

# SC37 report on Biometric Data Format and Related Standards

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- ISO/IEC JTC1/SC37 WG3 Convenor -

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2025-01-17

# Meetings Report

## Bertinoro Meeting

- 2024-07-15 to 2024-07-19
- 78 participants

## Wellington Meeting

- 2025-01-13 to 2025-01-16
- 71 participants

# Biometric Data Interchange Formats

# G2 development

## Status in 2025

- Revision of ISO/IEC 19794-14

**RESOLUTION 3.1 – Initiation of Revision process for ISO/IEC 19794-14:2022 standard**

WG 3 requests the SC 37 Committee Manager to initiate the revision process for the following standard(s):

This Revision will include data format corrections and metadata enhancements designed to support effective DNA data exchange in Missing Person, DVI, and Mixture Use Cases. These improvements were identified in the Test Report from the Ad Hoc Group on ISO/IEC 19794-14 Testing (WG 3 [N1631](#)) and were recommended for inclusion in the revision.

<b>Reference</b> (e.g., ISO/IEC xxx)	ISO/IEC 19794-14:2022
<b>Title</b>	Biometric data interchange formats — Part 14: DNA data
<b>List Target Dates</b> (e.g. below based on 36 month SDT) 2025-02-17 WD text 2026-01-05 CD consultation 2027-01-15 DIS ballot 2028-01-31 publication	2026-01-05 CD consultation 2027-01-15 DIS ballot 2028-01-31 publication
<b>Project Editor (PE)</b>	C.J. Lee
<b>Standards development timeframe</b> (e.g. 18, 24, 36 months)	24 month
<b>Will the revision expand the scope of the original project?</b>	No

# G3 development

## Status in 2025 of ISO/IEC 39794

- Several parts are published
  - ▶ Part 1 (Framework)
  - ▶ Part 2 (Finger minutiae)
  - ▶ Part 4 (Finger image data)
  - ▶ Part 5 (Face image data)
  - ▶ Part 6 (Iris image data)
  - ▶ Part 9 (Vascular image data)
  - ▶ Part 16 (Full body image data)
  - ▶ Part 17 (Gait image sequence)
- Parts under development
  - ▶ Part 12 (Fingermark image data)

### RECOMMENDATION 3.6 – DIS/DAM Registration/Circulation

<b>Reference</b> (e.g. ISO/IEC DIS xxx)	ISO/IEC 39794-2 DAmD 1
<b>Title</b>	Extensible biometric data interchange formats – Part 2: Finger minutiae data - AMD 1: Handling of the on-card biometric comparison format
<b>Project Editor (PE)</b>	Robert Mueller, Olaf Henniger, Andreas Wolf, Markku Metsämäki, Ralph Lessmann
<b>Deadline for submitting DAM text to the SC Committee Manager</b>	15 February 2025
<b>Deadline for PDoC Circulation</b>	As soon as possible after the closure of the DAM ballot
<b>Subsequent stage (if necessary)</b>	2 <sup>nd</sup> DAM/FDAM

### RECOMMENDATION 3.5 – Working Draft/Standing Document/Base Document Circulation

WG 3 requests its WG 3 Convener/WG Secretary to circulate the following texts to WG 3 experts for

<b>Reference</b> (e.g. ISO/IEC WD xxx)	ISO/IEC PWI 39794-12
<b>Title</b> <i>Please also include any requests to experts for comment/contributions on specific sections issues</i>	Extensible biometric data interchange formats — Part 12: Fingermark image data
<b>Project Editor (PE)</b>	Ralph Lessmann
<b>Deadline for submitting WD text to the WG Convenor/ Secretary</b>	14 February 2025
<b>Deadline for Expert Comments</b>	5 May 2025

# G3 development

## Status in 2025 of ISO/IEC 25447

## Face image profile for less constrained capture conditions

### RECOMMENDATION 3.5 – Working Draft/Standing Document/Base Document Circulation

WG 3 requests its WG 3 Convener/WG Secretary to circulate the following texts to WG 3 experts for review.

<b>Reference</b> (e.g. ISO/IEC WD xxx)	ISO/IEC WD 25447
<b>Title</b> Please also include any requests to experts for comment/contributions on specific sections issues	<i>Face image profile for less constrained capture conditions</i>  Call for contributions (please see WG3 doc. <a href="#">N1632</a> ): <b>AU 4-011:</b> There is a substantial use case for verification with the use of mobile phone and selfies type images being used in digital identity solutions. The requirements might be different if the capture of a facial image will be used and enrolled into an identification solution like a watchlist etc.  Discuss either creating two profiles, separate requirements under this profile or combining requirements under a single profile that can be universally used. <ul style="list-style-type: none"><li>- Add visas to the list of excluded use cases. See AU-6</li></ul> <b>Please contribute on reference to the biometric enrolment guide</b> <b>US6-009:</b> Consider whether LED lighting and digital image capture should be allowed, and if so, what useful parameters should be set. <ul style="list-style-type: none"><li>- <b>Strike 2<sup>nd</sup> paragraph please contribute</b></li></ul>
<b>Project Editor (PE)</b>	Udo Mahlmeister
<b>Deadline for submitting WD text to the WG Convenor/Secretary</b>	14 February 2025
<b>Deadline for Expert Comments</b>	5 May 2025
<b>Deadline for PDoC Circulation</b>	26 May 2025
<b>Subsequent stage (if necessary)</b>	2 <sup>nd</sup> WD/CD

## Related Standards

# Biometric Sample Quality

## Status in 2025 of 29794

- ISO/IEC 29794:2024 Part 1: Framework (published)
  - ▶ definition of quality score, quality component, quality measure, EDC
- ISO/IEC 29794:2024 Part 4: Finger image data (published)
  - ▶ the reference implementation NFIQ2.3 is in GitHub  
<https://github.com/usnistgov/NFIQ2>
- ISO/IEC 29794 Part 5: Face image data (FDIS)
  - ▶ the reference implementation OFIQ1.0 is in GitHub  
<https://github.com/BSI-OFIQ/OFIQ-Project>
  - ▶ Specific Image Defect Detection (SIDDD) test report  
[https://pages.nist.gov/frvt/reports/quality\\_sidd/frvt\\_quality\\_sidd\\_report.pdf](https://pages.nist.gov/frvt/reports/quality_sidd/frvt_quality_sidd_report.pdf)
- ISO/IEC 29794 Part 6: iris image data
- ISO/IEC 29794 Part 9: vascular image data
- ISO/IEC 29794 Part 12: fingerprint image data



# Biometric Sample Quality

## Status in 2025

## Content of the report WG3 N1617

- Introduction
- Face image quality
- Biometric fairness overview
- Demographic variables of interest
- Quality measures of interest
- Demographic variability reports
- Methodology
- Conclusion and recommendations

### Report of the Ad Hoc Group on Demographic Variability of Face Image Quality Measures

Christoph Busch<sup>1\*</sup>, Andre Doersch<sup>1</sup>, Pierre Gacon<sup>1</sup>,  
Marcel Ginzler<sup>1</sup>, Patrick Grother<sup>1</sup>, Rudolf Haraksim<sup>1</sup>,  
Daniel Hartung<sup>1</sup>, Olaf Henniger<sup>1</sup>, John Howard<sup>1</sup>,  
Wassim Kabbani<sup>1</sup>, C.J. Lee<sup>1</sup>, Johannes Merkle<sup>1</sup>, Lisa Mugnano<sup>1</sup>,  
Torsten Schlett<sup>1</sup>, Kerry Shannon<sup>1</sup>, Yevgeniy Sirotin<sup>1</sup>,  
Anna Stratman<sup>1</sup>, Benjamin Tams<sup>1</sup>, Joyce Yang<sup>1</sup>

<sup>1</sup>ISO/IEC JTC1 SC37 WG3 .

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#### Abstract

This report addresses the challenge of demographic variability of **biometric recognition** systems, which are based on face image analysis and which are incorporating biometric sample quality assessment algorithms. When dealing with operational systems, the quality of captured face images is relevant as it will impact the recognition accuracy. Thus, it is required to measure the **utility** of a face sample with a quality score but also with complementary measures that can provide actionable feedback. Acceptability of biometric systems requires fairness of biometric algorithms and artificial neural networks that are used. It is important to determine if face recognition systems are/are not biased towards a specific demographic group. In order to investigate this challenge SC37 WG3 has started in July 2024 an Ad Hoc group on demographic variability of face image quality measures. This is the first report of the groups' work from July to December 2024. **Disclaimer-01:** It is desirable to investigate the demographic variability for sample quality assessment algorithms for fingerprint images and other. However this report is limited to face images.

**Disclaimer-02:** For the sake of providing a self-contained document, we included textual components from ISO/IEC standards [1–3] that we have developed and papers or reports [4–6] which we have published recently.

**Keywords:** Biometric face recognition systems, Sample quality, Biometric fairness

# Biometric Sample Quality

## Status in 2025

## Part of the content of the report WG3 N1617

- transferred to a Technical Report



### Resolution 3.2 – Technical Report on “Demographic variability of face image quality measures”

WG 3 requests the SC 37 Committee Manager to initiate a Technical Report on *Demographic variability of face image quality measures*. This Technical Report will augment and process the report of the AhG on demographic variability of quality measures (WG 3 [N1617](#)) to become an ISO/IEC Technical Report.

Title	<i>Demographic variability of face image quality measures</i>
<b>List Target Dates</b> (e.g. below based on 36 month SDT) 2025-02-17 WD text 2026-01-05 DTR 2028-01-31 publication	2025-02-17 WD text 2026-01-05 DTR 2028-01-31 publication
<b>Project Editor (PE)</b>	Anna Stratmann

# Biometric Sample Quality

## Status in 2025

- Revision of ISO/IEC 29794 - Part 1: Framework

**RESOLUTION G.12 – Initiation of Revision process for ISO/IEC 29794-1:2024, Information technology – Biometric sample quality — Part 1: Framework**

SC 37 requests its Committee Manager to initiate the revision process for the following standard:

Revision of *ISO/IEC 29794-1:2024, concerning definitions on generating Error vs. Discard Characteristics, Biometric Utility and Biometric Sample Quality Variation across Demographic Groups* and process the methodology section from the report of the AhG on demographic variability of quality measures (WG 3 [N1617](#)).

<b>Reference</b>	<i>ISO/IEC 29794-1:2024</i>
<b>Title</b>	<i>Biometric sample quality — Part 1: Framework</i>
<b>List Target Dates</b> (e.g. below based on <a href="#">36 month</a> SDT) 2025-02-17 WD text 2026-01-05 CD consultation 2027-01-15 DIS ballot 2028-01-31 publication	2025-02-17 WD text 2026-01-05 CD consultation 2027-01-15 DIS ballot 2028-01-31 publication
<b>Project Editor (PE)</b>	Olaf Henniger
<b>WG in charge</b>	WG 3
<b>Standards development timeframe</b> (e.g. 18, 24, 36 months)	<a href="#">36 month</a>
<b>Will the revision expand the scope of the original project?</b>	Yes

# Biometric Sample Quality

## Status in 2025

- Scope of ISO/IEC 29794:2024 - Part 1: Framework
- This document establishes the following items for any or all biometric sample types as necessary:
  - ▶ terms and definitions that are useful in the specification and use of quality measures;
  - ▶ purpose and interpretation of biometric quality scores;
  - ▶ motivation for developing biometric sample datasets for the purpose of quality score normalization;
  - ▶ format for exchange of quality assessment algorithm results;
  - ▶ methods for aggregation of quality scores;
  - ▶ methods for evaluating the efficiency of quality assessment algorithms.

# Biometric Sample Quality

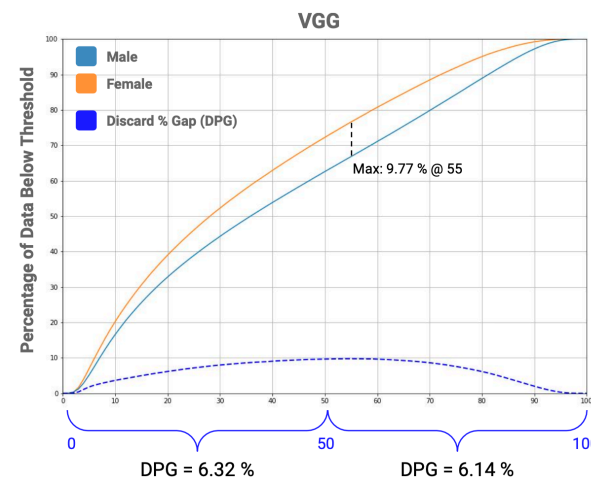
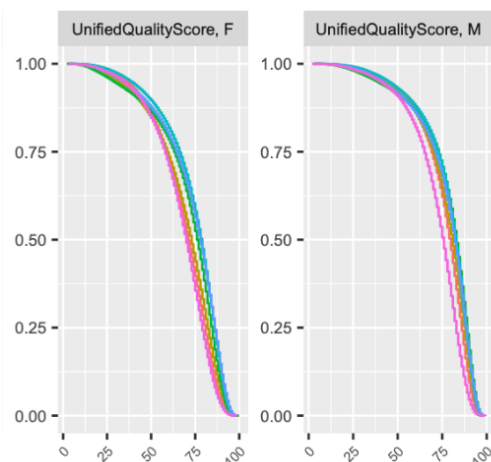
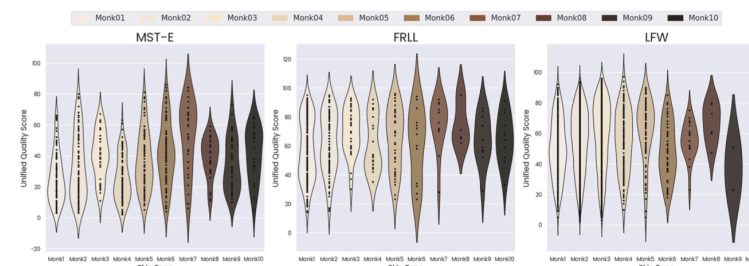
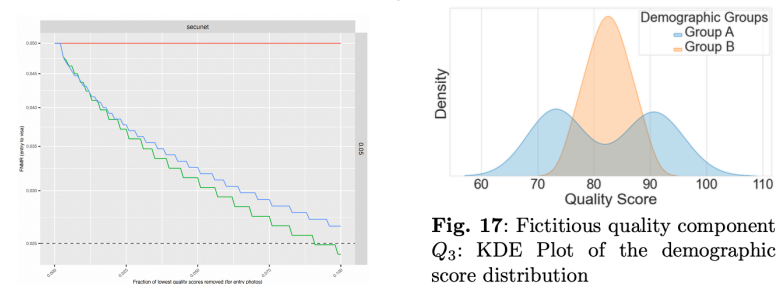
## Status in 2025

- New Scope of rev ISO/IEC 29794- Part 1: Framework
- This document establishes the following items for any or all biometric sample types as necessary:
  - ▶ terms and definitions that are useful in the specification and use of quality measures;
  - ▶ purpose and interpretation of biometric quality scores;
  - ▶ motivation for developing biometric sample datasets for the purpose of quality score normalization;
  - ▶ format for exchange of quality assessment algorithm results;
  - ▶ methods for aggregation of quality scores;
  - ▶ methods for evaluating the efficiency of quality assessment algorithms;
  - ▶ methods for reporting demographic variability of quality measures

# Biometric Sample Quality

## Status in 2025

- methods for reporting demographic variability of quality measures.
- Select from these candidates
  - ▶ EDC curves
  - ▶ Kernel density estimate curves
  - ▶ Violin plots
  - ▶ Cumulative score distributions
  - ▶ Discard gap curves



# Biometric Sample Quality

## Status in 2025

- ISO/IEC 29794 - Part 4: Finger image data

### RECOMMENDATION 3.11 – Continuation of WG 3 Ad hoc group on finger image quality

WG 3 requests its WG Convener/Secretary to re-establish a WG 3 Ad-Hoc Group on Finger Image Quality, to plan for a revision of ISO/IEC 29794-4 (Information technology–Biometric sample quality–Part 4: Finger image data).

**Terms of Reference:** In particular, the ad hoc group will determine the roadmap for ISO/IEC 29794-4, edition 3 including a timeline for a PWI or WD for ISO/IEC 29794-4, edition 3. The group will additionally work to develop and test a reference implementation of the proposed changes.

# Biometric Sample Quality

## Status in 2025

- NWIP ISO/IEC 29794 Part 9: Vascular image data

**RECOMMENDATION 3.4 – Progression from PWI to New Work Item ballot on “Biometric sample quality - Part 9: vascular image data”**

WG 3 supports the progression of PWI to NWIP and invites the Chinese NB to submit a New Work Item Proposal on *Biometric sample quality - Part 9: vascular image data*.

<b><i>Proposer (e.g. which National Body?)</i></b>	China
<b><i>Title</i></b>	ISO/IEC 29794-9 - Biometric sample quality- Part 9: vascular image data
<b><i>Project Editor (PE)</i></b>	Yinfei Zheng
<b><i>Deadline for submitting NWIP text to the SC Committee Manager</i></b>	14 February 2025
<b><i>Subsequent stage (if necessary)</i></b>	WD/CD



# Biometric Sample Quality

## Status in 2025

- ISO/IEC 29794 PWI Part 12: Fingermark image data

<b>Reference</b> (e.g. ISO/IEC WD xxx)	ISO/IEC PWI 29794-12
<b>Title</b> Please also include any requests to experts for comment/contributions on specific sections issues	<i>Biometric sample quality – Part 12: Fingermark image data</i>  Calls for Contributions are highlighted as warning messages in the OSD.
<b>Project Editor (PE)</b>	Raul Sanchez-Reillo
<b>Deadline for submitting WD text to the WG Convenor/ Secretary</b>	14 February 2025
<b>Deadline for Expert Comments</b>	5 May 2025
<b>Deadline for PDoC Circulation</b>	26 May 2025
<b>Subsequent stage (if necessary)</b>	NP

# Morphing Attack Potential

## Status in 2025 on ISO/IEC FDIS 20059

- Methodologies to evaluate the resistance of biometric recognition systems to morphing attacks

### RECOMMENDATION 3.7 – FDIS/FDAM Registration/Circulation

<b>Reference</b> (e.g. ISO/IEC FDIS xxx)	ISO/IEC FDIS 20059
<b>Title</b>	Methodologies to evaluate the resistance of biometric recognition systems to morphing attacks
<b>Project Editor (PE)</b>	Matteo Ferrara
<b>Deadline for submitting FDIS text to the SC Committee Manager</b>	14 February 2025

# WG3 Roadmap SD14-3

## Status in 2025 on future projects

- Face image data interchange format with 2D barcodes

### **Recommendation 3.19 - Face image data interchange format with 2D barcodes**

WG 3 requests the WG 3 Convener/Secretary to issue a call for contributions to respond on the idea to develop a face image data format with 2D barcodes with a target size of 1 KB. Experts are invited to review WG3 [N1637](#) and the slides at:

[https://www.icao.int/Meetings/TRIP-Symposium-2024/Documents/HANSSON\\_BONN%20joint%20presentation2.pdf](https://www.icao.int/Meetings/TRIP-Symposium-2024/Documents/HANSSON_BONN%20joint%20presentation2.pdf)

Experts are requested to submit comments and contributions to the WG 3 Convener/Secretary by 2025-05-15.

# WG3 Roadmap SD14-3

## Status in 2025 on future projects

- Interoperable face embedding

### Recommendation 3.20 - Interoperable face embedding

WG 3 requests the WG 3 Convener/Secretary to issue a Call for contributions to respond on the idea to develop an interoperable face embedding face image data format to be specified while preserving high accuracy. Experts are invited to review WG3 [N1636](#).

Experts are requested to submit comments and contributions to the WG 3 Convener/Secretary by 2025-05-15.

# Thanks

## Many thanks

- to the sponsors
  - ▶ for meetings facilities and social events
- to the editors
- to the delegates

# References

## Web

- Convenors website with latest news and slides  
<http://www.christoph-busch.de/standards-sc37wg3.html>
- ISO/IEC JTC SC37  
<http://isotc.iso.org/livelink/livelink?func=ll&objId=2262372&objAction=browse&sort=name>
- Published ISO/IEC Standards  
[http://www.iso.org/iso/iso\\_catalogue/catalogue\\_tc/catalogue\\_tc\\_browse.htm?commid=313770&published=on](http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_tc_browse.htm?commid=313770&published=on)