

Specification for

Picks, beater picks and mattocks

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Committees responsible for this British Standard

The preparation of this British Standard was entrusted to Technical Committee MTE/15, upon which the following bodies were represented:

- British Coal Corporation
- British Telecommunications plc
- Consumer Policy Committee of BSI
- Federation of British Hand Tool Manufacturers
- Handle Manufacturers' Association
- Institute of Carpenters
- Institute of Trading Standards Administration
- Ministry of Defence

The following bodies were also represented in the drafting of the standard, through subcommittees and panels:

- Association of Metropolitan Authorities
- British Hardware Federation
- County Surveyors' Society
- London Borough of Barking and Dagenham

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Foreword

This British Standard has been prepared by Technical Committee MTE/15 and is based on a draft submitted by the Federation of British Hand Tool Manufacturers. This revision has been undertaken to keep abreast of improvements in the manufacture and design of picks, beater picks, and mattocks.

This standard supersedes BS 1421:1947 which is withdrawn.

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 to iv, pages 1 to 30, 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 Scope

This British Standard specifies the quality, dimensions and mass, together with the dimensions of shafts where appropriate, for the following types of picks:

- a) navy pick;
- b) beater pick;
- c) mattock;
- d) miner's pick;
- e) ACME pick.

2 References

2.1 Normative references

This standard incorporates, by dated or undated reference, provisions from other publications. These normative references are made at the appropriate places in the text and the cited publications are listed on the inside back cover. For dated references, only the edition cited applies; any subsequent amendments to or revisions of the cited publication apply to this standard only when incorporated in the reference by amendment or revision. For undated references, the latest edition of the cited publication applies, together with any amendments.

2.2 Informative references

This standard refers to other publications that provide information or guidance. Editions of these publications current at the time of issue of this standard are listed on the inside back cover, but reference should be made to the latest editions.

3 Forms and dimensions

The eyes of the navy picks, beater picks and mattocks shall be of a tapered oval form and dimensioned as shown in Figure 1.

The eyes of the miner's picks, pick head, digging (see Figure 12) and poll pick (see Figure 13) shall be of a tapered oval form and dimensioned as shown in Figure 2.

NOTE In these figures an approximate draft angle is indicated on the end elevations. This draft angle and the point at which the die-line occurs (where applicable) is at the manufacturer's discretion.

The form and dimensions of the heads, sockets and shafts shall be as shown in Figure 3 to Figure 22 and Table 1 to Table 11.

NOTE Examples of European types of eye are shown in Annex C.

4 Mass

The mass (in kg) of any pick head shall be in accordance with the mass given in Table 1 to Table 11.

5 Material for heads

For navy picks, beater picks and mattocks (with eyes as shown in Figure 1), heads shall be made of good quality carbon steel with an analysis in accordance with Table 12.

For miner's picks (with eyes as shown in Figure 2), heads shall be manufactured from fully killed forging quality steel in accordance with the basic analysis range given in Table 13. The steel shall have a controlled grain size within the range 5 to 8 (McQuaid-Ehn) as defined in BS 4490:1989.

For pickhead, digging (with eye as shown in Figure 2; see Figure 10), the material shall be good quality carbon steel with an analysis in accordance with Table 12.

6 Manufacture

The heads shall be evenly shaped, free from flaws, seams or other deleterious defects. Excessive fins or flashes shall be removed. The eyes shall be evenly shaped and central and the major axis shall be in line with the axis of the implement. The longitudinal axis of the eye shall coincide with the longitudinal axis of the pick head within 3° for miner's picks and ACME picks, and within 5° for all other products.

7 Finish

The points and cutting edges of the picks shall be finished to a smooth surface. Points shall have a square-based pyramidal shape to an approximate included angle of 40°. Cutting edges shall be to an approximate included angle of 20°.

The striking face of the hammer ends shall be convex and have a smooth, bright finish.

The striking face shall have a chamfer at approximately 45° (or equivalent radius) all around the circumference with width equal to approximately one-twelfth of the diameter of the striking face, when measured across the chamfer angle.

All heads shall be free from all surface inclusions such as cracks, frays, laps and piping, which could affect or impair the functional requirement of the tool.

8 Heat treatment

8.1 Navy picks, beater picks and mattocks

8.1.1 The pointed end of the picks, beater picks and mattocks shall be heat treated during the course of the manufacture to give a hardness with the range of 46 to 54 HRC as defined in BS 891. The point tested shall be as near as practicable to the working point or cutting edge of the implement so as to obtain an accurate reading.

8.1.2 The mattock blade and beater end of the beater pick shall be heat treated to give a hardness within the range 38 to 54 HRC as defined in BS 891.

8.2 Miner's picks and ACME picks

8.2.1 Miner's pick heads shall be in the normalized condition prior to hardening.

8.2.2 The head shall be hardened at the working ends in order to achieve a martensitic structure and tempered so that the hardness is in the range 46 HRC to 54 HRC except for the striking face of hammer ends which shall be 48 HRC to 56 HRC as defined in BS 891.

8.2.3 The hardness on the hammer end striking face when measured from any point along that face shall extend to a minimum depth of 3 mm at which the hardness shall not be less than 44 HRC and not be greater than that of the surface.

8.2.4 The hardness at the points and cutting edges shall extend to a minimum depth of 20 mm from the point or cutting edge at which the hardness shall not be less than 42 HRC.

8.2.5 The eye hardness shall not exceed 35 HRC when tested using the Rockwell hardness test method.

NOTE Alternative methods of hardness testing may be used in conjunction with BS 860.

9 Shafts

9.1 General

Shafts shall be manufactured from wood, or fibre-glass reinforced plastics.

9.2 Wood shafts

Wood shafts shall be made of hickory of at least grade BW/BR in accordance with BS 3823.

9.3 Fibre-glass reinforced plastics shafts

Fibre-glass reinforced plastics shafts shall be moulded in thermosetting type plastics containing a minimum of 60 % fibre-glass (*m/m*). Glass fibres shall be continuous, unidirectional and longitudinal.

Where the butt end of the shaft is provided with a grip, it shall be securely fitted, and suffer no deterioration due to the action of oil and/or grease.

10 Fitting and finish of shafts

10.1 Miner's picks with No. 1 Universal Eye other than ACME picks (see 10.2)

Where fitted the socketed shaft shall be visually square with the pick head and shall fully fit the eye. The projection of the socketed wooden shaft, when stamped home in the eye of the pick, shall be not less than 10 mm or greater than 35 mm.

10.2 ACME picks

The shaft shall be rivetted to the socket by means of a rivet as shown in Figure 19 and the socketed shaft shall be visually square with the pick head. The head shall be held in position by a steel wedge as shown in Figure 19 and Figure 20.

10.3 Navy picks, beater picks and mattocks

The projection of the shafts when fully fitted in the eye of the pick head shall be not less than 12.5 mm or greater than 38 mm.

10.4 Finish

Wood and fibre-glass reinforced plastics shafts shall be smoothly finished so that there are no surface imperfections. Wood shafts may be smooth sanded, waxed, lacquered or varnished.

11 Dimensions of shafts

Unless intended for use in special circumstances, for example for use in confined spaces, the dimensions of the shafts shall be as follows, depending upon the type of eye and the material used for the shaft.

- a) With No. 6 eyes the dimensions of the shafts shall be as follows.
 - 1) For wooden shafts the dimensions shall be as given in Figure 14.
 - 2) For fibre-glass shafts the dimensions shall be as given in Figure 15.
- b) With No. 1 eyes the dimensions of the shafts shall be as follows.
 - 1) The dimensions of wooden shafts shall be as given in Figure 16.
 - 2) The dimensions other than length of fibre-glass reinforced plastics shafts shall be as given in Figure 18.

NOTE For fibre-glass reinforced plastics shafts, the lengths shown in Figure 18 are recommended.

12 Sockets

If shafts are fitted with sockets of steel for miner's picks and malleable cast iron for ACME picks, they shall be shaped and dimensioned as shown in Figure 2, Figure 19 and Figure 20.

13 Tests

Each pick, beater pick or mattock shall be capable of passing the tests in Annex A. After hardness testing in accordance with **A.1**, the pick head hardness shall be in accordance with clause 8.

After testing the soundness of the pick head in accordance with **A.2.1**, the pick head shall on examination show no signs of cracking or damage.

After drop testing of the pick head in accordance with **A.2.2**, the working end of the tool shall show no sign of deformation or cracking.

In the case of fibre glass shafts, after testing in accordance with **A.3.1**, there shall be no defect as a result of the test that would affect the safe use of the pick.

After testing the adhesion of the shaft grip in accordance with **A.3.2**, the shaft grip shall remain firmly attached to the shaft.

After testing the attachment of the head and handle in accordance with **A.3.3**, the head/plug/handle shall show no sign of having pulled apart or loosened.

14 Marking

14.1 Heads

Each head shall be legibly marked with the following:

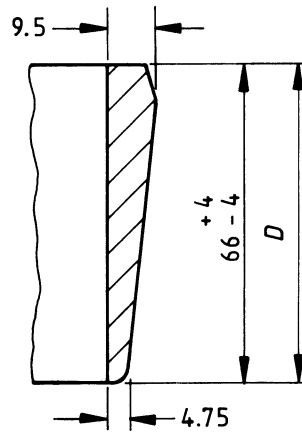
- a) nominal mass;
- b) manufacturer's name or trademark;
- c) where space permits, the number of this British Standard, i.e. BS 1421:1995.¹⁾

In order to avoid stress concentration, all markings shall be applied to the unhardened part of the head.

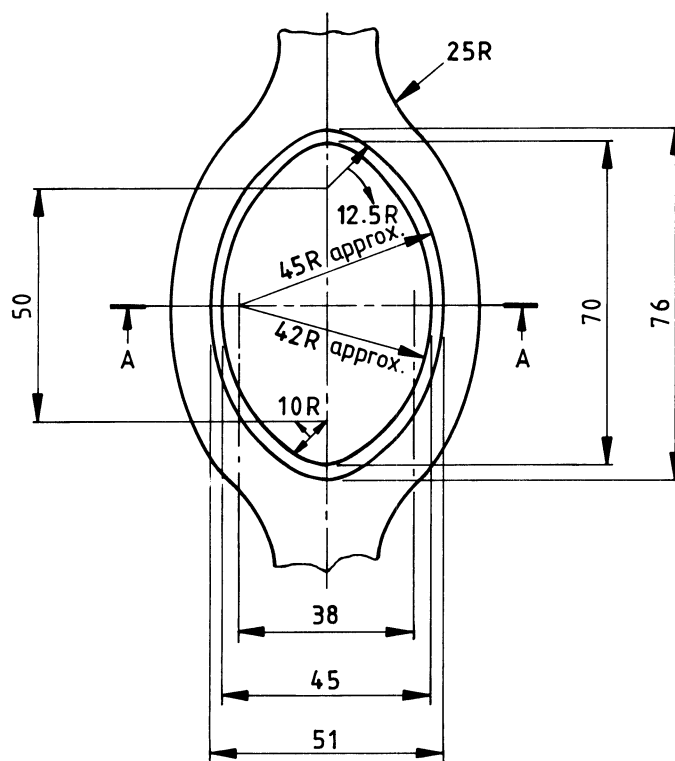
14.2 Traceability mark of shaft

Each shaft shall be legibly branded with a traceability mark in such a way that the source of manufacture may be readily determined.

¹⁾ Marking BS 1421:1995 on or in relation to a product represents a manufacturer's declaration of conformity, i.e. a claim by or on behalf of the manufacturer that the product meets the requirements of the standard. The accuracy of the claim is solely the claimant's responsibility. Such a declaration is not to be confused with third party certification of conformity, which may also be desirable.



Section on A - A for figs 1.3.4.5.6.7.8

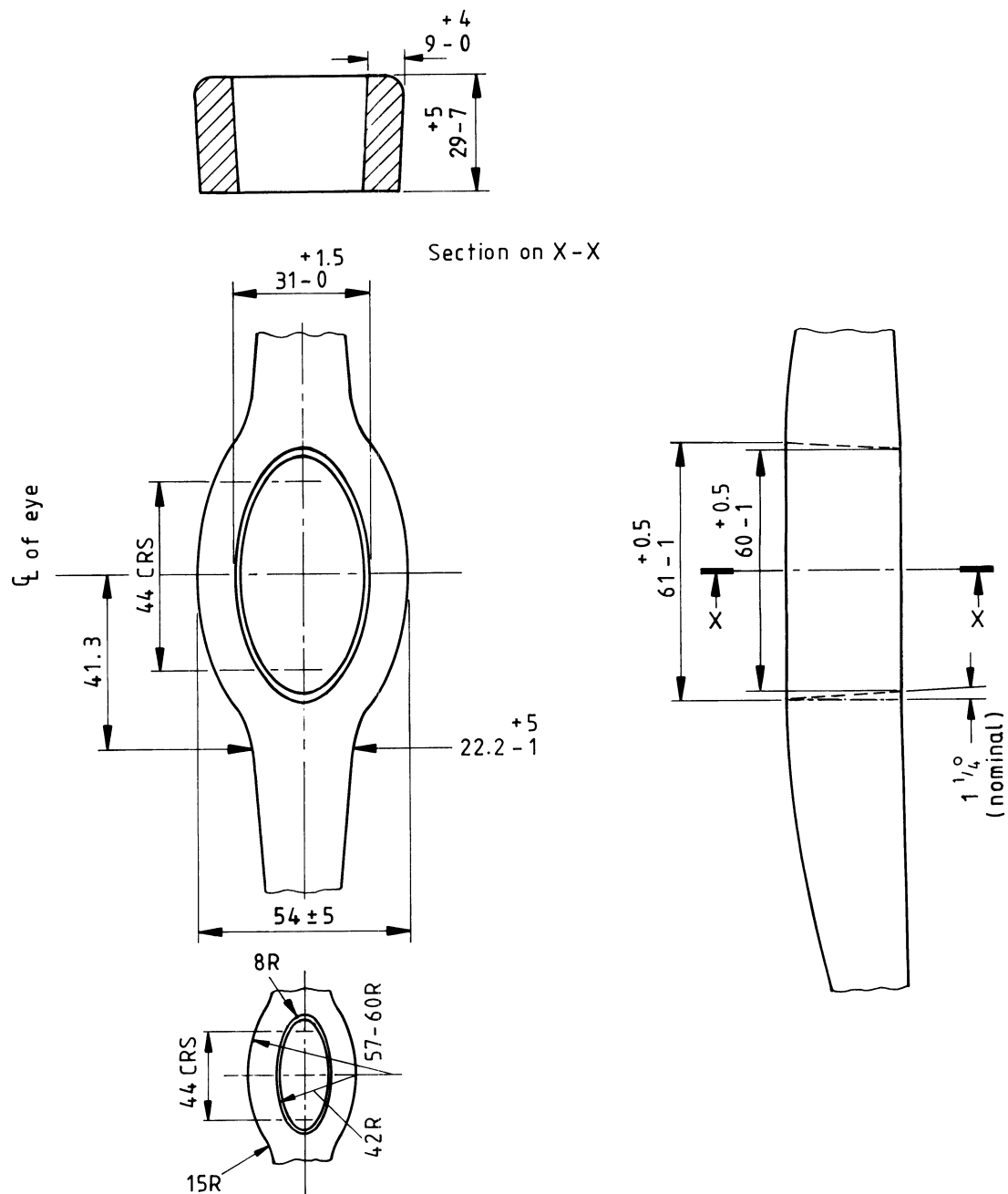


Dimensions in millimetres.

Tolerances: Axes and radii $\begin{smallmatrix} +1.5 \\ 0 \end{smallmatrix}$

Other dimensions ± 1.5

Figure 1 — Form and dimensions of eyes for navy picks, beater picks and mattocks for American standard No. 6 eye



Dimensions in millimetres.

Figure 2 — Form and dimensions of eyes for Universal No. 1 miner's picks

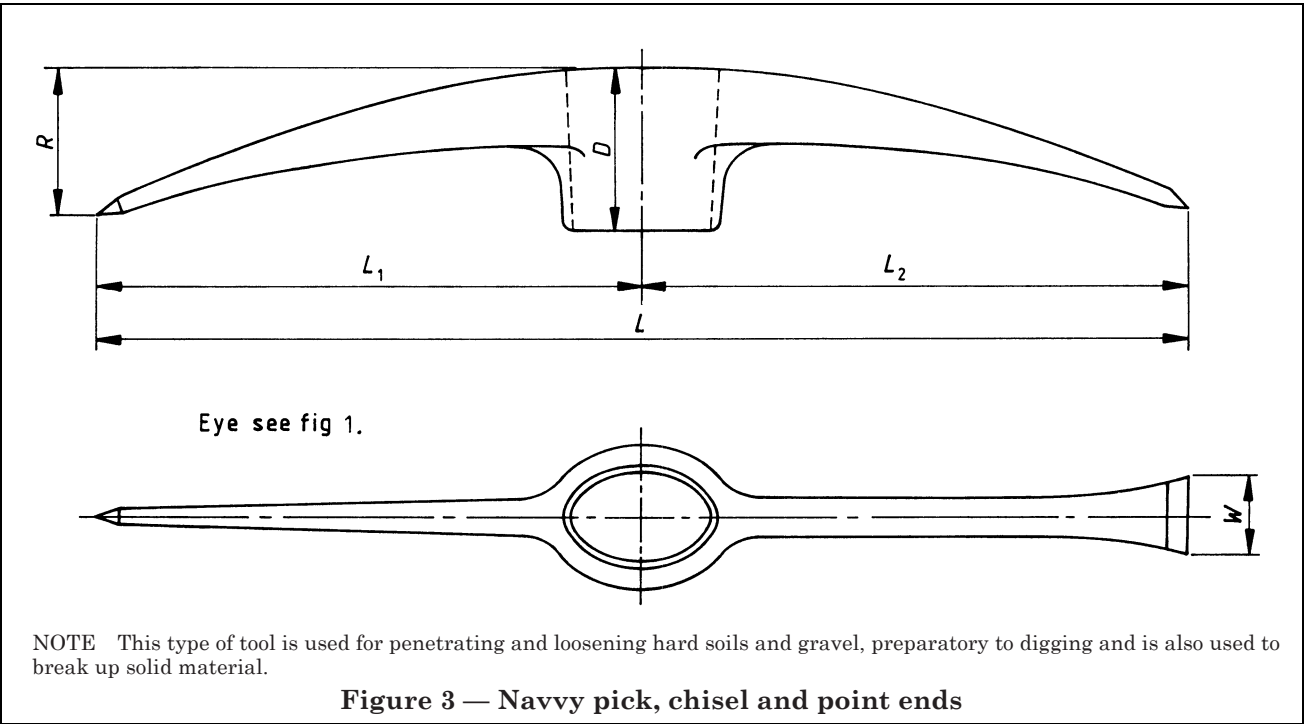


Table 1 — Navy pick, chisel and point ends

Nominal mass ^a kg	Overall length $L \pm 25.0$ mm	Half length $L_1 \pm 12.5$ $L_2 \pm 12.5$ mm	Rise of point and chisel $R \pm 6.0$ mm	Width of chisel $W \pm 6.0$ mm	Depth of eye $D \pm 4.0$ mm
2.5	590	295	73	40	66
3.15	650	325	73	40	66

^a The tolerance on the actual mass is $+7.5$ -5.0 %.