BRITISH STANDARD

BS 3649:1963

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DECEMBER 2007

Recommendations for

Original printing plates

Co-operating organizations

The Printing, Stationery and Allied Trades Standards Committee, under whose supervision this British Standard was prepared, consists of representatives from the following government department and scientific and industrial organizations:

Association of British Manufacturers of Printers' Machinery*
British Federation of Master Printers*
British Paper & Board Makers' Association (Incorporated)
Business Equipment Trade Association
Electrotyping & Stereotyping Employer's Federation*
Envelope Makers' & Manufacturing Stationers' Association
Federation of Master Process Engravers*
H.M. Stationery Office*
National Association of Paper Merchants
Newspaper Society*
Periodical Proprietors Association Ltd.*
Printing, Packaging & Allied Trades Research Association*
Society of British Printing Ink Manufacturers
Stationers' Association of Great Britain & Ireland

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:

Advertisement Production Employers' Federation
Association of Manufacturers and Suppliers for the Graphic Arts
Incorporated Society of British Advertisers
Institute of Practitioners in Advertising
London College of Printing
London Typographical Society
National Society of Electrotypers & Stereotypers
Newspaper Proprietors' Association
Society of Lithographic Artists, Designers, Engravers & Process Workers
Typographical Association

This British Standard, having been approved by the Printing, Stationery and Allied Trades Standards Committee, was published under the authority of the General Council on 9 August 1963

The following BSI references relate to the work on this standard:
Committee reference S/25
Draft for comment D62/9984

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Amendments issued since publication

Amd. No.	Date	Comments

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Foreword

This standard makes reference to the following British Standard:

BS 1705, *Sizes of metal sheets for letterpress photo-engravings.*

At a conference on newspaper and rotary letterpress work called by the Printing, Packaging and Allied Trades Research Association, there was a strong feeling that the issue and adoption of a British Standard Recommendation could help to overcome such faults as shallow half-tones, thickness variations across plate and insufficient routing. Accordingly the Printing, Stationery and Allied Trades Standards Committee authorized the preparation of this recommendation at the request of the Printing, Packaging and Allied Trades Research Association.

The Committee responsible for preparing the recommendation have recognized that results which seem to arise from such faults may in fact be caused by other factors in the printing process. However, it is hoped that general use of this recommendation will be of considerable value to platemakers, printers and other purchasers of plates.

NOTE Where metric equivalents are stated the figures in British units are to be regarded as the standard. The metric conversions are approximate. More accurate conversions should be based on the tables in BS 350, "*Conversion factors and tables*".

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.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 and 2 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 Scope

These recommendations deal with the depth of etch for haft-tone and line printing plates used for direct flat-bed printing or duplication. Appendix A gives guidance on the use of these plates.

2 Materials

Plates should be made from sheets complying with the dimensional requirements of BS 1705, "*Sizes of metal sheets for letterpress photo-engravings*".

The type of material should be agreed between customer and engraver.

3 Depth of etch (line)

Line plates for subsequent duplication and use in newspaper rotary printing should be etched to a depth of 0.028 in (0.711 mm).

Line plates for direct letterpress should be etched to a depth of 0.022 in (0.559 mm).

Line plates for rubber stereos should be etched to a depth as agreed between engraver and the customer, and may well vary considerably in accordance with the purpose for which the rubber plate is to be used.

The above-mentioned depths may reasonably be expected to vary by plus or minus 0.001 in (0.025 mm). All readings should be taken in the open etched areas, not less than $^1/_4$ in (6.3 mm) from the printing area.

4 Depth of etch (half-tone)

Half-tone plates should be etched to a depth not less than that given for the appropriate number of screen lines per linear inch given in Table 1.

Recommendations for future developments in plate-making should be considered on their individual merits and as they arise.

5 Method of depth measurement

A depth measuring microscope is the only reliable instrument for the accurate measurement of the depth of etch. A depth measuring microscope with a maximum dial reading of 0.015 in (0.381 mm) is recommended for half-tones. For the measuring of line plates, a needle type depth gauge is considered adequate.

NOTE In general, an 8 mm objective will give a suitable depth of focus and the field of view and working distance will be adequate for depth measurements on all half-tone plates. For coarse screen plates the larger field of a 16 mm objective may be preferable and for measurements on the finest screens a 4 mm objective would permit greater accuracy.

6 Quality of etch

The profile of the relief, whether line or dot, should be clearly etched and be similar to that shown in Figure 1. All other profiles, as illustrated in Figure 2 – Figure 8 shall be avoided.

7 Finishing

Physical corrections of tone values by burnishing should be avoided. The routing of plates to obtain greater depth to ensure clean printing is an accepted practice. The degree of "skeletonizing" (excessive removal of non-printing metal) is a matter for agreement between the purchaser and the photo-engraver, and should take account of the need to minimize the risk of distortion during, transport and use.

Table 1 — Recommended minimum depths of etch

Screen lines per liner inch	Highlight 10 per cent		Midtone 50 per cent		Shadow 90 per cent	
	0.001 in	mm	0.001 in	mm	0.001 in	mm
50	6	0.152	$4^3/_4$	0.121	$3^3/_4$	0.095
55	$5^1/_2$	0.140	$4^1/_4$	0.108	3	0.076
60	$5^1/_4$	0.133	4	0.102	$2^1/_2$	0.063
65	$4^3/_4$	0.121	$3^1/_2$	0.089	$2^1/_4$	0.057
75	$4^1/_4$	0.108	3	0.076	$1^3/_4$	0.044
85	$3^1/_2$	0.089	$2^1/_2$	0.063	$1^1/_2$	0.038
100	3	0.076	2	0.051	$1^1/_2$	0.038
120	$2^1/_2$	0.063	$1^1/_2$	0.038	$1^1/_4$	0.032
133	$2^1/_4$	0.057	$1^1/_2$	0.038	1	0.025
150	2	0.051	1	0.025	$^3/_4$	0.019

Appendix A Notes on the use of half-tone and line printing plates

Whatever the quality of plate it will not print satisfactorily unless the paper used for printing has been taken into account when the screen ruling is selected. In general, coated papers are less likely to result in the filling-up of etched areas on half-tone plates than are uncoated papers. Frequently the complaint that the block is shallow is incorrect. The fault may result from the screen selected being too fine for the paper being used, or the ink being too thin. Either or both of these conditions would produce a similar result to that caused by lack of printing depth.

Experiments have shown that there is a loss of depth in the moulding process, especially in newspaper printing. In certain circumstances this may be critical and allowance may have to be made for the quality and treatment of the flong.

Figure 1 — Correctly formed profile

Figure 2 — Pin point highlights
Will probably collapse under pressure

Figure 3 — Insufficient depth
Possible "filling-in" especially after moulding

Figure 4 — Over etched
Tops of dots below printing surface

Figure 5 — False depth
Effective printing depth less than measured depth

Figure 6 — Underbiting
Will prevent removal of matrix. Dots will be damaged

Figure 7 — Pitted dots
Reduction in printing area. Loss in density

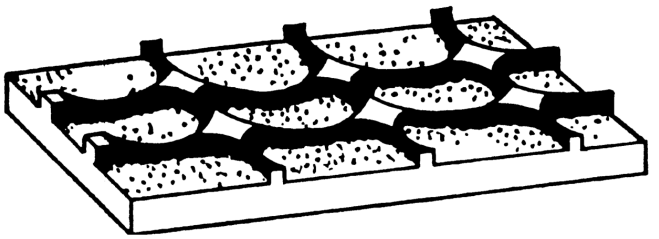

Figure 8 — Bridges connecting dots
Could print up during printing run

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