भारतीय
मानक
Indian Standard

पंचिंग बॉल्स — विशिष्टि

Punching Balls — Specification

ICS 97.220.40; 97.220.30

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Sports Goods Sectional Committee, PGD 41

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Sports Goods Sectional Committee had been approved by the Production and General Engineering Division Council.

Punching balls are specialized training equipment widely used in boxing, kickboxing, and martial arts disciplines. These include speed balls, and double-end balls—each serving a specific purpose such as strength training, hand–eye coordination, and reflex development Punching balls were earlier covered under following Indian Standard which have been now amalgamated into single standard:

a) IS 6479 : 1972 — Specification for Balls, Punching .

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.

Indian Standard

PUNCHING BALLS — SPECIFICATION

1 SCOPE

This standard specifies the requirements for punching ball including speed ball , double-end ball, and similar training equipment for boxing and martial arts.

2 TERMINOLOGY

2.1 Punching Ball - A ball for training that you punch or kick.

2.2 Speed Ball - A small, air-filled ball (tear-drop shaped) attached to a swivel to improve hand speed and timing.

2.3 Double-End Ball - An air-filled ball (round or peanut shaped) tied to floor and ceiling with cords to train reflexes.

2.4 Outer Shell / Case - The ball outer layer made of leather or strong synthetic fabric, protecting the filling or bladder.

2.5 Bladder - The inflatable inner ball (rubber or PVC) inside speed and double-end balls.

2.6 Seam - The stitched line joining panels of the outer shell; must be strong enough to resist splitting.

2.7 Stitch Density - Number of stitches per unit length (per 10 cm) higher density means a stronger seam.

2.8 Stitching Thread - Strong, waxed thread (hemp, polyester, or nylon) used for sewing seams.

2.9 Hanging Mechanism - Parts (straps, D-rings, chains, swivels) used to suspend the ball securely.

2.10 Ball and Socket Joint - A swivel fitting for speed ball :

- Socket: Hardened iron piece with a 27 mm seat to hold the ball, with three holes for screws.
- Ball: Hardened iron sphere (30.16 mm) with a 6.35 mm hole for an eyepin; sits in the socket to allow rotation.

3 CLASSIFICATION

3.1 Punching balls are classified into following four different levels based on their intended training intensity and application as given below:

a) Level 1 — Recommended for professional/match‑level training (Speed Ball)

b) Level 2 — Recommended for advanced/training-level practice (Speed Ball; Double-End Ball)
c) Level 3 — Recommended for beginner/skill-development use (Double-End Ball)

3.2 Ball Types (by Construction and Intended Function)

a) Speed Ball — Small, air-inflated ball mounted on a swivel, used to improve hand speed, rhythm, and coordination.
b) Double-End Ball — Air-inflated spherical or peanut-shaped ball fixed via bungee cords between floor and ceiling (or frame), used for timing, precision, and reflex training.

3.3 Each ball type (3.2) is further classified into various sizes based on intended use; size and weight ranges shall conform to requirements specified in the relevant tables.

4 REQUIREMENTS

4.1 Materials

4.1.1 Outer Shell

The outer cover of the ball shall be made of tough, abrasion-resistant material:

Leather: Full-grain cowhide or buffalo leather (1.2–1.6 mm thick) is preferred. Split leather is not recommended.

Synthetic: High-strength fabrics (rip-stop vinyl, ballistic nylon, PVC-coated polyester) are allowed if they resist tears and abrasion.

All colors and coatings shall be non-toxic.

4.1.2 Inner Bladder (Speed & Double-End Balls)

Bladders shall be rubber or PVC that remains airtight and resists punctures.

Material must meet safety standards (no harmful chemicals).

Thickness and elasticity should give proper rebound.

4.1.3 Thread

Use waxed polyester or nylon thread with high tensile strength.

Stitching must be dense enough (at least 24–28 stitches per 10 cm) for seam strength.

4.1.4 Metal Parts

Rings, hooks, swivels, and D-rings shall be steel (zinc-plated or stainless).

Welds and joints must be smooth, free of burrs.

Valve grommets shall be brass or stainless steel to resist corrosion.

4.2 Construction

4.2.1 Seams

All panels of the outer shell shall use double or reinforced seams.

Stitch lines must be straight and uniform.

Openings for filling or valves shall close securely (laces or heavy-duty zippers) with no protruding parts.

4.2.2 Hanging Attachments

Reinforce attachment points with extra leather or webbing patches.
D-rings or straps shall form a secure anchor (eyebolt style).
Speed-balls swivels must be mounted on a sturdy board or frame.

4.2.3 Valves and Caps

Inflation valves (for speed/double-end balls) must be firmly embedded.
Valve caps shall fit snugly to prevent leaks.
Valve assemblies shall be tested for airtightness.

5 MANUFACTURING AND WORKMANSHIP

5.1 Manufacturing Methods

Punching balls can be manufactured using any of the following methods:

a) Hand-stitched
b) Machine-stitched
c) Heat-sealed or laminated (for synthetic shells)

5.1.1 Panel Assembly

Shells shall be made from a suitable number of panels cut to give a smooth, rounded profile.

5.2 Opening and Closure

The opening shall be large enough to accommodate filling (cloth, sand, etc.) or a pump nozzle (for speed/double-end bladders). Suitable closure (laces, heavy-duty zipper, or tight valve) must be provided to seal the ball without protruding parts.

6 PERFORMANCE TEST

6.1 Impact/Durability Test

The balls shall resist repeated blows without rupture or tearing.
Method: Perform pendulum-impact or drop-weight tests as per ISO 20957-1.
Requirement: No visible damage after 100 consecutive impacts.

6.2 Seam Strength Test

Stitched seams must retain integrity under load.
Method: Conduct tensile testing on seam samples in accordance with ISO 13935-1.
Requirement: Breaking strength $\geq 3\times$ the maximum expected static load.

6.3 Air Retention Test *(Inflatable Balls Only)*

Inflatable balls (speed and double-end) must retain pressure over time.
Method: Inflate to the manufacturer's recommended pressure and measure pressure loss after 24 h at 23 ± 2 °C, per ISO 17627.
Requirement: Pressure loss ≤ 5 % of initial pressure.

6.4 Abrasion Resistance Test

Outer material must resist wear under friction.

Method: Test a shell sample using Martindale or Taber abrasion methods as per ISO 12947 or ISO 9352.

Requirement: No through-wear or rupture after 10 000 cycles.

6.5 Material Safety Test

All materials (leather, synthetics, dyes, adhesives) must meet chemical-safety limits.

Method:

- Leather pH: must be between 3.5–7.0 ISO 4045.
- Azo dyes must not release banned amines above 30 mg/kg ISO 14362.
- Chromium (VI) in leather must be less than 3 mg/kg AS PER ISO 17075.

Table 1 – Summary of Performance Tests for Punching Balls

Test	Purpose	Applicable to	Standards Referenced
Impact/Durability Test	Ensures the balls withstands repeated strikes without tearing.	All punching balls	ISO 20957-1 (general equipment safety)
Seam Strength Test	Confirms stitched seams won't break under stress.	speed, and double-end balls	ISO 13935-1 (seam tensile strength)
Air Retention Test	Checks inflatable balls retain pressure over time.	Speed and double-end balls (inflatable)	ISO 17627 (inflation pressure retention)
Abrasion Resistance Test	Verifies the shell can resist wear from repeated contact.	All punching balls	ISO 12947 / ISO 9352
Material Safety Test	Ensures leather/textile materials are non-toxic and chemically safe.	All punching balls	ISO 4045, 14362, 17075, 17072, EN 16523

Table 2 – Punching Ball Size, Weight, and Reference

Attribute	Speed Ball	Double-End Ball
Training Level	Expert / Competition (used by advanced boxers)	Intermediate / Club (used by semi-pro and clubs)
Dimensions (cm)	Height 15–25 × Diameter 7–10	Diameter 20–35 (usually round or peanut shape)
Circumference (cm)	22–31	63–110 (π × diameter; varies by shape)
Weight (kg)	0.30 – 1.20	0.50 – 2.50
Application	Hand speed & timing drills; rebound drills	Reflex & precision training; timing drills
References	ISO 20957-1 (static-load test for swivel)	ISO 20957-1 (impact/durability)

7 PACKING AND MARKING

7.1 Packing

Each punching ball shall be wrapped in polyethylene, paper, or similar cover and packed to prevent damage. Lightweight balls (speed/double) may be placed in protective sleeves or polybags . Balls should be tied or secured to prevent filling from shifting. Packing shall follow best trade practice or purchaser's instructions.

7.2 Marking

7.2.1 Each ball or its packaging shall be marked with the following information:

a) Manufacturer's name, logo, or trademark;
b) Product type/model and nominal weight or size;
c) Batch or lot number for traceability;

d) Month and year of manufacture;

7.2.2 *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 product(s) may be marked with the standard mark.