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Performance evaluation protocol for digital fitting systems —

Part 2: Virtual garment

Protocole d'évaluation de la performance des systèmes d'habillage virtuel —

Partie 2: Vêtement virtuel

Reference number
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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 133, *Clothing sizing systems — size designation, size measurement methods and digital fittings*.

A list of all parts in the ISO 20947 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

The use of the digital fitting system, employed to evaluate the suitability of real garments on real human body with the use of virtual garments on a virtual human body in cyberspace, is growing in popularity. The system eliminates the need for physical garment production with fabric in product evaluation. Using computer-generated virtual garment pattern, virtual garment is created and tested on either a virtual human body or a virtual fit mannequin (fit form). The technology is expected to improve garment fit and increase productivity. It benefits not only those engaged in garment design but also consumers at the time of garment purchase, with better fit and wider choice of sizes in mass-produced products. Such system is useful for designers, manufacturers, educationalists because the system helps to improve the fit of garments and productivity.

Digital fitting technology is still developing, and there is a wide range of differences in the specification and performance between digital fitting systems. This makes it difficult for users to select an appropriate system for their purposes.

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Performance evaluation protocol for digital fitting systems —

Part 2: Virtual garment

1 Scope

This document specifies a method for describing the functions and the method for evaluating the performance of the virtual garment pattern cutting and clothing simulation modules of digital fitting systems. This document is applicable to fashion designers and pattern technologists (makers) for generating virtual garment patterns, and testing them on a virtual fit mannequin (fit form).

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1 General

3.1.1
digital fitting system
simulation of a virtual garment pattern or virtual garment over a *virtual fit mannequin (fit form)* (3.1.2) providing qualitative and/or quantitative evaluation of the fit through analysis of the distribution of, among other things, surface strain, gap between body and garment, tension map, cross section, surface wrinkles, garment balance

3.1.2
virtual fit mannequin (fit form)
model used for draping and examining silhouette and fit of a garment in a virtual space used for digital fitting

3.1.3
virtual garment
three-dimensional clothing in digital form that exists in virtual space

3.1.4
virtual garment pattern
shapes consisting of straight lines and closed curves that mark the area of a digitized pattern used on the *virtual garment* (3.1.3)

Note 1 to entry: Each pattern consists of a contoured and multiple internal lines, which are used to express seams, internal openings, fold lines, and other garment characteristics.

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3.1.5
clothing simulation
creation and drape simulation of a virtual garment on the virtual human body using a *virtual garment pattern* (3.1.4), virtual sewing and bounding volume

3.1.6
material properties
physical properties of material, including tensile modulus, bending rigidity, shear resistance, thickness, weight

Note 1 to entry: These can be simulated for virtual fabrics using cloth simulation models.

Note 2 to entry: See Annex C.

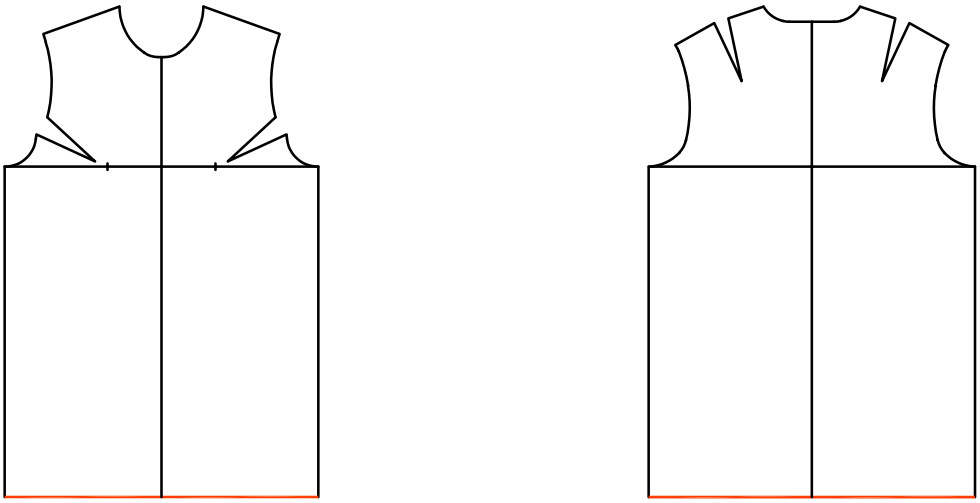
3.1.7
sewing information
information necessary to construct a virtual garment from virtual garment patterns, including seam lines, specific points on a virtual garment pattern such as positions of snaps, hooks, and buttons, notch marks, grain line, and layer information

3.2 Lines on virtual pattern and their lengths

3.2.1 Upper pattern

3.2.1.1
hem line
line at the hem of front bodice or back bodice

Note 1 to entry: See Figure 1. Length of the front hem line, length of back hem line, and total length are measured.



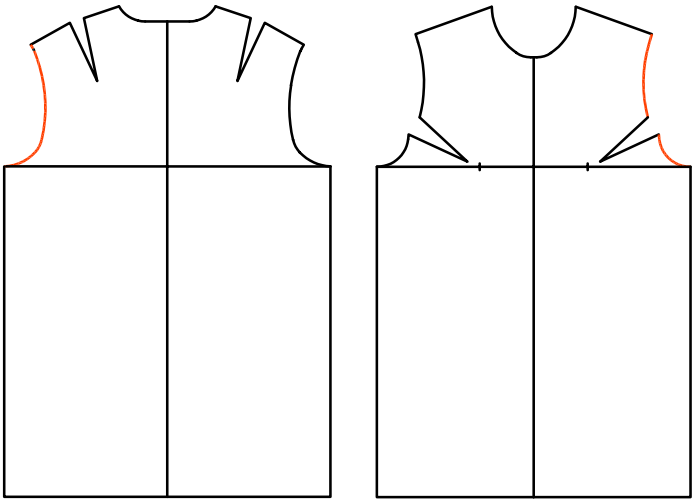
a) Front hem line of front bodice **b) Back hem line of back bodice**

Figure 1 — Hem line

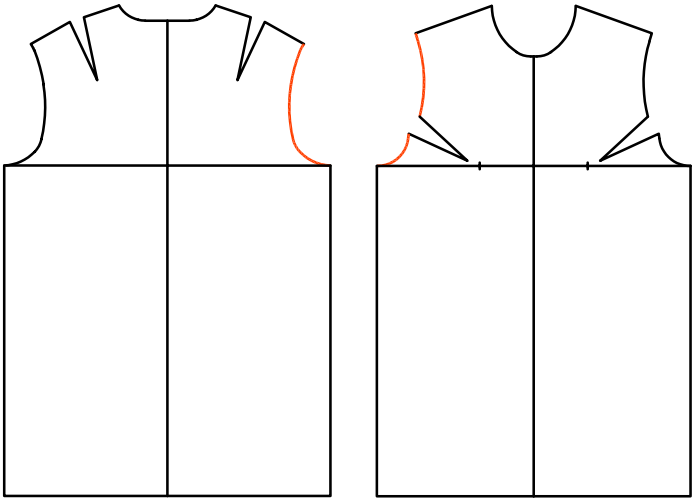
3.2.1.2
armhole line
line at the left and right armhole of front bodice or back bodice

Note 1 to entry: See Figure 2. Length of armhole lines, and total length of armhole lines of front bodice and back bodice are measured.

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a) Left armhole line of front bodice or back bodice



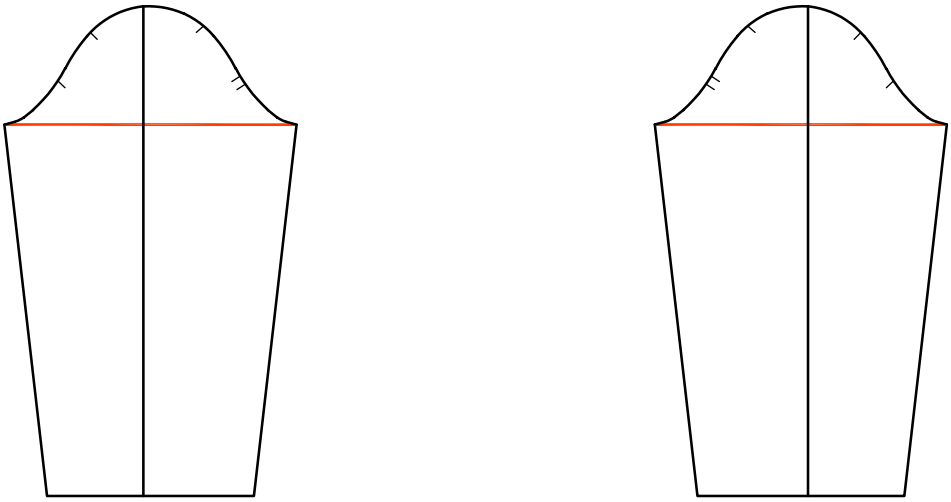
b) Right armhole line of front bodice or back bodice

Figure 2 — Armhole line

3.2.1.3
sleeve width line
straight line connecting the two ends of a line sewing front bodice and back bodice (left or right)

Note 1 to entry: See Figure 3. Length of right or left sleeve width line is measured.

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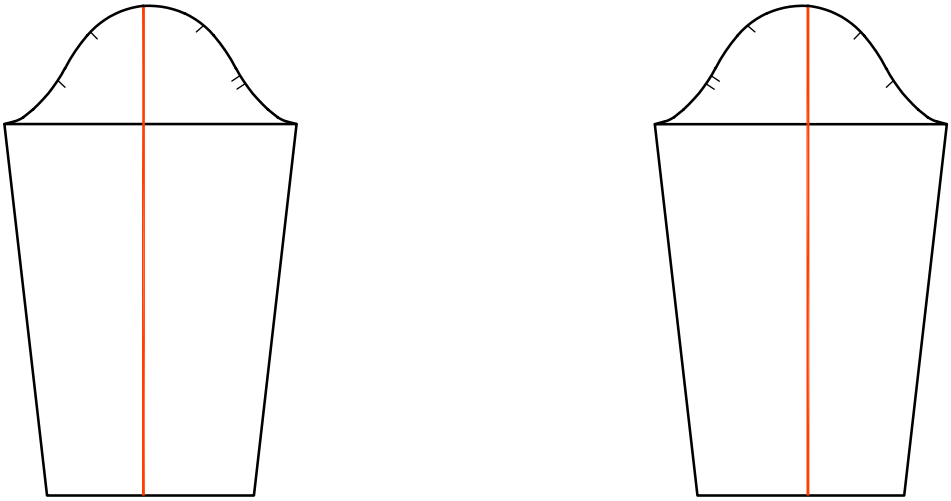


a) Left sleeve **b) Right sleeve**

Figure 3 — Sleeve width line

3.2.1.4
sleeve length line
straight line passing the top of the line sewing front bodice and back bodice and perpendicular to sleeve width line (bicep line) (left or right)

Note 1 to entry: See Figure 4. Length is measured from the top of the sleeve crown seam line to sleeve hem line of the right or left sleeve.



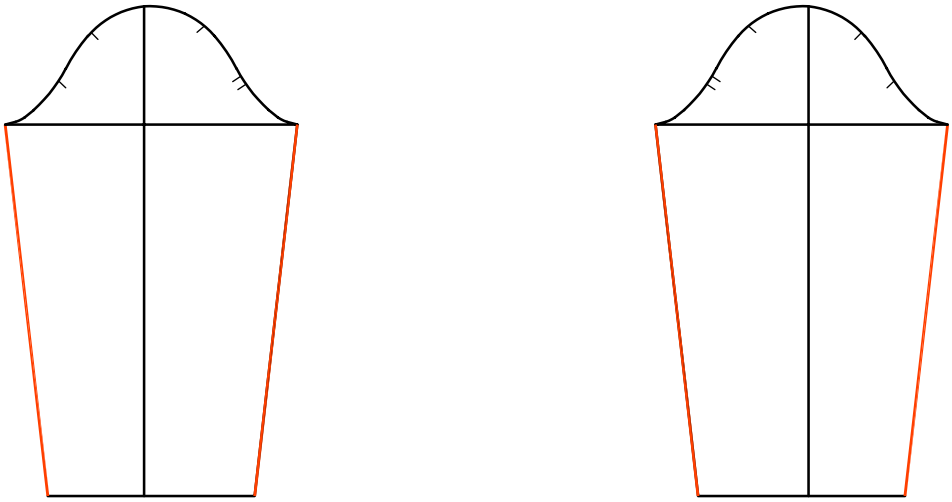
a) Left sleeve **b) Right sleeve**

Figure 4 — Sleeve length line

3.2.1.5
underarm seam line
lines connecting the edge of line sewing front bodice and back bodice and edge of sleeve hem line along which a sleeve is stitched to make a tube (left or right)

Note 1 to entry: See Figure 5. Length is measured from the edge of line sewing front bodice and back bodice to the edge of sleeve hem line of the right or left sleeve. Either line of the left or right sleeve is measured because they are the same length.

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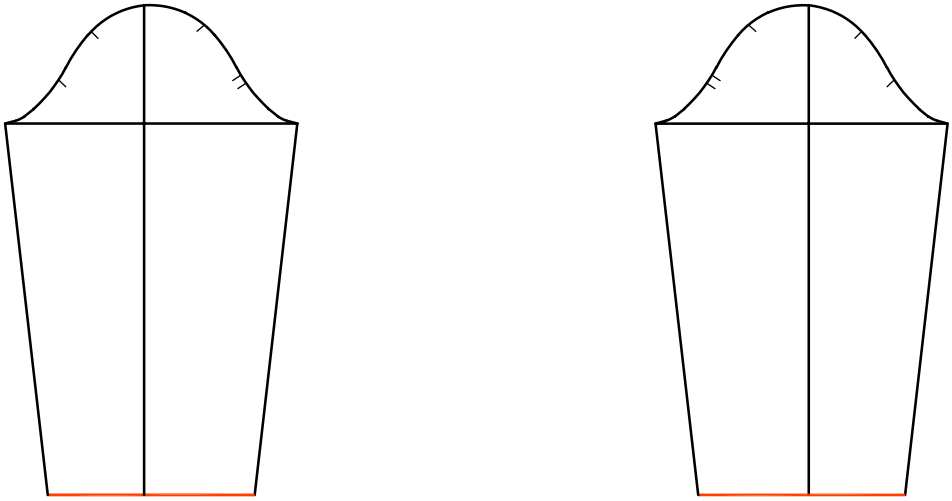


a) Left underarm **b) Right underarm**

Figure 5 — Underarm seam line

3.2.1.6
sleeve hem line
line at the lower edge of the sleeve pattern indicating the hem (left or right)

Note 1 to entry: See Figure 6. Length is measured for the right or left sleeve hem line.



a) Left sleeve **b) Right sleeve**

Figure 6 — Sleeve hem line

3.2.2 Upper pattern and one-piece dress

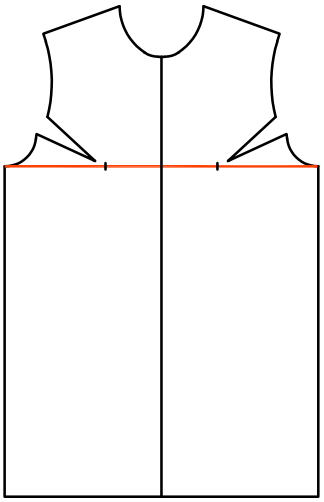
3.2.2.1
bust line
straight line passing the level of the breast point of the pattern and

— perpendicular to the front centre line of the front bodice from the left side line to the right side line (front bust line), or

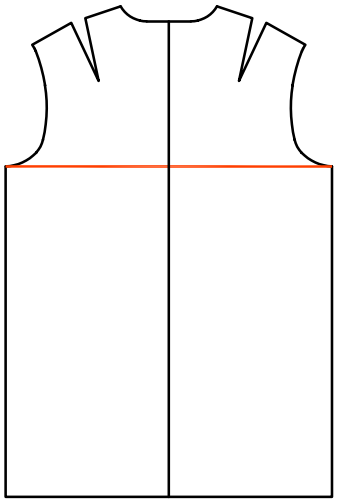
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— perpendicular to the back centre line of the back bodice from the left side line to the right side line (back bust line)

Note 1 to entry: Upper pattern, see Figure 7, one-piece dress, see Figure 8. Length of the front bust line, length of back bust line, and total length are measured.

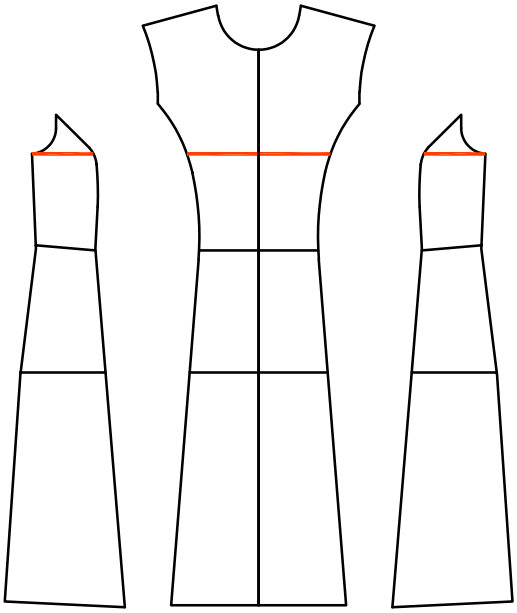


a) Front bust line of front bodice



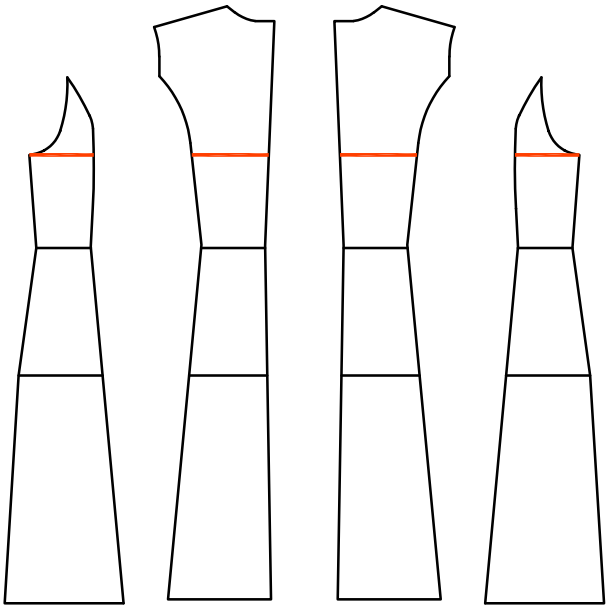
b) Back bust line of back bodice

Figure 7 — Bust line (upper pattern)



a) Front bust line of front bodice

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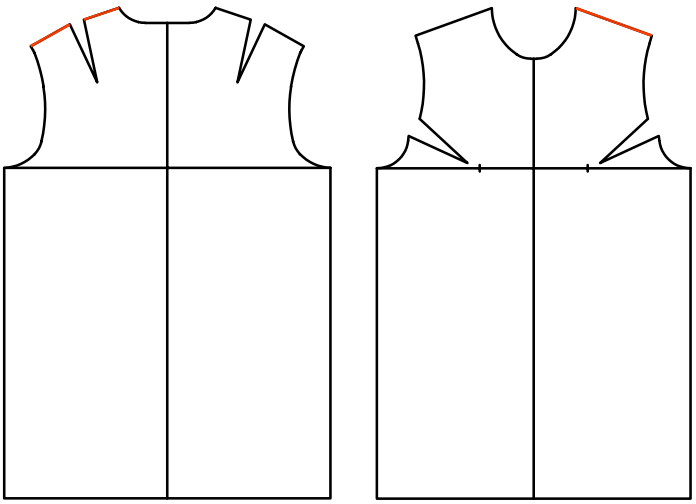


b) Back bust line of back bodice

Figure 8 — Bust line (one-piece dress)

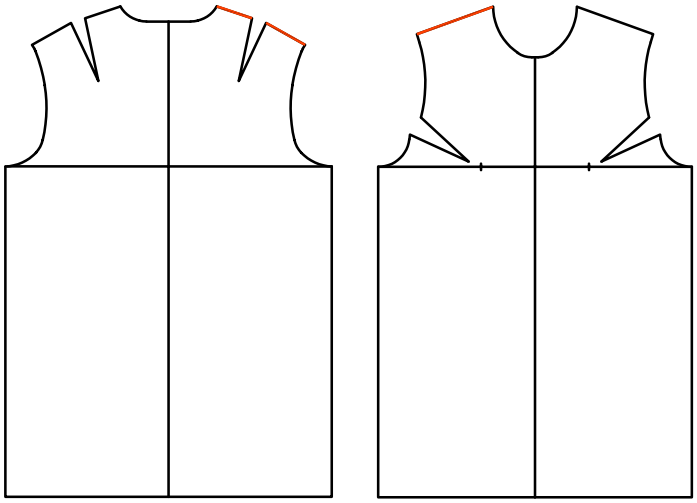
3.2.2.2
shoulder line
straight line at the shoulder of front bodice or back bodice along which the front bodice and back bodice are stitched together

Note 1 to entry: Upper pattern, see Figure 9, one-piece dress, see Figure 10. Length of shoulder lines are measured.



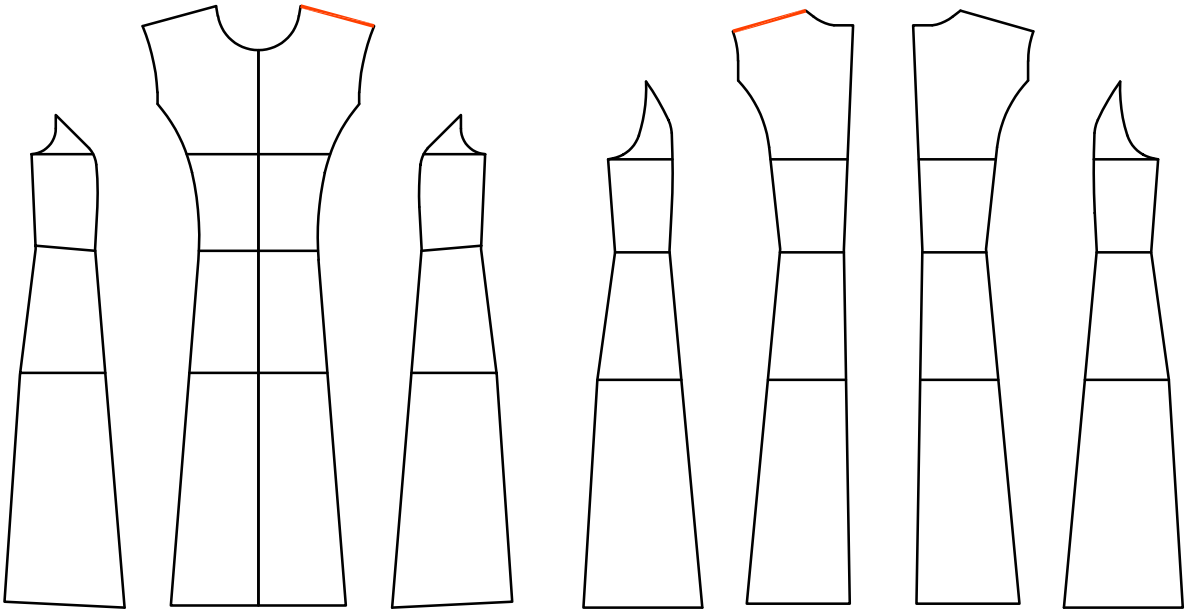
a) Left shoulder line of front bodice or back bodice

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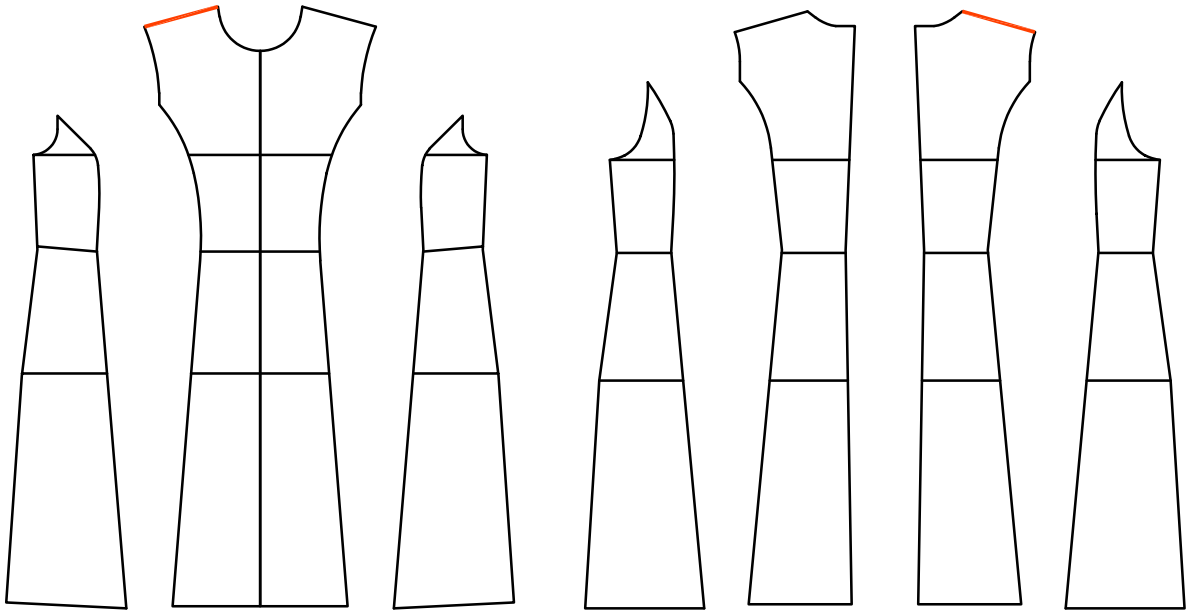
b) Right shoulder line of front bodice or back bodice

Figure 9 — Shoulder line (upper pattern)



a) Left shoulder line of front bodice

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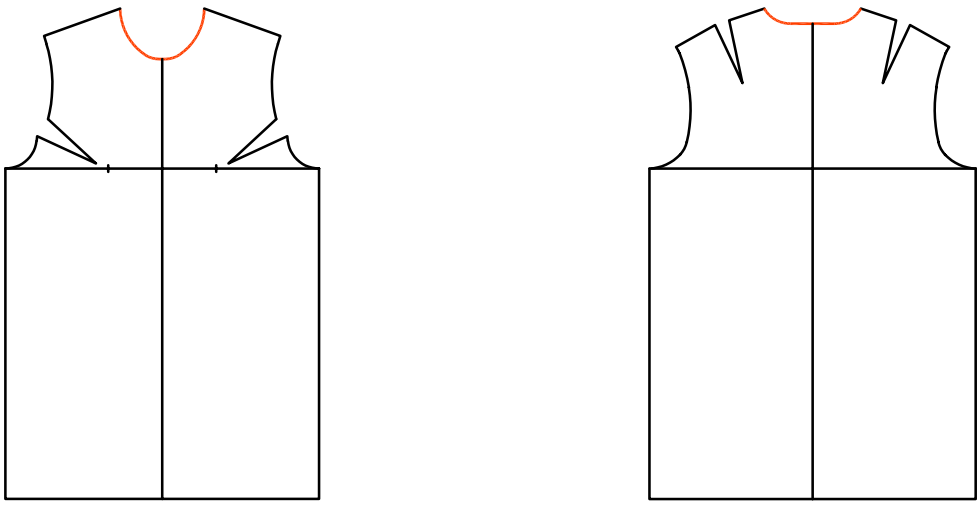


b) Right shoulder line of back bodice

Figure 10 — Shoulder line (one-piece dress)

3.2.2.3
neck line
line at the neck of front bodice or back bodice

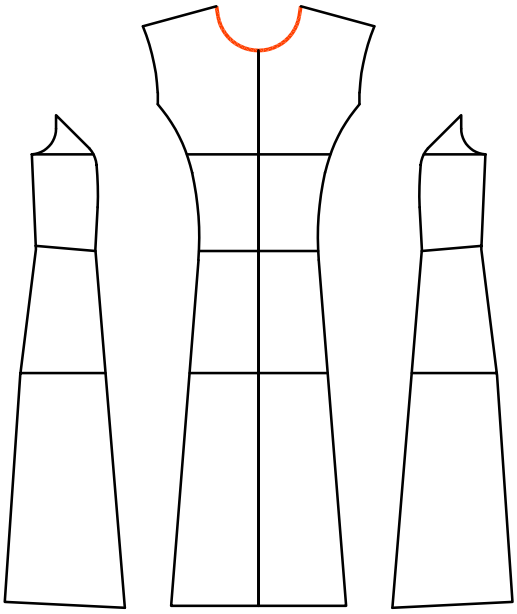
Note 1 to entry: Upper pattern, see Figure 11, one-piece dress, see Figure 12. Length of front neck line, length of back neck line, and total length are measured.



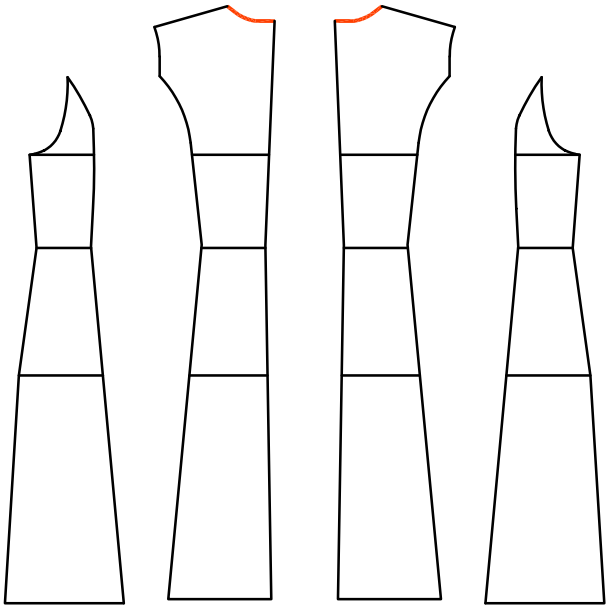
a) Front neck line of front bodice **b) Back neck line of back bodice**

Figure 11 — Neck Line (upper pattern)

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a) Front neck line of front bodice



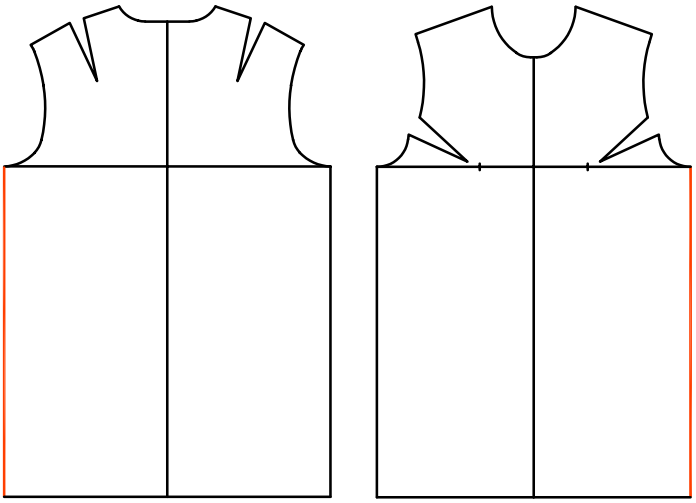
b) Back neck line of back bodice

Figure 12 — Neck line (one-piece dress)

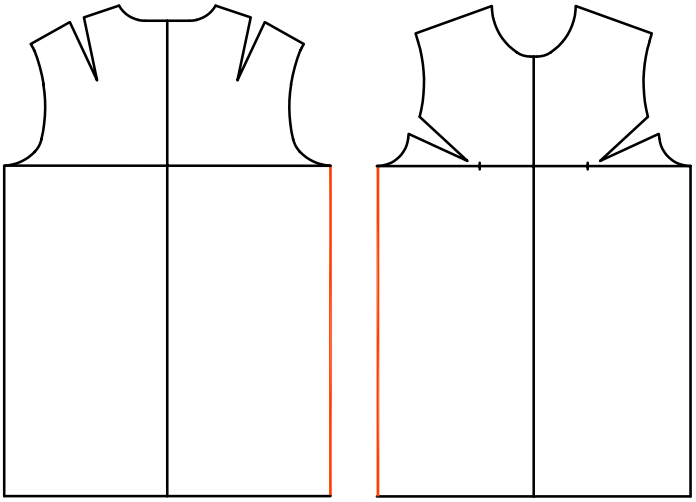
3.2.2.4
side seam line
lines at the side of front bodice or back bodice along which the front bodice and back bodice are stitched together (left or right)

Note 1 to entry: Upper pattern, see Figure 13, one-piece dress, see Figure 14. Length of side lines (right or left of front or back side lines) are measured.

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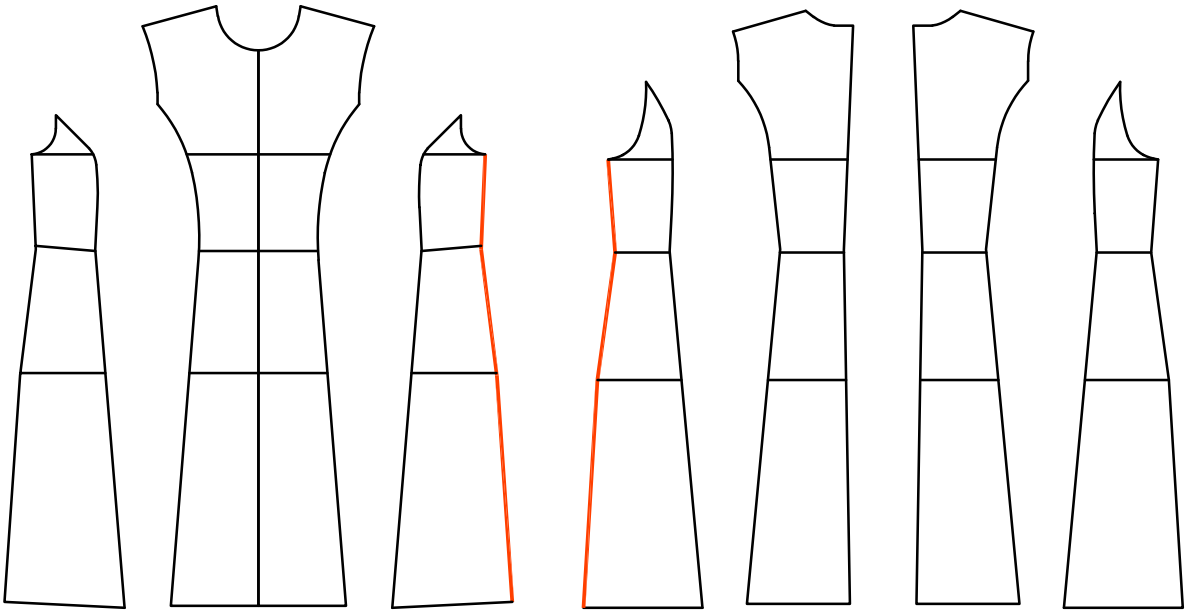
a) Left side line of front bodice or back bodice



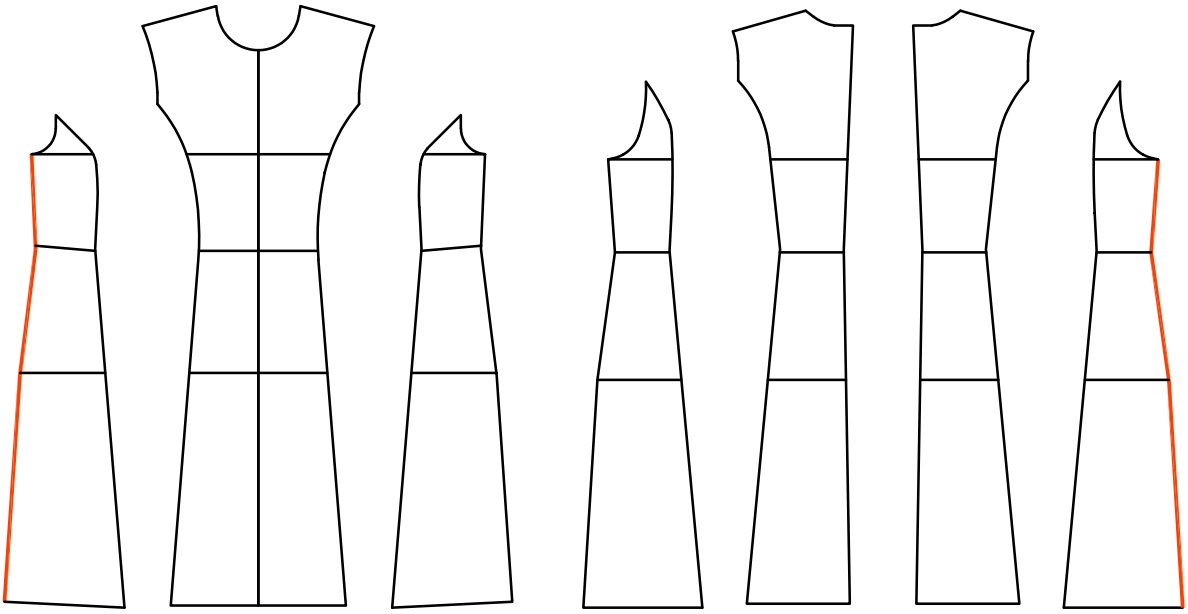
b) Right side line of back bodice or back bodice

Figure 13 — Side line seam line (upper pattern)

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a) Left side seam line of the side of front and back bodice



b) Right side seam line of the side of front and back bodice

Figure 14 — Side seam line (one-piece dress)

3.2.2.5
centre front line
straight line passing the centre of front neck line and perpendicular to the bust line

Note 1 to entry: Upper pattern, see Figure 15, one-piece dress, see Figure 16. Length is measured from neck line to hem line.

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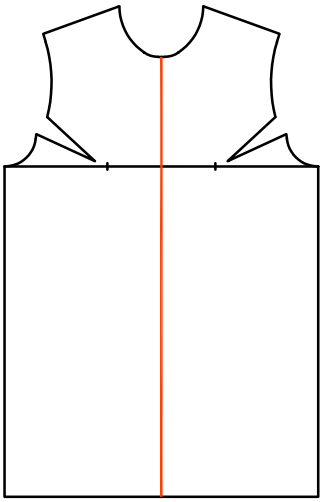


Figure 15 — Centre front line (upper pattern)

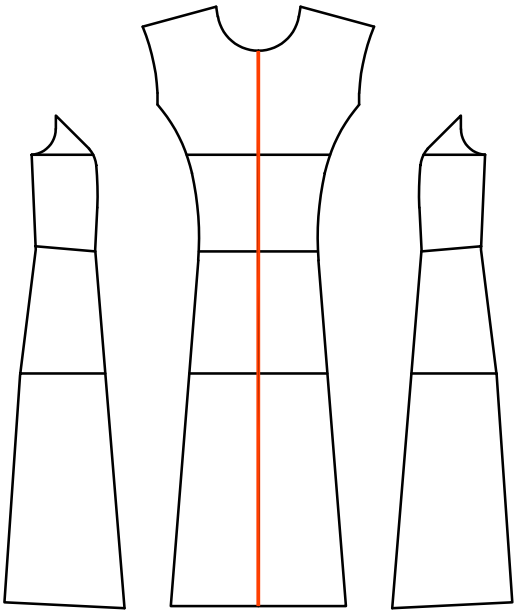


Figure 16 — Centre front line (one-piece dress)

3.2.2.6
centre back line
straight line passing the centre of back neck line and perpendicular to the bust line

Note 1 to entry: Upper pattern, see Figure 17, one-piece dress, see Figure 18. Length is measured from neck line to hem line.

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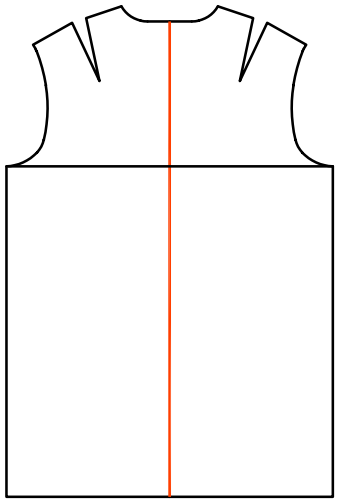


Figure 17 — Centre back line (upper pattern)

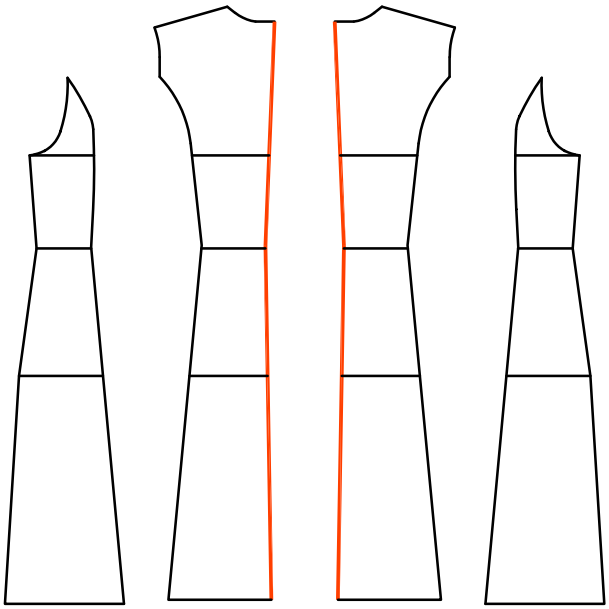


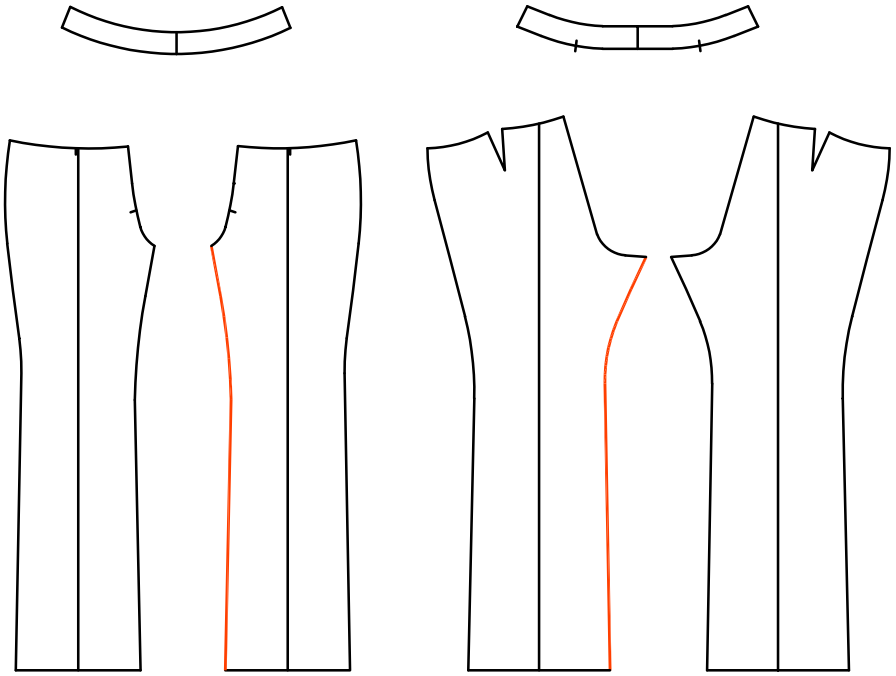
Figure 18 — Centre back line (one-piece dress)

3.2.3 Lower pattern

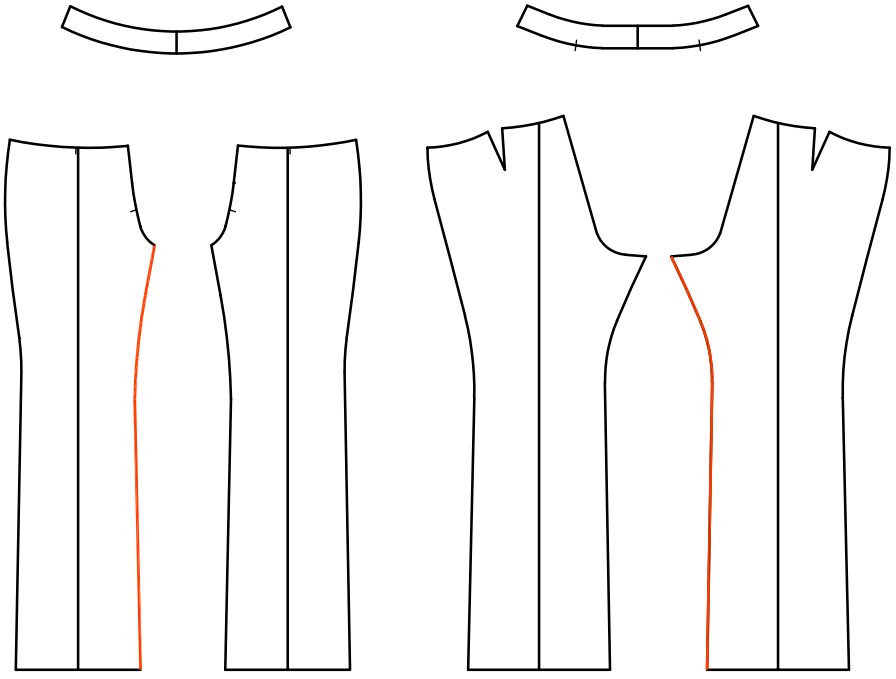
3.2.3.1
inseam line
inside line of the pant legs (below the crotch) (left or right)

Note 1 to entry: See Figure 19. Length of inseam lines are measured.

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a) Left inseam line of the front and back of the left pant legs



b) Right inseam line of the front and back of the right pant legs

Figure 19 — Inseam line

4 Functions

4.1 General

Digital fitting systems shall have functions as described in 4.2 to 4.4.

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