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**Clothing — Digital fittings —  
Attributes of virtual garments**

*Habillement — Bien-être virtuel — Caractéristiques des vêtements  
virtuels*

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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](http://www.iso.org/directives)).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

The committee responsible for this document is ISO/TC 133, *Clothing sizing systems — Size designation, size measurement methods and digital fittings*.

## Introduction

This International Standard is the second of a series which deals with virtual garments for digital fitting.

This International Standard specifically presents attributes of virtual upper and lower body garments, virtual hats and gloves in the virtual garment system, thus supporting online consumers, fashion designers, manufacturers and retailers who have an interest in the style and fit of clothes. It is related to ISO 18163, which deals with composition and attributes of the virtual garments. It is therefore expected to improve convenience for consumers, improve efficiency in clothing manufacturing and contribute to a decrease in the return rate of clothes purchased online.

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# Clothing — Digital fittings — Attributes of virtual garments

## 1 Scope

This International Standard defines the attributes required to produce virtual garments, including virtual hats and virtual gloves using virtual garment software.

## 2 Terms and definitions

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

### 2.1 General terms

#### 2.1.1

##### **virtual garment items**

virtual garments worn on the virtual human body for digital fitting

Note 1 to entry: Includes virtual jackets, virtual shirts, virtual blouses, virtual T-shirts, virtual skirts, virtual trousers, virtual dresses, virtual hat, virtual gloves, etc.

Note 2 to entry: Woven fabric is made by the interlacement of two sets of warp and weft yarn. Knitted fabric is made by interlooping of one set of yarn. Virtual garment system represents the type of fabric through a process of texture mapping and rendering regardless of construction method.

#### 2.1.1.1

##### **virtual jacket**

virtual upper body garments that are worn on the virtual human body and come down between the waist and hips

Note 1 to entry: See [Figure A.1](#).

#### 2.1.1.2

##### **virtual shirt**

virtual men's upper body garments that are worn as a middle layer or outside layer and have a collar, collar stand, cuff opening and decorative cuffs, and are worn on the upper virtual human body

Note 1 to entry: See [Figure A.2](#).

#### 2.1.1.3

##### **virtual blouse**

virtual women's upper body garments that are worn on the upper virtual human body

Note 1 to entry: See [Figure A.3](#).

#### 2.1.1.4

##### **virtual T-shirt**

virtual garments that are shirts made of knit material and are worn on the upper virtual human body

Note 1 to entry: See [Figure A.4](#).

#### 2.1.1.5

##### **virtual skirt**

lower body garment for digital fitting in a cylindrical shape that covers both legs at once

Note 1 to entry: Includes skirts of various lengths and silhouettes.

Note 2 to entry: See [Figure B.2](#).

**2.1.1.6**

**virtual trousers**

lower body garment for digital fitting that covers each leg separately

Note 1 to entry: Includes trousers of various lengths and silhouettes.

Note 2 to entry: See [Figure B.1](#).

**2.1.1.7**

**virtual dress**

virtual women's whole body garment that consists of a skirt with an attached bodice

Note 1 to entry: See [Figure C.1](#).

**2.1.1.8**

**virtual hat**

virtual garment worn on the head of the virtual human body

Note 1 to entry: Virtual caps and virtual beanies are included.

**2.1.1.8.1**

**virtual cap**

virtual garment worn on the head of the virtual human body with a partial visor

**2.1.1.8.2**

**virtual beanie**

virtual garment worn on the head of the virtual human body with no brim and just a crown that is made of a stretchy knit material

Note 1 to entry: Includes berets.

**2.1.1.9**

**virtual gloves**

virtual garment worn on the hands of the virtual human body

**2.2 Terms relating to basic composition and attributes**

**2.2.1 Virtual garment pattern**

**2.2.1.1**

**virtual upper body garment pattern**

virtual upper body garment based on a basic garment pattern consisting of a virtual front bodice pattern, virtual side bodice pattern, virtual back bodice pattern, and virtual sleeve pattern

Note 1 to entry: An example of a virtual upper body garment pattern is shown in [Figure 1](#).

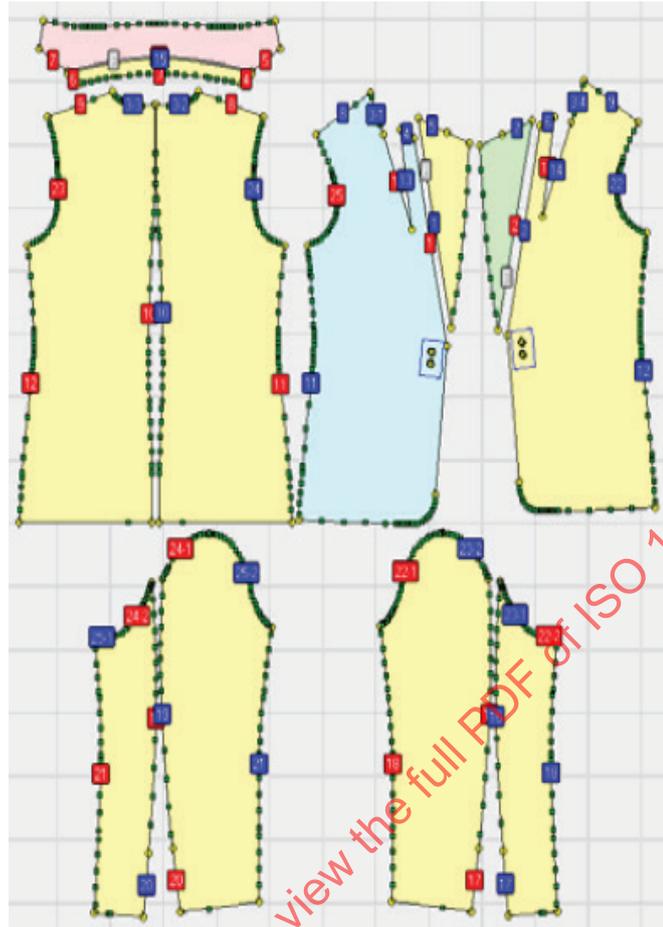


Figure 1 — Example of the structure of a virtual upper body garment pattern

#### 2.2.1.1.1

##### **virtual front bodice pattern**

virtual garment pattern placed on the front of the torso of the virtual human body

#### 2.2.1.1.2

##### **virtual side bodice pattern**

virtual garment pattern placed on the side of the torso of the virtual human body

#### 2.2.1.1.3

##### **virtual back bodice pattern**

virtual garment pattern placed on the back of the torso of the virtual human body

#### 2.2.1.1.4

##### **virtual sleeve pattern**

<upper body> virtual garment pattern placed on the arms of the virtual human body

Note 1 to entry: A garment may not have sleeves according to the design.

#### 2.2.1.2

##### **virtual lower body garment pattern**

virtual lower body garments based on basic garment patterns, including the virtual front pattern, virtual back pattern and virtual waist belt pattern

Note 1 to entry: An example of a virtual lower body garment pattern is shown in [Figure 2](#) and [Figure 3](#).

2.2.1.2.1

**virtual front pattern**

<lower body> virtual garment pattern placed on the front of the leg of the virtual human body

2.2.1.2.2

**virtual side pattern**

virtual garment pattern placed on the side of the leg of the virtual human body

2.2.1.2.3

**virtual back pattern**

<lower body> virtual garment pattern placed on the back of the leg of the virtual human body

2.2.1.2.4

**virtual waist belt pattern**

virtual garment pattern placed on the waist of the virtual human body

Note 1 to entry: The lower body garment may not have a belt according to the design.

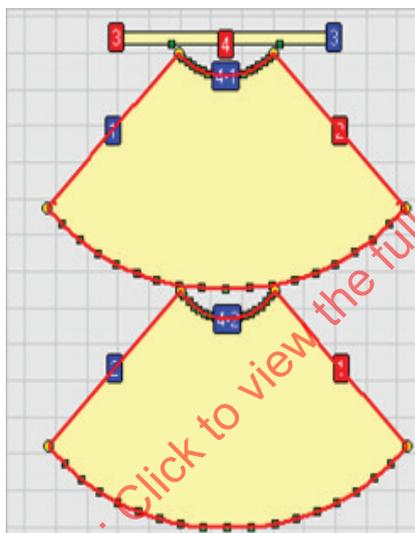


Figure 2 — Example of the structure of a virtual skirt pattern

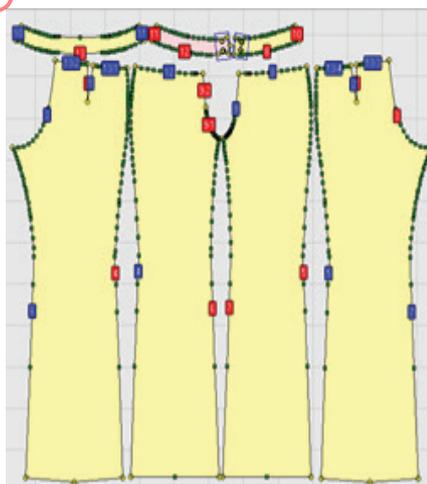


Figure 3 — Example of the structure of a virtual trousers pattern

### 2.2.1.3

#### virtual whole body garment pattern

virtual whole body garments based on basic garment patterns, including the *virtual front pattern* (2.2.1.3.1), *virtual back pattern* (2.2.1.3.2) and *virtual sleeve pattern* (2.2.1.3.3)

Note 1 to entry: An example of a virtual whole body garment pattern is shown in [Figure 4](#).

#### 2.2.1.3.1

##### virtual front pattern

<whole body> virtual garment pattern placed on the front of the virtual human body

#### 2.2.1.3.2

##### virtual back pattern

<whole body> virtual garment pattern placed on the back of the virtual human body

#### 2.2.1.3.3

##### virtual sleeve pattern

<whole body> virtual garment pattern placed on the arms of the virtual human body

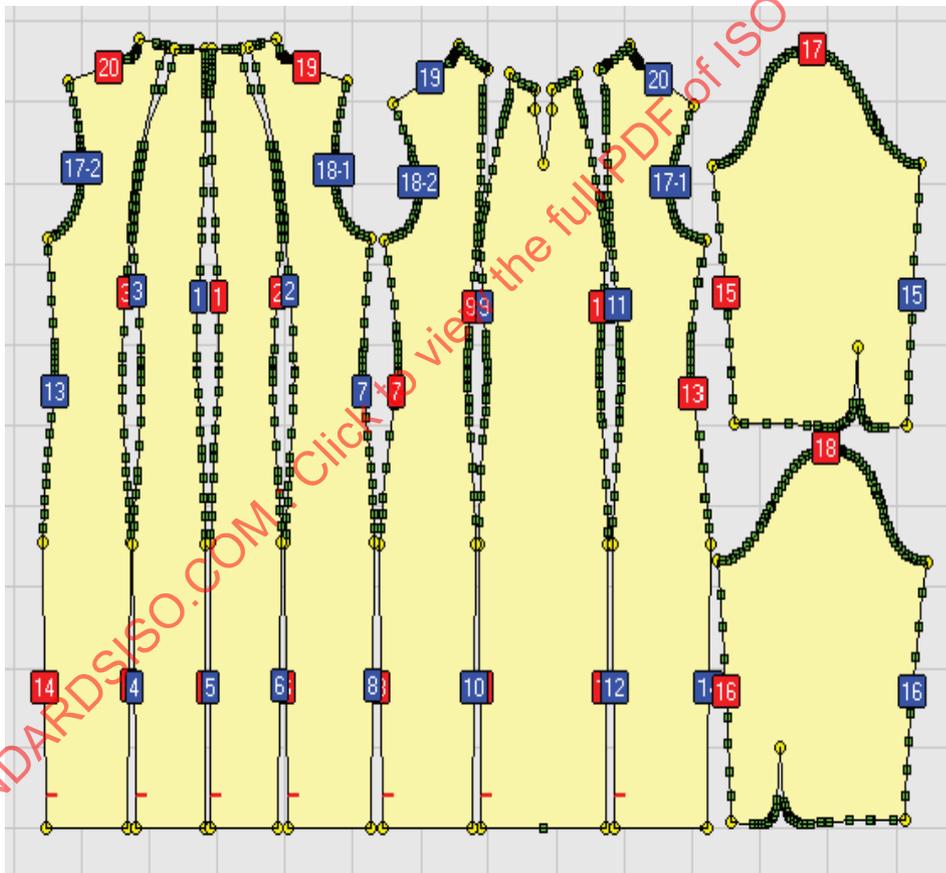


Figure 4 — Example of the structure of a virtual dress pattern

### 2.2.1.4

#### virtual hat pattern

*virtual hat* (2.1.1.8) based on a basic garment pattern which consists of a virtual crown pattern and/or a virtual brim pattern

#### 2.2.1.4.1

##### virtual crown pattern

part of the *virtual hat* (2.1.1.8) placed on the head of the virtual human body

Note 1 to entry: It can be round or angular, etc.

Note 2 to entry: The crown of a hat generally consists of an outside pattern and inside pattern, but a digital pattern only has one outside pattern. An example of a virtual crown pattern is shown in [Figure 5](#).

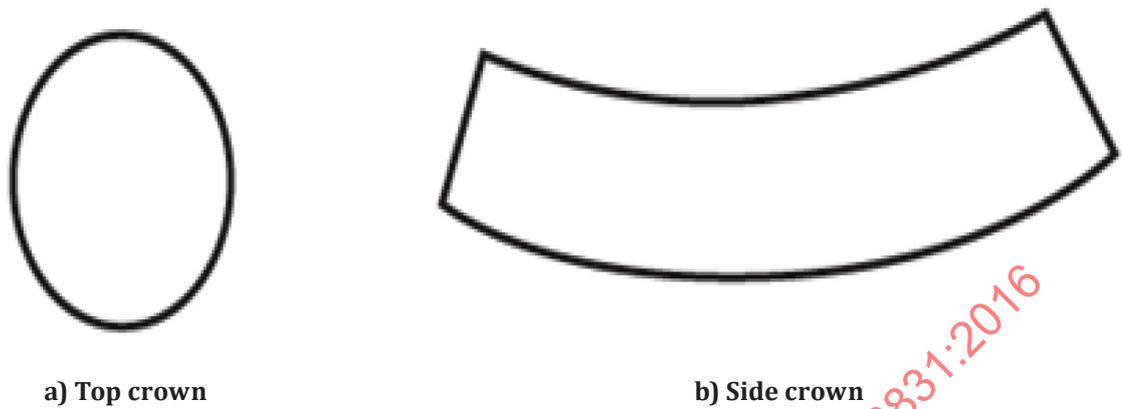


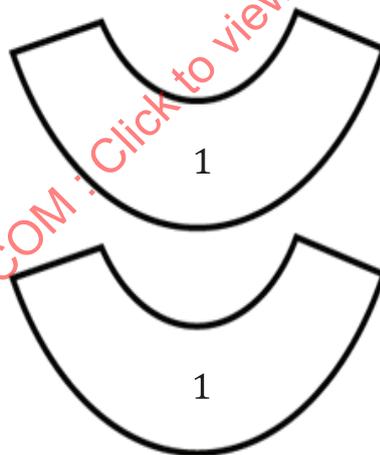
Figure 5 — Example of the pattern structure of a virtual crown

**2.2.1.4.2**  
**virtual brim pattern**

brim of a hat that can be pushed up or pulled down

Note 1 to entry: A hat may have no brim.

Note 2 to entry: An example of a virtual brim pattern is shown in [Figure 6](#).



**Key**  
1 brim

Figure 6 — Example of the pattern structure of a virtual brim

**2.2.1.5**  
**virtual gloves pattern**

*virtual gloves* (2.1.1.9) based on a basic pattern which consists of the main pattern, a thumb pattern, and finger gusset patterns

Note 1 to entry: An example of a virtual gloves pattern is shown in [Figure 7](#).

**2.2.1.5.1****main pattern**

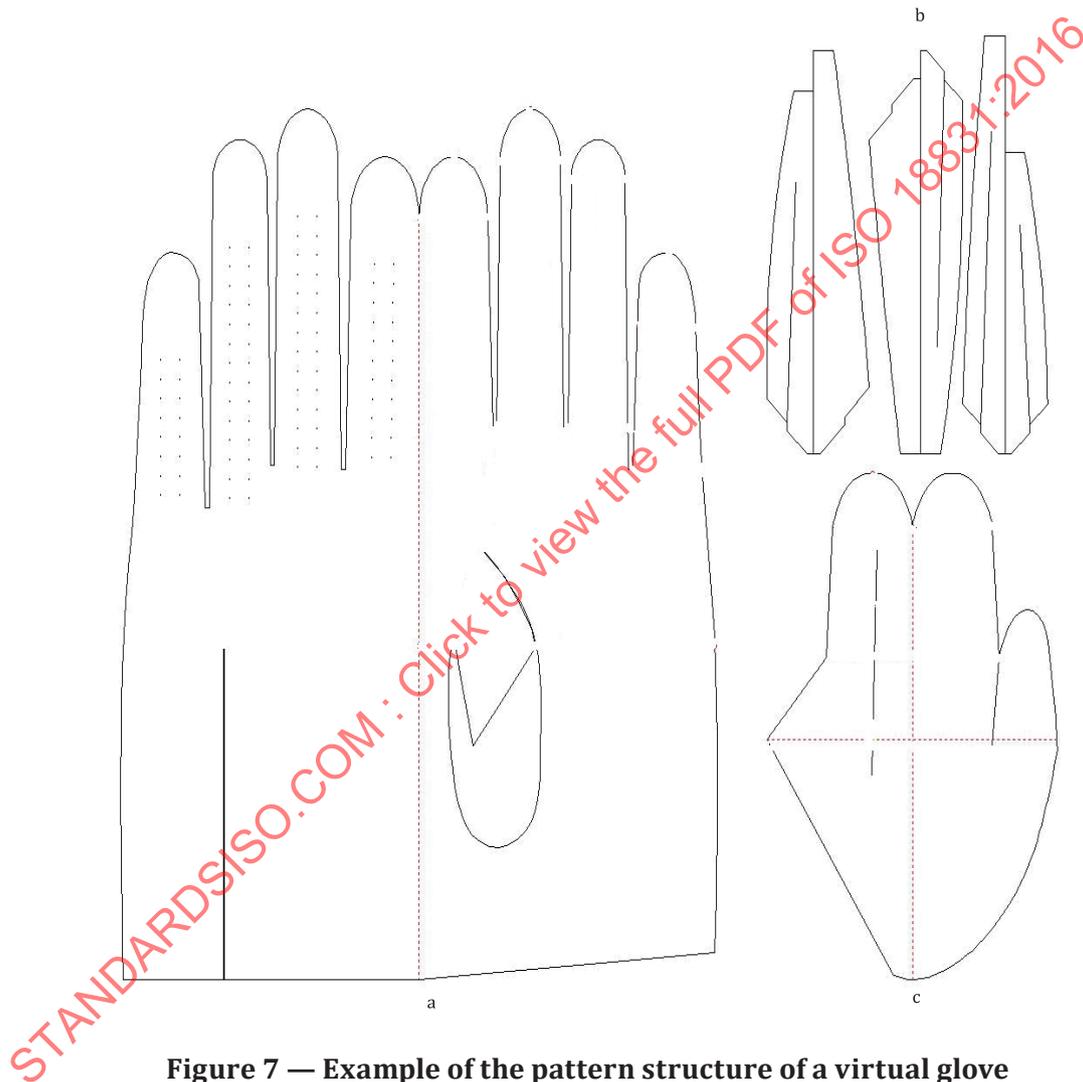
single pattern that wraps both sides of a hand which has four fingers without thumb

**2.2.1.5.2****thumb pattern**

pattern that wraps the thumb of a hand

**2.2.1.5.3****finger gusset pattern**

narrow striped patterns that form the side walls of fingers



**Figure 7 — Example of the pattern structure of a virtual glove**

**Key**

- a main pattern (one piece)
- b finger gusset patterns
- c thumb pattern

**2.2.2****virtual garment design details**

design elements of the virtual body garment including virtual collars, virtual cuffs, virtual yokes, virtual plackets, virtual pockets, virtual slits, virtual overlaps, etc.

Note 1 to entry: An example of a *virtual gloves pattern* (2.2.1.5) is shown in [Figure 7](#).

Note 2 to entry: Decorative design elements used for *virtual hats* (2.1.1.8) include virtual corsages, virtual ribbon, virtual tape and virtual strings, etc.

Note 3 to entry: Design elements of the *virtual gloves* (2.1.1.9) include internal openings, drill holes, etc.



Figure 8 — Example of design elements of the virtual body garment

#### 2.2.2.1

##### virtual collar

area closest to the neck, consisting of a collar and collar band

Note 1 to entry: Upper body garments generally consist of an outside pattern and inside pattern, such as interfacing and lining.

#### 2.2.2.2

##### virtual cuff

area beneath the sleeves that wrap around the wrists

Note 1 to entry: Cuffs exist in shirts and trousers.

Note 2 to entry: Cuffs generally consist of an outside pattern and inside pattern, but a digital pattern only has one outside pattern.

#### 2.2.2.3

##### virtual yoke

part that connects the front and back bodices of the shirt and covers the shoulders

Note 1 to entry: Yokes generally consist of an outside pattern and inside pattern, but a digital pattern only has one outside pattern.

**2.2.2.4****virtual placket**

extension for closing on a shirt with buttonholes

Note 1 to entry: Extensions for closing are generally cut and sewn separately or created by rolling the front part of the bodice material.

Note 2 to entry: However, a digital pattern has an extension for closing that is an elongation of the front bodice, or expresses the area with internal lines.

**2.2.2.5****virtual pocket**

pockets of various shapes attached to the bodice or trousers

Note 1 to entry: The location of the pocket is sewn on the marked location of the digital garment.

**2.2.2.6****virtual slit**

long back slit placed on *virtual skirts* ([2.1.1.5](#))

Note 1 to entry: Digital patterns express a garment as one piece without seam allowance or lining. The skirt is sewn up to the location of the slit to express the slit.

**2.2.2.7****virtual overlap**

extended part of the under lap pattern piece with buttons (or button holes)

Note 1 to entry: For digital garments, the horizontal/vertical margin where the material overlaps, focusing on the buttons, is defined to create an opening.

**2.2.2.8****virtual corsage**

flower-shaped decoration used to decorate a dressy hat

Note 1 to entry: Includes decorative elements, such as feathers. Decorative feature used to enhance the garment.

**2.2.2.9****virtual ribbon**

item made of thin material used for functional decorative purposes, e.g. hat trimmings

**2.2.2.10****virtual tape**

image or colour to create the effect of decorative tape

Note 1 to entry: Inside lines can be added to a pattern and filled with an image or colour to create the effect of decorative tape.

**2.2.2.11****virtual string**

string used to decorate a hat

**2.2.2.12****internal opening**

arbitrarily shaped cut lines inside a pattern which make openings after assembly

**2.2.2.13****drill hole**

placement for effective ventilation

Note 1 to entry: Internal section of the material used to create a shape and flat material.

### 2.2.3

#### **virtual garment details that create shape**

elements that create the shape of a virtual body garment including virtual darts, virtual pleats, virtual tucks, virtual ease, virtual gathers, virtual stretch, etc.

#### 2.2.3.1

##### **virtual dart**

triangle used to create curves in flat material

Note 1 to entry: See Reference [3].

Note 2 to entry: A digital pattern expresses virtual darts with internal lines with direction.

#### 2.2.3.2

##### **virtual pleats**

type of fold created by folding the material

Note 1 to entry: A digital pattern expresses the parts where pleats will be folded with internal lines, and a different angle is applied to each line to express diverse pleats.

#### 2.2.3.3

##### **virtual tuck**

feature created by selecting part of the material and sewing it down in a vertical line, horizontal line, diagonal line, etc.

Note 1 to entry: A digital pattern expresses various tucks with internal lines and stitching.

#### 2.2.3.4

##### **virtual ease**

feature created by sewing two seams of different lengths, used to express volume in tailored clothing

Note 1 to entry: A digital pattern sews two seams of different lengths without wrinkles to express natural volume.

#### 2.2.3.5

##### **virtual gather**

decorative sewing technique for shortening the length of a strip of fabric so that the longer piece can be attached to a shorter piece

Note 1 to entry: For digital patterns, these can be created when two lines of different lengths are sewn together.

#### 2.2.3.6

##### **virtual stretch**

feature created by sewing two seams of different lengths, used to express stretch

Note 1 to entry: A shorter seam is stretched and sewn onto a longer seam.

### 2.2.4

#### **virtual body garment closure and cinch tools**

closure and cinching of virtual body garments, including under and overlap, edge to edge and cinching within the garment area

Note 1 to entry: Fasteners of *virtual hats* (2.1.1.8) are in the form of *virtual cap* (2.1.1.8.1) back fasteners. The fastener can be expressed through texture mapping or objects.

#### 2.2.4.1

##### **under and overlap closure**

circular or other-shaped tool attached to one side of the material to open and close the clothing at regular intervals

Note 1 to entry: See Reference [3].

Note 2 to entry: Expressed as a point on digital patterns. Texture mapping used to express texture.

**EXAMPLE** Slide fasteners, buttons, hooks and eyes, touch and close and winding of thread shank (for digital patterns, a sewing distance value is entered to express a thread shank so buttons and buttonholes can be sewn a set distance from the material).

#### 2.2.4.2

##### **edge to edge closure**

fastening that helps to open and close clothing easily

**EXAMPLE** Slide fasteners.

Note 1 to entry: Consists of fastener, tape, a chain, slider and pull tab.

Note 2 to entry: The shape of a zipper is expressed through texture mapping for digital patterns.



a) Virtual zipper



b) Virtual buttons

**Figure 9 — Example of closure of the virtual body garment**

#### 2.2.4.3

##### **cinch closure**

closure to adjust the size of the virtual area of the garments

#### 2.2.4.4

##### **texture maps**

bitmap images used for the realistic visualization of virtual garments

#### 2.2.4.5 Optional tools

##### 2.2.4.5.1

##### **initials**

initials of the wearer's name

Note 1 to entry: Usually consists of a few letters for customization.

##### 2.2.4.5.2

##### **logos**

small signs or logos attached on the back pattern for decoration purpose

## Annex A (informative)

### Example of virtual upper body garment

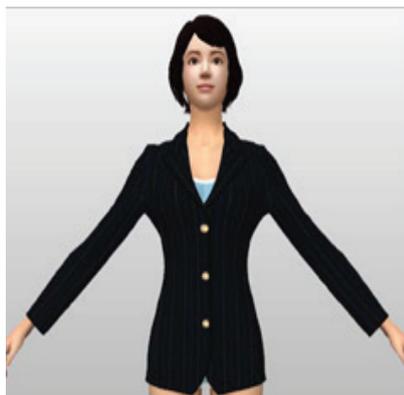


Figure A.1 — Virtual jacket



Figure A.2 — Virtual shirt



Figure A.3 — Virtual blouse



Figure A.4 — Virtual T-shirt