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शॉट गन कार्ट्रिज भाग 3 खाली केस —

विशिष्टि

(IS 10994 *भाग* 3 *का पहला पुनरीक्षण*)

Draft Indian Standard

CARTRIDGES FOR SHOTGUNS PART 3 EMPTY CASE — SPECIFICATION

(*First revision of* IS 10994 Part 3)

ICS 95.060

Arms and Ammunition for Civilian Use Sectional Committee PGD 28	Last Date for Comments: 15-09-2024

FOREWORD

(Formal Clause will be added later)

This Indian Standard was first published in 1984. This first revision has been taken up to keep pace with the latest technological developments and international practices. In this revision following major changes have been made:

a) New figures have been added;
b) References for test methods have been updated; and
c) Structure of the document has been updated.

This Standard has been published in nine parts. Other part in this series are:

Part 1	General requirements
Part 2	Blank cartridges
Part 4	Cap filled
Part 5	Anvil
Part 6	Propellant
Part 7	Discs
Part 8	Air cushion
Part 9	Lead shots

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

SPECIFICATION FOR CARTRIDGES FOR SHOT GUNS PART 3 EMPTY CASE

(*First revision of* IS 10994 *Part 3*)

1 SCOPE

This Standard covers dimensional and material requirements of empty case for shot gun cartridges.

2 REFERENCES

IS No.	*Title*
IS 1993 : 2018	Specification for cold — reduced tin plate and cold — reduced black plate *(First Revision)*
IS 3168 : 2024	Brass Strip and Foil for Deep Drawing — Specification *(Second Revision)*
IS 1060 (Part 1) : 2022	Methods of Sampling and Test for Paper and Allied Products Part 1 Test Methods for General Purpose
IS 1060 (Part 2) : 1960	Methods of sampling and test for paper and allied products Part 2
IS 5285 : 1998	Fibre analysis of paper and board — Methods of test (*First Revision*)
IS 1060 (Part 4/Sec 2) : 2018	Methods of sampling and test for paper and allied products: Part 4 methods of test for paper, board and pulps: Sec 2 determination of residue (Ash) on ignition at 525°C
IS 1060 (Part 4/Sec 7) : 2018	Methods of sampling and test for paper and allied products: Part 4 methods of test for paper, board and pulp: Sec 7 determination of pH of aqueous extracts — Hot extraction method
IS 1060 (Part 5/Sec 2) : 2021	Methods of Sampling and Test for Paper and Allied Products Part 5 Methods of Test for Paper and Board Section 2 Determination of moisture content of a lot — Oven-drying method
IS 1060 (Part 5/Sec 3) : 2014	Methods of sampling and test for paper and allied products: Part 5 methods of test for paper and board: Sec 3 determination of thickness, density and specific volume
IS 1060 (Part 5/Sec 4) : 2014	Methods of sampling and test for paper and allied products: Part 5 methods of test for paper and board: Sec 4 determination of water absorptiveness — Cobb method
IS 1060 (Part 5/Sec 5) : 2021	Methods of Sampling and Test for Paper and Allied Products Part 5 Methods of Test for Paper and Board Section 5 Determination of grammage
IS 1060 (Part 5/Sec 6) : 2014	Methods of sampling and test for paper and allied products: Part 5 methods of test for paper and board: Sec 6 determination of tensile properties — Constant rate of elongation method (20 Mm/min)
IS 1060 (Part 6/Sec 1) : 2014	Methods of sampling and test for paper and allied products: Part 6 methods of test for paper: Sec 1 determination of tearing resistance — Elmendorf method
IS 1060 (Part 6/Sec 2) :	Methods of Sampling and Test for Paper and Allied Products Part 6

2024	Methods of Test for Paper Section 2 Determination of bursting strength of paper
IS 1060 (Part 6/Sec 3) : 2015	Methods of sampling and test for paper and allied products: Part 6 methods of test for paper and board: Sec 3 determination of folding endurance of paper
IS 10994 (Part 1) : 2024	Specification for cartridges for shot gun Part 1 General requirements

3 DIMENSIONS

The dimensions of the empty case shall be as given in Table 1 and Fig. 1.

All dimensions are in millimetres.

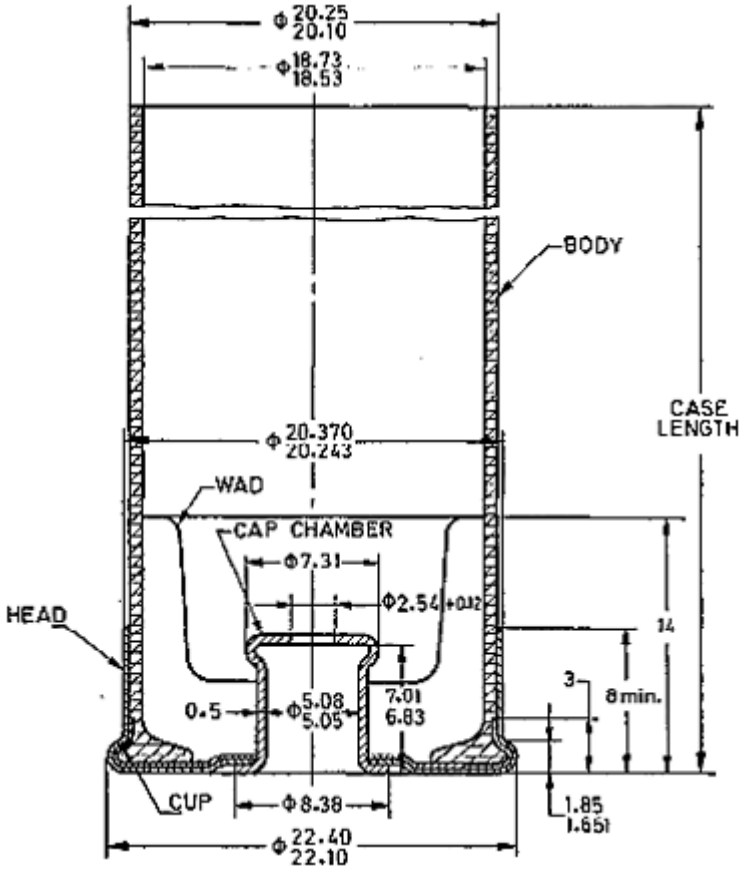

FIG 1 DIMENSIONS OF EMPTY CASE

Table 1 Dimensions of Empty Case
(*Clause* 3)

Cartridge Nominal Size		50	65	70
Case Length	*Max*	50.800	65.024	69.850
	Min	50.292	64.008	69.088

4 MATERIAL

4.1 Body — The tube shall be made by rolling cartridge paper on mandrel and securing it with casein glue. Important requirements of cartridge paper shall be as given in Annex A and that of casein glue shall be as given in Annex B.

4.2 Head — The head shall be made from brass strip conforming to Grade Cu Zn 30 of IS 3168. It shall be chrome passivated.

4.3 Cup — The cap shall be made from deep-stamping quality tin plate conforming to minimum tin coating of grade E 5.6/5.6 as per IS 1993.

4.4 Cap Chamber — The cap chamber shall be made from brass strip conforming to grade Cu Zn 30 of IS 3168. It shall be chrome passivated.

4.5 Base Wad — The base wad shall be made from paper conforming to the requirements given in Annex C.

5 OTHER REQUIREMENTS & TESTS

The empty cases shall also conform to all the requirements and tests given in IS 10994 (Part 1).

6 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.

ANNEX A
(*Clause* 4.1)

REQUIREMENTS FOR CARTRIDGE PAPER

A-1 CHEMICAL REQUIREMENTS

The cartridge paper shall conform to the chemical requirements as given in Table 2.

Table 2 Chemical Requirements for Cartridge Paper
(*Clause* A-1)

Sl. No.	Characteristics	Percent, *Max*	Test Methods
1.	Moisture content	9.0	IS 1060 (Part 5/Sec 2) : 2021
2.	Chloride calculated as sodium chloride	0.05	Clause **17** of IS 1060 (Part 2) : 1960 'Methods of sampling and test for paper and allied products, Part 2'.
3.	Sulphate calculated as anhydrous sodium sulphate	0.25	Clause **18** of IS 1060 (Part 2) : 1960
4.	Fatty and/or rosin acid calculated as oleic acid	0.25	Clause **19** of IS 1060 (Part 2) : 1960
5.	Ash	7.5	IS 1060 (Part 4/Sec 2) : 2018
6.	Alkalinity and acidity a) Acidity to methyl-orange b) Acidity to phenolphthalein Calculated as anhydrous sodium carbonate c) Alkalinity to methyl-orange calculated as anhydrous sodium carbonate d) Alkalinity to phenolphthalein	 Nil 0.10 0.10 Nil	Add 15 g of material cut into small pieces to 620 ml of boiling distilled water (equivalent to 600 ml at 15 to 20°C). Stir well and allow to stand for 18 h in an acid free atmosphere. Stir the material and allow to stand for one further hour. Decant two quantities each of 200 ml solution into 40 ml beakers (filtering if necessary through a dry sintered glass filter and discarding the first 25 ml of filtrate). Titrate the solution representing 5 g of sample immediately using phenolphthalein and methyl— orange respectively as indicator with N/10 sodium hydroxide solution or N/10 hydrochloric acid solution as may be necessary. Carry out blank tests under identical conditions and apply the necessary corrections.

A-2 PHYSICAL REQUIREMENTS

The cartridge paper shall conform to the physical requirements as given in Table 3.

Table 3 physical Requirements for Cartridge Paper
(*Clause* A-2)

Sl. No.	Characteristics	Requirements	Test Methods
1.	Substance	105 to 115 g/m^2	IS 1060 (Part 5/Sec 5) : 2021
2.	Thickness	0.142 to 0.162 mm	IS 1060 (Part 5/Sec 3) : 2014
3.	Bursting strength	5.25 kgf/cm^2 (514.914 kPa), *Min*	IS 1060 (Part 6/Sec 2) : 2014
4.	Burst factor/index	45, *Min*	IS 1060 (Part 6/Sec 2) : 2014
5.	Tearing resistance (each direction)	120, *Min*	IS 1060 (Part 6/Sec 1) : 2014
6.	Breaking length/ tensile strength a) Machine direction b) Cross direction	 7 500 to 9 000 m 3500 to 4500 m	IS 1060 (Part 5/Sec 6) : 2014
7.	Stretch/elongation a) Machine direction b) Cross direction	4 percent, *Min* 12 percent, *Min*	IS 1060 (Part 5/Sec 6) : 2014
8.	Folding endurance	10 000, *Min*	IS 1060 (Part 6/Sec 3) : 2015
9.	Cobb test ($\frac{1}{2}$ minute)	100 to 150 g/m^2	IS 1060 (Part 5/Sec 4) : 2014
10.	Fibre length	2.00 mm, *Min*	IS 5285 : 1998

NOTES

1 The material shall be conditioned prior to test for 24 h in an atmosphere of 65 ± 2 percent relative humidity and 27 ± 2°C temperature [*see also* **3.1** of IS 1060 (Part l) : 2022].

2 Breaking length is a theoretical value that helps to compare the strength of different papers. It is calculated using the tensile strength and grammage of the paper. The formula is:
Breaking Length (m) = [{Tensile Strength (N/m)}/ {Grammage (g/m^2)}]×1000

3 The burst factor and burst index have a direct conversion relationship since they essentially measure the same property but are expressed differently. Burst Factor is defined as the ratio of bursting strength (in kPa) to grammage (in g/m^2). It is dimensionless. Burst Index is also defined as the ratio of bursting strength (in kPa) to grammage (in g/m^2), but typically expressed in kPa·m^2/g. Burst Index (kPa·m^2/g) = Burst Factor

ANNEX B
(*Clause* 4.1)

REQUIREMENTS FOR CASEIN GLUE

B-1 COMPOSITION

The casein glue shall be prepared according to, any one of the formulations given in Table 4.

Table 4 Formulations for Casein glue
(*Clause* B-1)

Formulation 1	Casein	18.5 percent by mass
	Ammonia	1.5 percent by mass
	Water	80 percent by mass
	Fungicide	1 to 2 percent by mass
or		
Formulation 2	Casein	9.5 percent by mass
	Ammonia	6.8 percent by mass
	Water	83.7 percent by mass
	Fungicide	0.6 to 1.2 percent by mass
or		
Formulation 3	Casein	100 parts
	Disodium hydrogen phosphate	27.5 parts
	Lime fresh	9 parts
	Fungicide	8 parts
or		
Formulation 4	Casein	1000 parts
	Borase	200 parts
	Sodium pentachlorophenate	120 parts
	Belloid TD	As required but up to 60 parts, *Max*
	Water	10 litres

ANNEX C
(*Clause* 4.5)

REQUIREMENTS FOR PAPER FOR BASE WADS

C-l CHEMICAL REQUIREMENTS

The chemical requirement for paper wads shall be as given in Table 5.

Table 5 Chemical requirement for paper for base wads
(*Clause* C-1)

Sl.No.	Characteristics	Requirements	Test Methods
1.	Moisture content	7.5 percent, Max	IS 1060 (Part 5/Sec 2) : 2021
2.	Chloride calculated as sodium chloride	0.05 percent, Max	**17** of IS 1060 (Part 2) : l960
3.	Sulphate calculated as anhydrous sodium sulphate	0.25 percent, Max	**18** of IS 1060 (Part 2) : l960
4.	Fatty and/or rosin acid calculated as oleic acid	0.25 percent, Max	**19** of IS 1060 (Part 2) : l960
5.	Ash	10 percent, Max	IS 1060 (Part 4/Sec 2) : 2018
6.	*p*H of aqueous extract	5.5 to 7.5	IS 1060 (Part 4/Sec 7) : 2018

C-2 PHYSICAL REQUIREMENTS

The physical requirement for paper wads shall be as given in Table 6.

Table 6 Physical requirement for paper for base wads
(*Clause* C-2)

Sl. No.	***Characteristics***	***Requirements***	***Test Methods***
1.	Substance	210 to 250 g/m^2	IS 1060 (Part 5/Sec 5) : 2021
2.	Thickness	0.36 to 0.38 mm	IS 1060 (Part 5/Sec 3) : 2014
3.	Bursting strength	1.40 kgf/m^2, *Min*	IS 1060 (Part 6/Sec 2) : 2024
4.	Breaking load on a 50.8 mm wide strip a) Machine direction b) Cross direction	18.12 kgf, *Min* 11.33 kgf, *Min*	IS 1060 (Part 5/Sec 6) : 2014
5.	Water absorption test	2.5 cm, *Max*	When a strip of 15 cm X 2.5 cm is suspended vertically in distilled water with the lower end of the strip reaching to 3.7 cm below the surface of water, the rise of water in the strip (as indicated by the moist surface) shall not be more than 2.5 cm after 30 min

			[see also **8.2** of IS 1060 (Part l) : 2022]. Note — The material shall be conditioned prior to test for 24 h in an atmosphere of 65 ± 2 percent relative humidity and 27 ± 2°C temperature [see also **3.1** of IS 1060 (Part l) : 2022].