

Forks, shovels and spades — Requirements and test methods

ICS 53.120

Confirmed January 2011

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by Technical Committee MTE/15, Hand tools, to Subcommittee MTE/15/13, Spanners, screwdrivers, pliers and nippers, upon which the following bodies were represented:

Federation of British Hand Tool Manufacturers
Ministry of Defence — UK Defence Standardization

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 26 May 2004

©BSI 26 May 2004

First published June 1961
First revision June 1973
Second revision May 2004

The following BSI references relate to the work on this British Standard:
Committee reference MTE/15/13
Draft for comment 02/714030 DC

ISBN 0 580 43727 2

Amendments issued since publication

Amd. No.	Date	Comments

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Foreword

This British Standard has been prepared by Subcommittee MTE/15/13 and is based on a draft submitted by the Federation of British Hand Tool Manufacturers. It supersedes BS 3388:1973, which is withdrawn.

The main difficulty in the standardization of forks, shovels and spades is the very strong regional preferences for particular shapes of blade and handle, which has led to the development, over several centuries, of a number of variations of the basic design. Stronger preferences have been recognized and included in the standard and it is hoped that as the work of standardization proceeds, agreement will be reached on the further rationalization of types and sizes, thus leaving a reasonable range of tools covering all fields of general usage which can be manufactured with greater economy.

The tools in this edition have been arranged in four performance categories which are given in **3.2**. These categories are intended to aid the consumer to select a tool suitable for the task to be performed and they cater for the increasing market in forks, shovels and spades for the domestic user.

Furthermore, with customer safety in mind, an annex giving guidance on safe use of the tools included in this British Standard has been added.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its 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 61 and a back cover.

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1 Scope

This British Standard specifies the dimensions, materials, construction, finish and testing for a range of garden, agricultural and contractors' tools.

NOTE Guidance on the safe use of tools is also given in Annex B.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS 970-1, Specification for wrought steels for mechanical and allied engineering purposes — Part 1: General inspection and testing procedures and specific requirements for carbon, carbon manganese, alloy and stainless steels.

BS 1449-1, Steel plate, sheet and strip — Part 1: Carbon and carbon-manganese plate, sheet and strip.

BS 3823, Grading of ash and hickory wood handles for hand tools.

BS 8020, Tools for live working — Insulating hand tools for work on or near conductor rail systems operating at voltages up to 1 000 V a.c. or 1 500 V d.c.

BS EN 10216-2, Seamless steel tubes for pressure purposes — Technical delivery conditions — Part 2: Non-alloy and alloy steel tubes with specified elevated temperature properties.

BS EN 10217-2, Welded steel tubes for pressure purposes — Technical delivery conditions — Part 2: Electric welded non-alloy and alloy steel tubes with specified elevated temperature properties.

BS EN 10296-1, Welded circular steel tubes for mechanical and general engineering purposes — Technical delivery conditions — Part 1: Non-alloy and alloy steel tubes.

BS EN 10305-3, Steel tubes for precision applications — Technical delivery conditions — Part 3: Welded cold sized tubes.

BS EN 10305-5, Steel tubes for precision applications — Technical delivery conditions — Part 5: Welded and cold sized square and rectangular tubes.

BS EN 13706 (all parts), Reinforced plastics composites — Specifications for pultruded profiles.

BS EN ISO 6508-1, Metallic materials — Rockwell hardness test — Part 1: Test method (scales A, B, C, D, E, F, G, H, K, N, T).

3 Nomenclature and classification

3.1 For the purposes of this British Standard, the nomenclature given in Figure 1 and Figure 2 applies.

3.2 Tools shall be classified according to their usage as a result of testing in accordance with Annex A into the following categories:

- a) light duty garden tools;
- b) standard garden tools (covering both domestic and professional gardener use);
- c) professional and agricultural tools;
- d) contractors' tools.

An example of a test rig for forks is shown in Figure 3 and an example of a test rig for shovels and spades is shown in Figure 4.

4 Types and dimensions

The various types and dimensions, with a tolerance of ± 10 mm unless otherwise stated, of garden, agricultural and contractors' tools are detailed in Figure 5 to Figure 36. The dimensions of wooden handled tools shall conform to Figure 5 to Figure 36.

Optional variations to the range of tools are shown in Figure 37 to Figure 62.

NOTE The dimensions of handles and sockets may vary depending upon the handle materials used.

5 Materials

5.1 General

The prongs of forks and blades of shovels and spades shall be manufactured from steel, alloys or plastics. Finished tools shall be tested in accordance with Clause 9 and the performance of the tool in the anticipated range of operating conditions shall not be impaired (in respect of toxicity, tolerance of climate variations and the effects of oil, grease and sunlight).

NOTE 1 The handles of tools are traditionally made of wood, but other materials such as light alloy, fibreglass or plastics may be used, see 5.6.

NOTE 2 When selecting manufacturing materials for tool prongs and blades, the anticipated range of operating conditions for the tool should be considered, so the performance of the tool is not impaired.

5.2 Forged forks, shovels and spades

The prongs of forged forks and blades of forged shovels and spades shall either be manufactured from steel whose component analysis conforms to Table 1 or steels with hardness values in accordance with Clause 6 and that successfully withstand testing in accordance with Clause 9.

Table 1 — Component analysis of steel for prongs and blades of forged tools

Element	Content %
Carbon	≥ 0.32
Manganese	≥ 0.50
Silicon	≤ 0.40
Sulfur	≤ 0.06
Phosphorus	≤ 0.06
Carbon and manganese together	≥ 1

5.3 Open-socket or fabricated tools

Heads of open-socket or fabricated tools shall be manufactured from steel conforming to BS 1449-1.

5.4 Straps and sockets

The straps and sockets of tools which are not solid forged shall be manufactured from low carbon steels, i.e. steels containing less than 0.3 % carbon and less than 0.9 % manganese, conforming to BS 1449-1.

5.5 Rivets/fasteners

Rivets/fasteners shall be manufactured from material conforming to BS 1449-1 or BS 970-1.

5.6 Handles

Handles of forks, shovels and spades shall be manufactured from one of the following materials:

- graded ash conforming to BS 3823;
- hardwoods conforming to BS 3823;
- tubular steel conforming to BS EN 10296-1, BS EN 10305-3 or BS EN 10305-5 for high tensile steel tubes and BS EN 10216-2 or BS EN 10217-2 for seamless tubes;
- fibreglass reinforced plastics conforming to BS EN 13706 or BS 8020.

NOTE 1 When selecting materials for tool handles, the anticipated range of operating conditions for the tool should be considered, e.g. environmental toxicity, climate variation, and the effects of oil, grease and sunlight.

NOTE 2 Users are cautioned that as wood is a natural grown material, it can be inconsistent in performance.

6 Heat treatment and hardness

When measured not less than 50 mm from the shoulder, heat-treated unalloyed steel prongs of forks and blades of shovels and spades which have been hardened and tempered shall have a hardness value between 39 HRC and 47 HRC in accordance with BS EN ISO 6508-1.

NOTE 1 Corresponding values of Brinell and Rockwell hardness numbers may be used as given in BS 860.

NOTE 2 The hardness of alloy steels may vary.

Non-heat-treated steel tools shall undergo the same testing as heat-treated steel tools.

7 Construction

7.1 Fully forged tools

Fully forged tools shall be constructed with the prongs of forks and the blades of shovels and spades forged integrally with straps, sockets and tangs from a single piece of material.

7.2 Part forged tools

Part forged tools shall be constructed with the prongs of forks and the blades of shovels and spades either:

- a) forged and welded to the straps or socket; or
- b) welded to a forged tang and the tang welded to a socket or straps.

7.3 Fabricated tools

Fabricated tools shall have a multi-piece, welded construction.

7.4 Open-socket tools

Open-socket tools shall be constructed with the prongs or blades and sockets formed integrally from a single piece of material.

8 Finish

8.1 When inspected visually, the prongs or blades of tools shall be free from scale, cracks and deformations and shall be uniform in shape.

8.2 All sockets and straps shall be smooth (i.e. have a surface that is even and regular, free from perceptible lumps, projections, indentations or roughness) and permanently secured (for example, riveted or in the case of fibreglass epoxy glued) to the handles preventing movement of the component parts against each other. The sockets and straps shall be close fitting and shall have a smooth transition from shaft to socket. Rivets, where used, shall be given a smooth finish.

8.3 Handles shall be in alignment with the shoulders of the prongs or blades (see Figure 1 or Figure 2).

NOTE 1 The configurations of handles which are available and handle construction are shown in Figure 37 to Figure 45.

NOTE 2 Where handles manufactured from materials other than wood are used, the socket may be shorter than indicated.

8.4 The blades of all spades shall have a sharp working edge. Handles shall have a smooth finish in order to prevent injury to hands.

8.5 All metal surfaces shall be finished with one of the following methods:

- a) bright finish with an anti-corrosion treatment;
- b) self-coloured;
- c) paint-finished.

9 Testing

9.1 Mechanical testing

When tested in accordance with **A.1**, forks, shovels and spades shall, on removal of the load, show no signs of damage or loosening of any component part, nor shall there be any permanent set in excess of 25 mm when measured at the centre of the hilt (i.e. at the standard test length of 710 mm).

9.2 Individual tine testing for forks designed for digging

When tested in accordance with **A.2**, the fork shall, on removal of the load, show no signs of damage or loosening of any component part, nor shall there be any permanent set in excess of 10 mm when measured at a distance of 533 mm from the centre of Roller A, see Figure 3. Individual tine displacement shall not exceed 4 mm.

9.3 Tine or prong squeeze testing

When tested in accordance with **A.3**, the tines or prongs of the fork shall show no sign of permanent set or damage in excess of 1 mm per tine or prong.

10 Marking

10.1 All forks, shovels and spades shall either be legibly and permanently marked on the metal portion of the tool or foil marked/branded on the handle with the following information:

- a) the supplier's name or trademark;
- b) the number and date of this British Standard, i.e. BS 3388:2004¹⁾.

10.2 Light duty tools shall be marked with the words "light duty".

10.3 Tools which are marked on the prong or blade shall be marked not more than 50 mm from the shoulder.

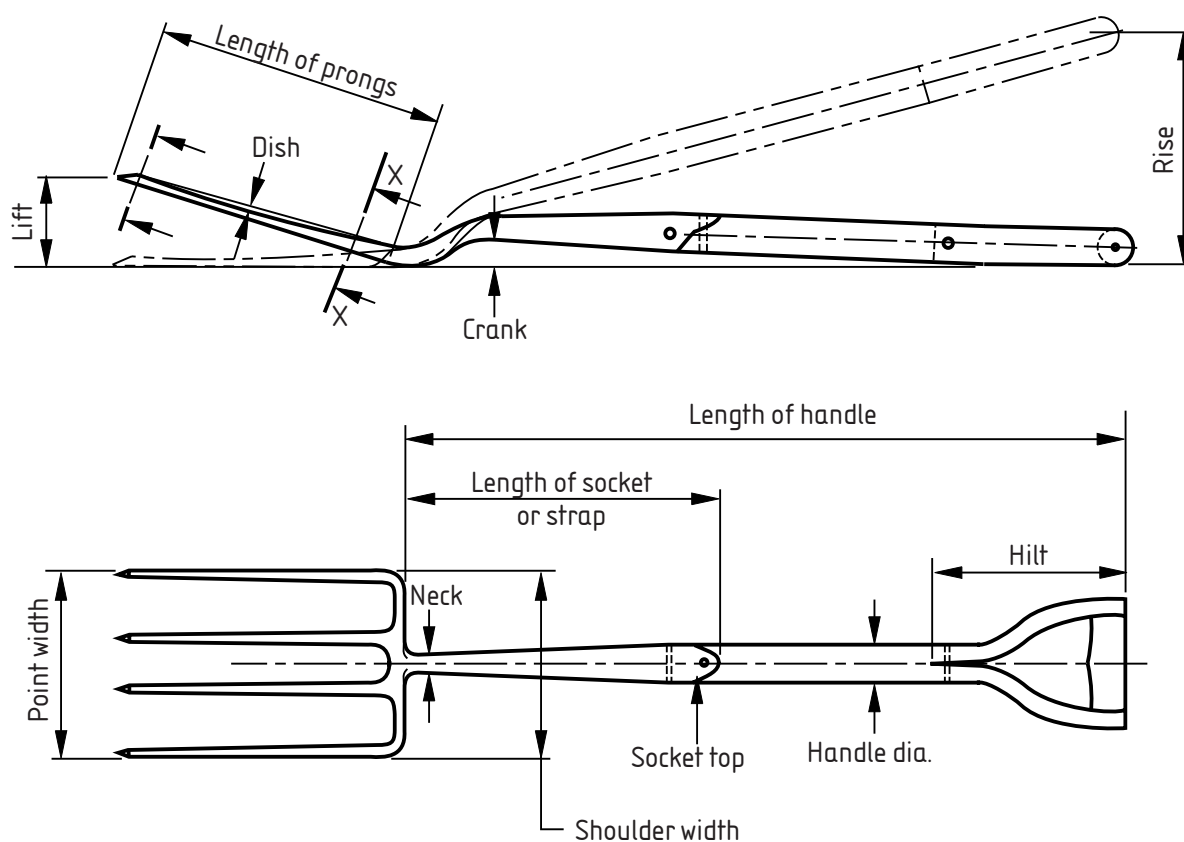
11 User information

The information given in **B.1** shall be supplied with all forks when requested, along with the information regarding the appropriate designed use of the fork given in **B.3**.

The information given in **B.2** shall be supplied with all shovels and spades when requested, along with the information regarding the appropriate designed use of the shovel or spade given in **B.3**.

The information given in Annex C shall be supplied with all wooden handled tools when requested.

¹⁾ Marking BS 3388:2004 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.



Prong profile at X - X Normal use

Square		Garden, contractor's, ballast
Diamond		Coke
Round or oval		Hay, bale manure, ballast, beet or potatoe ball end
Ribbed back		Potato

Prong point Normal use

Pencil		with round or oval prong
Chisel		with square prong
oval or ball end		with round or oval prong
Square		with square or ribbed back
Pyramid		with square or diamond

Figure 1 — Nomenclature for forks

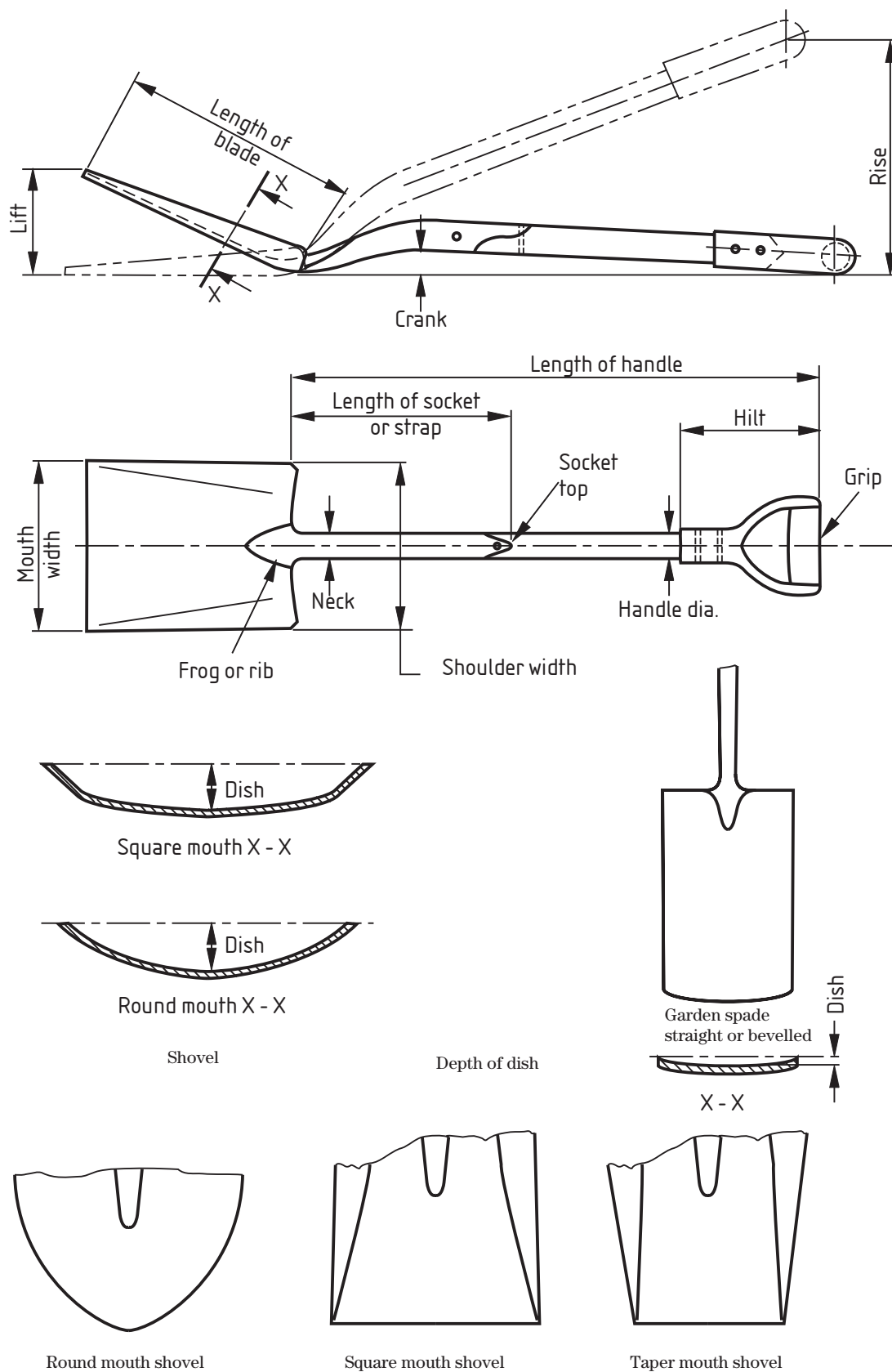


Figure 2 — Nomenclature for typical shovels and spades

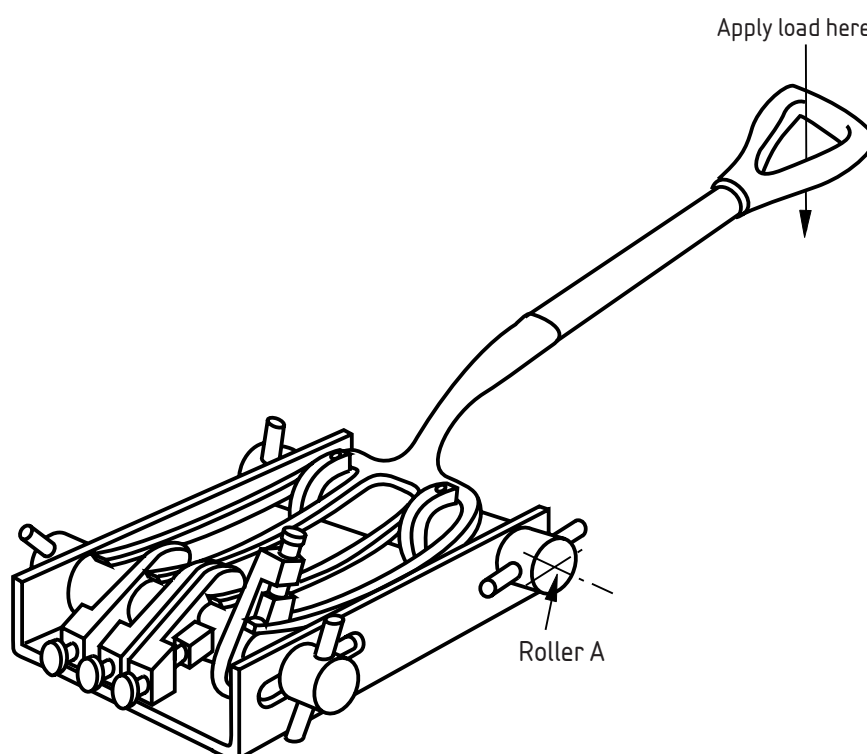
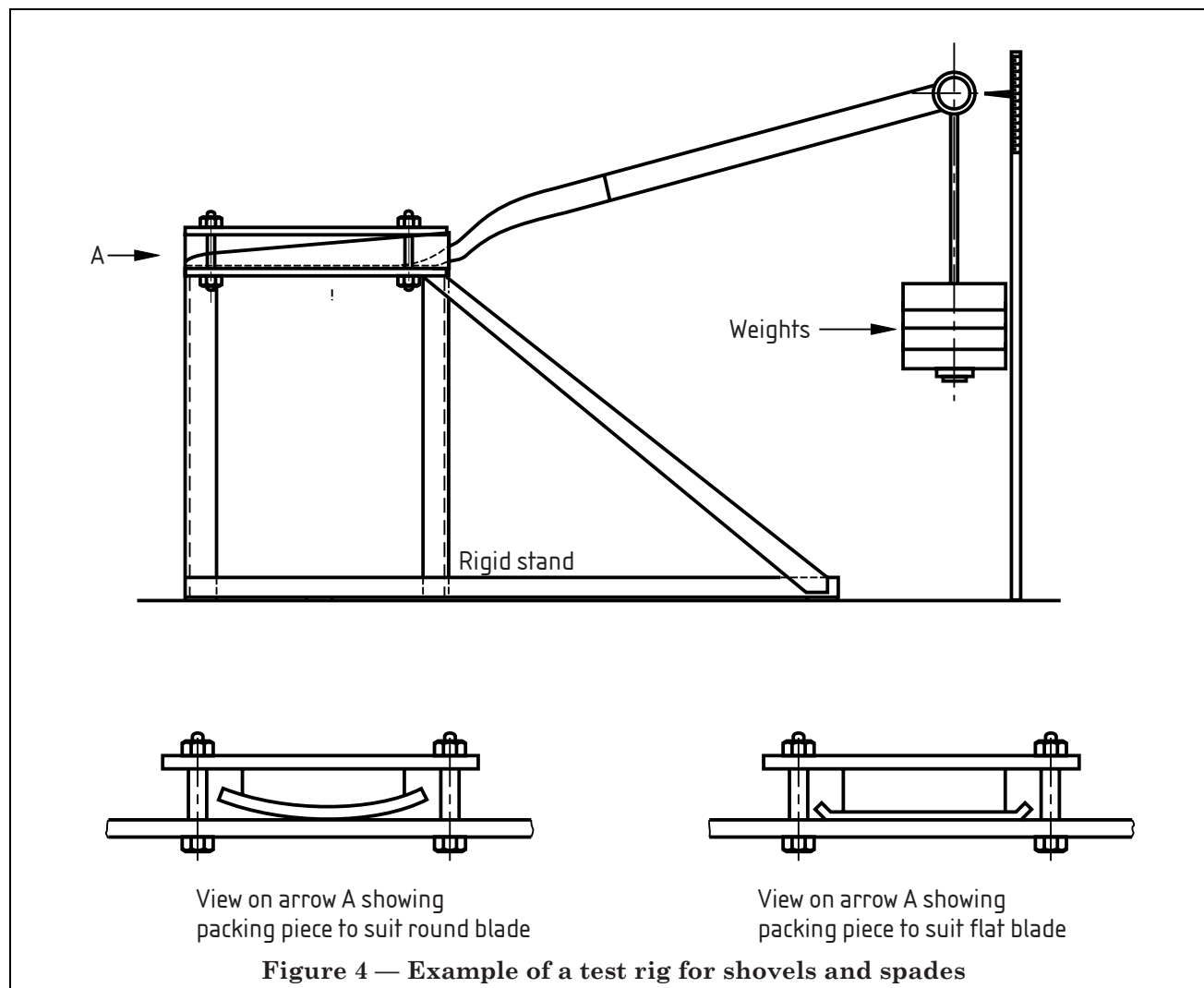


Figure 3 — Example of a test rig for forks



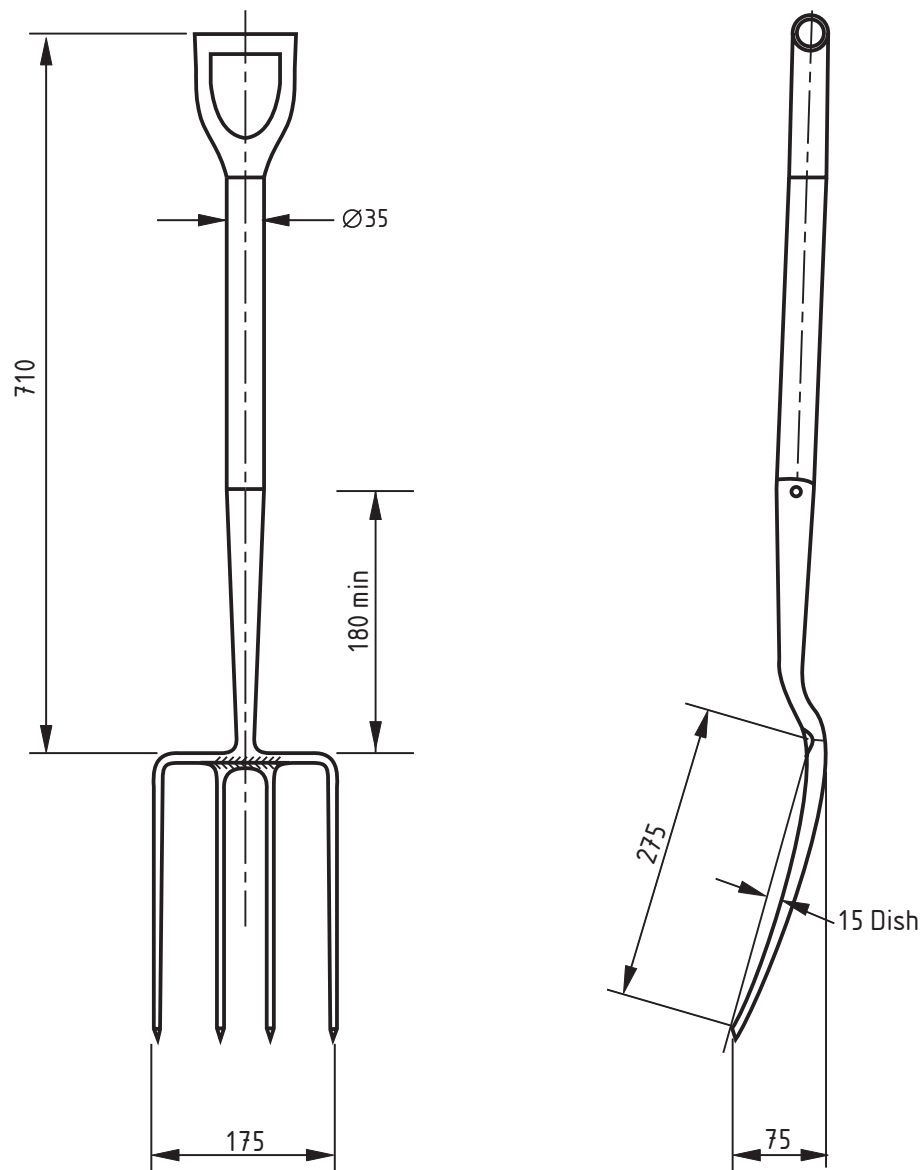


Figure 5 — Light duty garden fork

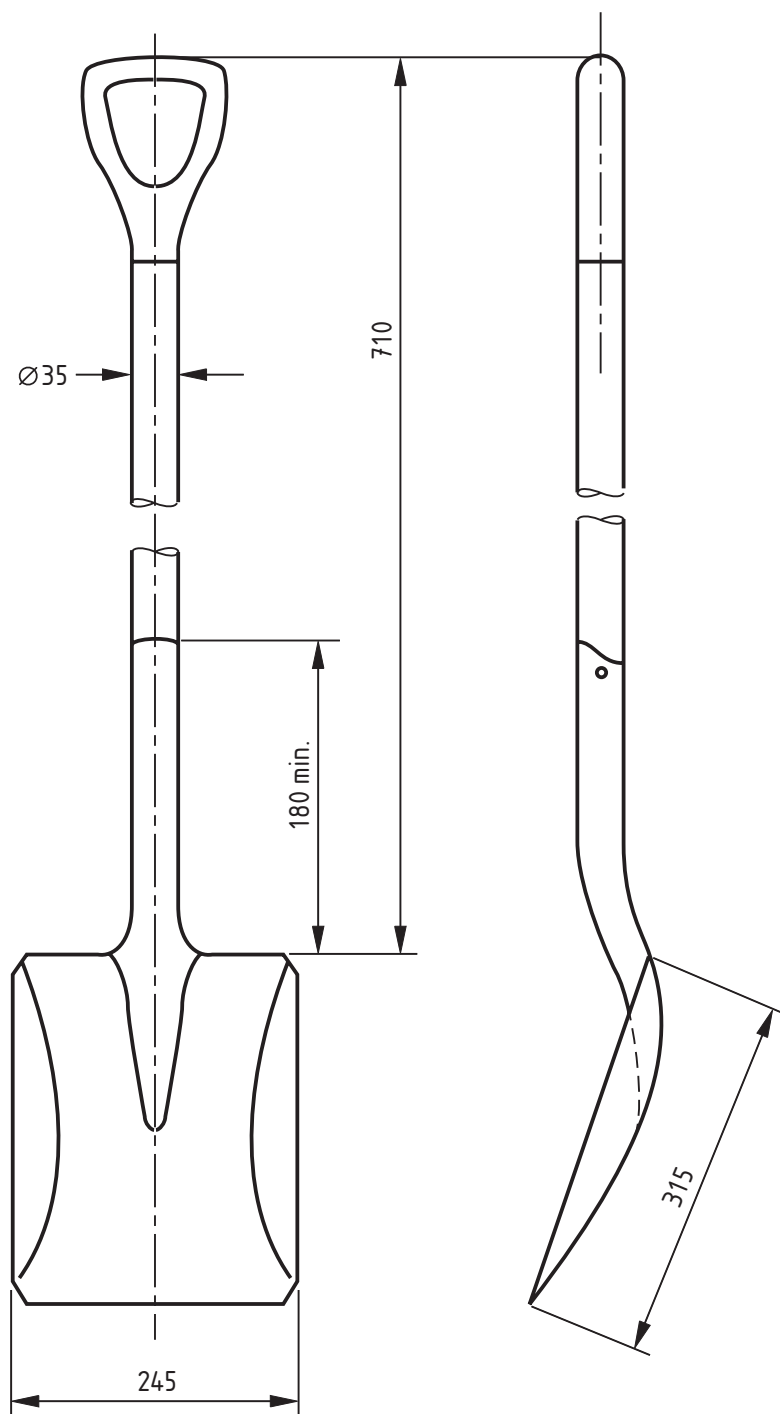


Figure 6 — Light duty square-mouth (open-socket) shovel

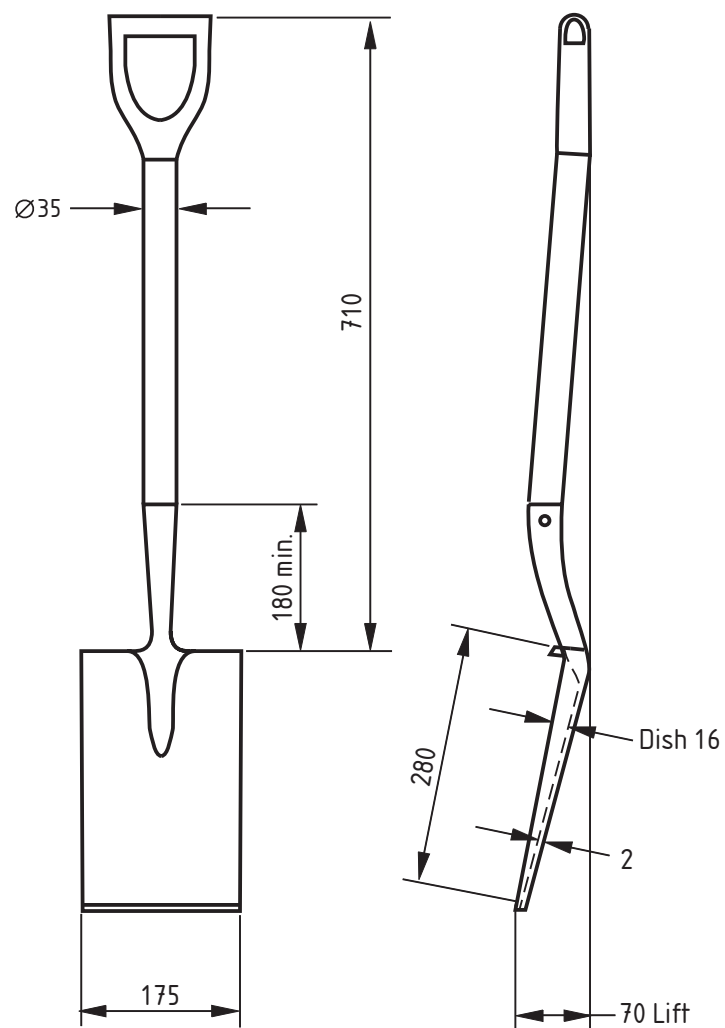


Figure 7 — Light duty garden space (open-socket or fabricated with or without treads)

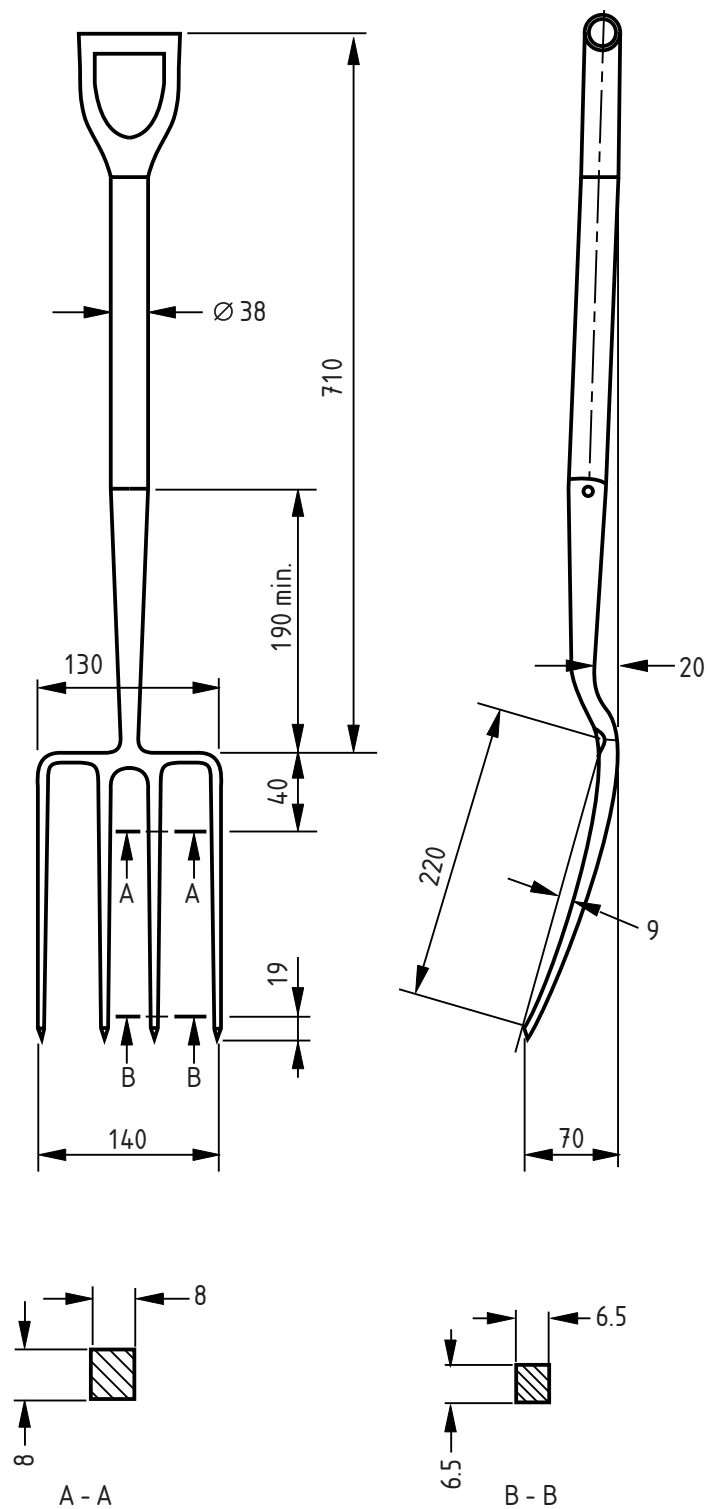


Figure 8 — Standard garden border fork

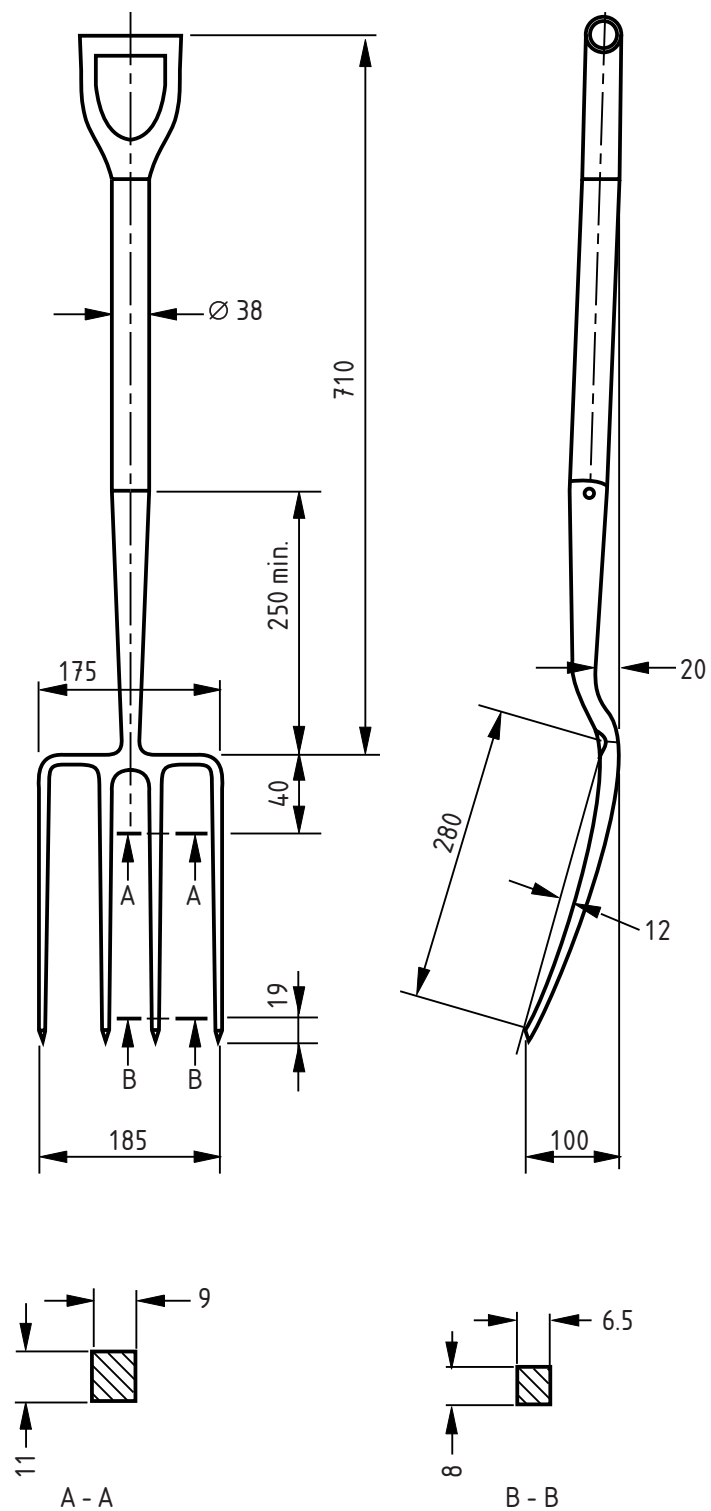


Figure 9 — Standard garden fork

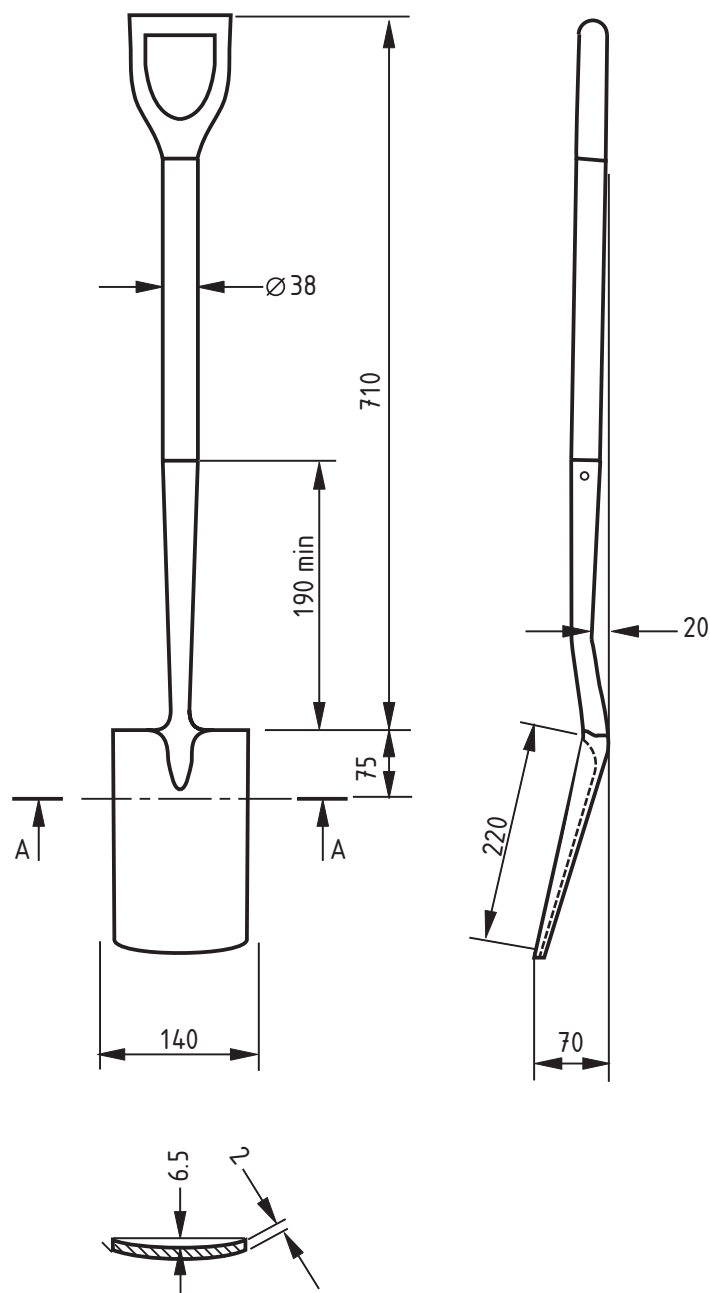


Figure 10 — Standard garden border spade

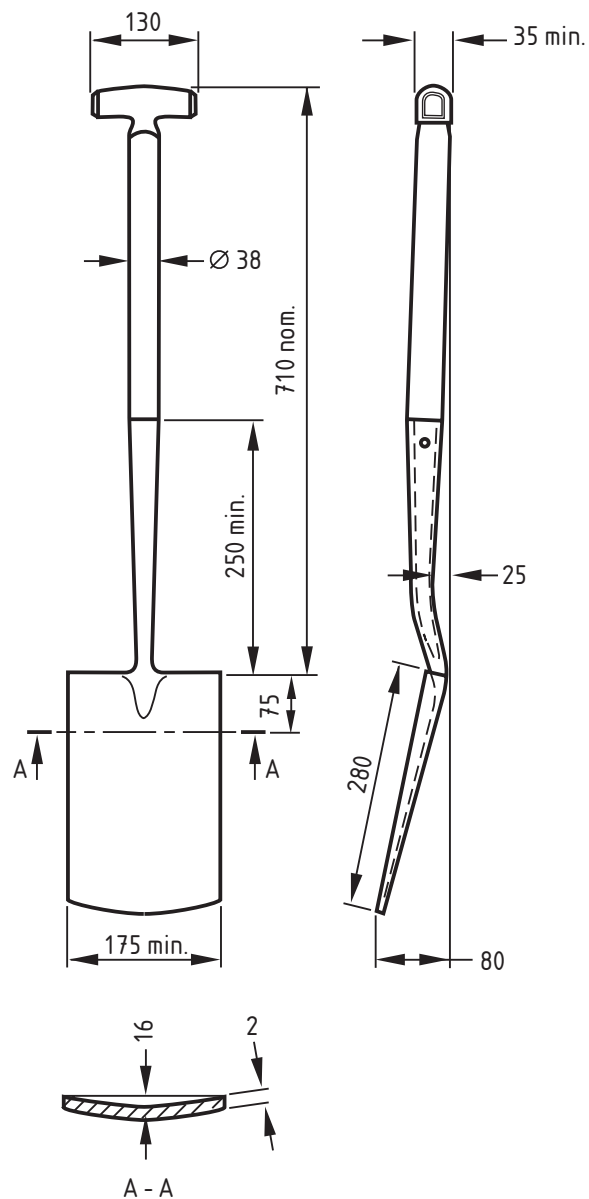


Figure 11 — Standard garden digging spade