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INDUSTRY STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GA 950-2011

V50 test methods for ballistic materials and products

防弹材料及产品V50试验方法

(English Translation)

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Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009.

This standard replaces GA 950-2011 "Test methods for bullet-proof materials and products V50", compared with GA 950-2011 as follows.

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-Revised normative references (see Chapter 2, Chapter 2 of the 2011 edition);

-Revised terms and definitions (see 3.4, 3.6, 3.11, 3.12, 3.13, 3.4, 3.6, 3.11 of the 2011 edition 3.12, 3.13);

-Modified the ballistic test system (see 4.1, 4.1 of the 2011 edition);

-The test projectile was modified (see 4.2, 4.2 of the 2011 edition);

-Revised the speed target (see 4.5, 4.5 of the 2011 version);

-Modified target frame (see 4.7, 2011 version 4.7);

--Modified the verification board (see 4.10.1, 4.10.1 of the 2011 version);

-Modified test environmental conditions (see 4.13, 4.13 of the 2011 edition);

-Modified the fragmentation system (see A.1.2 in Appendix A, A.1.2 in Appendix A of the 2011 edition);

-Revised system relative error and system difference error (see B.3.1, B.3.2 in Appendix B, Appendix B of the 2011 edition B.3.1, B.3.2);

-The applicability of the four-round assessment method has been modified (see C.1 in Appendix C, C.1 in Appendix C of the 2011 edition)-Modified the conversion between the measured bullet velocity and the target speed (see D.1 in Appendix D, D.1 in Appendix D of the 2011 edition).

This standard was proposed and managed by the National Police Equipment Standardization Technical Committee (TC561).

This standard was drafted. China Weapon Industry Group No.3 Research Institute, Ministry of Public Security Special Police Equipment Quality Supervision and Inspection Center, Physical and Chemical Testing Center for Nonmetal Materials in the Weapon Industry.

1 Scope

This standard specifies the technical requirements, test methods, and V50 value meter for evaluating the ballistic limit V50 of ballistic materials and products.

Calculation and correction, preparation of test reports, etc.

This standard is applicable to the testing and evaluation of ballistic limit V50 of various ballistic materials and products.

2 Normative references

The following documents are essential for the application of this document. For dated references, only the dated version applies this document. For undated references, the latest version (including all amendments) applies to this document.

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GB/T 699-1999 high-quality carbon structural steel GB/T 1446-2005 General rules for test methods of fiber reinforced plastics GB/T 3880.1-2012 Aluminum and aluminum alloy plates and strips for general industrial use Part 1. General requirements GJB 3196.30A-2005 Test methods for bullets. Part 30 Speed test. Light curtain target method GA 141-2010 police body armor

3 Terms and definitions

The following terms and definitions apply to this document.

Ballistic limit V50

A certain type of bullet will form a target with a penetration probability of 50% for the sample, which is represented by V50.

Sample

Bulletproof materials or products for V50 testing.

Fragment simulating projectile A projectile made of a specific material, shape, and size for a ballistic test.

Sabot

Lightweight bracket for stably pushing high-speed launch of analog fragments.

Witness plate

Aluminum alloy sheet used to monitor the damage of the sample after it is penetrated by the projectile.

Perforation

One of the following phenomena occurs when the sample is impacted by the projectile.

a) forming a perforated perforation;

b) projectile or projectile fragments appear behind the sample;

c) Verify that there are perforations on the board.

Stop

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When the sample is impacted by the projectile, it does not constitute any phenomenon of penetration.

Angle of incidence

The angle between the projectile's flight direction and the normal at the point of impact of the impact point is shown in Figure 1.

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Figure 1 Schematic diagram of incident angle

Impact point

The center point of the puncture or depression after the bomb impacts the sample.

3.10

Fair hit

During the firing test, the incident angle of the projectile is less than or equal to 5o, the distance between the impact points is greater than or equal to 51mm, and the distance between the impact point and the edge is greater than Equal to 75mm projectile impact.

3.11

Range of mixed results Among all effective hit speeds produced by the ballistic limit V50 test, there is a region where the speed of the blocking bullet is higher than the speed of the penetration bullet.

3.12

Velocity difference in range of mixed results in the mixed result area, the absolute value of the difference between the lowest bounce velocity and the highest bounce velocity blocked by the sample.

3.13

Evaluating velocity difference of the effective ballistic speeds produced by the ballistic limit V50 test, it is used to evaluate the maximum ballistic speed and maximum ballistic speed of the ballistic limit V50.

Low speed difference.

3.14

Backing material

Material used to simulate the human torso.

4.1 Ballistic test system

Ballistic test systems generally consist of test firearms, speed targets (including start and stop targets), chronographs, backing materials, target racks, and the main components of the ballistic interceptor are shown in Figure 2.

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Figure 2 Schematic of ballistic test system

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