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Draft Indian Standard
SPECIFICATION FOR GUN POWDER
(*First Revision*)

ICS 59.100.20, 01.040.95

Explosives and Pyrotechnics Sectional Committee, CHD 26

Last date for Comments: 16th Dec, 2023

FOREWORD

(*Formal Clause to be added later*)

This Indian Standard was originally published in 1973. This standard prescribes the requirements and the methods of tests for gun powder commonly known as black powder.

This first revision has been taken up to update the ICS No and several other editorial changes in order to bring out the standard in the latest style and format of the Indian Standards

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
SPECIFICATION FOR GUN POWDER
(First Revision)

1 SCOPE

This standard prescribes the requirements and the methods of tests for gun powder commonly known as black powder.

2 REFERENCE

The standards listed below contain provisions which through reference in this text, constitute provisions of the 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 below.

<i>IS No</i>	<i>Title</i>
IS 1260 (Part 1) : 1973	Pictorial Marking for Handling and Labelling of Goods: Part 1 Dangerous Goods <i>(first revision)</i>
IS 1350 (Part 4/Sec 1) : 1974	Methods of test for coal and coke: Part 4 ultimate analysis, section 1 determination of carbon and hydrogen <i>(first revision)</i>
IS 1446 : 2002	Classification of dangerous goods <i>(second revision)</i>
IS 6609 (Part 1) : 1972	Methods of test for commercial blasting explosives and accessories: Part 1 gun powder

3 TYPES

3.1 The material shall be of following three types:

- a) Granulated,
- b) Pebble, and
- c) Mealed

4 REQUIREMENTS

4.1 Description — The material shall consist essentially of an intimate mixture of potassium nitrate, charcoal and sulphur.

4.2 Physical Appearance — Gun powder shall be homogeneous and shall be free from lumps, visible impurities and foreign matter.

4.2.1 Granulated powder shall be in the form of grains with rounded edges. It shall be thoroughly glazed by graphiting or friction as required.

4.2.2 The pebble powder shall be granular in form with rounded edges and shall be glazed by graphiting.

4.2.3 Mealed powder shall be in the form of fine powder.

4.3 Particle Size — The particle size of the material when determined by the method prescribed in **2.1.8** of IS 6609 (Part 1) shall be as agreed to between the purchaser and the supplier.

4.4 The material shall also comply with the requirements prescribed in Table 1 when tested according to the methods prescribed in IS 6609 (Part 1). Reference to the relevant clauses of IS 6609 (Part 1) is given in col 4 of the table.

TABLE 1 REQUIREMENTS FOR GUN POWDER

SL No	CHARACTERISTIC	REQUIREMENT	METHOD OF TEST [REF TO CL No. IN IS 6609 (PART 1)]
(1)	(2)	(3)	(4)
i)	Potassium nitrate, percent by mass	(75 ± 2)	2.6
ii)	Charcoal, percent by mass	(15 ± 2)	2.7
iii)	Sulphur, percent by mass	(10 ± 1)	2.7
iv)	Moisture, percent by mass	0.9 to 1.4	2.5
v)	Chlorides (as KCl), percent by mass, <i>Max</i>	0.15	2.13
vi)	Total chlorine (as KClO_4), percent by mass, <i>Max</i>	0.40	2.12
vii)	Sodium compound (as NaNO_3), percent by mass, <i>Max</i>	0.30	2.6.2
viii)	Sulphate (as K_2SO_4), percent by mas, <i>Max</i>	0.10	2.15
ix)	Acidity	Not more than that of 40 ppm of sulphuric acid	2.9
x)	Density, not less than:		2.10
	a) for granulated powder	1.70	
	b) for pebble powder	1.75	

NOTES:

1. The composition specified in Table 1 normally corresponds to gun powder having a lead fuse burning speed of (98 ± 3) seconds per 100 cm. However, a change in the composition may be effected, if necessary, to get the specified lead fuse speed.

2. Density requirement is not applicable to mealed powder.

4.5 Flashing Test — When tested according to the method prescribed in **2.8** of IS 6609 (Part 1), the material shall burn with very few sparks and the residue left shall be in fine powder form free from specks of fused salt and carbon. The residue shall be not more than 6 percent by mass.

4.6 Hygroscopicity — The hygroscopicity of the material when determined by the method prescribed in **2.11** of IS 6609 (Part 1) shall not exceed 3.0 percent.

NOTE — This requirement is not applicable to mealed powder.

4.7 Lead Fuse Burning Speed — When tested according to the method prescribed in **2.17** of IS 6609 (Part), the burning speed of the material shall be (98 ± 3) seconds per 100 cm.

NOTES

1 — Gun powder of other lead fuse burning speed as agreed to between the purchaser and the supplier may be required. In that case the composition of the powder may be suitably varied (*see* Table 1).

2 — This requirement shall apply only to granulated powder.

4.8 Carbon Content of Charcoal — The carbon content of the charcoal extracted from gun powder shall be 70 to 80 percent by mass when determined according to the method prescribed in **Annex A**.

NOTE — This requirement shall apply only to mealed powder.

5 PACKING AND MARKING

5.1 Packing — The material shall be packed in clean and sound containers as agreed to between the purchaser and the supplier.

5.1.1 When the material is required to be transported by rail, the packing shall conform to the provisions of Indian Railways Conference Association, Red Tariff No. 18.

5.2 Marking — The containers shall be legibly and indelibly marked with the following information:

- a) Name and type of the material;
- b) Net mass and average gross mass;
- c) Manufacturer's name and/or his recognized trade-mark, if any;
- d) Year of manufacture; and
- e) Lot number in code or otherwise to enable the batch of manufacture to be traced from records.

5.2.1 The containers shall also be marked with the words 'EXPLOSIVE CLASS 1a' (*see* IS 1446) along with the appropriate symbol indicating the explosive nature of the material [see Fig. 1 of IS 1260 (Part 1)].

5.3 The packing and marking shall further conform to the provisions of the Indian Explosives Rules, 1940 as amended from time to time.

5.3.1 BIS Certification Marking

The containers may also be marked with the Standard Mark. The use of the Standard Mark is governed by the provisions of The Bureau of Indian Standards Act, 2016 and the Rules and Regulations made thereunder. The details of the conditions under which the licence for use of the Standard Mark may be granted to manufacturers or producers, may be obtained from the Bureau of Indian Standards.

ANNEX A
DETERMINATION OF CARBON CONTENT OF CHARCOAL
(Clause 4.8)

A-1 PROCEDURE

A-1.1 Extract about 10 g of gun powder successively with hot water and carbon disulphide. Dry the residue at 60°C in a current of nitrogen, free from oxygen. Allow the charcoal to cool in nitrogen.

A-1.1.1 Take 0.5 g of the extracted charcoal and again dry this portion to constant mass in nitrogen atmosphere at 125 °C to 143 °C. Without further exposure to air, determine the carbon content by the method prescribed in **5** of IS 1350 (Part 4/Sec 1): 1974.