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Specification for

35 mm microcopying of technical drawings —

Part 1: Operating procedures

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Association of Manufacturers and Suppliers for the Graphic Arts	Her Majesty's Stationery Office*
Association of Photographic Laboratories	Illuminating Engineering Society
British Broadcasting Corporation*	Institute of Incorporated Photographers
British Kinematograph, Sound and Television Society	Institute of Reprographic Technology*
British Photographic Manufacturers' Association*	Lighting Industry Federation
British Printing Industries Federation	Ministry of Defence*
Drawing Office Material Manufacturers' and Dealers' Association*	Photographic Dealers' Association
	Post Office*
	Royal Photographic Society
	Scientific Instrument Manufacturers' Association

The organizations marked with an asterisk in the above list, together with the following, were directly represented on the committee entrusted with the preparation of this British Standard:

Association of Medical Records Officers	Greater London Council
Association of Photographic Technicians	Industrial Council for Educational and Training Technology
British Airways (European Division)	Library Association
British Airways (Overseas Division)	Microfilm Association of Great Britain
British Bankers' Association	National Coal Board
Business Equipment Trade Association	National Reprographic Centre for documentation
Civil Service Department	Public Services Microfilm Liaison Group
Department of Industry (Warren Spring Laboratory)	Royal Institute of British Architects
Electricity Supply Industry in England and Wales	Society of British Aerospace Companies
Electronic Engineering Association	Society of Motor Manufacturers and Traders
Engineering Equipment Users' Association	United Kingdom Atomic Energy Authority

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Foreword

BS 4210 is divided into three Parts:

- *Part 1: Operating procedures;*
- *Part 2: Photographic requirements for silver film;*
- *Part 3: Unitized microfilm carriers.*

This edition of BS 4210-1 supersedes the 1967 edition of BS 4210 “35 mm microcopying of engineering drawings and associated data” — *Part 1 “Recommended procedures”*. It deals with requirements for microcopying all documents prepared by drawing offices, including technical drawings (dimensioned architectural and engineering), calculation notes, specifications and parts lists, on 35 mm microfilm, whether in roll or unitized form, and the subsequent use of such microfilm for reproduction, enlargement and viewing.

The standard has been revised to bring it up-to-date and, as far as possible, to align its requirements with those of ISO 3272-I¹⁾, but BS 4210-1 enters into more detail. It is unlike ISO 3272-I in that it includes requirements for drawings larger than A0 size and excludes the reduction ratios 1 : 16 and 1 : 24. The reduction ratios 1 : 10.6 and 1 : 7.5, which were included in the 1967 edition, have been deleted.

This standard is based on the use of the ISO A series of drawing sheet sizes specified in BS 3429. It assumes that originals have been prepared in compliance with the requirements of BS 308 or BS 1192, although it can also be used as a guide when microfilming originals that do not comply with the requirements of these standards.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 8, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

¹⁾ In course of preparation.

1 Scope

This Part of this British Standard specifies procedures for microcopying technical drawings and associated data, either for the production of prints or for viewing.

2 References

The titles of the standards publications referred to in this standard are listed on the inside back cover.

3 Definitions

For the purposes of this British Standard the following definitions apply.

3.1

enlargement ratio

the ratio of the linear measurement of a microimage of a document to the linear measurement of the enlarged image, expressed as, for example, 30 : 1, 15 : 1

3.2

frame

that area of the film which is exposed by the camera

3.3

frame pitch

the distance the film is advanced after each exposure

3.4

generation

a measure of the remoteness of the copy from the original document. The film of the original is termed "first generation" microfilm (camera microfilm). Copies made from this "first generation" are termed "second generation" and copies from the "second generation" are termed "third generation", etc.

3.5

image

that area within the frame which, after exposure and processing, contains the representation of the original

3.6

negative-reading

of microfilm that has clear images on an opaque background

3.7

original

the drawing or document to be microfilmed

3.8

positive-reading

of microfilm that has opaque images on a clear background

3.9

reduction ratio

the ratio of the linear measurement of a document to the linear measurement of the image of the same document expressed as, for example, 1 : 30, 1 : 15

4 Originals suitable for microfilming

4.1 Original. The original is normally the primary drawing or document produced by the draughtsman, tracer or typist, or by automated means. The original may also be produced by a combination of these processes, or be itself a reproduction of sufficiently high quality, or may be two or more documents placed together, provided their reflectance values are similar. The drawing should be prepared in accordance with the requirements of BS 308, BS 1192 or BS 5536.

4.2 Sizes of originals. The following range of sizes of originals, as defined in BS 3429, is particularly suitable for microfilming to comply with the requirements of this standard.

A0	841 mm × 1 189 mm
A1	594 mm × 841 mm
A2	420 mm × 594 mm
A3	297 mm × 420 mm
A4	210 mm × 297 mm

The dimensions are those of the outside edges of the drawing sheet. A border line is normally drawn inside these dimensions, limiting the drafting area (see 4.3 for recommended minimum borders).

4.3 Borders. The working tolerances required in a microfilm system shall be provided for in the unused border of the original and the border of the subsequent print. The border of the original shall be large enough to accommodate all the tolerances imposed by microfilming. The following minimum borders shall be provided (on all four sides of an original) inside the A series dimensions:

A0	20 mm
A1	20 mm
A2	10 mm
A3	10 mm
A4	10 mm

4.4 Centring marks on originals. There shall be a centring mark in the form of a line at the centre of each of the four sides of the drawing frame within 0.5 mm of the true position (see Figure 1 and BS 5536).