

ISO/IEC 24956:2026-09 (E)

Information technology - 3D printing and scanning - Phantom-based evaluation methods for 3D printing modeling software

Contents

Page

Foreword.....	v
Introduction.....	vi
1 Scope.....	1
2 Normative references.....	1
3 Terms, definitions and abbreviated terms.....	1
3.1 Terms and definitions.....	1
3.2 Abbreviated terms.....	3
4 Modelling phase considerations for quality control of 3D printing.....	3
4.1 General.....	3
4.1.1 Background.....	3
4.1.2 Related works.....	3
4.2 Workflow and product quality.....	3
4.3 Image acquisition.....	4
4.4 Quality management of modelling software and modelling process.....	4
4.5 Segmentation.....	5
4.6 3D modelling.....	5
4.7 Editing and refinement.....	5
5 Quality requirements and recommendations for 3D modelling software.....	5
5.1 Quality requirements and recommendations.....	5
5.1.1 General.....	5
5.1.2 Accuracy.....	5
5.1.3 Precision.....	5
5.1.4 User friendliness.....	5
5.1.5 Performance.....	6
5.1.6 Repeatability and reproducibility.....	6
5.1.7 Compatibility with medical 3D printing hardware and software.....	6
5.1.8 Regulatory compliance.....	6
5.2 Evaluation items.....	6
6 Precision or accuracy evaluation using phantoms.....	6
6.1 Advantages of software testing methods using phantoms.....	6
6.1.1 General.....	6
6.1.2 Standardization.....	6
6.1.3 Objectivity.....	7
6.1.4 Realism.....	7
6.1.5 Repeatability and reproducibility.....	7
6.1.6 Cost-effectiveness.....	7
6.2 Required items for evaluation.....	7
6.2.1 Mandatory items.....	7
6.2.2 Optional item — CT phantom for 3D printing evaluation.....	8
7 Evaluation procedure and methods.....	8
7.1 Preparation.....	8
7.2 Evaluation methods.....	8
7.2.1 Test phantom CT data.....	8
7.2.2 Segmentation function accuracy or precision test.....	8
7.2.3 3D reconstruction functional accuracy or precision test.....	9

8	Report	9
Annex A (normative)	Measurement criteria and methods	10
Annex B (normative)	Measurement items on each phantom element	12
Annex C (informative)	3D modelling for part repair, remanufacturing	15
Annex D (informative)	Non-destructive, 3D scanning of internal and external geometries benefits of CT scanning	17
Annex E (informative)	Assessment metrics of image-based 3D modelling	20
Annex F (informative)	Evaluation report template	21
Bibliography		23