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Indian Standard

SPECIFICATION FOR BUDDING AND GRAFTING KNIFE COMBINED

(First Revision)

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INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

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Indian Standard

SPECIFICATION FOR BUDDING AND GRAFTING KNIFE COMBINED

(First Revision)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 30 September 1982, after the draft finalized by the Horticultural Equipment Sectional Committee had been approved by the Agricultural and Food Products Division Council.

0.2 The budding and grafting knife is one of the essential tools for a horticulturist who specializes in evolving new varieties of crops with improved characteristics by using the budding and grafting technique. This knife, as the name suggests, has two blades meant for the two different purposes — budding and grafting, riveted to either end of a common handle. Such knives are used extensively in orchards, vegetable gardens and plantation nurseries.

0.3 This standard, covering the requirements for combined budding and grafting knife, was first published in 1965. A need was felt to revise the standard in order to make it up to date.

0.4 The figures in the standard are given only as typical illustrations and should not be considered as suggestive of any standard design.

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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1. SCOPE

1.1 This standard specifies material, dimensions and other requirements for the combined budding and grafting knife (hereinafter termed as knife).

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*Rules for rounding off numerical values (*revised*).

2. NOMENCLATURE

2.1 The nomenclature of various parts of the knife shall be as given in Fig. 1.

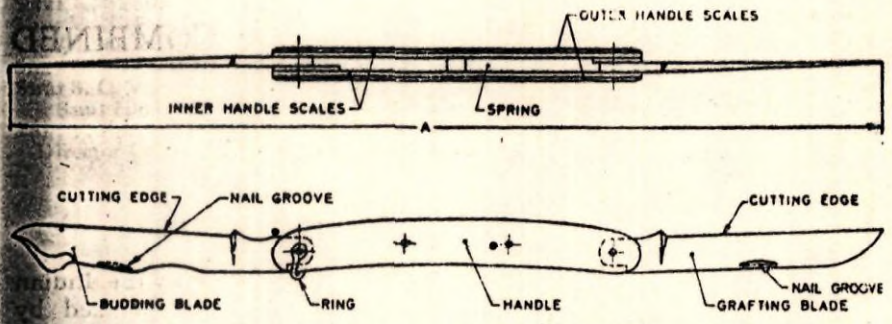

FIG. 1 ASSEMBLY OF BUDDING AND GRAFTING KNIFE, COMBINED

3. MATERIAL

3.1 Blades — The blade of the knife shall be manufactured from carbon steel, alloy steel or tool steel.

3.1.1 The chemical composition of the carbon steel shall be as follows:

a) Carbon 0·7 to 0·9 percent;

b) Silicon 0·1 to 0·4 percent;

c) Manganese 0·5 to 1·0 percent;

d) Sulphur 0·05 percent, *Max*; and

e) Phosphorus 0·05 percent, *Max*.

3.1.1.1 Some of the typical carbon steels that may be used are: C 75, C 80 and C 85 grades [*see* IS : 1570 (Part II)-1979*].

3.1.2 Alloy steel preferably conforming to Grade 16 NiCr2Mo20, 37Si2 Mn90 or 37Mn2 of IS : 4367-1967† may be used.

3.1.3 Tool steel preferably conforming to Grade T 75 or T 85 of IS : 4367-1967† may be used.

3.2 Handle

3.2.1 *Outer Handle Scales* — Unless specified otherwise, the outer handle scales shall be made of horn or plastic material.

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*Schedules for wrought steels for general engineering purposes: Part II Carbon steels (unalloyed steel) (*first revision*).

†Specification for alloy and tool steel forgings for general industrial use.

3.2.2 *Inner Handle Scales* — It shall be made of brass (*see* IS : 410-1977*) or aluminium alloy (*see* IS : 737-1974†).

3.3 Spring — It shall be made of spring steel wire [*see* IS : 4454 (Part I)-1975‡).

3.4 Rivets — They shall be made of brass, copper, aluminium alloy or nickel plated steel.

4. HARDNESS

4.1 The blades shall be heat treated to give a hardness of 460 to 510 *HB* (*see* IS : 1500-1968§) or equivalent Rockwell or Vickers hardness number (*see* IS : 4258-1967‖). The hardness shall be tested within a distance of 5 mm from the cutting edge.

5. SIZE

5.1 The size (*see A* in Fig. 1) shall be declared by the manufacturer. The size shall not differ by more than ± 5 mm from the declared value.

6. DIMENSIONS

6.1 The minimum thickness of the blades (*see A* in Fig. 2) and inner handles scale (*see B* in Fig. 2) shall be 3·5 mm and 1·0 mm respectively.

6.2 The working length of the blades (*see C* in Fig. 2) shall be between 65 to 75 mm.

6.3 The distance from the outer edge to centre of rivet hole for blade (*see D* in Fig. 2) and for inner handle scale (*see E* in Fig. 2) shall be 5·0 ± 0·5 and 10·0 ± 0·5 respectively. The intermediate rivet holes in inner handle scale shall be equidistant.

6.4 The diameter of rivet shall be 2·0 mm.

6.5 The other dimensions shown in Fig. 2 are for guidance only.

7. OTHER REQUIREMENTS

7.1 The blades of the knife shall be suitably forged to shape and shall be annealed.

7.2 The nail groove shall be on one side of the blade only.

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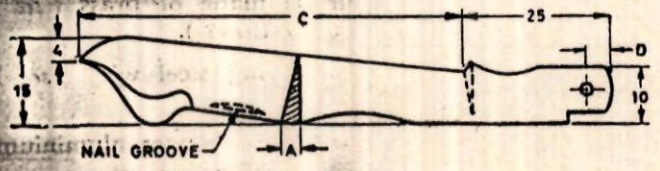
*Specification for cold rolled brass sheet, strip and foil (*third revision*).

†Specification for wrought aluminium and aluminium alloys, sheet and strip (for general engineering purposes) (*second revision*).

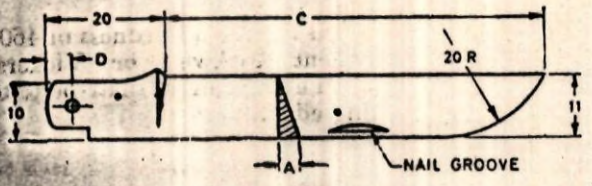
‡Specification for steel wires for cold formed springs: Part I Patented and cold drawn steel wires — unalloyed (*first revision*).

§Method for Brinell hardness test for steel (*first revision*).

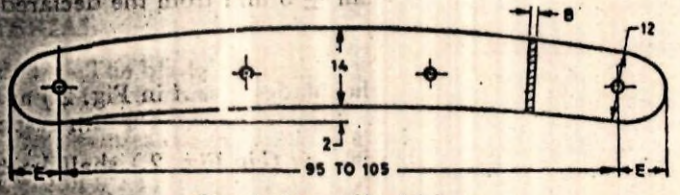
‖Hardness conversion tables for metals.



Detail of Budding Blade



Detail of Grafting Blade



Detail of Inner Handel Scale

All dimensions in millimetres.

FIG. 2 DIMENSIONS OF BLADES AND HANDLE SCALE FOR BUDDING AND GRAFTING KNIFE, COMBINED

7.3 The blades, the springs and the handle scales shall be so assembled and riveted as to permit free movement of the blades without undue play or stiffness. The blades shall close with a springing action. The outer edge of the blade shall have nail groove for pulling out the blade from its closed position. The heads of the rivets shall be finished flush with the handle on both the sides.

7.4 In the closed position, the cutting edge of the blades shall remain inside the handle and shall not protrude out. The nail groove of the blades shall be outside the handle in the closed position.

7.5 The outer handle scales shall be flush with the closing edges of the inner handle scales.

7.6 A fixed circular ring shall be provided on one end of the handle to facilitate convenient handling in key chains or belts.

8. PRACTICAL TEST

8.1 The edges of the two blades shall be tested separately by cutting not less than 20 samples of grafts of rose, citrus, guava or mango suitably prepared and in green condition. The cut on the bark of last sample shall be clean.

9. WORKMANSHIP AND FINISH

9.1 The entire surface of the blade and the edges shall be ground in a direction, preferably, at right angle to the cutting edge. The blade shall be buffed to give a fine finish. The cutting edge shall be sharp enough for immediate use. All sharp edges, except the cutting edges, shall be rounded.

9.2 The blades shall be free from cracks, seams, pits, burrs and other defects.

9.3 The blades of the knife shall be smeared with any suitable mineral jelly as a preservative treatment.

10. MARKING AND PACKING

10.1 The following particulars shall be stamped on the outer scales of the handle:

a) Manufacturer's name or recognized trade-mark,

b) Size, and

c) Batch or code number.

10.1.1 Each knife may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors may be obtained from the Indian Standards Institution.

10.2 Packing — The knife shall be packed, as agreed to between the purchaser and the supplier, for safe handling in transit.

11. SAMPLING FOR LOT ACCEPTANCE

11.1 Unless otherwise agreed to between the purchaser and the supplier, sampling of the knife for lot acceptance shall be done in accordance with 3 of IS : 7201-1974*.

*Method of sampling of agricultural machinery and tractors.

INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

Quantity	Unit	Symbol
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

Quantity	Unit	Symbol
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

Quantity	Unit	Symbol	Definition
Force	newton	N	1 N = 1 kg.m/s^2
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	1 T = 1 Wb/m
Frequency	hertz	Hz	1 Hz = 1 c/s (s^{-1})
Electric conductance	siemens	S	1 S = 1 A/V
Electromotive force	volt	V	1 V = 1 W/A
Pressure, stress	pascal	Pa	1 Pa = 1 N/m^2

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