
**Dentistry — Vocabulary of process
chain for CAD/CAM systems**

*Médecine bucco-dentaire — Vocabulaire de la chaîne de procédé
applicable aux systèmes de CFAO*

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ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Contents

	Page
Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
3.1 Process step terms.....	1
3.2 Measurement and calibration terms.....	6
Annex A (informative) Flow chart of process chain for CAD/CAM-systems	9
Index	10

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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. 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 106, *Dentistry*, Subcommittee SC 9, *CAD/CAM-Systems*.

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Introduction

Terms and designations for individual system parts and process steps used in product descriptions and instructions for use provided by the manufacturers of dental CAD/CAM systems differ from each other, thus creating confusion among dentists and dental technicians. In order to overcome these ambiguities, it was decided to prepare an International Standard for terminology used in the process chain for CAD/CAM systems.

For the purposes of illustrating the logic sequence of the process chain for CAD/CAM systems, a flow chart of this process chain is shown in [Annex A](#).

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Dentistry — Vocabulary of process chain for CAD/CAM systems

1 Scope

This International Standard specifies terms, synonyms for terms and definitions used in the process chain for CAD/CAM systems in dentistry.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 1942, *Dentistry — Vocabulary*

ISO 5725-1, *Accuracy (trueness and precision) of measurement methods and results — Part 1: General principles and definitions*

ISO 16443, *Dentistry — Vocabulary for dental implants systems and related procedure*

ISO/ASTM 52900, *Additive manufacturing — General principles — Terminology*

3 Terms and definitions

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For the purposes of this document, the terms and definitions given in ISO 1942, ISO 5725-1, ISO 16443, ISO/ASTM 52900 and the following apply.

NOTE In the following, first the preferred term and then the synonyms which have been in use so far are given. For the future it is recommended to use the preferred terms instead of the synonyms.

3.1 Process step terms

3.1.1

3D data acquisition

three dimensional data acquisition

3D digitization and generation of a digital data set

3.1.2

3D data acquisition system

three dimensional data acquisition system

hardware and software used for 3D data acquisition

3.1.3

3D scanning

3D digitizing

raw data acquisition

method of acquiring the shape and size of an object as a 3-dimensional representation by recording x,y,z coordinates on the objects surface and through software the collection of points is converted into digital data

Note 1 to entry: This collection of data via the scanning process creates a raw *data set* (3.1.14).

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Note 2 to entry: Typical scanning methods use some amount of automation, coupled with a touch probe or an optical sensor, or other device.

[SOURCE: ISO/ASTM 52900:2015, definition 2.4.1, modified]

3.1.4 additive manufacturing AM

process of joining materials to make parts from 3D model data, usually layer upon layer, as opposed to subtractive manufacturing and formative manufacturing methodologies

[SOURCE: ISO/ASTM 52900:2015, definition 2.1.2, modified]

3.1.5 artifact

any undesired alteration of data introduced in a digital process by an involved technique and/or technology

3.1.6 CAD

computer-aided design
hardware and software supporting the designing process

Note 1 to entry: The acronym CAD is commonly used as preferred term.

3.1.7 CAD data

design data set
result of the *CAD process* (3.1.8) gained by manipulating the model data set for the purposes of transfer to the CAM system

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3.1.8 CAD process

design process (DEPRECATED)
process of generating design data sets

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3.1.9 CAD software

design system
system for the generation of a design data set

3.1.10 CAM

computer-aided manufacturing
hardware and software supporting the manufacturing process

Note 1 to entry: The acronym CAM is commonly used as preferred term.

3.1.11 CAM system

manufacturing system
digitally controlled system for the manufacture of CAD/CAM dental restorations

EXAMPLE Milling machine, CAM software.

3.1.12 CAM software

software used for manipulating design data for manufacturing

EXAMPLE Software for the calculation of milling paths.

3.1.13**data record**

one or more data items treated as a unit within a data set

3.1.14**data set**

complete numerical description

EXAMPLE Raw data set (dot model), digitization data set (manipulated raw data set), surface model, facet model or volume model.

Note 1 to entry: Raw data set is obtained by processing scanning data.

3.1.15**data structure**

defined format interrelating the data (records) in the data set

3.1.16**dental CAD/CAM system**

a set of hardware, software, materials, and devices, used to fabricate dental restorations

Note 1 to entry: Hardware and software are used for data acquisition, design and manufacturing.

3.1.17**dental CAD/CAM restoration**

dental restoration (3.1.18) produced by a dental CAD/CAM system

3.1.18**dental restoration**

any kind of restoration which replaces intra-oral hard and/or soft tissues

3.1.19**design data manipulation process**

CAD data manipulation process

process of generating the manufacturing data set

EXAMPLE Tooth path generation process.

3.1.20**digital impression**

acquisition of a data set with the numerical 3D-representation of the surfaces from the patient directly

3.1.21**digitizing device**

hardware for computer-aided design and manufacturing of custom-made indirect dental restorations used to record the topographical characteristics (e.g. surface) of teeth and surrounding tissues, implant connecting components, dental impressions, dental moulds or stone models by analogue or digital methods

Note 1 to entry: These systems consist of a scanning device, hardware and software.

Note 2 to entry: A surface digitization procedure starts with the generation of actually measured surface points (or their conversion, for example, in STL format), which are the measured digitization data. In most digitizing systems, the measured points are mathematically processed by operations such as:

- matching
- filtering
- weighing
- selective removal
- smoothing, etc.