Australian Standard™

Non-destructive testing

Part 1: Guide to radiography for ferrous castings

Standards Australia

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Australian Aerospace Non-Destructive Testing Committee

Australian Industry Group

Australian Institute for Non-Destructive Testing

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Australian Pipeline Industry Association

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Part 1: Guide to radiography for ferrous castings

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee MT-007, Non-Destructive Testing of Metals and Materials, at the request of industry. This Standard supersedes, in part, AS 3507—1987, *Non-destructive testing—Radiography of steel castings and classification of quality*.

This Standard was prepared by the Australian members of the joint Standards Australia/Standards New Zealand Committee MT-007. After consultation with shareholders in both countries, Standards Australia and Standards New Zealand decided to develop this Standard as an Australian Standard rather than an Australian/New Zealand Standard.

The objective of this Standard is to specify methods for film radiography of ferrous castings for the determination of quality.

In preparation of this Standard, cognizance was taken of the BS 4080, *Methods for non-destructive testing of steel castings.*

This Standard is Part 1 of a series of Standards covering the radiography of ferrous castings.

The series comprises the following Parts:

AS	
3507	Non-destructive testing
3507.1	Part 1: Guide to radiography for ferrous castings (this Part)
3507.2	Part 2: Radiography determination of quality for ferrous castings

The term ‘informative’ has been used in this Standard to define the application of the appendix to which it applies. An ‘informative’ appendix is only for information and guidance.

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FOREWORD

Diagnosis of the nature of discontinuities located by radiography can only be made by consideration of both metallurgical and radiographic factors. Consideration should therefore be given to the method of manufacture of the casting under test, and the type, position and probable distribution of any discontinuities likely to be present.

Radiographic sensitivity, in addition to consideration of surface conditions or preparation prior to radiography, depends upon scattered radiation energy (kilovolt or isotope spectrum), film/screen combination, scatter radiation control, exposure geometry (source to film distance and effective source size) and several less important parameters; usually, the highest sensitivity methods necessitate the use of X-rays. However, thickness limitations and accessibility may preclude the use of X-rays.

For hollow components it may be possible to use single-wall or double-wall methods. Although radiographic sensitivity obtained with single-wall methods is generally superior to that obtained with double-wall methods, other factors such as diameter, thickness and accessibility may have a pronounced influence on the choice of a method.

Where alternatives exist, the exact method should be agreed on between customer and contractor if not covered by the product or application Standard.

Non-destructive testing methods are mutually complementary; it is emphasized that the results of one test should be considered in relation to those obtained by another method. Accordingly differing interpretations may be required to be reassessed by alternative methods.

STANDARDS AUSTRALIA

Australian Standard
Non-destructive testing

Part 1: Guide to radiography for ferrous castings

1 SCOPE

This Standard specifies the methods for film radiography of whole or specified areas of ferrous castings.

NOTES:

1 Information to be supplied with the enquiry and order is given in Appendix A.

2 Any repair welding carried out is deemed to be part of the casting.

2 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS
1929 Non-destructive testing—Glossary of terms

2177 Non-destructive testing—Radiography of welded butts joints in metal
2177.2 Part 2: Image quality indicators (IQI) and recommendations for their use

2243 Safety in laboratories
2243.4 Part 4: Ionizing radiation

3507 Non-destructive testing
3507.2 Part 2: Radiographic determination of quality of ferrous castings

3998 Non-destructive testing—Qualifications and certification of personnel (ISO 9712)

4738 Metal casting—Ferrous sand moulded

ISO
11699 Non-destructive testing—Industrial radiographic films
11699-1 Part 1: Classification of film systems for industrial radiography

ASTM
E1165 Standard test method for measurement of focal spots of industrial X-ray tubes by pinhole imagining

3 DEFINITIONS

For the purpose of this Standard, the definitions given in AS 1929 apply.

4 DESIGNATION

4.1 Principle

Radiographic methods shall be designated in accordance with the following scheme (see Table 1):

(a) By a prefix letter ‘C’ to signify testing of a casting.

(b) By a second letter to indicate source of ionizing radiation, as follows: