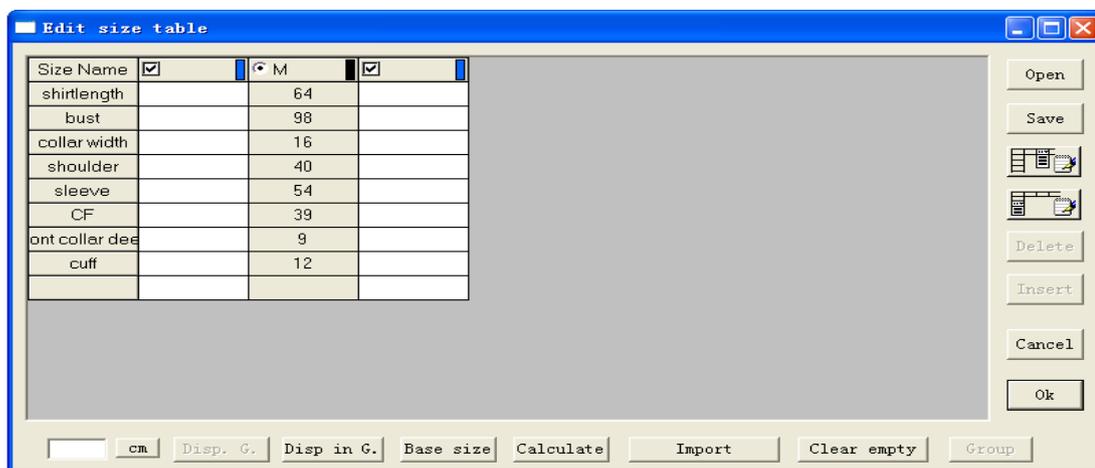
Pattern made by hand import

We can input pattern to computer by camera or digitizer, Can input one size, Also can Input more size.

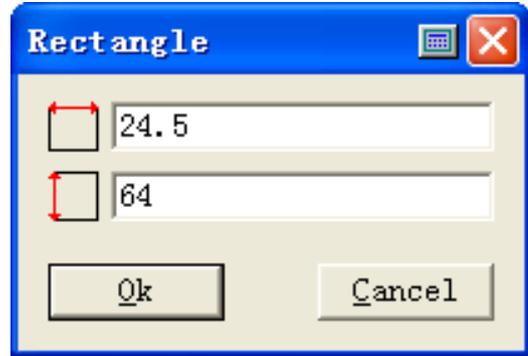
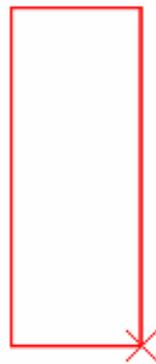
Design Pattern Making Steps by CAD

Here we are illustrating a example of a ladies garment pattern by using CAD software. Steps are as follows-

1. Click **【size】** menu- **【Edit size and measurement】** , Input size in measurement size

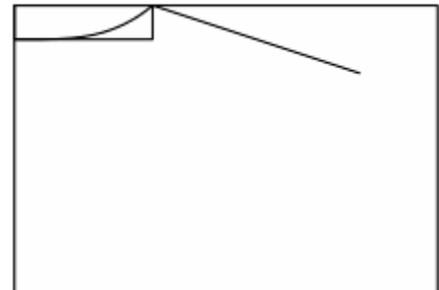
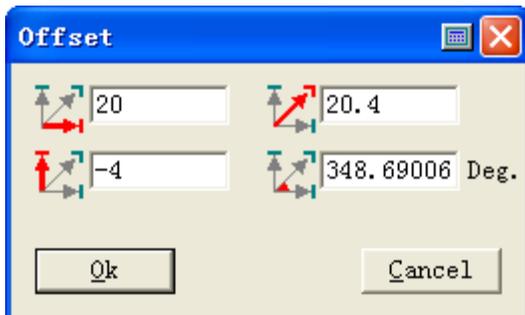


2. Select intelligent pen , drag length(64CM) and back bust($Bust98/4=24.5CM$)

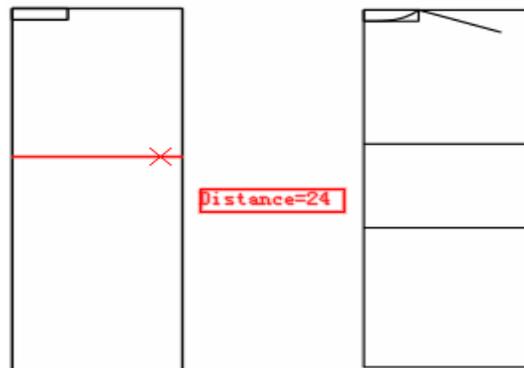


3. Draw back collar width 8cm, Back collar deep 2 cm with rectangle tool , Select intelligent pen draw back collar curve, And adjust collar curve with symmetry adjust tool;

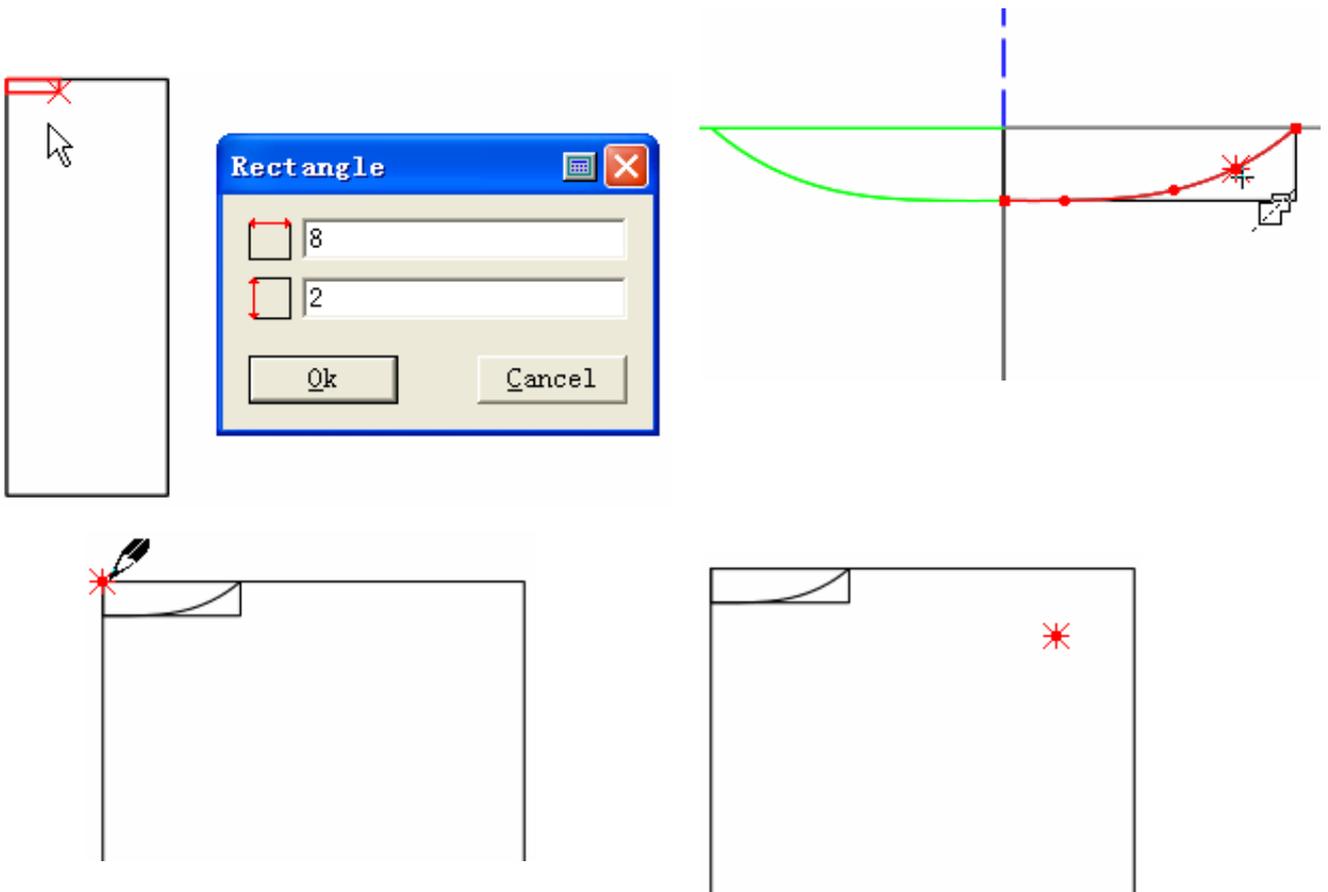
4. Select Intelligent pen, Put cursor on back centre point, When appear red icon, Press Enter on keyboard, You will see dialoge table, Input offset value, And connect with collar width point;



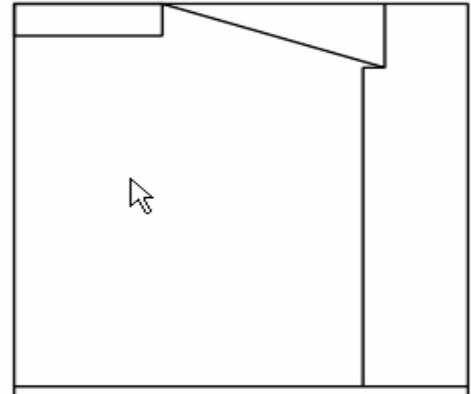
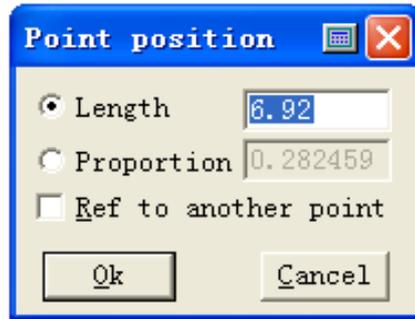
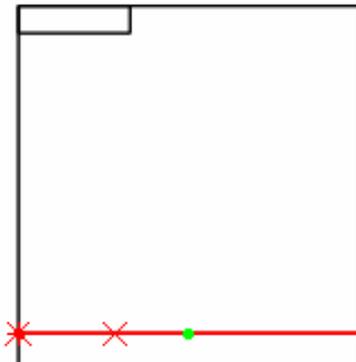
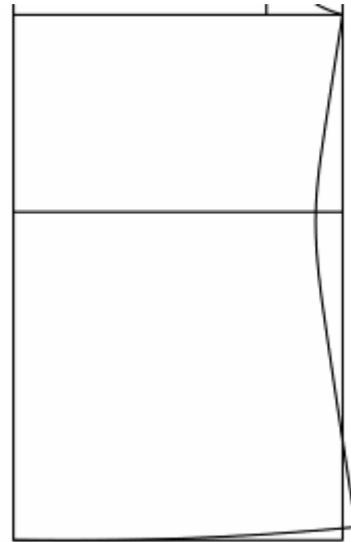
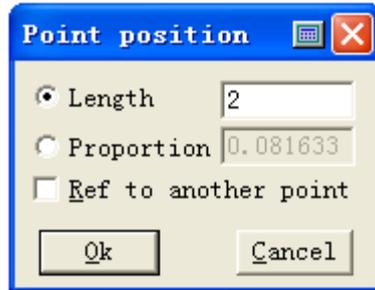
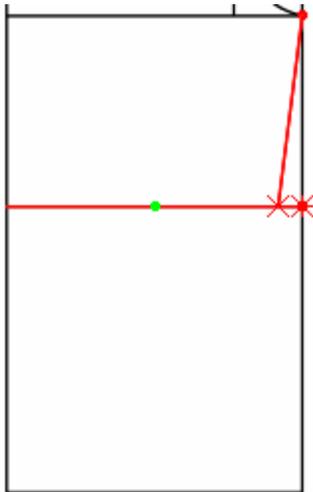
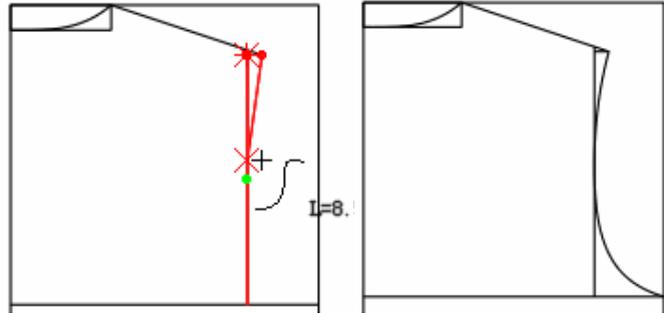
5. Intelligent pen, put on horizontal line and drag, Input 24 on key board to fix bust line, Same operation to get waist line;



6. Draw back breadth with Intelligent Pen (Can use calculator $\text{bust}/6+2.5=18.8$);

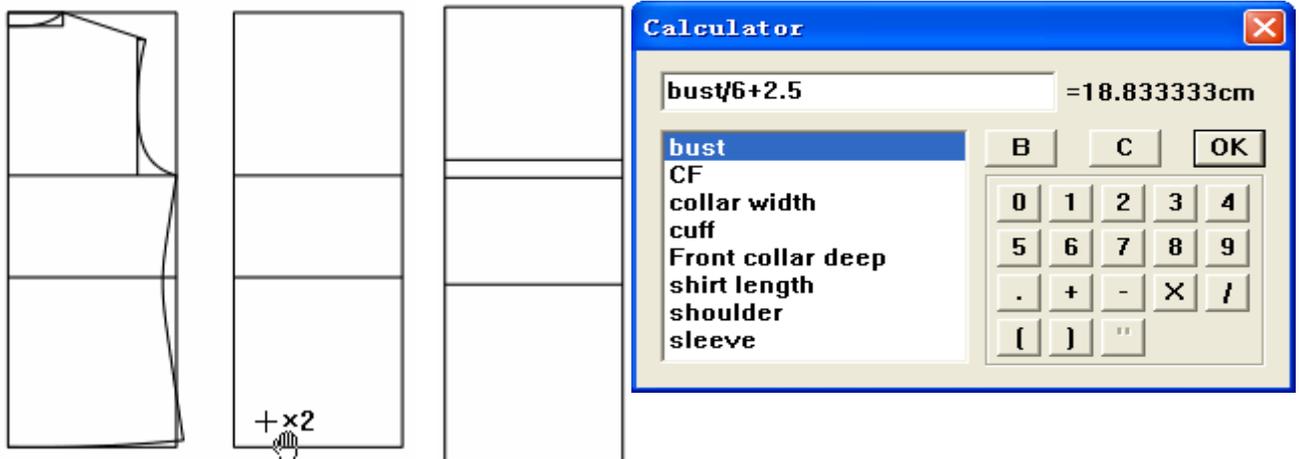


7. Draw back armhole with intelligent pen , Get equal point on back breadth, If it is not 2, You can input 2 in shortcut toolar bar , Make curve smooth with modify tool ;

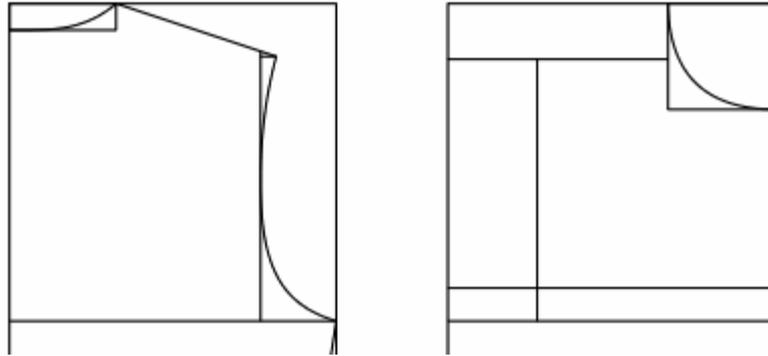


8. Draw side seam curve and bottom line, Make curve smooth with modify tool ;

9. Make front by coping design line of back with move tool ,Draw 2.5CM line from bust line with intelligent pen

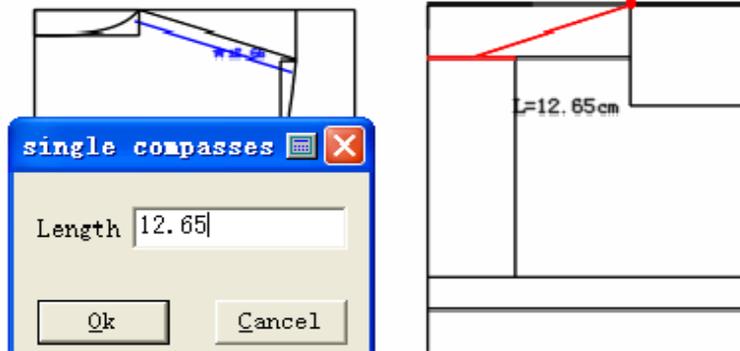


10. Draw front collar deep 9cm ,and front collar width 8cm with rectangle , Draw front shoulder down line 4.2 cm, Draw front bust width 17.8cm, At the same time draw front collar with intelligent pen ,Adjust with symmetry adjust tool until satisfy.

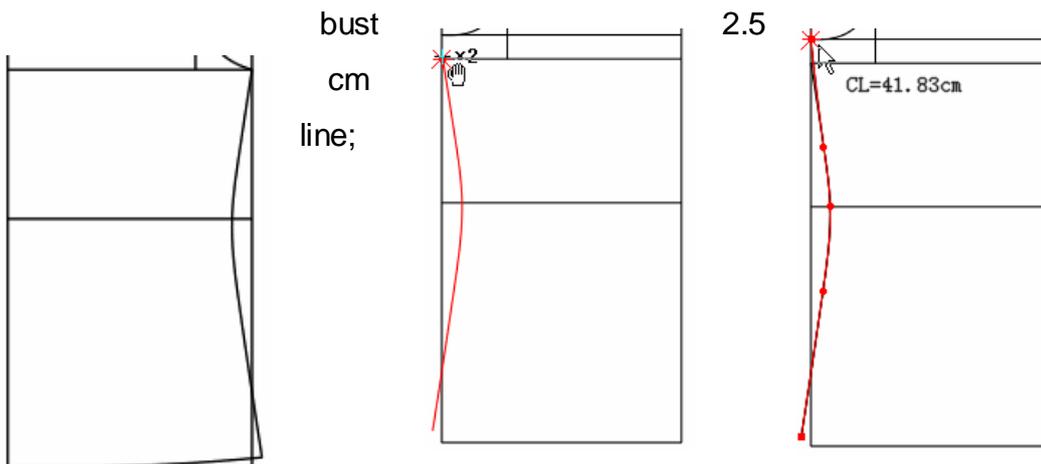


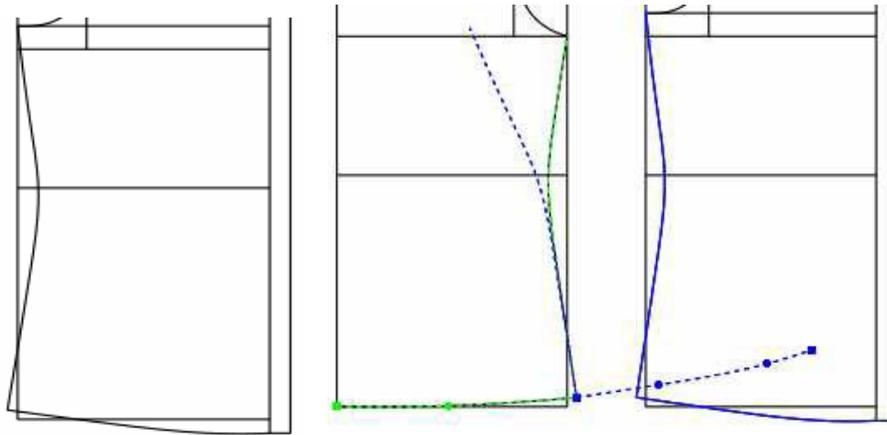
11. Measure and record small shoulder length with compare length tool , Make

Front shoulder with compasses , Draw front armhole with Intelligent pen ;

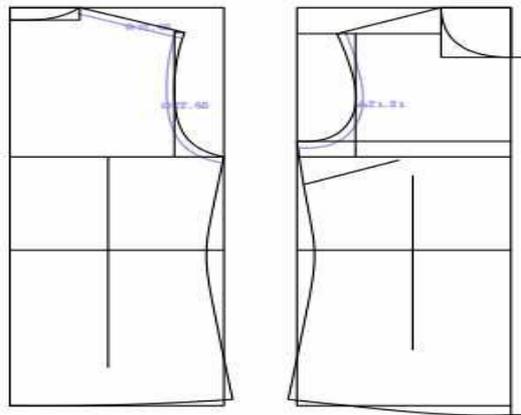


12. Copy back seam line with move tool , At the same time move side point to up



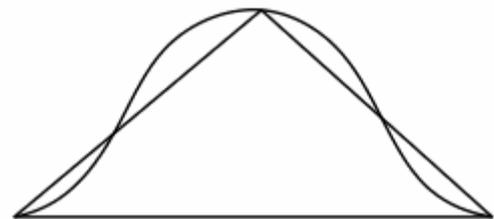
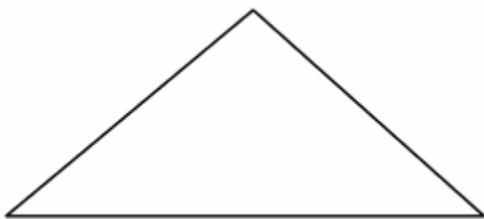


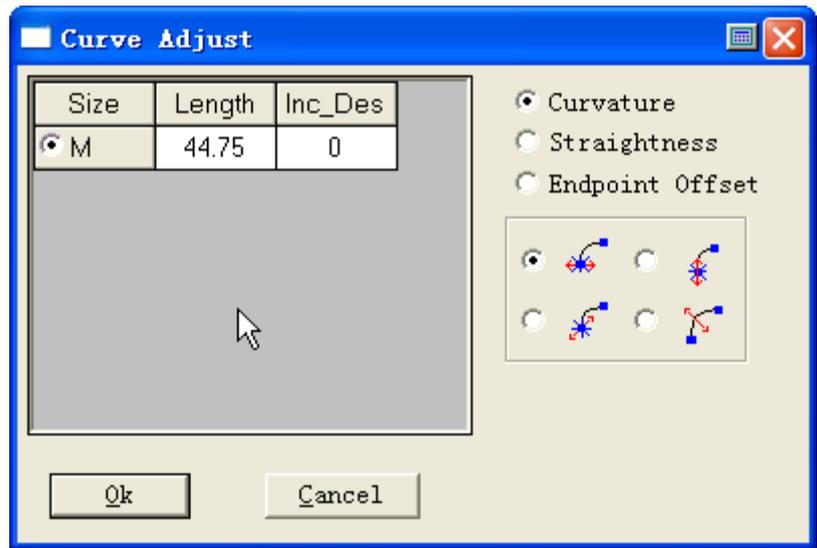
13. Draw closing and bottom line with aptitude pen , Adjust front and back armhole, Front and back collar, Front and back bottom with move and rotate adjust tool ,Make sure these line smooth.



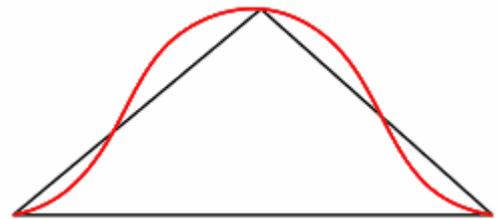
14. Make under armhole center line and fastigate centre line with intelligent pen, measure front and back armhole length and record with compare length tool.

15. Draw sleeve width with intelligent pen, Draw front and back sleeve slope with Compasses tool.

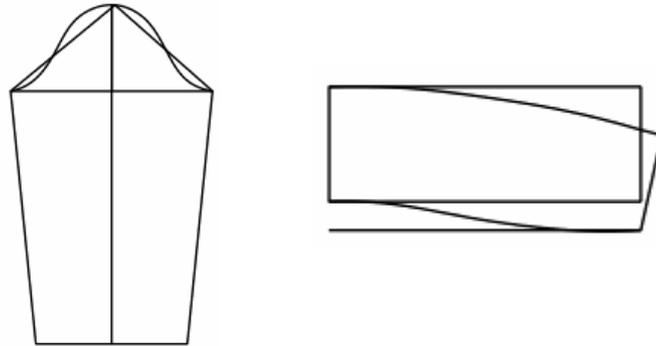




16. Draw sleeve curve with aptitude pen, Adjust it make sleeve line smooth.



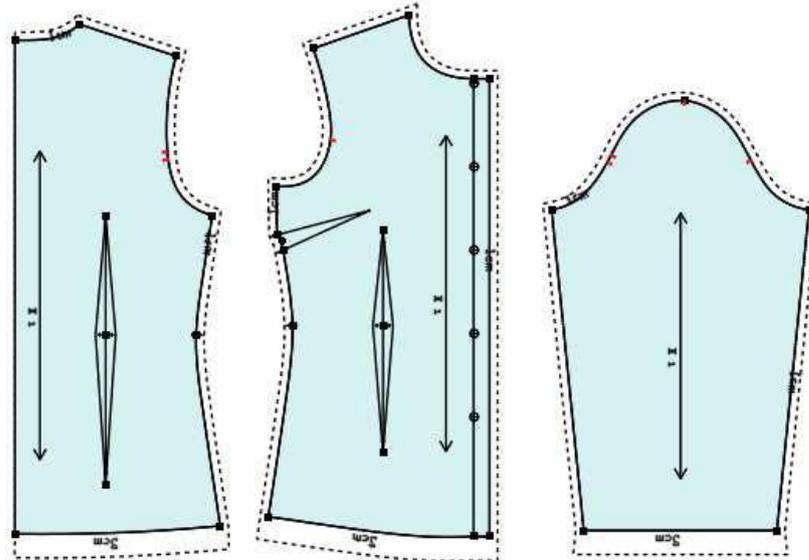
17. Compare Armhole and sleeve value margin with compare length tool If it is not your wanted value, Adjust with curve adjust tool.



18. Draw sleeve center line and cuff and sleeve side seam

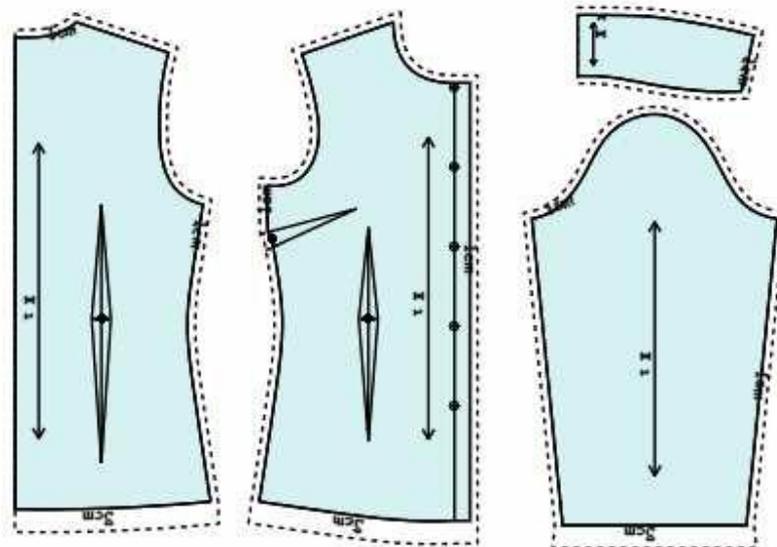
19. Measure front and back collar length with compare length tool , Draw collar with Intelligent pen

20. Get pattern border line with Forflex tool ,Also pattern dart centre line

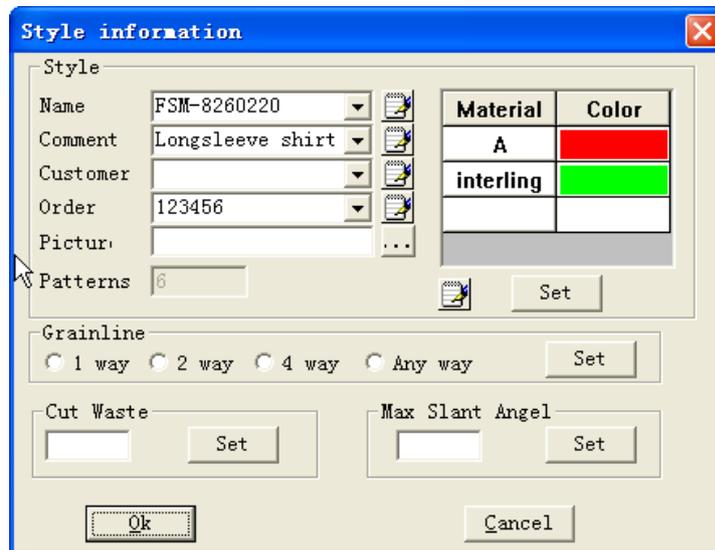
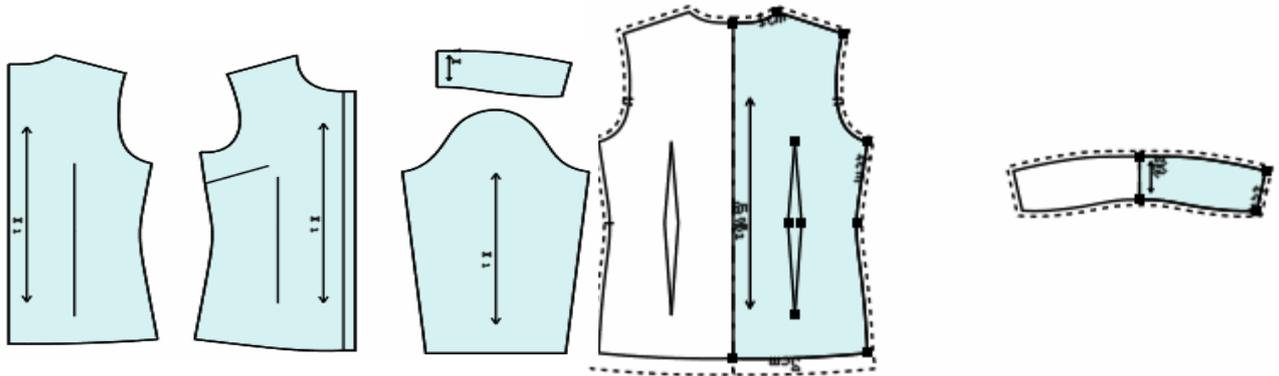


21. Adjust

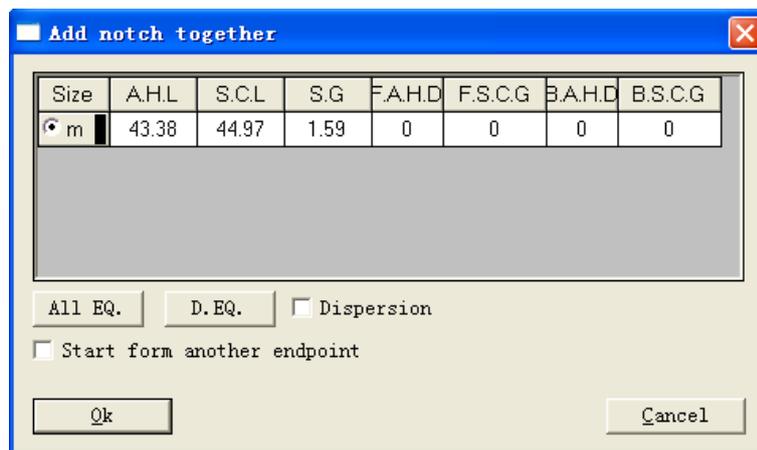
Grainline direction with Grain line tool , Add side seam dart in front with v dart tool , Add waist dart with Fastigate dart tool , Add button on front with drill tool, Add seam with add seam tool.



22. Make notch with Notch tool on waist, Make notch on armhole, sleeve curve with “sleeve Crown and armhole notch tool.

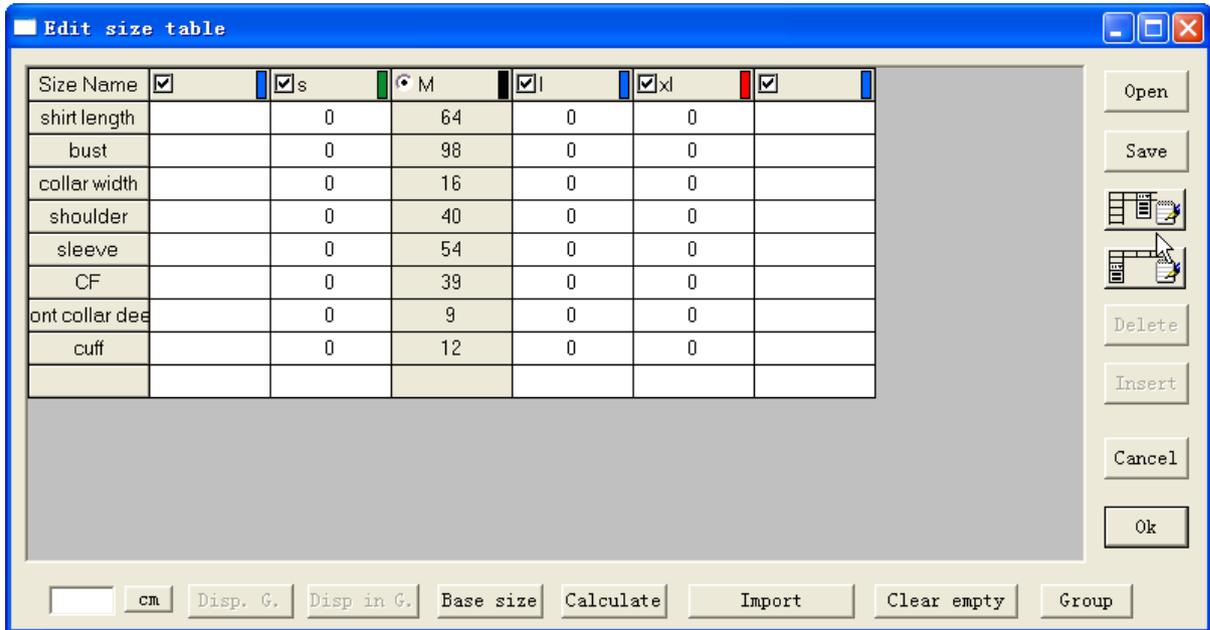


23. Symmetry back and collar with pattern symmetry tool



24. Click [pattern]-[style info], You can see [style information] dialogue table, Set name ,customer, order, Material color, Set the same way for grainline

25. Double click on pattern on pattern list, you can see 【Pattern info】 dialogue table, Input pattern name, Material and copies



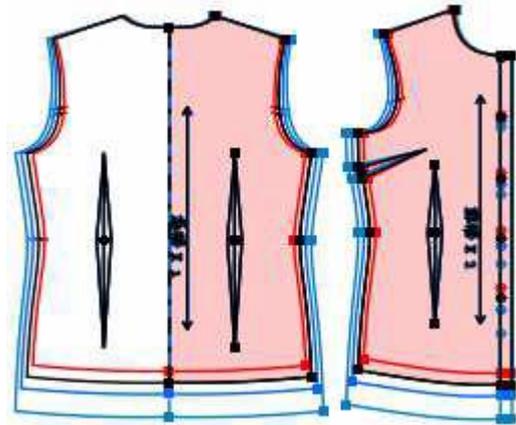
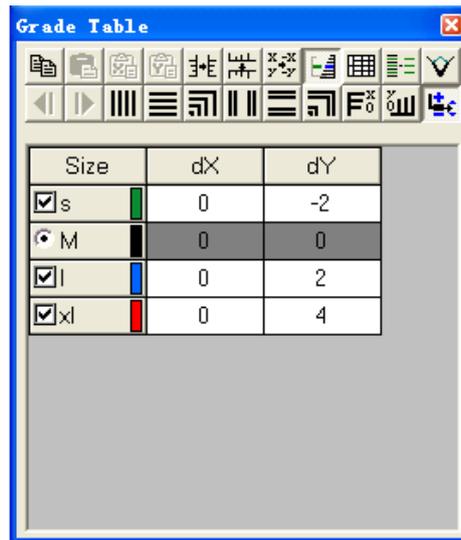
26. Save file, Make new file each time, Click save button , There are 【save as】 dialogue table appear, Select path, save it, If you open again, and modify file , need to save, only need to press save icon
Grading System



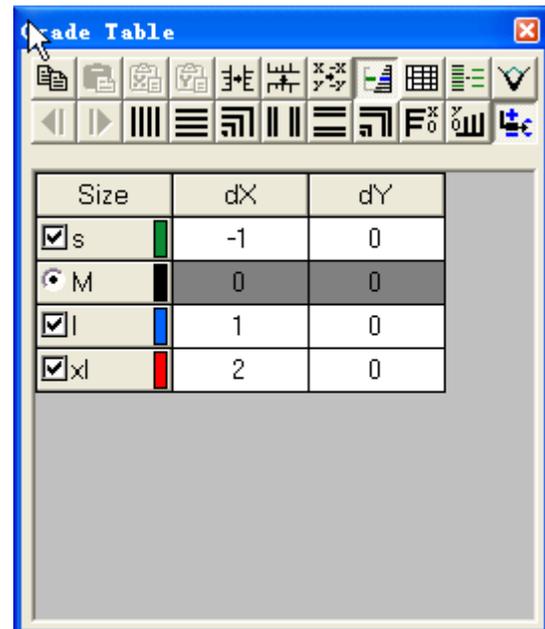
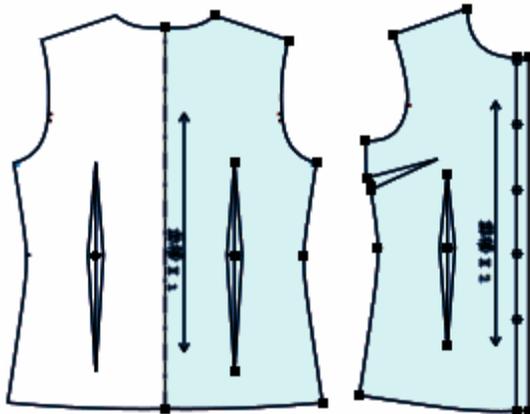
1. Grading: edit size and measurement. Click 【size】 - 【Edit size and measurement】 , Input size needed and Set size color

2. Make display/hide design line icon up ,Make view pattern icon down, hide seam allowance, Put front pattern to work are, Make location well, Click

Grade table icon , You can see Grade table dialogue table, make Auto confirm sign icon down.



3. Finish Front and back pattern shoulder and collar grading with same operation.
4. Select bottom of front and back, If some size dispersion is not same, You can click equal Y first, Input value in different size, Then input Y non equal grading.

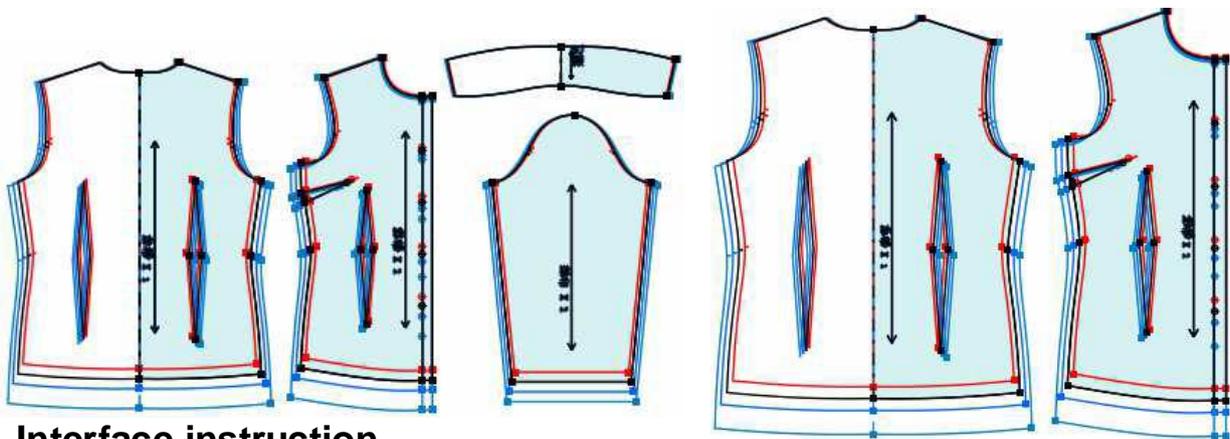


5. Auto confirm sign icon, Make it up. Grading for front and back waist length, Armhole deep, Front collar, Grading for dart with V dart and fastigate dart

6. Grade for sleeve and collar with point grading, And check dispersion Between armhole and sleeve curve with compare length tool

Marker System

GMS is a professional marker-making system specifically for garment industry, This system can help you to improve cutting room efficiency, shorten the production cycle, increase productivity and add additional value to the garment.

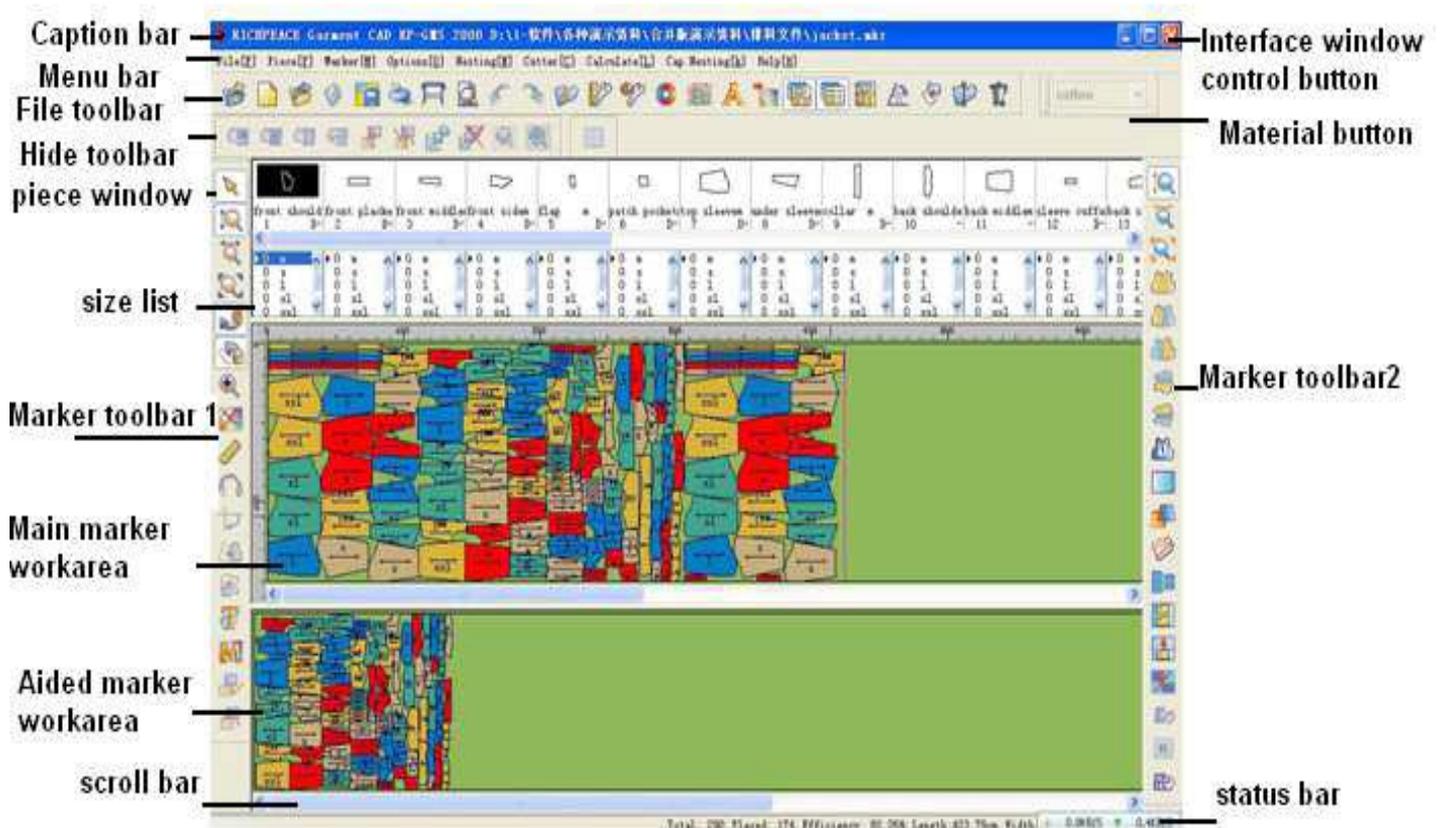


Interface instruction

Caption bar

It is positioned in the top of window showing the file name, type and file saved path

Menu bar



GMS Menu is designed as per the standard windows based software. It contains nine menus which can be selected by clicking on respective menu or by pressing the short key ALT + the underlined letter in each menu

File tool bar

This tool bar has all the usual commands necessary for defining the marker parameters, defining the constraint's to be applied, change the work units, file open and file save, etc.



Hide toolbar



Piece window :

In **Piece window**, it shows all the pieces for a marker file. Each piece is put into the individual box. The size of piece box can be adjusted by dragging its right or left border. By clicking the right button one can rearrange the pieces by their area, height, width, material and or original order in the dialog box.

Size list :

Each small piece box has its size list where all sizes and the piece numbers of each size are shown.

Ruler

It is used for showing the unit of current marker

Marker toolbar 1



Main marker work area

In the main marker work area, you can set the pieces in a manner so as to achieve a highly efficient marker

Scroll bar

It includes horizontal or vertical scroll bar, Drag can browser main and aided marker whole work area, Pattern in piece list, pattern different size.

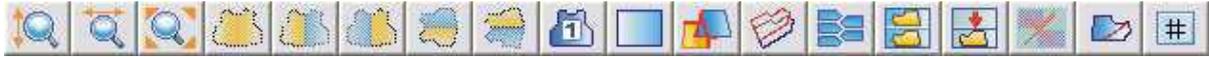
Aided marker work area :

You can put Pieces in the aided marker according to the size, and then drag pieces into the work area to operate as per request.

Status bar :

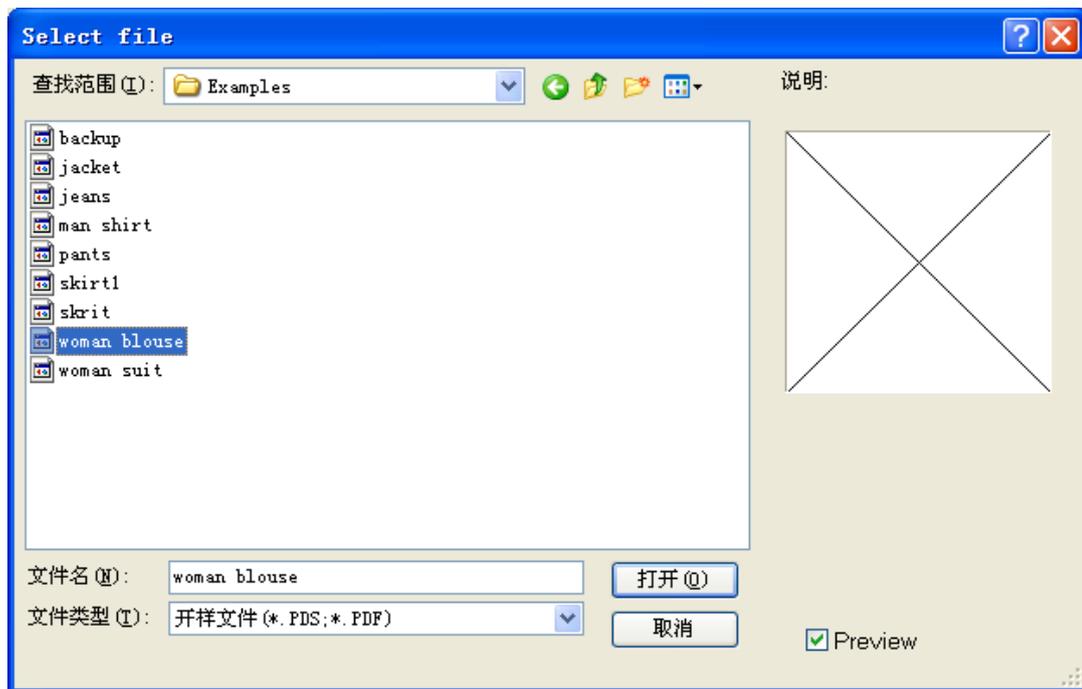
The Status bar is at the bottom of the interface. It shows important information. it contains 8 parts from left to right.

Marker toolbar 2

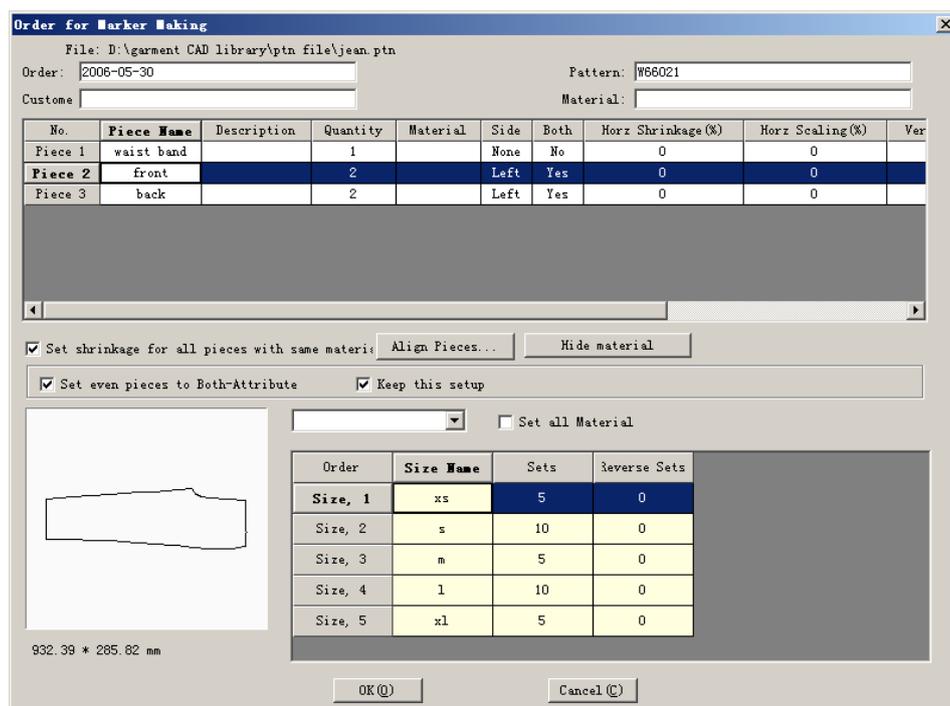


Marking Operation Steps

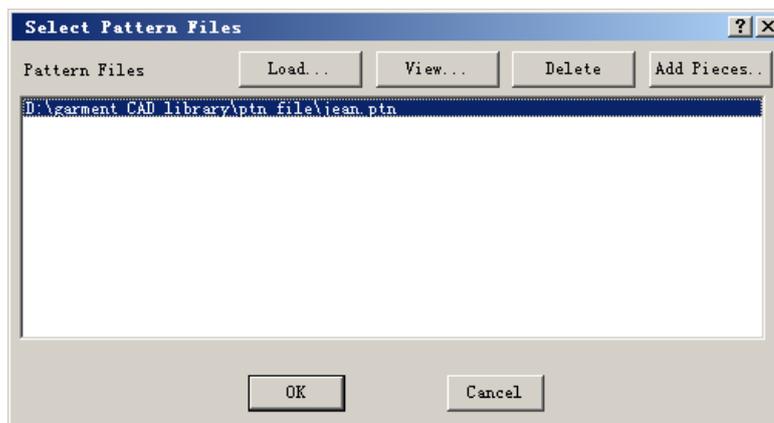
1. Click and the dialog box in the dialog box and the marker border. The marker width in the dialog box can be defined as per the real width of cloth; Length is suggested longer slightly.
2. Click **【Ok】** to get the dialog box.



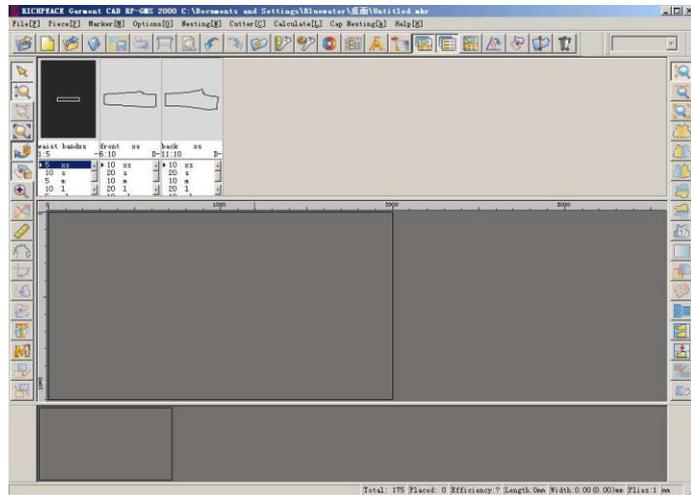
- Click filename, then click **Open** to get the dialog box **Order for Marker Making**. Then you can alter or add more parameter inside the table. All information about pieces in this dialog box have been defined in DGS system when you design your pattern; and you can click the textbox to renew or revise these contents as you require.



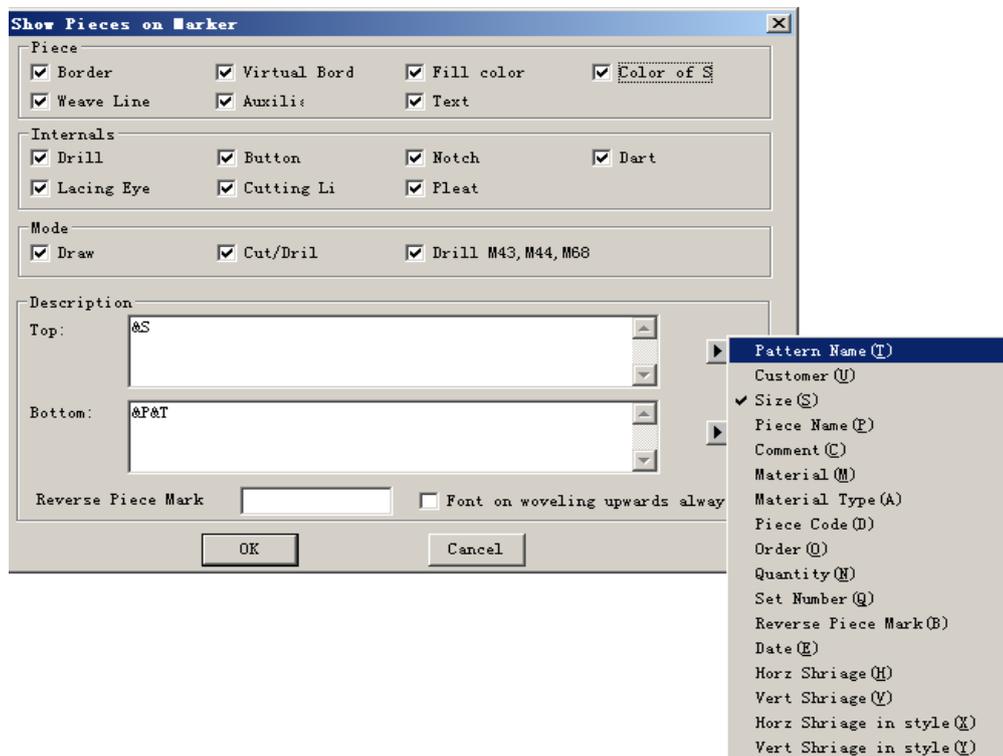
- Input the size quantity for each set: come to the **Sets** column and enter the sets quantities requested in each box.
- Click **Ok** to return to the previous dialog box.

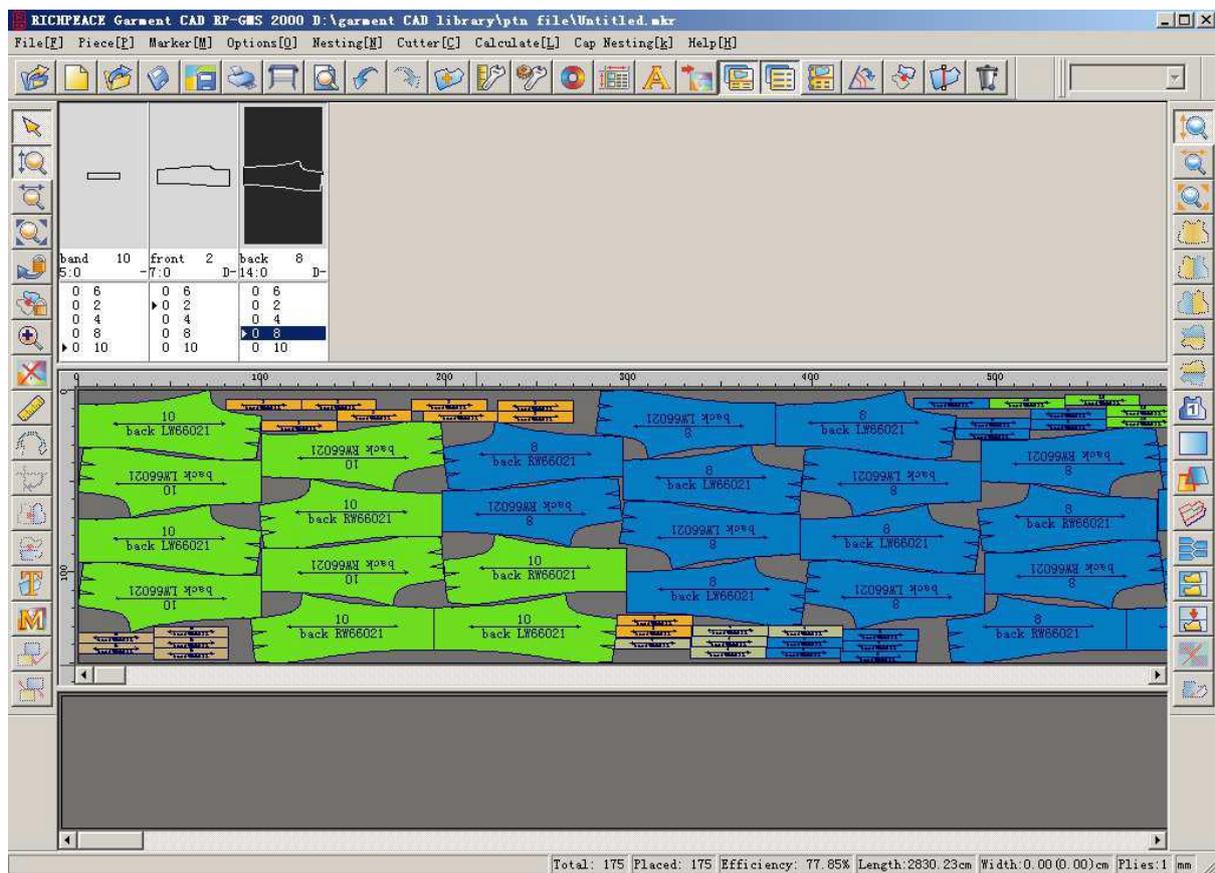


- Click **Ok** again, and you will see that the pieces with their sizes list have been displayed in piece window and size list bar.



- Then you should set the parameter for the pattern display and print. Click **Options** — **Pieces on marker**, click to cancel **Colors of set**, click the arrow slider by **Above weave line** to tick **Size**, **Pattern name** and what are needed to be displayed in piece to define the description.





8. You can view the marker-related information in status bar, **Length** will show the real used material.

9. Click **File** — **Save as** to flip the dialog box **Save as** , and click for a new folder.

Pattern Shrinkage System- Whole pattern shrink operation

1. Select shrink tool;
2. Click on blank or pattern, Then click right, You can see **shrink** dialogue table;
3. Select shrink material, select proper option, input weft and warp shrink, then click Ok

Shrink (unit:%)

No.	Item name	Old weft shrink	New weft shrink	Weft scale	Old warp shrink	New warp shrink	Warp scale
1	sleeve	0.00	0.00	0.00	0.00	0.00	0.00
2	Front	0.00	0.00	0.00	0.00	0.00	0.00
3	Back	0.00	0.00	0.00	0.00	0.00	0.00

Only select pattern Material Weft shrink Weft scale

All patterns in view Warp shrink Warp scale

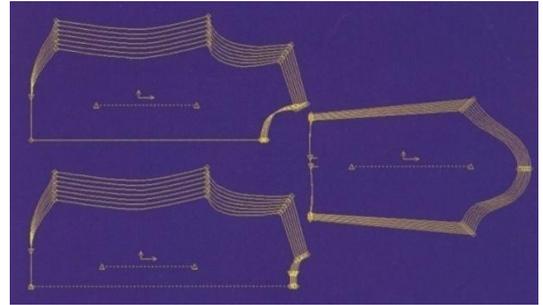
All patterns of style

Presentation :

1. Whole shrink can record old shrink, also can change or delete shrink. For example, Add 5% shrink, After changing new material, shrink is 7%, Input 7 directly, delete shrink, input 0;
2. Change or clear shrink, Table color will filled, it is alert function;
3. Shrink and scale is relevant, Input value on shrink, System will calculate scale automatically, Also, Input value on scale, there are corresponding value in shrink. Take size is 100 as example,When add shrink, Formula is:
 $100+100*10\%+100*10\%*10\%+100*10\%*10\%*10\%.....\approx 111.11$, If add 10%scale, Formula is $100+100*10\%=110$.

Part shrink operation :

1. Click or marquee select shrink border line or assistant line, click right, You can see **【Partial shrink】** dialogue table
2. Input shrink, input proper option;
3. Click **【ok】**



Auto CAD Plotting

To know how to use Auto CAD Plotting instructions-

1. **Set the units-**
 - The first rule is set your drawing correctly
 - Draw with that unit
 - If the unit are not correctly, the blocks will look messy
 - Rescale it manually
 - AutoCAD only recognize two units in plotting: inch and mm
2. **Set your page/layout-**
 - Open your layout
 - Open your page setup manager dialog box and you will see a list of your layouts
 - create a new page setup, give it name, then press ok.
 - Set this values :
 - Your printer/plotter type and sheet size.
 - On what to plot, select Layout.
 - Select plot scale
 - Plot style table you want to use



3. **Set your title block-**

- The dashed rectangle is the area where the printable area.
- Place the title block there.



4. **Place viewports and set the scale-**

- Place it by clicking in view tab viewports section, new icon.
- opened dialog box, select single standard viewport, then click OK
- Draw viewport
- see all the drawing inside it
- set the scale, select the viewport, and select the scale that's wanted

5. **PLOT IT-**

- Last step is just activate plot by typing plot or hit enter
- Make sure everything is correctly done

