

**BUREAU OF INDIAN STANDARDS**

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**भारतीय मानक मसौदा**

**रोटरी टिलर (रोटावेटर) के लिए ब्लेड – पावर टिलर/ट्रैक्टर चालित – विशिष्टि**

**(आइ एस 6690 का दूसरा पुनरीक्षण)**

*Draft Indian Standard*

**BLADES FOR ROTARY TILLER (ROTA VATOR) — POWER  
TILLER/TRACTOR DRIVEN — SPECIFICATION**

*(Second Revision of IS 6690)*

**ICS 65.060.20**

Agricultural Machinery and Equipment  
Sectional Committee, FAD 11

Last date for Comments: **18 November 2024**

**FOREWORD**

*(Formal clause will be added later)*

A blade is an important soil engaging component of rotavator which breaks up clods and tills the soil. Due to its high-wear nature, blades tend to deteriorate faster than other parts, causing frequent replacement. Therefore, to ensure that quality blades are produced by manufacturers, the standard was published in 1972 under the title “Specification for blades for rotavator for power tillers”. Subsequently, the standard was first revised in 1981 wherein modifications were made in hardness and dimensions to ensure better implementation of the standard.

The current revision of the standard has been undertaken to incorporate following modifications:

- a) Scope of the standard has been widened to cover blades for rotavators operated by tractor and title of the standard has been modified accordingly to reflect the change.
- b) Raw material requirement and hardness requirement has been updated as per current manufacturing practices
- c) Necessary editorial changes have been made including updating of referred Indian Standards and schematic diagrams given in the standard.

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

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 or analysis, shall be rounded off in accordance with IS 2: 2022 'Rules for rounding off numerical values' (*second revision*). The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*Draft Indian Standard*

**BLADES FOR ROTARY TILLER (ROTAVATOR) — POWER  
TILLER/TRACTOR DRIVEN — SPECIFICATION**

(*Second Revision of IS 6690*)

**1 SCOPE**

This standard specifies material, hardness, dimensions and other requirements for blades used in rotary tillers (rotavators) operated by power tillers or tractors.

**2 REFERENCES**

The Indian Standards listed below contain provisions which, through reference in this text, constitute provision of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated there.

<i>IS No.</i>	<i>Title</i>
IS 7201 (Part 1) : 1987	Methods of sampling for agricultural machinery and equipment : Part 1 Hand-tools and hand-operated / animal drawn equipment ( <i>first revision</i> )
IS 1570 (Part 1) : 1978	Schedules for wrought steels: Part 1 Steels specified by tensile and/or yield properties ( <i>first revision</i> )
IS 1586 (Part 1) : 2018/ISO 6508-1 : 2016	Metallic materials — Rockwell hardness test: Part 1 Test method ( <i>fifth revision</i> )

**3 TYPES**

Blades shall be of the following types:

- a) Type A - Straight blade (*see Fig. 1*), and
- b) Type B - Hatchet blade (right or left) (*see Fig. 2*).

## 4 MATERIAL

4.1 The chemical composition of the steels used for the manufacture of blades shall be as follows:

a) Carbon steel:

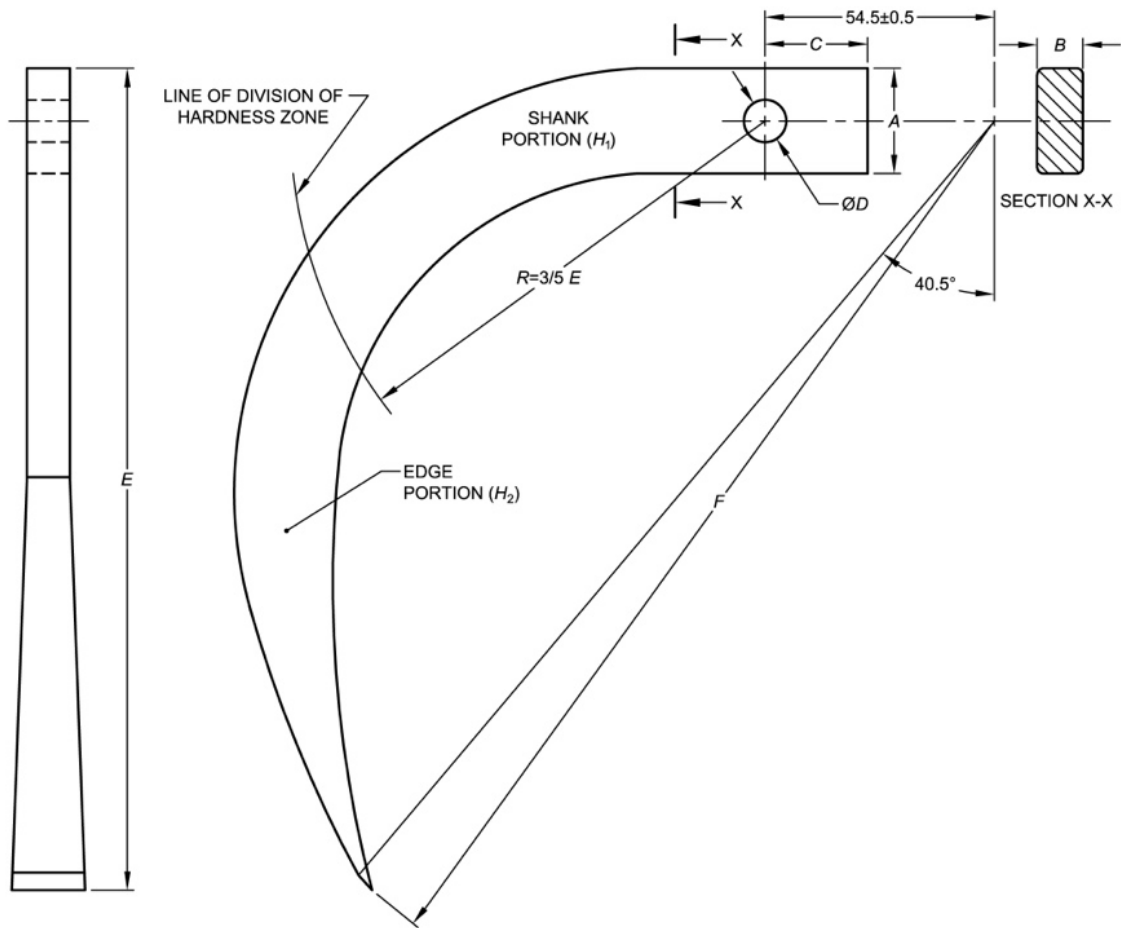
Carbon	0.70 to 0.85 percent
Silicon	0.10 to 0.40 percent
Manganese	0.50 to 1.00 percent
Sulphur	0.05 percent, <i>Max</i>
Phosphorus	0.05 percent, <i>Max</i>

b) Silica Manganese Steel:

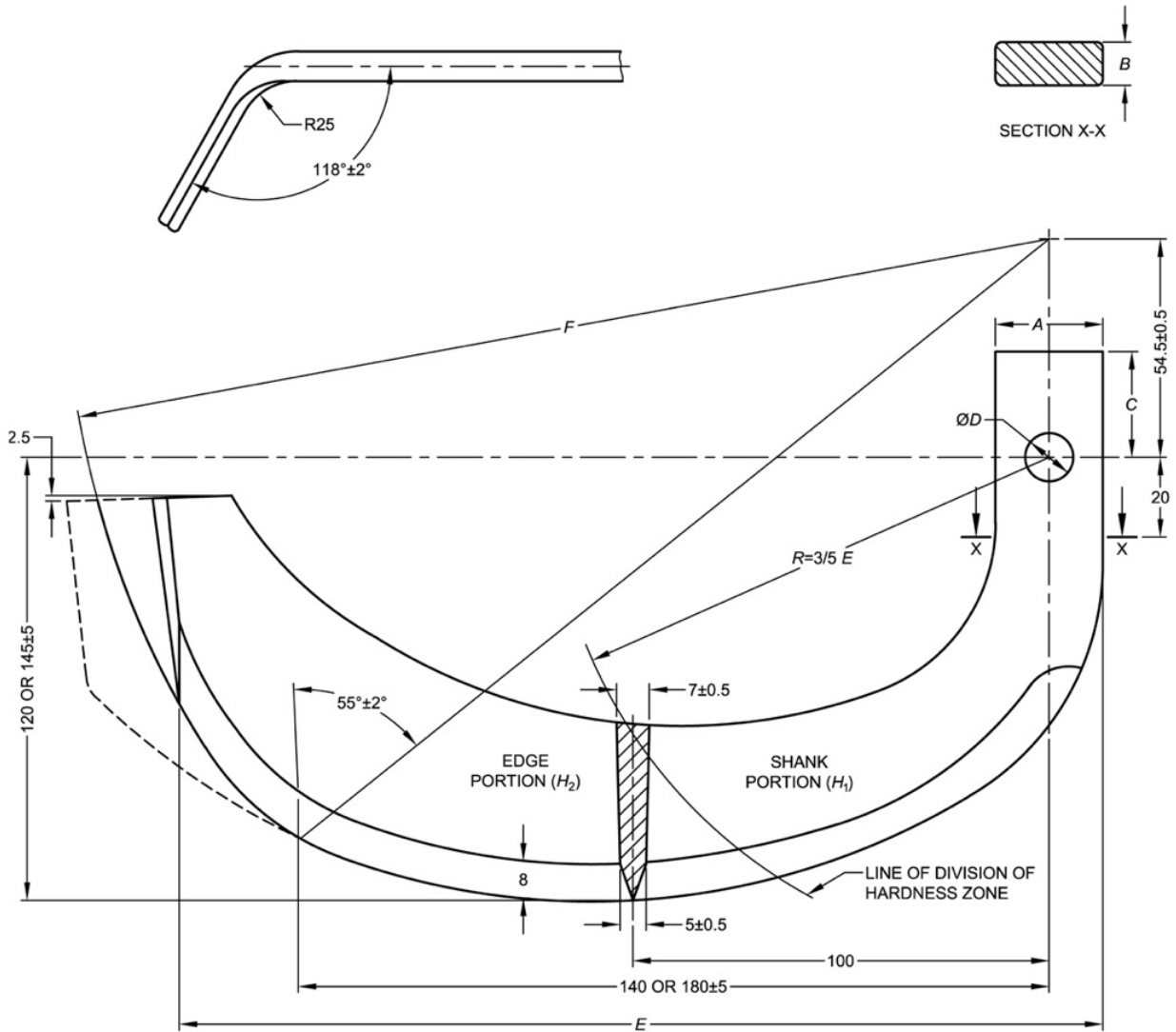
Carbon	0.50 to 0.60 percent
Silicon	1.50 to 2.00 percent
Manganese	0.50 to 1.00 percent
Sulphur	0.05 percent, <i>Max</i>
Phosphorus	0.05 percent, <i>Max</i>

c) Boron Steel

Carbon	0.24 to 0.30 percent
Silicon	0.4 percent, <i>Max</i>
Manganese	1.10 to 1.40 percent
Sulphur	0.035 percent, <i>Max</i>
Phosphorus	0.025 percent, <i>Max</i>
Chromium	0.30 to 0.60 percent
Boron	0.0008 to 0.005 percent



All dimensions are in mm  
FIG. 1 STRAIGHT BLADE



All dimensions are in mm  
 FIG. 2 HATCHET BLADE

4.1.1 Some of the typical steels that may be used are 75C6, 80C6 [see IS 1570 (Part 2/Sec 1)].

**5 HARDNESS**

The blades shall be heat treated, quenched and tempered. The hardness in edge portion (see  $H_2$  in Fig. 1 and 2) shall be  $58 \pm 5$  HRC and in shank portion (see  $H_1$  in Fig. 1 and 2) shall be 37 to 45 HRC when measured as per IS 1586 (Part 1).

NOTE — In Fig. 1 and 2 a line separating edge portion and shank portion has been indicated for the guidance.

## 6 DIMENSIONS AND TOLERANCES

6.1 The essential dimensions of Type A and Type B blades when read in conjunction with Fig. 1 and 2 respectively, shall be as given in **Table 1**.

**Table 1 Essential Dimensions of Blades**

All dimensions in millimetres.

Sl. No.	Description	Dimension	Tolerance on the declared value
(1)	(2)	(3)	(4)
i)	<i>A</i>	25.0, 26.0	- 0.3 -0.8
ii)	<i>B</i>	10.0	± 0.5
iii)	<i>C</i>	25.0	± 0.5
iv)	<i>D</i>	10.5	+ 0.3 - 0.0
v)	<i>E</i>	150 to 225	± 5
vi)	<i>F</i>	240 to 245	± 5

6.2 Other dimensions of Type A and Type B blades given in Fig. 1 and 2, respectively are only recommendatory. However, these dimensions shall be declared by the manufacturer. The tolerance for declared values shall be as given in Fig. 1 and 2.

## 7 WORKMANSHIP AND FINISH

7.1 The blades shall be free from cracks, seams and other visual defects which may be detrimental for their use.

7.2 The blades shall be free from rust and shall have a protective coating which will prevent surface deterioration in transit and storage.

## 8 MARKING AND PACKING

### 8.1 Marking

Each blade shall be marked with the following particulars at a suitable place avoiding the soil facing side:

- Manufacturer's name or recognized trade-mark;
- 'L' or 'R', in case of hatchet type blades to denote 'left' or 'right' and
- Batch or code number.

### 8.2 BIS Certification Marking

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act, 2016*

and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.

### **8.3 Packing**

The blades of the same type shall be packed for safe handling in transit as agreed to between the purchaser and the supplier.

## **9 SAMPLING FOR LOT ACCEPTANCE**

**9.1** Unless otherwise agreed to between the purchaser and the supplier, the sampling of blades for lot acceptance shall be done in accordance with **3** of IS 7201 (Part 1).

**9.1.1** The classification of different requirements of this standard for the purpose of testing for lot acceptance is given below for guidance:

- a) Dimensional and Visual Requirements — *see 6, 7 and 8.1.*
- b) Other Than Dimensional and Visual Requirements — *see 5.*