BS ISO 20947-2:2020

BSI Standards Publication

Performance evaluation protocol for digital fitting systems

Part 2: Virtual garment

Documents
Document Sharing Hub

Full document details: BS ISO 20947-2:2020

National foreword

This British Standard is the UK implementation of ISO 20947-2:2020.

The UK participation in its preparation was entrusted to Technical Committee TCI/66/-/3, Clothing sizing systems.

A list of organizations represented on this committee can be obtained on request to its committee manager.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2021
Published by BSI Standards Limited 2021

ISBN 978 0 580 98476 1

ICS 61.020

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 January 2021.

Amendments/corrigenda issued since publication

Date	Text affected

Documents
Document Sharing Hub

Full document details: BS ISO 20947-2:2020

INTERNATIONAL STANDARD

ISO 20947-2

First edition
2020-12

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
ISO 20947-2:2020(E)

Documents
Document Sharing Hub

© ISO 2020

Full document details: BS ISO 20947-2:2020

COPYRIGHT PROTECTED DOCUMENT

© ISO 2020

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

© ISO 2020 – All rights reserved

Documents
Document Sharing Hub

Full document details: BS ISO 20947-2:2020

Contents

Page

Foreword ... **iv**
Introduction ... **v**
1 Scope ... **1**
2 Normative references ... **1**
3 Terms and definitions ... **1**
3.1 General ... 1
3.2 Lines on virtual pattern and their lengths ... 2
4 Functions ... **15**
4.1 General ... 15
4.2 Data import ... 16
4.3 Digital fitting ... 16
4.4 Function to measure lengths of lines ... 16
5 Qualitative evaluation of performance ... **17**
6 Quantitative evaluation of performance ... **17**
6.1 General ... 17
6.2 Import of virtual fit mannequin (fit form) ... 17
6.3 Import of virtual garment pattern and line measurement ... 18
6.3.1 General ... 18
6.3.2 Upper ... 18
6.4 Import sewing information ... 19
6.5 Three-dimensional arrangement of virtual patterns ... 20
6.6 Virtual sewing ... 22
6.7 Measurement of lengths of virtual garment ... 24
6.8 Calculation of difference ... 24
7 Report ... **24**
8 Evaluation ... **24**
Annex A (normative) **Format for report: Qualitative evaluation of a digital fitting system** ... **25**
Annex B (normative) **Example of report: Qualitative evaluation of a digital fitting system** ... **26**
Annex C (informative) **Format for report (Upper): Quantitative evaluation of a digital fitting system** ... **27**

© ISO 2020 – All rights reserved

Documents
Document Sharing Hub
Full document details: BS ISO 20947-2:2020

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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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.

© ISO 2020 – All rights reserved
Documents
Document Sharing Hub
Full document details: BS ISO 20947-2:2020

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.

© ISO 2020 – All rights reserved

Documents
Document Sharing Hub
Full document details: BS ISO 20947-2:2020

Documents
Document Sharing Hub

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.

© ISO 2020 – All rights reserved

Documents
Document Sharing Hub
Full document details: BS ISO 20947-2:2020

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.

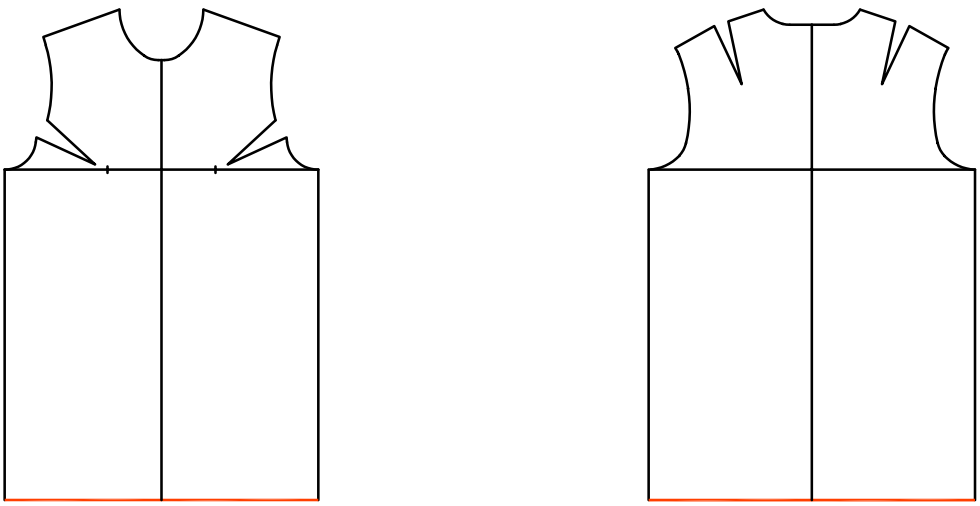
3.1.7
sewing information
information necessary to construct a virtual garment from virtual garment patterns, including seam lines, specific points on a virtual garment pattern such as positions of snaps, hooks, and buttons, notch marks, grain line, and layer information

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.



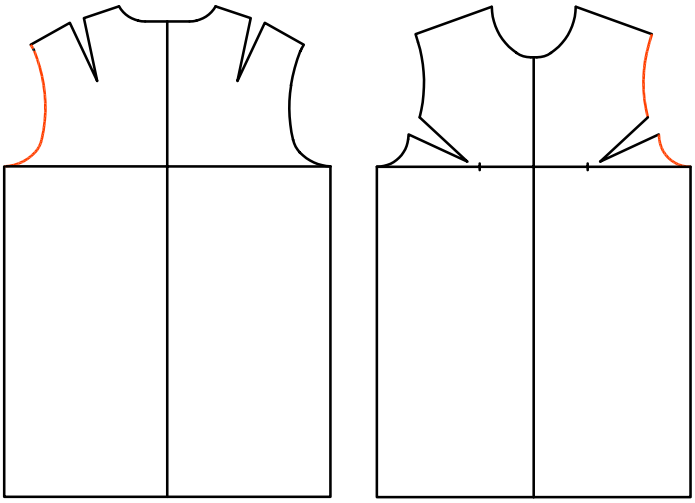
a) Front hem line of front bodice **b) Back hem line of back bodice**

Figure 1 — Hem line

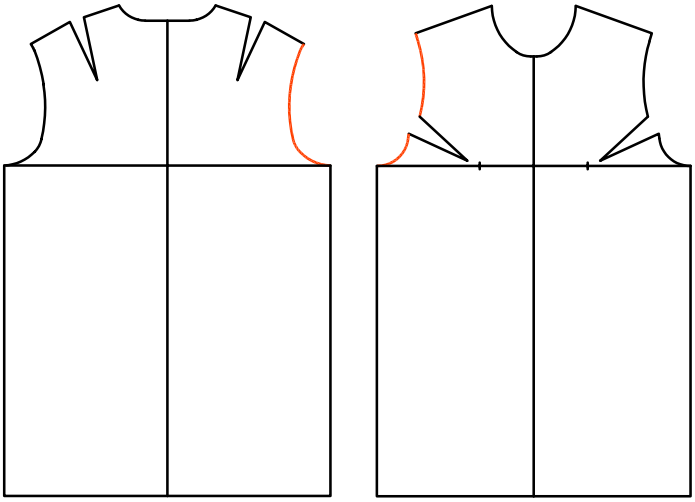
3.2.1.2
armhole line
line at the left and right armhole of front bodice or back bodice

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.

© ISO 2020 – All rights reserved
Documents
Document Sharing Hub
Full document details: BS ISO 20947-2:2020



a) Left armhole line of front bodice or back bodice



b) Right armhole line of front bodice or back bodice

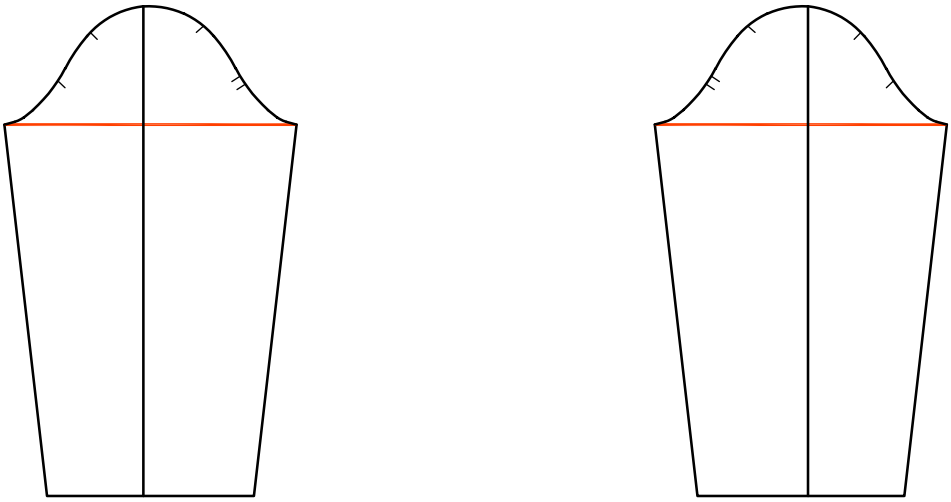
Figure 2 — Armhole line

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.

© ISO 2020 – All rights reserved

Documents
Document Sharing Hub
Full document details: BS ISO 20947-2:2020

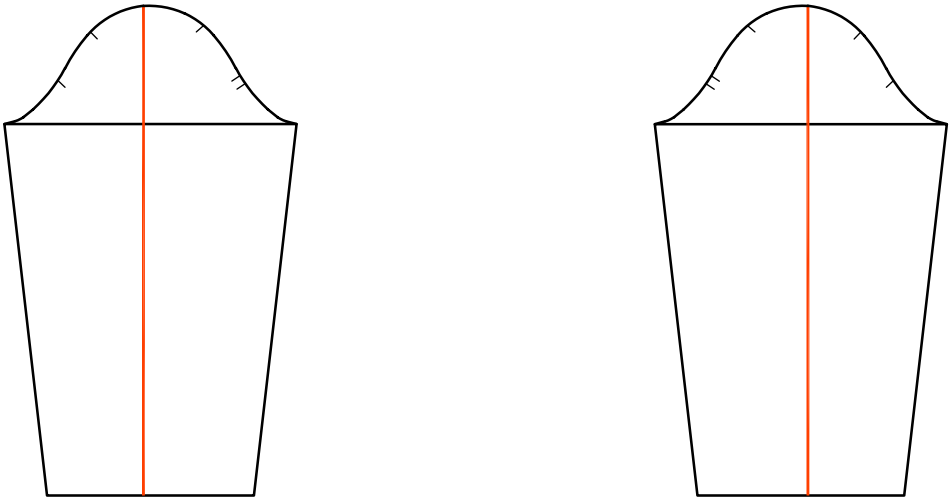


a) Left sleeve b) Right sleeve

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.

© ISO 2020 – All rights reserved
Documents
Document Sharing Hub
Full document details: BS ISO 20947-2:2020