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DRAFT EAST AFRICAN STANDARD

Sport balls— Specification — Part 1: Outdoor Footballs

Edition 2022

EAST AFRICAN COMMUNITY

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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 063, Leather and Leather Products

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.

Sport balls— Specification — Part 1: Outdoor Footballs

1 Scope

This Draft East African Standard Specifies the requirements, sampling and test methods for outdoor footballs.

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 2589:2016 *Leather — Physical and mechanical tests — Determination of thickness*

ISO 11640:2018 *Leather — Tests for colour fastness — Colour fastness to cycles of to-and-fro rubbing*

ISO 11642:2012 *Leather — Tests for colour fastness — Colour fastness to water*

3 Terms and definitions

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For the purposes of this document, the following terms and definitions apply.

3.1
PU coated leather
leather with a coating of polyurethane

3.2
PVC coated textiles
textiles with a coating of polyvinylchloride

3.3
synthetic materials
materials made of PU, PVC and other synthetic materials which are used as natural leather substitute

4 Requirements

4.1 General Requirements

The footballs shall fulfil the following general requirements

a) Have a safety valve to prevent the loss of pressure
b) Bladder shall retain the inflation pressure
c) For footballs having panels, the latter shall be well sewn together, and the seams shall be intact

4.1.1 Material requirements

The footballs may be made of stitched leather, stitched synthetic material or moulded material that shall comply with the requirements given in Table 1.

4.1.2 Workmanship

Footballs shall be free from all defects which might affect their functionality
Footballs shall have a smooth surface finish.

4.1.3 Shape, dimensions and mass

Shape, dimensions and mass for various grades shall be as given in Table 1.

4.2 specific requirements

Table 1 — Material characteristics and specific requirements for outdoor football

Characteristic	Materials and requirements				Test method
	Grade 1 (size 5) (13 year and above)	Grade 2 (size 5) (13 year and above)	(size 4) (U10-12)	Size 3 (U7-9 years)	
Weight, g	420 – 445	410 – 450	350 – 390	312 –340	Annex A
Circumference, mm	685 – 695	680 – 700	635 – 660	585-610	Annex B
Sphericity, %, Max.	1.5	1.8	1.8	1.8	Annex B
Loss of pressure, max.	20	25	25	25	Annex C

Water absorption test a) Average water uptake of the initial mass of the tested balls, %, max. b) Water uptake per ball, %, max.	 10 15	 15 20	 15 20	15 20	 Annex D
Rebound at 20 °C, cm	120 – 165	115 – 165	110 – 160	110 - 150	Annex E
Rebound at 5 °C, cm, min.	120	110	110	110	Annex E
Difference between lowest and highest rebound per ball tested, mm, max.	10	10	10	10	Annex E
Shape and size retention test, including change of pressure (after 2 000 kicks) a) Damage to seams and air valve b) Increase in circumference, mm, max. c) Deviation on sphericity d) Change of pressure, bar, max.	 None 1.5 1.5	 — — —	 — — —	— — — — 0.8	 Annex F FIFA
Ball pressure, bars (+/- 0.01)				No damage	Visaul
Seam /Valve	0.1 0.8 No damage	— 0.8 No damage	— 0.8 No damage		
U= Under					

The football covers shall also comply with the additional requirements given in Table 2

Table 2- physical requirements for the football cover

S/N	Characteristics	Requirement	Test methods
i.	**Thickness, mm, min**	**2.2**	**ISO 2589**
iii.	**Colour fastness to water, min**	**4**	**ISO 11642**
iv	**Colour fastness to rubbing, min**	**4**	**ISO 11640**

5 Packaging

Football shall be packed in a suitable manner so as to protect it from damage during normal transportation, storage and handling

The football shall be packed in individual suitable material and then so packed, in suitable bulk containers, as to protect them from damage during transportation and storage.

6 Marking

6.1 Each ball shall be legibly and indelibly marked with the following;

a) Name of the material;
b) Manufacturer's name and/or registered trade mark;
c) Month and year of manufacture;
d) country of origin;
e) Batch number.
f) Size

6.2 Bulk Package

Each bale shall be legibly and indelibly marked with the following information:

a) Name of product as footballs;
b) The number of balls;
c) Name of manufacturer or local supplier's name and/or registered trade mark; and
d) country of origin.

Annex A
(normative)

Determination of weight

A.1 Principle

The weight of balls is very important to ensure consistence for the wind resistant.

A.2 Apparatus

An electronic balance, capable of measuring to the nearest 0.01 g.

A.3 Procedure

Select 3 pre-conditioned balls. Weigh them in an enclosed chamber to avoid wind flow. Record the mass to the nearest 0.01 g.

A.4 Results

Record the average mass of the three balls.

Annex B

(normative)

Determination of circumference and sphericity

B.1 Principle

The circumference test indicates the dimension of the ball as an average value measured from different axes. This test is critical to ensure the ball is the correct size for the game of football.

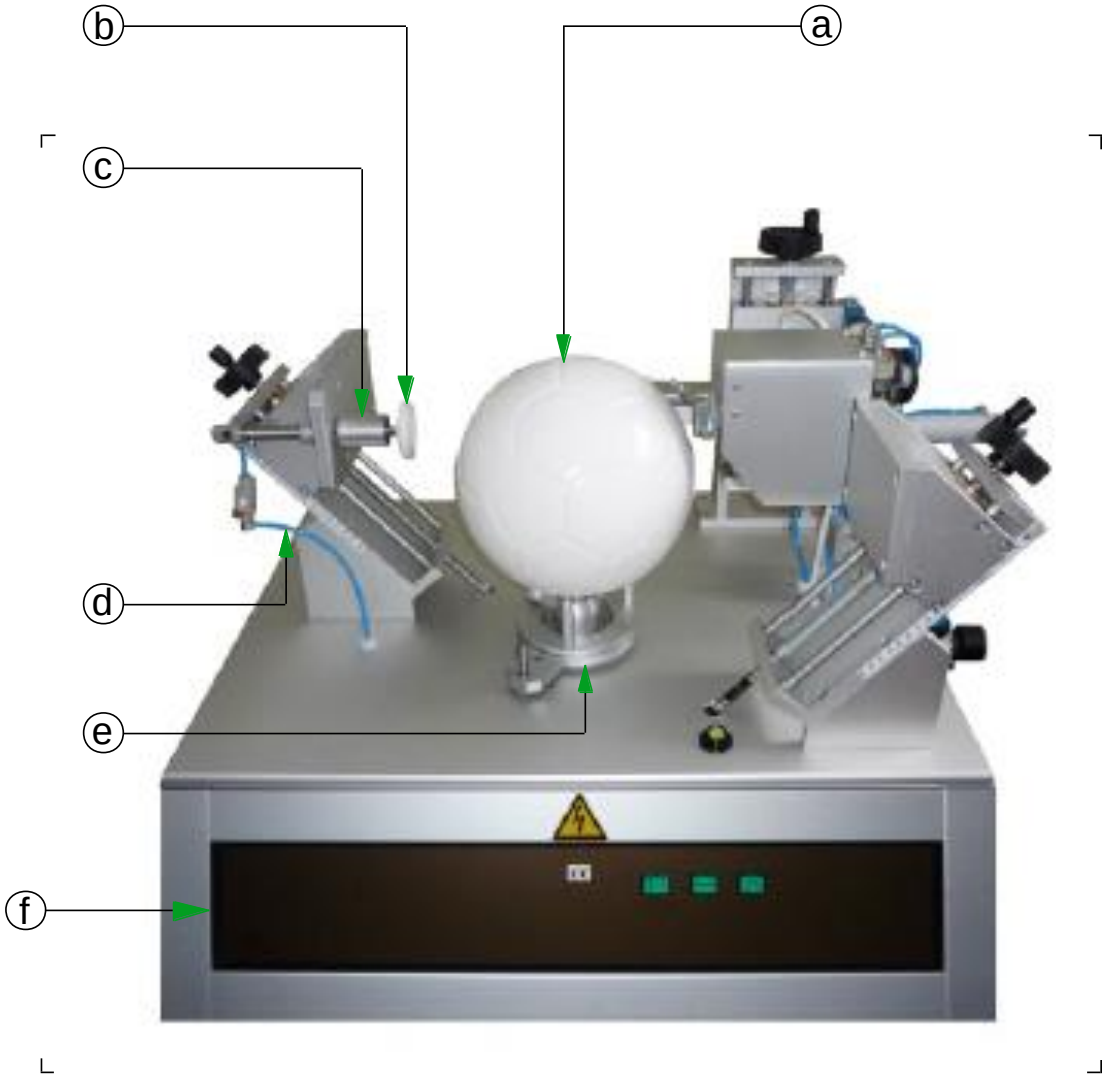
B.2 Apparatus

Equipment capable of measuring circumference and sphericity (roundness) of footballs (see Figure B.1).

The equipment may be automated and connected to a PC monitor with measuring software capable of taking several radii of a ball and giving an average measurement of the circumference and sphericity or any other suitable equipment.

B.3 Expression of results

The results will be read off the monitor for automatic equipment or any other suitable equipment display.



KEY

a) Ball
b) Grippers
c) Tangential arms
d) Pressure pipe
e) Rotating arm
f) Control panel with display screen

Figure B.1 — A typical equipment for circumference and sphericity

Annex C

(normative)

Determination of loss of pressure

C.1 Principle

This test measures the difference in pressure over time. The aim is to ensure that the ball does not deflate too quickly, even when not used.

C.2 Apparatus

A calibrated pressure gauge, capable of measuring 1.5 bar and an accuracy of ± 0.01 bar.

C.3 Procedure

C.3.1 Condition 3 football samples for at least 24 h in a standard atmosphere of temperature 20 °C ± 2 °C and relative humidity 65% ± 5%.

C 3.2 Measure the pressure in the balls to ensure that they comply with the recommended pressure before the test.

C.3.3 Keep the samples in the same standard atmosphere of temperature 20°C ± 2°C and relative humidity 65% ± 5% for 72 h.

C 3.4 After this period, measure the pressure in the samples and note the difference.

C.4 Results

Calculate the pressure difference and report to the nearest 0.01 bar.

Annex D

(normative)

Determination of water absorption

D.1 Principle

The football is placed in container filled with water. The ball is then compressed into the water by appropriate means and left to soak in the water. The ball is then weighed again after 250 compression cycles and compared to the original weight.

D.2 Apparatus

Equipment capable of turning the football in various directions between the compressions thus, the complete football comes in contact with the water during the test (see Figure D.1).

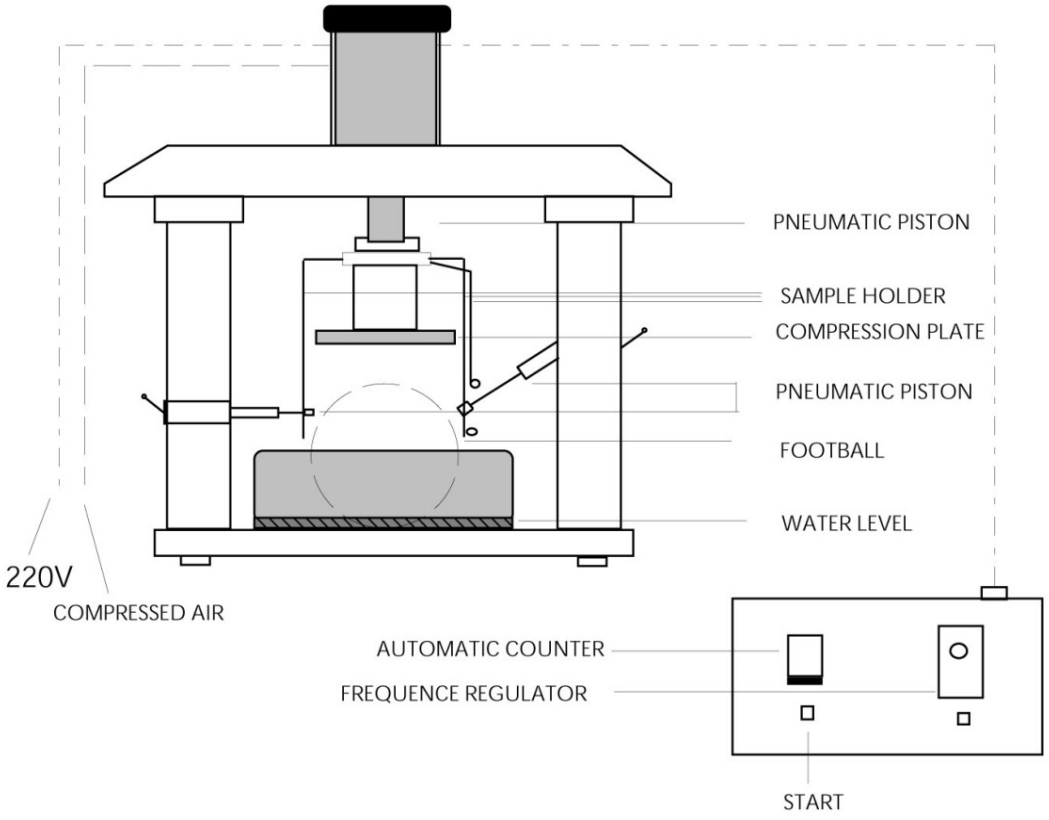


Figure D.1 — A typical water absorption equipment

D.3 Results

Calculate the weight difference between the initial and final weight

$$Y = \frac{M_2 - M_1 \times 100}{M_1}$$

Where

M_1 is the initial weight of the sample;

M_2 is the weight after water absorption; and

Y is the % weight gain (amount of water absorbed).

Annex E

(normative)

Determination of ball rebound

E.1 Principle

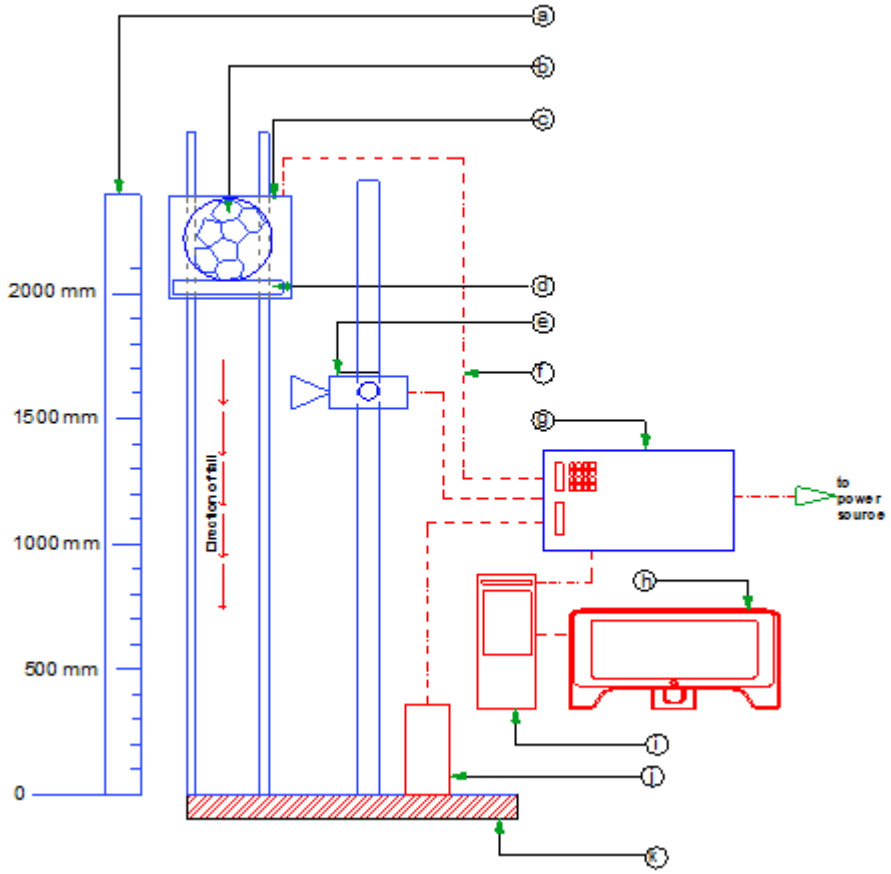
The sample ball is dropped in a guided free fall with a defined velocity on to a fixed plate. The ball hits the surface at specific points in the middle of the panels, distributed over the surface of the ball. The panels will be selected such that the number of testing points is evenly distributed on the different panel shapes.

E.2 Apparatus

Equipment capable of allowing for the ball to free fall vertically from a height of 2.00 m ± 0.01 m (measured from the bottom of the ball) without imparting any impulse of spin. The surface that the ball is to rebound on shall be metal for outdoor and beach soccer balls (see Figure E.1).

E.3 Results

The ball rebound height of any tested sample is the mean of 10 from the 10 performed from each ball in ambient conditions. The mean value of each of the three samples must fall within the requirements. In addition, the difference between the highest and lowest means shall be compared and shall also fall within the respective requirement.



KEY

a) Vertical scale
b) Ball
c) Guidance system
d) Ring
e) Video camera
f) Connecting cables
g) Control panel complete with switches
h) Display screen
i) Digital recording system
j) Sensor (for determining time of impact)
k) Metal surface

Figure E.1 — A typical football rebound test equipment

Annex F

(normative)

Determination of shape and size retention

F.1 Principle

The ball is repeatedly shot against a metal surface automatically (or otherwise stated) before being returned into the shooting device. The number of cycles simulates use over a period of time. The worn samples can then be re-checked for size, weight and shape in order to ensure they do not change significantly with use.

F.2 Apparatus

Equipment capable repeatedly throwing a ball (2000 times) against a specified surface automatically or otherwise stated (see Figure F.1).

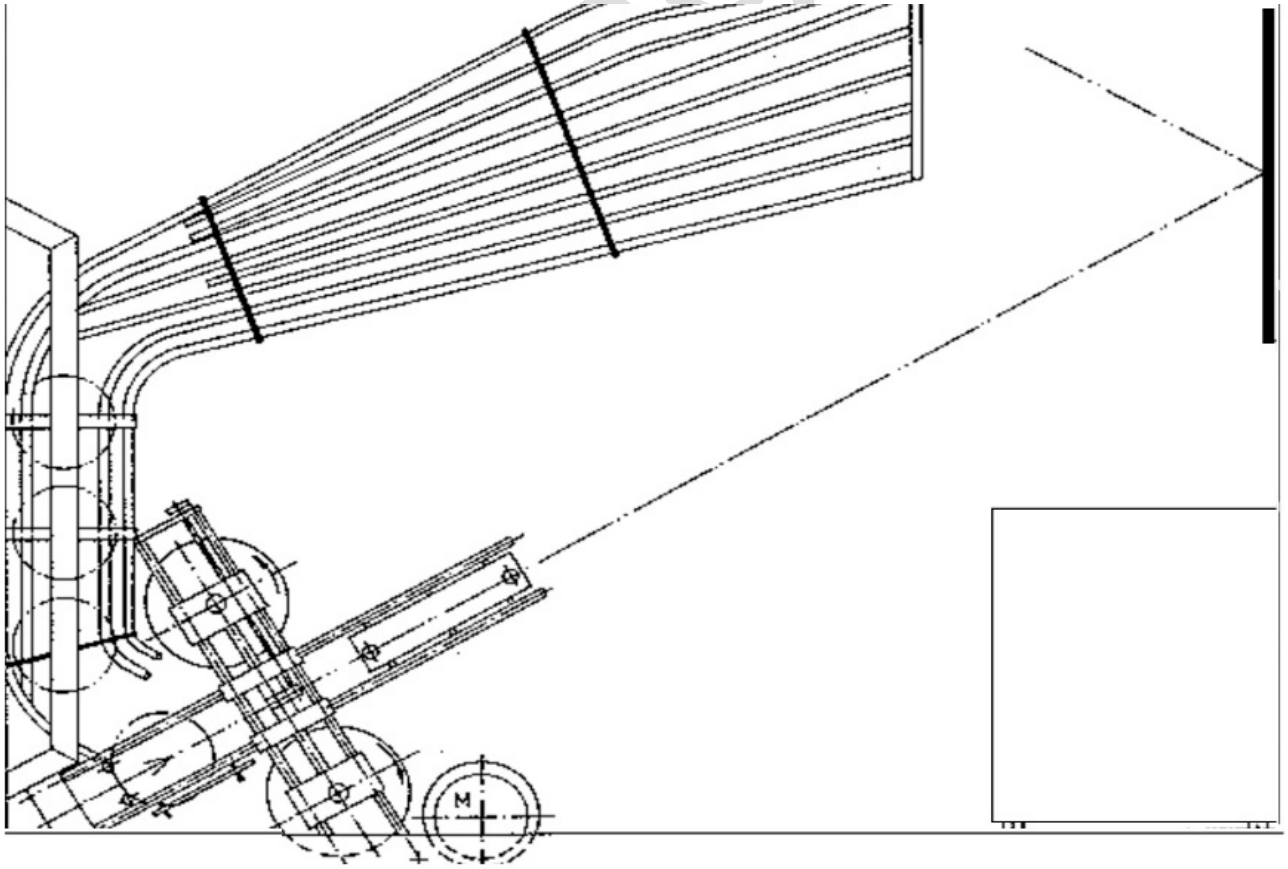


Figure F.1 — A typical Device for throwing balls

F.3 Calculation and expression of results

The results from the tests performed after the 2000 cycles are noted as follows:

a) Initial pressure of the samples (before shooting) minus pressure after shooting gives

b) Pressure loss expressed in bar with 2 decimal places; example -0.02 bar.

c) Visual inspection of any damage.

d) Change in circumference results as per the prescribed test method.

e) Change in sphericity results as per the prescribed test method.

The values of circumference, sphericity and pressure are compared to the values from the previous tests. The difference between the value obtained after the shooter test and prior to the test, is denoted as an absolute increase/decrease for circumference and pressure and a percentage

ANNEX G

(NORMATIVE)

SAMPLING OF FOOTBALLS

A -1 SCALE OF SAMPLING

A -1.1 LOT

In any consignment, all the balls of one type manufactured from same raw materials shall be grouped together to constitute a lot.

A – 1.2 For ascertaining the conformity of the lot to the requirements of this standard, tests shall be carried out for each lot separately. The number footballs to be sampled from a lot shall be in accordance with Table 3.

A -1.3 The balls shall be selected at random from the lot.

A -2 CRITERIA FOR CONFORMITY

A-2.1 Shape, Dimension, Mass and Finish

The Sample balls selected as pe col 3 of Table 3 shall be tested for shape, dimensions and mass and examined for finish. Any balls failing in one or more of the requirements shall be termed as defective. The lot shall be accepted if the number of defective balls in the sample does not exceed the acceptance number given in col 4 of Table 3.

A-2.2 **Prolonged inflation test and loss of pressure, water absorption, rebound test, shape and size retention test including loss of pressure**.

The sample size given in col 5 of Table 3 shall be subjected to prolonged inflation test and loss of pressure, water absorption, rebound test , shape and size retention test including loss of pressure. Any ball failing in one or more of the requirements shall be termed as defective. The lot shall be accepted if the number of defective balls in the sample does not exceed the acceptance number given in col 6 of Table 3.

Table 3 Scale of Sampling and Acceptance Number

Sl No.	**Lot size**	**For shape, Dimension, mass and visual Examination**		**For prolonged inflation test and loss of pressure, water absorption, rebound test, shape and size retention test including loss of pressure**	
		Sample size	Acceptance number	Sample size	Acceptance number
I	Up to 500	13	1	5	0
Ii	501 to 1000	20	2	8	0
Iii	1001 t0 3000	32	3	13	0
Iv	3001 t0 5000	50	5	20	1

v	5001 and above	80	7	32	2

Bibliography

The assistance derived from these sources is hereby acknowledged.

IS 417:2003, Indian Standard — Footballs, volleyballs, basketballs, netballs, throw balls and water-polo balls — Specification Part1: Footballs.

IS 4207, Indian Standard — Specifications for Leather for football.

FIFA Quality Programme for Footballs (outdoor, futsal and beach soccer footballs), Manual.