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National Standards of the People's Republic of China

GB XXXX – 200X

Fireworks and Firecrackers
Firecrackers - Black Powder Bangers

(Draft for approval)

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Standardization Administration of the People's Republic of China (SAC)

Preface

Appendices A and B to this standard are standardised appendices.

This standard was proposed by China National Light Industry Council (CNLIC) and is under the jurisdiction of the National Standardization Technology Committee of Fireworks and Firecrackers.

The organisation in charge of drafting this standard was the National Key Laboratory of Fireworks and Firecrackers (HuNan).

The main drafters of the standard were: TanAiXi, ZhangGuangHui, JiangZiCheng, OuYang, LiuJinBiao, JiangFangMing, XuPeng, XiongHao.

This is the first issue of this national standard.

Fireworks and Firecracker – Firecrackers
Black powder Bangers

1 Scope

This Standard sets the technical terms and definitions, classifications, technical requirements, test methods and regulations, product labelling, packaging, transportation and storage requirements for black powder bangers.

This standard applies to the manufacture, acceptance checks, sales, transportation, storage and launching of black powder bangers.

2 Normative References

The provisions of the following documents become provisions of this standard after being referenced. For dated reference documents, all later amendments (excluding corrigenda) and versions do not apply to this standard; however, the parties to the agreement are encouraged to study whether the latest versions of these documents are applicable. For undated reference documents, the latest versions apply to this standard.

GB 10631-2004	Fireworks and Firecracker Safety and Quality
GB/T 10632-2004	Fireworks Firecracker Rules of Sampling for Inspection

3 Technical terms and definitions

The following terms and definitions and defined in GB 10631-2004 apply to this standard.

3.1 Black Powder bangers

Black powder bangers have a single, non-metal main body filled with black explosive powder (with the exception of the friction head) that serves to ignite the blasting fuse. The outer shell and end seal (if any) are designed so as to confine the explosive powder; the solidity of the outer shell can increase the sound level of the explosion on ignition of the product.

3.2 Black powder banger batteries

Multiple black powder bangers are assembled and fused together with only one ignition point - a design that is intended for producing continuous explosions.

3.3 Projected debris

Debris pertains to any materials such as scraps of paper, firework powder and the bottom stopper, that fall from the black powder bangers when set off into the sky.

4 Product classifications

4.1 Black powder firecrackers

4.1.1 Class C black powder firecrackers should not contain more than 2.0g pure black powder.
4.1.2 Class B black powder firecrackers should not contain more than 8.0g pure black powder.

4.2 Black powder banger batteries

4.1.3 For Class C black powder banger batteries: each container should hold no more than 2.0g pure black powder.

5 Technical requirements

5.1 Appearance

5.1.1 No perforations, splits, leaks or protrusions should be found on the outer shell of the main body of the product and there should be no perforations or splits on the end seal.
5.1.2 The exterior of the product should appear clean and tidy; no loose powder, mould or contaminants should be found.
5.1.3 The paper displaying the symbol on the outer body of the tube should be pasted smoothly and neatly and should fit perfectly to the product. Writing and images should be clear.

5.2 Blasting fuse
5.2.1 The surface of the blasting fuse should be dry and clean, unbroken, and without leaks or mould.
5.2.2 Chlorate blasting fuses may not be used.
5.2.3 Durability of the blasting fuse: must conform to the requirements set out in Article 5.4.2 of GB 10631-2004.
5.2.4 Fuse protection: all fuses should pass the side ignition test, with the exception of fuses with inner packing or fuse-cover protection.
5.2.5 Main body - ignition timing must conform to the requirements set out in Article 5.4.2 of GB 10631-2004.

5.3 Powder type, powder quantity and safety performance: should conform to the safety requirements set out in Article 5.5 of GB 10631-2004.

5.4 Launch performance
5.4.1 Launch outcomes
All outcomes of the launch should conform to the product design requirements.
5.4.2 Sound levels
The maximum sound level of the explosion must not exceed 140 dB
5.4.3 Debris
5.4.3.1 For Class C black powder bangers: debris should not drop further than 8.0m away from the ignition area; any pieces of debris projected from the firecracker that drop at a distance of over 6.0m away from ignition area should weigh no more than 1.0g.
5.4.3.2 For Class B black powder bangers: debris should not drop further than 15.0m away from the ignition area.
5.4.4 Explosion sound ratio
5.4.4.1 The minimum sound ratio for Class C black powder bangers and batteries of black powder bangers should not be less than 90%.
5.4.4.2 The minimum sound ratio for Class B black powder bangers and batteries of black powder bangers should not be less than 85%.

6 Test methods

6.1 External appearance
Loose powder test for surfaces: collect loose powder from the product surface and use precision 0.001g scales to measure the amount of powder. A visual estimation should be completed for other tests.
6.2. Blasting fuse stability test
This test procedure should be carried out in accordance with Article 6.3.1 of GB 10631 – 2004.

6.3 Fuse side ignition test
This test procedure should be carried out according to Appendix A.

6.4 Ignition timing test for the blasting fuse
Using two different stopwatches, both with a precision of not less than 0.1s, test the timing of the fuse. The average value of the two readings should be taken using a rounding off method, to a

precision of 0.1s. If the difference between the readings produced by the two watches does not exceed 0.5s, then the test result is valid.

6.5 Powder type, powder quantity, and safety performance tests
Test procedures should conform to the rules and regulations stipulated in Article 6.4 of GB 10631-2004.

6.6 Launch performance test
Weigh the debris using a 0.1g precision scale.
Other tests should conform to the procedures and regulations set out in Article 6.5 of GB 10631 – 2004.

7 Test rules and regulations

7.1 Batches
Products of the same variety and specification, manufactured with the same original materials, produced using the same technology on the same production line, and with the same production time scale, constitute the same batch.

7.2 Product testing before leaving factory7.2.1 Products should be tested using a sample survey before leaving factories. Random samples should be taken as test specimens from each batch of products in accordance with the rules and requirements set out in GB/T 10632.
7.2.2 Before leaving the factory, tests should be carried out on the external appearance, blasting fuse, materials of main body, flight stabilisation equipment and launch performance of the samples.
7.2.3 Each batch of products must be tested and examined in accordance with the rules and regulations of the manufacturer's testing department, so as to certify the product's quality before leaving the factory.

7.3 Product type inspection test
Type inspection tests should be carried out:
a) before new products are put into production;b) if a certain product line has been discontinued for over six months then put back into production;c) if important changes have been made to the original materials or technology;d) according to the requests of the supervision and inspection department.
7.3.1 Type inspection testing items should include all of the technical required items stipulated in this standard.
7.3.2 Sample survey for type inspection tests: random sampling test specimens from factory-qualified products, the quantity of test specimens should satisfy every related test item.

7.4 Acceptance check tests
Refer to the process stipulated in section 7.2.
7.5 Test outcomes/conclusions
Product faults resulting from acceptance check tests that are carried out before leaving the factory should be dealt with according to the conditions stipulated in Appendix B. Results should be determined in accordance with the requirements stipulated in GB/T 16032-2004. Any products that do not satisfy the terms and conditions of this standard during type inspection testing shall be

considered as unqualified products.

8 Labelling, packaging, transportation and storage8.1 Labelling
Refer to the conditions stipulated in GB 10631-2004, “Fireworks and firecracker safety and quality”.

8.2 Packaging
Product packaging must conform to the rules and requirements of technical documents that are permitted by the rules and regulations of this standard, must be suitable in terms of product quality protection and convenient for transportation and storage.
8.2.1 Inner packaging
Inner packaging should completely cover the black powder bangers. With the exception of opening and technical requirements, no sign of perforation or breakage must be evident on the packaging. Inner packaging must be damp-proof and shockproof. The product should be lined with damp-proof paper and products should be separated by partition cardboard. Partition and securing cardboard or fine paper dividers should also separate the different levels within the packaging.
8.2.2 Outer packaging
Outer packaging must be sturdy and complete. Marks and symbols must be complete. Packaging boxes must meet the requirements of GB 10631-2004 and the total weight of each box must not exceed 30kg. The symbols and marks found on the packing boxes are:
- product name;- product number and batch number;- product quantity and specification;- gross weight;- size;- name and address of manufacturer;- date of leaving factory;- standard code name;- writing or marks such as “fire-proof”, “damp-proof”, “explosive”, “fragile”.

8.3 Transportation
Transportation of the products should be carried out in accordance with the rules and regulations stipulated in GB10631-2004, and must conform to the national rules and regulations for transporting dangerous goods.

8.4 Storage
Storage of the products should be carried out in accordance with the rules and regulations stipulated in GB10631-2004. Under normal conditions, the expiry date should be three years.

Appendix A
(standardised appendix)

Blasting fuse side ignition test

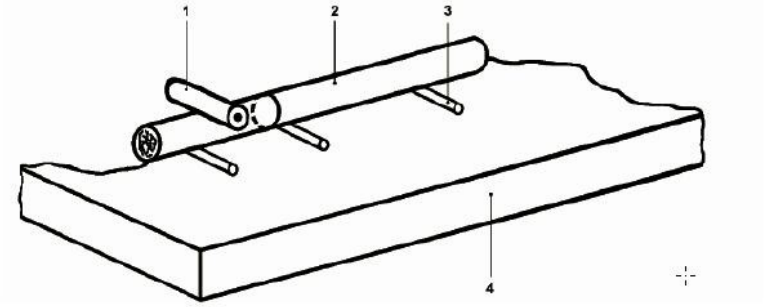
A. 1 MaterialsA. 1.1 Cigarette No filter tip, length 70mm± 4mm, diameter 8.0mm ± 0.5mm, mass 1.0g ± 0.1g.

A. 1.2 Testing site The testing site must be level; inside the ventilating cabinet should be a non-flammable platform or a sealed, airtight space, which is shielded from any wind movement. If an air pump is installed, switch off while testing.
A.2 Test instrumentsA.2.1 Metal stand3 metal stands: diameter 2.0mm ± 0.1mm, length 50mm.

A.2.2 Test specimen Dissected fuse may be used as the test specimen.

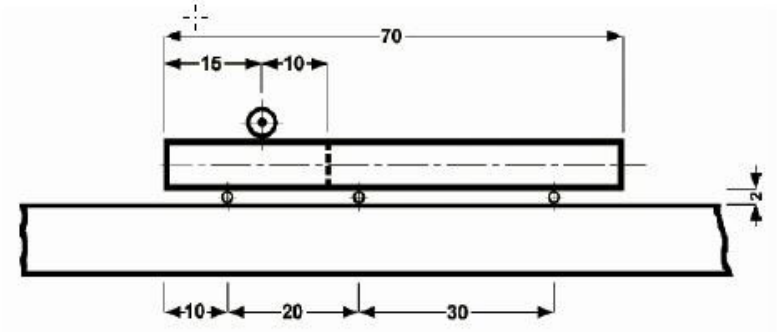
A.3 test procedure
Light the cigarette (A.1.1) and place horizontally across the metal stands (A.2.1), then place inside the ventilating cabinet at the testing site (A.1.2). Place the dissected fuse (A.2.2) onto the

cigarette. The distance from the cross-point of the dissected fuse and the cigarette to the lighted cigarette butt should be 15mm - see diagram A.1. Allow the cigarette to carry on burning until the burning point beyond the fuse and cigarette cross-point reaches about 10mm, and then record whether or not the fuse became lit.



1 test specimen
2 cigarette
3 metal stand
4 non-inflammable platform

a) test equipment unit: mm



b) test equipment dimension (mm)

Appendix B
(Standardised appendix)
Faulty black powder banger categories

See Table B.1 for faulty black powder banger categories

Table B.1 faulty black powder banger category

Tested items	Technical Requirements	Test Methods	Description of Fault	Fault Category
Labelling	8.1	Test procedures carried out in accordance with the requirements of GB XXXX- 200X	No labels or marks on product (inner packaging); no instructions for setting the rockets off	a_2
			Incomplete labels and marks; unclear information on labels and marks; covering damaged	b_1
Packaging	8.2	Test procedures carried out carried out in accordance with the requirements in	Inner packaging and outer packaging do not meet standard requirements	b_1

		Article 6.1 of GB10631-2004		
Appearance	5.1	6.1	Main body badly damaged by severe mould, and split	a_1
			Main body slightly damaged, loose powder on surface	b_1
			Contaminated: some mould visible on top and bottom - white colour	c_2
Blasting fuse	5.2	6.2. 6.3 6.4	t < required minimum value; used chlorate fuse	a_1
			t > required maximum value; not able to pass side ignition test;	b_1
			Mouldy; damaged; empty fuse; insufficient powder - trapped air in fuse	
			Unstable installation; incorrectly installed - wrong place; ignition point not clearly labelled.	c_1
Powder type and quantity	5.3	6.5	Used prohibited powder; powder exceeds the required quantity	a_1
Launch performance	5.4	6.7	Sound level exceeds the required level	a_1
			The fire of the lit firecracker goes out; launch results do not conform to design requirements due to the weight of the product; combustion ratio does not meet	b_2

			the required standard (Class B)	
			Combustion ratio does not meet standard requirements (Class C)	c_2