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DRAFT EAST AFRICAN STANDARD

Hoe — Specification

EAST AFRICAN COMMUNITY

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0 Foreword

Development of the East African Standards has been necessitated by the need for harmonizing requirements governing quality of products and services in the East African Community. It is envisaged that through harmonized standardization, trade barriers that are encountered when goods and services are exchanged within the Community will be removed.

The Community has established an East African Standards Committee (EASC) mandated to develop and issue East African Standards (EAS). The Committee is composed of representatives of the National Standards Bodies in Partner States, together with the representatives from the public and private sector organizations in the community.

East African Standards are developed through Technical Committees that are representative of key stakeholders including government, academia, consumer groups, private sector and other interested parties. Draft East African Standards are circulated to stakeholders through the National Standards Bodies in the Partner States. The comments received are discussed and incorporated before finalization of standards, in accordance with the Principles and procedures for development of East African Standards.

East African Standards are subject to review, to keep pace with technological advances. Users of the East African Standards are therefore expected to ensure that they always have the latest versions of the standards they are implementing.

The committee responsible for this document is Technical Committee EASC/TC 042, *Production and General Engineering*.

This third edition cancels and replaces the second edition (2021), which has been technically revised.

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Hoe — Specification

1 Scope

This draft East African Standard specifies the requirements, sampling and test methods for forged hoes; both plain and fork handheld hoes used for digging. It also covers double headed hoes.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

ISO 6508-1, *Metallic materials — Rockwell hardness test — Part 1: Test method*

ISO 9556, *Steel and iron — Determination of total carbon content — Infrared absorption method after combustion in an induction furnace*

ISO 10700, *Steel and iron — Determination of manganese content — Flame atomic absorption spectrometric method*

ISO 439, *Steel and iron — Determination of total silicon content — Gravimetric method*

ISO 10714, *Steel and iron — Determination of phosphorus content — Phosphovanadomolybdate spectrophotometric method*

ISO 671, *Steel and cast iron — Determination of sulphur content — Combustion titrimetric method*

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at <http://www.iso.org/obp>

4 Designation

A hoe shall be designated by the types of eye and the nominal mass given in Tables 2 to 6, for example, 'plain hoe round eye 1.2 kg'.

5 Types

5.1 General

Hoes shall be of two types:

- a) plain hoes; and
- b) fork hoes.

5.2 Plain hoes

A plain hoe may be one of the following types:

- a) raised eye plain hoe as illustrated in figure 1 and figure 2;
- b) sunken eye plain hoe as illustrated in figure 3; and
- c) hammer head plain hoe as illustrated in figure 4 and figure 5;

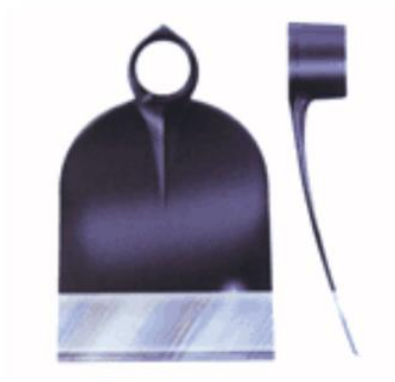


Figure 1 — Raised eye plain hoe

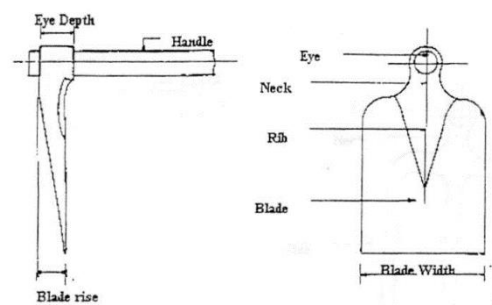


Figure 2 — Labelled raised eye plain hoe



Figure 3 — Sunken eye plain hoe



Figure 4 — Hammer head plain hoe

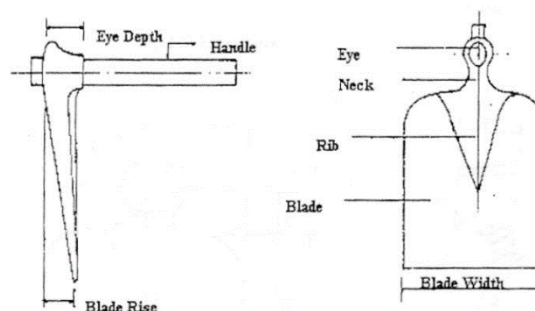


Figure 5 — Labelled hammer head plain hoe

5.3 Fork hoes

A fork hoe shall have three or four tines as illustrated in Figure 6 and 7.



Figure 6 — Fork hoe with four tines

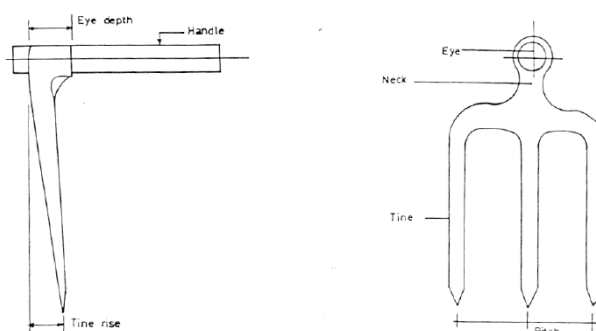
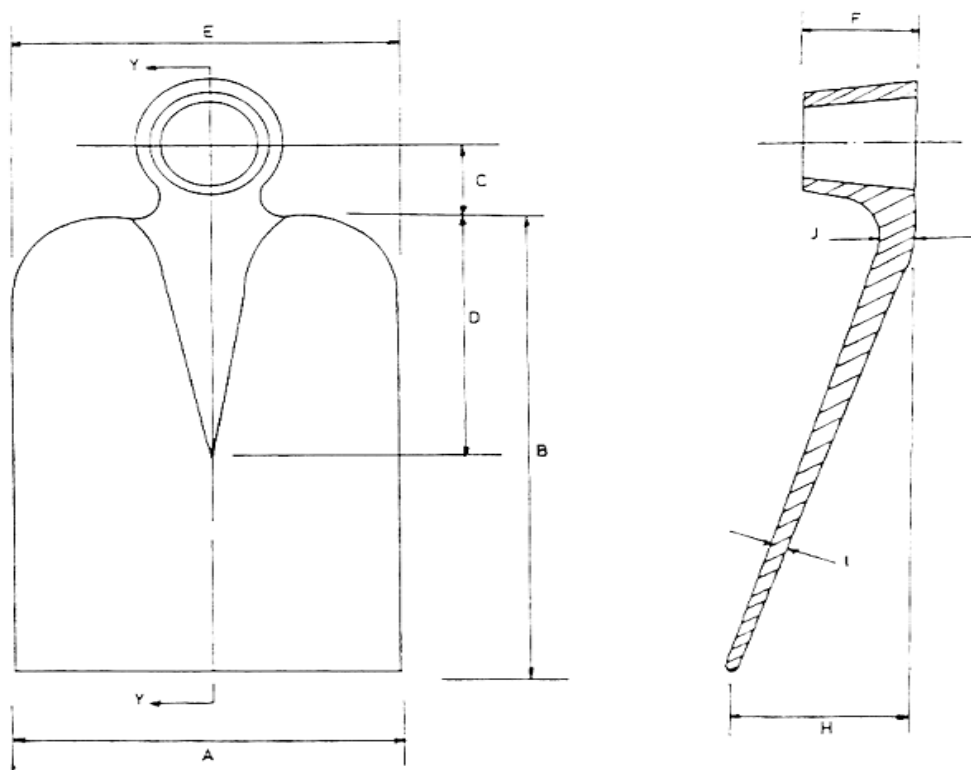


Figure 7 — Labelled fork hoe

6 Dimension

The dimensions and tolerances shall be as specified in Tables 1 to 7 read together with figures 8 to 14 respectively.



Key:

A – Blade width

B – Blade length

C – Neck Height

D – Rib Height

E – Shoulder width

F – Eye depth

H – Blade rise

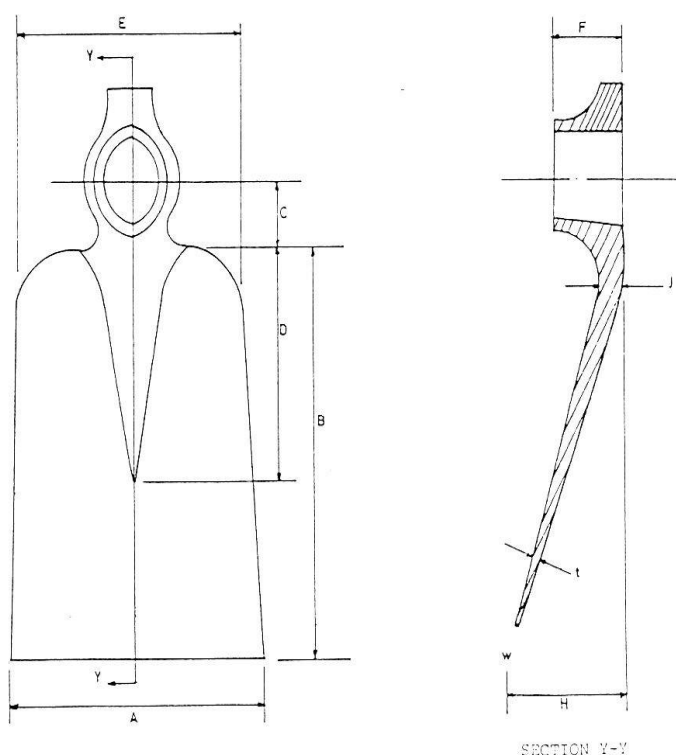
T – Blade thickness

J – Rib thickness

Figure 8 — Raised eye plain hoes dimensions

Table 1 — Dimensions of raised eye plain hoes

Designated mass, kg	Dimensions mm								
	A ± 5	B ± 5	C ± 2	D ± 10	E ± 5	F ± 2	H ± 3	J, Min	t, Min
0.7	115	175	30	110	115	38	40	7.0	2.5
1.2	150	210	35	110	140	40	40	9.0	2.5
1.3	165	225	35	110	160	40	40	9.0	2.5
NOTE For details of the eye, see Figure 5 and Table 5.									

**Key:**

- A – Blade width
- B – Blade length
- C – Neck Height
- D-Rib Height
- E – Shoulder width
- F – Eye depth
- H – Blade rise

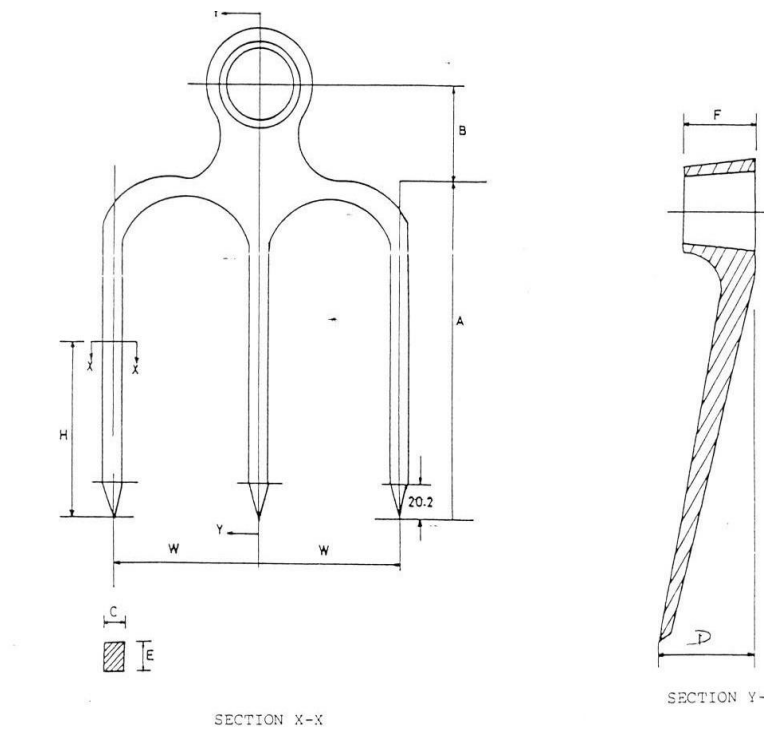
T – Blade thickness
J – Rib thickness

Figure 9 — Hammerhead plain hoes

Table 2 – Dimensions for hammerhead plain hoes

Designated mass, kg	Dimensions in millimetres								
	A ±5	B ±5	C ±2	D ±10	E ±5	F ±2	H ±3	J (min)	t (min)
1.2	140	200	35	120	130	45	70	9	2.5
1.4	150	215	35	120	135	45	75	9	2.5
1.7	165	220	35	120	140	45	80	9	3.0

NOTE For details of the eye see Figure 6 Table 6



Key:
A - Height of tine
B - Neck height

C - Cross-sectional width of the tine

D - Tine rise

E - Cross-sectional length of the tine

F - Eye depth

H - Half tine height

W - Distance between tines

Figure 10 —Forked hoes dimensions

Table 3 — Dimensions of forked hoes

Designated mass, kg	Dimensions mm								
	A ± 5	B ± 2	C ± 1	D ± 3	E ± 1	F ± 2	H ± 2	W ± 5	
								3 tines	4 tines
1.2	200	35	8	45	13	32	100	70	46
1.7	290	35	10	55	16	40	145	85	50

NOTE For details of the eye see Figure 11 and Table 4.

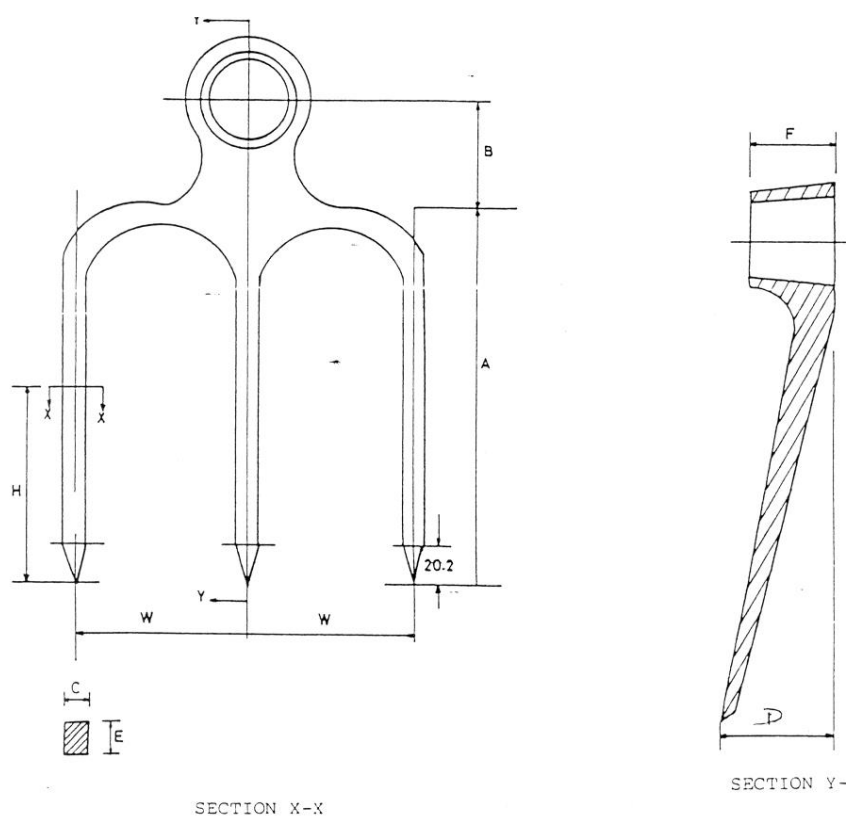


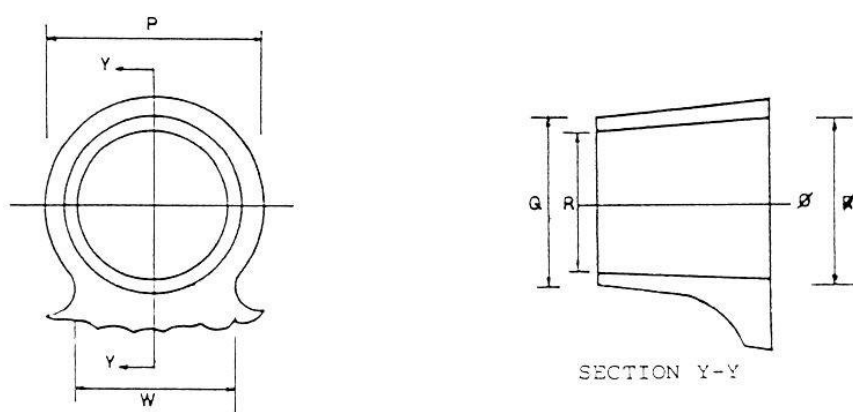
Figure 11 – Fully forged forked hoe

Table 4 – Dimensions for fully forged fork hoes

Designated mass kg	Dimensions in millimetres							
	A ± 5	B ± 2	C ± 1	D ± 3	E ± 1	F ± 2	H ± 2	W ± 5
1.2	100	44	9	50	13	34	80	80
1.7	200	55	11	60	16	45	100	90

NOTE 1 For details of the eye see Figure 5 Table 5

NOTE 2 The designated mass shall be taken as the one nearest to the measured mass.

**Key:**

P - Major outer diameter of the eye

W - Neck width

Q - Minor outer diameter of the eye

R - Minor hole diameter of the eye

R' - Major hole diameter of the eye

Figure 12 —Round eye for plain and forked hoes dimensions

Table 5 —Round eye for plain and fork hoes

Designated Maximum mass kg	Dimensions				
	R ± 2	P ± 2	Q ± 2	R' ± 2	W ± 2
0.7	40	50	44	38	35
1.2	50	62	50	45	40
1.4	50	62	50	45	45
1.7	50	62	50	45	50

NOTE The designated mass shall be taken as the one nearest to the measured mass.

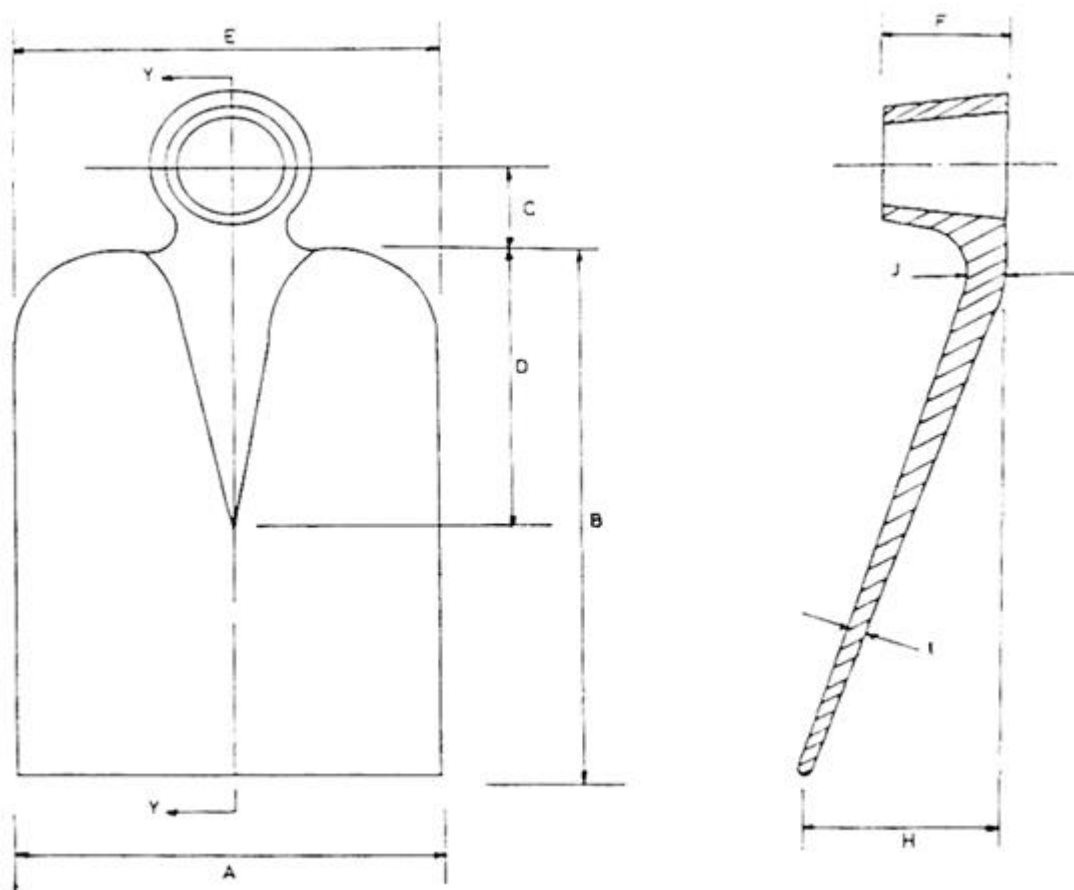
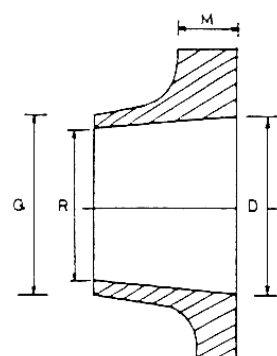
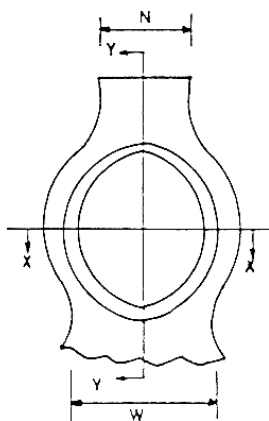


Figure 13 – Round eye plain hoes

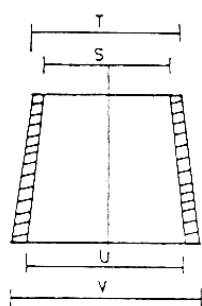
Table 6 – Dimensions for round eye plain hoes

Designated mass kg	Dimensions in millimetres								
	A ±5	B ±5	C ±2	D ±10	E ±5	F ±2	H ±3	J (min)	t (min)
0.7	120	180	35	120	120	40	40	7	2.5
1.2	155	215	35	120	145	50	40	9	2.5
1.3	170	230	35	120	165	50	40	9	2.5

NOTE The designated mass shall be taken as the one nearest to the measured mass.



SECTION Y-Y



SECTION X-X

Key:

T - Horizontal minor outer diameter

V - Horizontal major outer diameter

S - Horizontal minor hole diameter

U - Horizontal major hole diameter

Q - Vertical minor outer diameter

D - Vertical major hole diameter

R - Vertical minor hole diameter

W - Neck width

N - Hammer head width

M - Hammer head length

Figure 14 – The eye for hammerhead

Table 7 – Eye dimensions for hammerhead plain hoes

Designated mass kg	Dimensions in millimetres									
	M ± 2	N ±2	D ± 3	Q ± 2	R ± 2	S ± 2	T ± 3	U ± 2	V ±3	W ± 2
1.2	20	35	60	50	50	40	48	48	60	45
1.4	20	35	60	58	50	40	48	48	60	45
1.7	20	35	60	58	50	40	48	48	60	50
NOTE The designated mass shall be taken as the one nearest to the measured mass.										

7 Material

The material used for manufacture of hoes shall be from carbon steel with chemical composition as shown in table 8.

Table 8 — Chemical composition by weight of carbon steel

Element	Specified range (%)		Test method
	min.	max.	
Carbon	0.5	0.80	ISO 9556
Manganese	0.60	1.5	ISO 10700
Silicon	0.15	0.35	ISO 439
Phosphorous	-	0.05	ISO 10714
Sulphur	-	0.05	ISO 671

8 Heat treatment and hardness

8.1 The blade of plain hoes and tines of fork hoes shall undergo suitable heat treatment to have hardness values as shown in 8.2.

8.2 The blade of plain hoes and tines of forked hoes shall be heat treated to attain Rockwell hardness values (R_c) of 35 HRC – 45 HRC when tested in accordance with ISO 6508-1.

9 Construction and finish

9.1 The plain hoes and fork hoes shall be fully forged.

9.2 Forging shall be symmetrical, well-shaped and free from flaws or any other defects. All fins and flashes produced during forging shall be dressed to a reasonably smooth surface. The eye shall be symmetrical.

9.3 The blade of the plain hoes and tine tip of fork hoes shall be given a ground working edge and shape as shown in Figure 1, 3, 4 and 6.

9.4 The plain and fork hoes shall be protected against corrosion while in storage.

10 Tests

Plain and fork hoes shall satisfy the requirements of tests described in Annex A.

11 Packaging and marking

11.1 All hoes shall be packed in a way that prevents damage to the hoes during transportation and storage.

11.2 All hoes shall be clearly, legibly and permanently stamped with the following:

- a) the manufacturer's name and/or trade mark;
- b) designated mass;
- c) country of origin; and
- d) batch number.

12 Sampling

12.1 Lot

12.1.1 If the entire stock is of homogenous quality then in effect, the stock shall comprise a single lot. A sample of specified size may then be selected directly upon opening the stock.

12.1.2 If the lot is composed of boxes (for instance, each from a different manufacturer) then sampling shall be conducted in two stages. First select a sample number of boxes and then select a sample of hoes from within each selected box.

12.1.3 Once the samples have been selected, they shall be legibly marked (for example 1, 2, 3, etc.) and the box from which they were taken also marked so that each can be sourced back to the box from which it was taken.

12.2 Sample size

12.2.1 A zero-based acceptance sample shall be selected based on an Acceptable Quality Level of 2.5 %. The sample sizes to be selected are as given in Table 9.

Table 9— Acceptable Quality Level (AQL) of 2.5 %

Lot size	Sample size
Less than 90	7
91 to 150	11
151 to 280	13
281 to 500	16
501 to 1 200	19
1 201 to 3 200	23
3 201 to 10 000	29
10 001 to 35 000	35
35 001 and above	40

Annex A

(normative)

Strength test

A.1 Plain hoes

The tool is fitted with a temporary handle made from a metal tube and clamped as shown in Figure 7. Load of 30 kg is applied in increments of 5 kg, suspended from the handle at a distance of 1 000 mm from the eye (the handle may not necessarily be horizontal). On removal of the load, the tool shall not show any permanent set, crack or sign of failure.

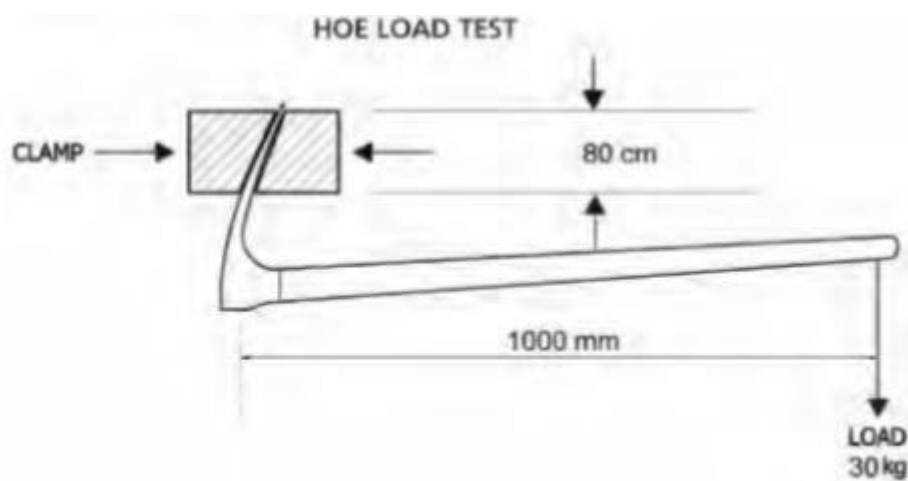


Figure A.1 – Blade test

A.2 Fork hoe

The tool is fitted with a temporary handle made from a metal tube and clamped with the handle vertical and supported below the head as shown in Figure (to be shown). A load of 30 kg is applied in increments of 5 kg, suspended from one of the tines at a distance of 15 mm from the tip. On removal of the load, the tine must not show any permanent set, crack or any sign of failure. Each tine is tested in a similar manner.

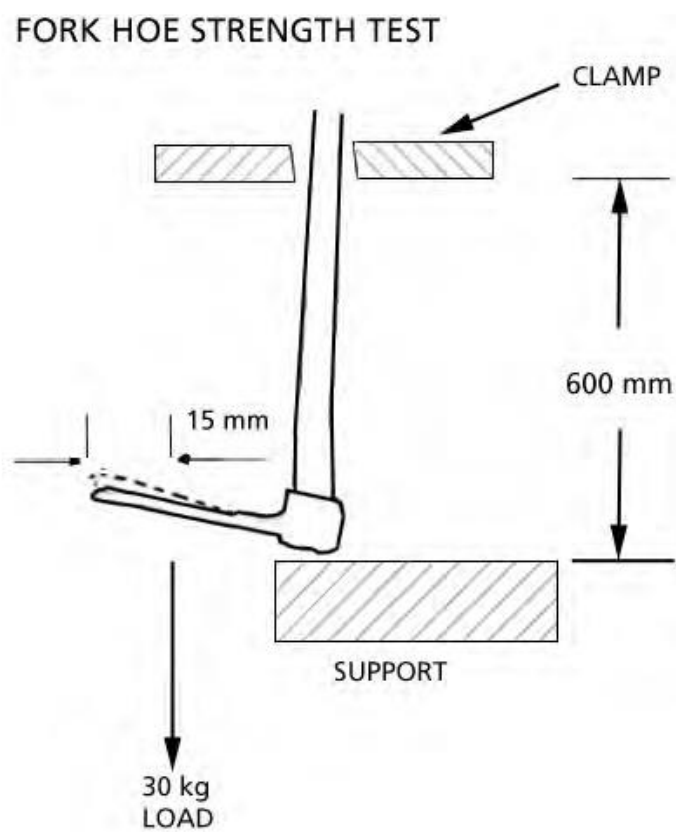


Figure A.2 – Tine test

Bibliography

- [1] US 220:2003, *Hoes — Specification*
- [2] US 220:2019, *Hoes — Specification*
- [3] KS 154:1999, *Specification for hoes, both plain and fork hoes*
- [4] TZS 242:2011, *Farm implement – Forged hand hoe – Material and manufacturing process – Specification*
- [5] ISO 6892:1998, *Metallic materials — Tensile testing at ambient temperatures*
- [6] *Agricultural hand tools in emergencies — Guidelines for technical and field officers, 2013.*

