

Method of preparation and use of radiographic techniques

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Foreword

This British Standard, prepared at the request of the Aerospace Industry Committee, is one of a series within the Aerospace series on the non-destructive testing and inspection of aerospace materials, components and structures. Its objective is to provide a standardized approach to the devising, presentation and application of radiographic techniques. Other standards in the series will cover magnetic particle, ultrasonic, etch and penetrant inspection techniques.

The SI system of physical units has been adopted as standard. Equivalent imperial or C.G.S units are quoted in parenthesis.

NOTE Information concerning SI units is given in BS 350, *Conversion factors and tables* and also PD 5686, *The use of SI units*.

This standard makes reference to the following British Standards:

- BS 2737, *Terminology of internal defects in castings as revealed by radiography*;
- BS 4000-1, *Sizes of paper and board — Part 1: Specification for A and B series of trimmed sizes of writing paper and certain classes of printed matters*;
- BS 4727-5:Group 01, *Glossary of electrotechnical power, telecommunication, electronics, lighting and colour terms — Part 5: Terms particular to electromedical equipment — Group 01: Radiology and radiological physics terminology*;
- BS EN 462-1, *Non-destructive testing — Image quality of radiographs — Part 1: Image quality indicators (wire type) — Determination of image quality value*;
- BS EN 462-2, *Non-destructive testing — Image quality of radiographs — Part 2: Image quality indicators (step/hole type) — Determination of image quality value*;
- BS EN 462-3, *Non-destructive testing — Image quality of radiographs — Part 3: Image quality classes of ferrous metal*;
- BS EN 462-5, *Non-destructive testing — Image quality of radiographs — Part 5: Image quality indicators (duplex wire type), determination of image quality value*;
- BS EN 1330-3, *Non-destructive testing — Terminology — Part 3: Terms used in industrial radiographic testing*.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 9 and a back cover.

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1 General requirements

1.1 Scope

All factors affecting the accurate repetition of a radiographic technique for the examination of a succession of similar material samples, components or structures are considered.

A recommended standard format for all techniques is given.

For the various broad fields of radiography, viz, castings, welds, structures and other applications, specific requirements are laid down as appropriate to each case.

Finally, consideration is given to the environmental and physiological conditions affecting the efficiency of film interpretation by operators, and certain minimum conditions recommended.

1.2 Definitions

For the purposes of this British Standard the definitions given in BS 4727-5:Group 01 and BS EN 1330-3 apply.

1.3 Identification of technique

The radiographic technique shall be stipulated on the relevant drawing or document by calling up "Radiograph to BS M 34 and technique No . . .".

1.4 Preparation of technique

1.4.1 The technique shall comprise sample radiographs accompanied by a technique sheet complying with the requirements of Appendix A. The technique sheet shall state the following conditions used to obtain the sample radiographs.

- 1) Apparatus used, type of radiation, source size.
- 2) Positions of source of radiation, component under examination and film, suitably illustrated by photographs or sketches.
- 3) Relating angles of 2).
- 4) Source-to-film distance (s.f.d.).
- 5) Kilo-voltage or isotope used.
- 6) Tube current or source strength.
- 7) Exposure time.
- 8) Thickness and material of filter used.
- 9) Thickness and material of intensifying screens.
- 10) Geometric unsharpness U_g .
- 11) Film used.
- 12) Size of film.
- 13) Processing conditions.
- 14) Specific requirements as applicable from the relevant Section 1 to Section 5 of this British Standard.

1.4.2 The technique, once established, shall not be altered in any way other than by that which does not detract from the quality of the resultant radiograph.

When an alteration is made to the technique the following points shall be considered.

- 1) A change in film size may prejudice the value of the shot due to a change in angle of the beam at the extremities of the film. This may also apply when a change in s.f.d. is made.
- 2) When a change in source size is noted, the s.f.d. may have to be altered to compensate for the image unsharpness as indicated in Appendix B.
- 3) When a change of type of apparatus is made (e.g. half wave self-rectified to constant potential) it could give rise to a detrimental change of contrast for the same nominal kV.
- 4) If a film of alternative manufacture is used, the type should remain constant.