DEAS 1293: 2025

ICS 25.140.30

HS 8201.30.00

EAST AFRICAN STANDARD

Fork and rake — Specification

EAST AFRICAN COMMUNITY

First Edition 2025

Contents

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.*

Attention is drawn to the possibility that some of the elements of this document may be subject of patent rights. EAC shall not be held responsible for identifying any or all such patent rights.

Fork and rake — Specification

1 Scope

This Draft East African Standard specifies requirements, test methods and sampling plan for forks and rakes. This standard also covers;

a) digging forks,
b) ballast forks,
c) road rakes, and
d) garden rakes.

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 4957, *Tool steels*
ISO 3573, *Hot-rolled carbon steel sheet of commercial and drawing qualities*
ISO 24153, *Random sampling and randomization procedures*
EAS 134, *Cold formed structural steel sections — Specification*
WD/TC 042/007:2025, *Handle for hand tool — Specification*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.
ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org
— ISO Online browsing platform: available at http://www.iso.org/obp

3.1
fork
hand tool used for loosening, lifting and turning over materials such as soil and manure in gardening, landscaping and farming.

3.2
rake
hand tool used for scooping, scraping, gathering, or leveling materials, such as soil, mulch, leaves or manure in gardening, landscaping and farming.

3.3
spike
tine
prong
tooth
parallel projecting and pointed (thin end tip) part at the end of a fork or rake forming its blade.

3.4
ferrule
protective metallic bush fitted at the junction of the blade and handle to keep the tang tight in the handle

3.5
handle
part for holding in operation of the fork or rake

3.6
frame
external portion of the blade or the reinforcement strip which is fixed into the handle

3.7
working width
width of blade
distance from the centre of extreme spike at one end to the centre of extreme spike at other end.
overall width of the blade including the outer prongs or teeth.

3.8
length of blade
overall length from and including the shoulder to the extreme end of the prongs or teeth of forks or rakes respectively

3.9
length of socket
overall length from the shoulder to the extreme end of the socket

3.10
socket
a) in the case of a fork: the extension of the shoulder which is formed to receive a wooden shaft
b) in the case of a rake: the tubular or open extension of the shoulder which is integral with or is welded or riveted to the shoulder to receive the handle

4 Types of forks and rakes

4.1 Fork types

The following are two types of forks;

a) digging fork
This fork is used for digging (loosening soil). It includes garden fork or spading fork.

b) ballast fork
This fork is used for transferring loose materials. It includes pitchfork, manure fork and scoop fork/ hay fork.

4.1.1 Each type of fork is further divided depending on the number of prong contained in the fork and size of fork (working width/width of blade) as shown in Table 1.

4.2 Rakes types

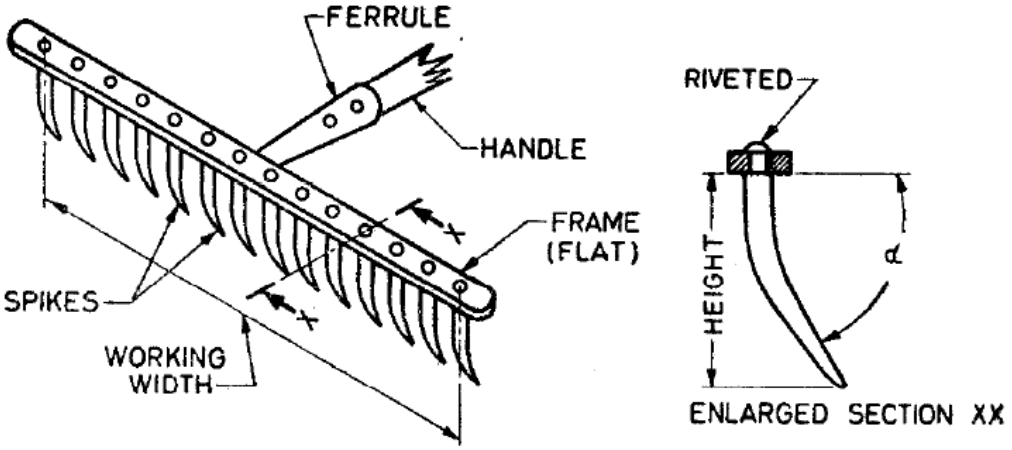
The following are two types of rakes;

a) road rake
This rake is used to remove large debris from the sides of roads, highway medians, shoulders, parking lots, and other paved surfaces.

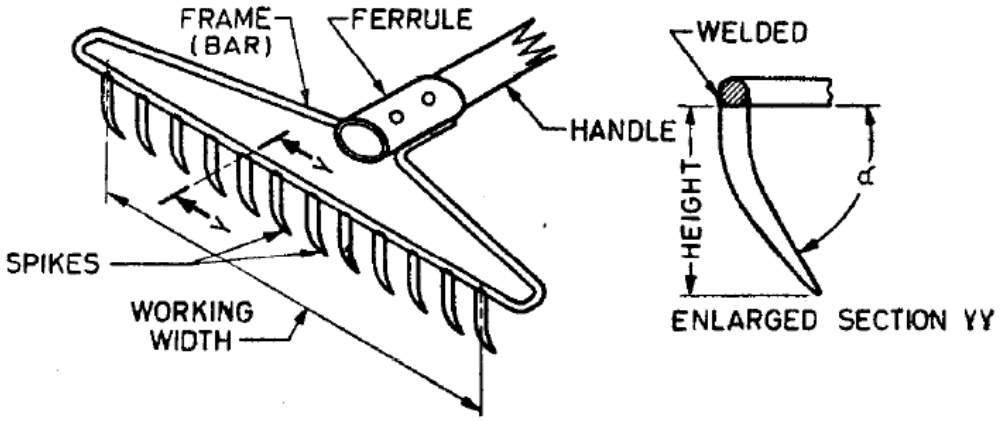
b) garden rake
This rake is used for scooping, scraping, gathering, or leveling materials in gardening, landscaping and farming. It includes leaf rake

4.2.1 Each type of rake is further divided depending on the number of spikes/teeth contained in the rake and size of the rake (working width/width of blade) as shown in Table 2.

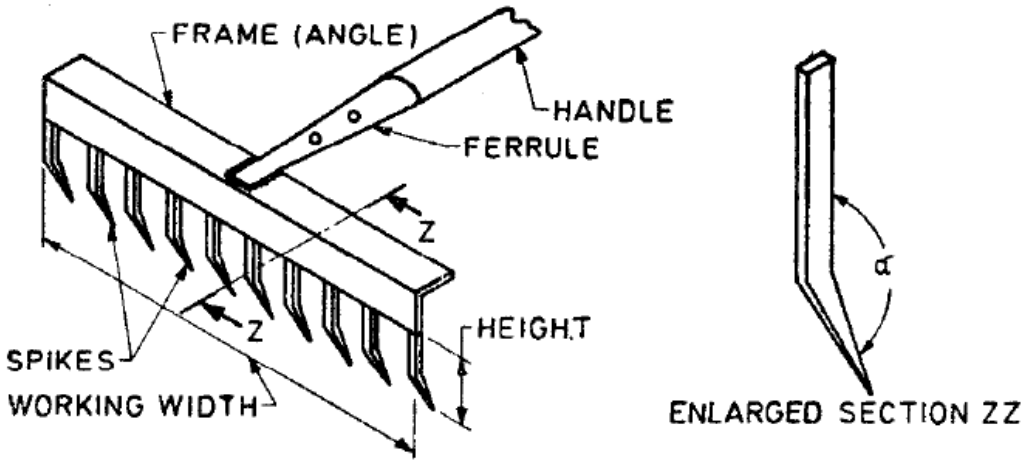
4.2.2 The rakes should be of following two classes depending on the nature of the spikes/teeth;
a) Forged-spike class (Shown in Figure 1), and
b) One-piece class (Shown in Figure 2).



a) Riveted spikes



b) Spikes welded to bar



c) Spikes welded to angle

Figure 1: Forged-spike rake

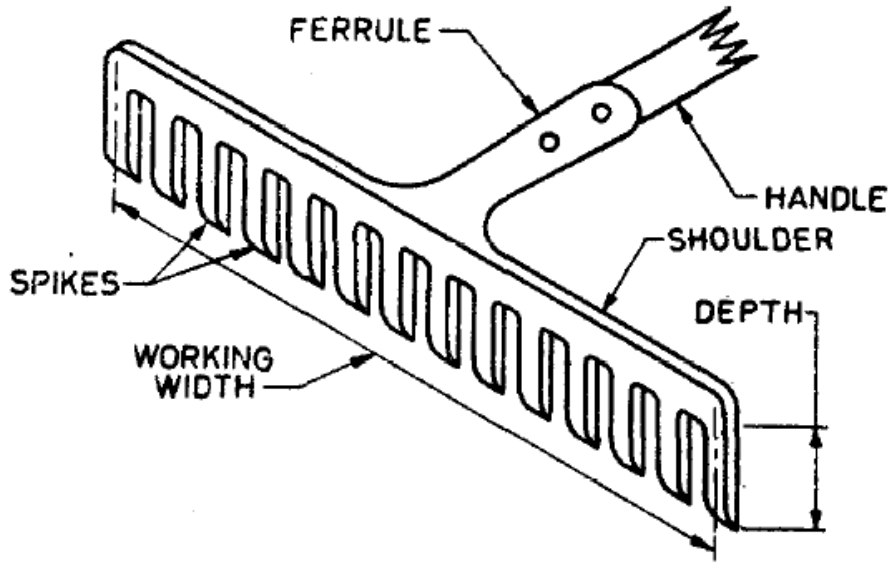


Figure 2: One-piece rake

5 Requirements

5.1 Material

5.1.1 Frame

Frame shall be made from cold formed steel sections according to EAS 134 or cold rolled steel sheets according to ISO 4997 and/or ISO 3574.

5.1.2 Spikes, prongs and teeth

Spikes prongs and teeth shall be made from tool steel according to ISO 4957. Spikes, prongs and teeth shall enable the forks and rakes to meet the strength test requirement specified in clause 10.

5.1.3 Ferrule

Mild steel sheet according to ISO 3573, tube according to EAS 134 or brass shall be used.

5.1.4 Handle

Handles shall be of wood, plastic or metallic material according to WD/TC 042/007:2025.

5.2 Hardness

5.2.1 Rake

The steel used for spikes/teeth shall be of unhardened or hardened condition as specified by the purchaser. In case of hardened condition, these shall have hardness not less than 25 HRC when measured at a distance between 15 mm to 35 mm from free end of the spikes.

5.2.2 Fork

The steel used for prongs/teeth shall be capable of being heat-treated and tempered to the hardness of not less than 37 HRC and not more than 46 HRC.

5.3 Sizes and dimensions

5.3.1 Sizes of the fork and rake

The size of the fork or rake shall be expressed by its working width (blade width) in mm, which is the distance from the centre of extreme spike/tooth at one end to the centre of extreme spike at other end. The size and number of spikes/teeth shall be as given in Table 1.

Handle length for forks and rakes shall be 1.5 – 1.75 m long with grip diameter 25 – 35 mm, ergonomically contoured.

Table 1: Sizes of fork and rake and number of spikes

Rake						
No. of spikes or teeth	8	10	12	14	16	24
Size, mm	210	260	330	390	450	590
Fork						
No. of prong or teeth	4	5	8	10	12	
Size, mm	190	210	250	280	300	
Note: Other sizes may be produced in accordance to agreement with the purchaser.						

The tolerance for the size of fork or rake shall be ± 5 mm.

5.3.2 Dimensions of rakes

Rake dimensions shall be according to Table 2.

Table 2: Dimensions of rakes

1	2	3	4	5
Type of rake	**Blade**		**Socket**	
	Length, mm, Minimum	**Width, mm, Minimum**	**Length, mm, Minimum**	**Outside diameter at end, mm**
14-tooth road rake	70	330	150	32
16-tooth road rake	70	390	150	32
24-tooth road rake	70	590	150	32
8-tooth garden rake	70	210	110*	32*
10-tooth garden rake	70	260	110*	32*
12-tooth garden rake	70	330	110*	32*
14-tooth garden rake	70	390	110*	32*
16-tooth garden rake	70	450	110*	32*
24-tooth garden rake	70	590	150*	32*
***These dimensions apply to garden rakes having a socket. Alternative devices for securing the end of the handle shall be of acceptable design and dimensions such that handles of the required diameter can be fitted. **Note:** Other dimensions may be produced in accordance to agreement with the purchaser.				

The tolerance for the dimensions of rake shall be ±5 mm except for outside diameter at end which shall be ±3 mm.

5.3.3 Dimensions of forks

Forks dimensions shall be according to Table 3.

Table 3: Dimensions of forks

1	2	3	4	5	6	7	8	9
Type of fork	**Blade**				**Socket**			**Handle**
	Length, mm, Min.	**Width, mm, Min.**	**Dish, mm, min.**	**Lift, mm ± 13**	**Length, mm, min.**	**Outside diam. 125 mm above shoulder, mm ± 2**		**Length, mm ± 25**
4-prong digging fork	300	190	15	90	250	38	32	700
5-prong digging fork	300	210	15	90	300	38	32	700
8-prong ballast fork	340	280	30	180	300	38	32	750
10-prong ballast fork wide	350	300	44	180	300	38	32	750
10-prong ballast fork narrow	350	250	44	180	300	38	32	750
12-prong ballast fork	350	300	44	180	300	38	32	750
Note: Other dimensions may be produced in accordance to agreement with the purchaser.								

5.3.4 Dimensions of metal hilts

The dimensions of metal hilts for forks shall, when relevant, conform to the values given in Table 4 appropriate to the type of hilt specified by the purchaser.

Table 4: Dimensions of metal hilts for forks

1	2	3	4	5
Type of hilt	**Diam. of grip at centre** mm ± 2	**Diam. of grip at ends** mm ± 2	**Distance between insides of arms** mm, min.	**Clearance between grip and end of shaft** mm, min.
4-prong digging fork	300	190	15	90
5-prong digging fork	300	210	15	90
8-prong ballast fork	340	280	30	180
10-prong ballast fork wide	350	300	44	180
10-prong ballast fork narrow	350	250	44	180
12-prong ballast fork	350	300	44	180

5.4 Construction and manufacture

5.4.1 Forks

5.4.1.1 Blade and shank

The prongs shall be of even construction and equally spaced so as to give a well-balanced tool.

5.4.1.2 Handle

Steel handle shall be integral with the shoulder.

5.4.1.3 Sockets for wooden handles

Sockets for wooden handle shall be of the tubular type or of the strap type. The tubular type shall have a square end and shall be partially recessed into the wooden handle, to which it shall be properly secured. The handle, when of wood, shall be properly secured in the socket. The top rivet shall be not less than 20 mm and not more than 30 mm from the ends of the strap.

5.4.1.4 Hilts

Hilts shall be of wood, plastic, metal, or in combination, and shall be of one of the following types as specified by the purchaser;

a) **wooden hilts:** Wooden hilts shall be of the crutch tee type (see figure 10) and shall be integral with the shaft.

b) **cast hilts**: Each cast hilt shall be an integral casting. The tubular section shall fit over the shaft or into the shaft and the hilt shall be secured to the shaft with a rivet or shall be securely crimped on to the shaft.

c) **pressed steel hilts**: The upper ends of the pressed sides of pressed steel hilts shall form cups to house the ends of the grip, which shall be secured to them with a full-length rivet positioned centrally in the grip.

The hilt shall be secured to the shaft with two rivets. The grip shall be of wood, metal or plastic, as specified by the purchaser. The grips of hilts shall be permanently secured against rotation.

5.4.2 Rakes

5.4.2.1 Garden rakes

Garden rakes shall be of fabricated, stamped, or cast construction. The socket, when provided, shall be welded or riveted to the shoulder or shall be cast integrally with the rake head. The handle, when of wood, shall be fixed in the socket and shall be properly secured. A steel handle shall be welded to the shoulder.

5.4.2.2 Road rakes

Road rakes shall be of fabricated, stamped, or cast construction. The connecting arms shall be riveted or welded to the shoulder and to the socket/shank. The handle, when of wood, shall be fixed in the socket by a rivet situated 25 ± 5 mm from the upper end of the socket. A steel handle shall be secured to the shoulder by means of connecting arms welded to the shoulder and to the handle.

5.4.2.3 Handles

The handles of rakes shall be of wood of the grade specified, plastic material or of steel, as specified by the purchaser. The handle shall be rigidly attached to the ferrule with the help of minimum two rivets. The length and diameter of the handle shall be in the range of 1.5 to 1.75 m and 25 to 35 mm respectively. The handles shall comply with WD/TC 042/007:2025.

5.4.2.4 Spikes/teeth

In case of the forged-spike type rakes, the spikes shall be welded or riveted to the frame and in case of one-piece type rakes, the spikes shall be formed by pressing or forging the sheets. The centre to centre distance of the spikes shall be uniform. The variation shall not exceed ±1 mm. The spikes shall be slightly curved at their louver ends. In case of forged-spike type rakes the spikes shall be so curved that the angle formed with the frame be in the range of 45 to 60º (see α in Fig. 1). The height or depth of the spikes (see Fig. 1 and 2) shall be in the range of 50 to 80 mm. However in a rake only one selected height or depth shall be used. The variation in declared height or depth shall be not more than ± 2 mm.

5.4.2.5 Ferrule

The ferrule shall be rigidly attached with the frame in case of the forged-spike type rake and with the shoulder in case of the one-piece type. In case of the one-piece type, the shoulder may be extended to form the ferrule. The minimum thickness of the ferrule shall be 1.5 mm. The ferrule may be cylindrical or conical. The diameter of rivet used for fixing the ferrule and handle shall be 3 to 6 mm.

5.4.3 Strength

5.4.3.1 Forks

When tested in accordance with 10.2.1, 10.2.2 and 10.2.3, forks shall show no sign of fracture and after removal of the load applied the permanent set shall not exceed 25 mm.

5.4.3.2 Rakes

5.4.3.2.1 When tested in accordance with 10.2.1, 10.2.2 and 10.2.3, rakes shall show no permanent set in any part of the head after the test load has been removed.

5.4.3.2.2 When tested in accordance with 10.2.1, 10.2.2 and 10.2.3, the handles shall not loosen, the spikes/teeth/prongs shall not loosen, bend, or break, and no part of the tool shall deform or fracture.

5.5 Workmanship and finish

5.5.1 All parts of forks and rakes shall be free from burrs and sharp edges. Any exposed unpainted metal shall be suitably coated to prevent corrosion during transportation and storage. The welds shall not be porous. The welded joints and riveted joints shall be well dressed and smoothly finished.
5.5.2 The components shall be free from cracks, splits, burrs and other defects.
5.5.3 The handle shall be finished smooth.

6 Inspection and methods of test

6.1 Inspection

Visually examine and measure each tool in the sample taken for compliance with those requirements of the specification for which tests to assess compliance are not given in 10.2.1 – 10.2.3 (inclusive).

6.2 Strength tests

6.2.1 Drop impact test

Extreme end of the handle shall be attached to a wood base and loosely pivoted at surface level with a flat horizontal steel plate. The head should be elevated to a height of one metre and dropped with spikes/teeth/prongs point falling on the steel plate. This should be repeated for four times. The spikes/teeth/prongs and other portions shall not flatten, chip, crack, fracture or deform as a result of this test.

6.2.2 Pull test for spikes/teeth/prongs

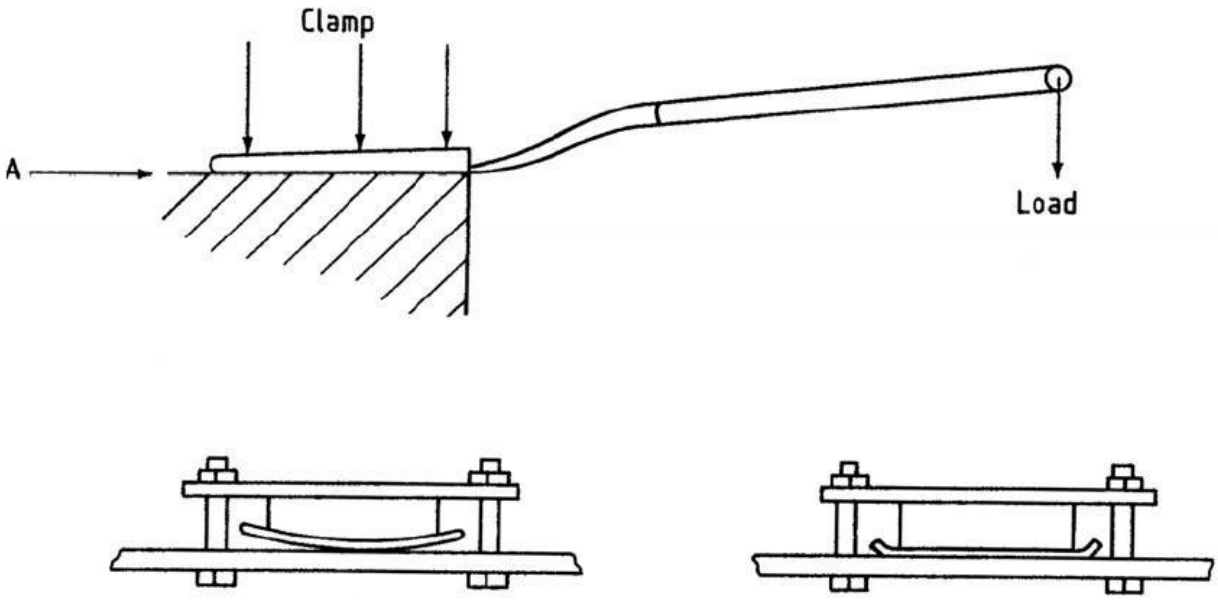
The frame or shoulder shall be secured in a stationary fixture and the ferrule of the fork or rake shall be kept vertical. A 35 kg mass shall be attached to the centre of any one spike/tooth/prong and suspended for 2 minutes. As a result of this test, the spike/tooth/prong tested shall not show deformation or permanent set during and after the removal of the mass.

6.2.3 Load test for sockets, handles and hilts

Support the tool as shown in Figure 3. Gradually apply a load to the hilt such as to impose a bending moment at the shoulder of the blade, equal to the relevant of:

a) 588 N.m (60 kgf.m) in the case of forks; or
b) 353 N.m (36 kgf.m) in the case of rakes

Maintain the bending moment for a period of 2 min and then release it. Immediately measure the vertical deflection of the grip from its initial position, and take this to be the permanent set.



a) View in direction A showing hardwood packing piece to suit round blade

b) View in direction A showing hardwood packing piece to suit flat blade

Figure 3: Strength test for sockets, shafts and hilts

6.3 Hardness test

Remove the protective coating from the blade of the tool and then use the method described in the relevant section of ISO 6508-1 to determine the hardness on the relevant Rockwell scale. Take at least three readings in the center of the width of the cleaned surface of the blade (within 50 mm of the working edge) and calculate the average of the readings.

7 Marking

Each rake and fork shall be marked with the following particulars:

a) manufacturer's name and/or registered trade-mark;

b) size of the rake or fork;

c) *H*, if hardened; and

d) batch number or code number.

e) country of origin

8 Sampling for lot acceptance

8.1 Lot

In any consignment all the tools/equipment of the same type, same size and belonging to the same batch of manufacture, shall be grouped together to constitute a lot.

8.2 Sample

For ascertaining the conformity of the material in a lot to the requirements of the specification, samples shall be tested from each lot separately.

8.3 Sample size

The number of tools/equipment to be tested from a lot shall depend on the size of the lot and shall be according to Table 5.

Table 5: Scale of sampling and permissible number of defectives for hand-tools

Number of tools in the lot	For visual, dimensional, weight and hardness requirements		Sub-sample size for other requirement
	Sample size	Permissible number of defectives	
(1)	(2)	(3)	(4)
Up to 100	5	0	1
101 to 300	8	0	2
301 to 500	13	1	3
501 to 1000	20	2	4
1001 and above	32	3	5

8.3.1 These tools/equipment shall be selected at random from the lot and for this purpose; guidance shall be obtained from ISO 24153. The procedures of simple random sampling or systematic sampling may be followed.

8.4 Number of tests and criteria for conformity

8.4.1 The hand-tools/equipment selected according to column 1 and 2 of Table 5, shall be examined for visual, dimensional, weight and hardness requirements as given in the relevant material specification. Any tool equipment failing to satisfy one or more of these requirements shall be considered as defective. The lot shall be considered as conforming to these requirements if the number of defectives found in the sample is less than or equal to the corresponding permissible number of defectives given in column 3 of Table 5.

8.4.2 The lot having been found satisfactory according to 12.4.1 shall be further tested for requirements other than those covered in 12.4.1. For this purpose, the number of tools equipment given for sub-sample in column 4 of Table 5, shall be selected from the lot. These tools/ equipment shall be selected from those already examined according to 12.4.1 and found satisfactory. The lot shall be declared as conforming to the requirements of the relevant material specification if none of the tools/equipment in the sub-sample fails in any of these requirements.

Bibliography

[1] RS 178:2013, *Forks and rakes — Specification*

[2] IS 2559:1978, *Specification for garden rake*

