
**Non-destructive testing — Radiation
methods — Computed tomography —**

**Part 1:
Principles**

*Essais non destructifs — Moyens utilisant les rayonnements —
Tomographie informatisée —*

Partie 1: Principes



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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.ch
Web www.iso.ch

Printed in Switzerland

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this part of ISO 15708 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 15708-1 was prepared by Technical Committee ISO/TC 135, *Non-destructive testing*, Subcommittee SC 5, *Radiation methods*.

ISO 15708 consists of the following parts, under the general title *Non-destructive testing — Radiation methods — Computed tomography*:

- *Part 1: Principles*
- *Part 2: Examination practices*

Annex A forms a normative part of this part of ISO 15708.

Introduction

This part of ISO 15708 provides a tutorial introduction to the theory and use of computed tomography. It begins with an overview intended for the interested reader possessing a general technical background. Subsequent, more technical clauses describe the physical and mathematical basis of CT technology, the hardware and software requirements of CT equipment, and the fundamental measures of CT performance.

This part of ISO 15708 includes an extensive glossary (with discussions) of CT terminology and an extensive list of references to more technical publications on the subject. Most importantly, this part of ISO 15708 establishes consensus definitions for basic measures of CT performance, enabling purchasers and suppliers of CT systems and services to communicate unambiguously with reference to a recognized standard. It also provides a few carefully selected equations relating measures of CT performance to key system parameters.

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Non-destructive testing — Radiation methods — Computed tomography —

Part 1: Principles

1 Scope

This part of ISO 15708 gives guidelines for, and defines terms for addressing the general principles of X-ray CT as they apply to industrial imaging. It also gives guidelines for a consistent set of CT performance parameter definitions, including how these performance parameters relate to CT system specifications.

2 Pre-amble

CT, being a radiographic modality, uses much the same vocabulary as other X-ray techniques. Because a number of terms have meanings or carry implications unique to CT, they appear with explanations in annex A. Throughout this part of ISO 15708, the term “X-ray” is used to denote penetrating electromagnetic radiation, however, electromagnetic radiation may be either X-rays or gamma rays.

3 Abbreviations

— BW	beam width
— CDD	contrast-detail-dose
— CT	computed tomography
— CAT	computerized axial tomography
— DR	digital radiography
— ERF	edge response function
— LSF	line spread function
— MTF	modulation transfer function
— NDE	non-destructive evaluation
— PDF	probability distribution function
— PSF	point spread function