



Metal Magicians at Work....creating Doorways of Distinction for the Pathways of Tomorrow

EXPLANATION OF BALLISTIC PERFORMANCE LEVELS

BACKGROUND:

First of all, the term "bulletproof" is widely but incorrectly used. No hollow metal materials are considered bulletproof, only bullet resisting for a specified charge and projectile. Ballistic performance (resistance) is based on Performance Levels as specified in UL-752 published by Underwriters Laboratories, Inc. This Document specifies the method of conducting the tests, the projectile, the weight of the charge, the velocity (speed) of the projectile and the number & location of the impacts.

Similar to other performance tests, such as for acoustics, windstorms, or fire protection, the test simulates specific controlled and repeatable conditions and acceptance parameters. These are not necessarily "real life" situations, nor are they intended to cover every possible weapon or distance. For example, it does not replicate firearms discharged at "point blank" range.

Passing a numerically higher Performance Level does not automatically assure passing a numerically lower Level.

TEST SUMMARY:

The test specimen is conditioned to a specified temperature and installed vertically into a test fixture. Sheets of material, generally cardboard, are positioned at a specified distance from the protected side of the sample to visually indicate any penetration or fragmentation (spalling).

A suitable means of measuring the velocity of the projectile is incorporated into the set-up. The projectile must be traveling at a specified minimum velocity, yet not more than 10% over that velocity. The velocity will vary with different Performance Levels and ammunition.

The size, type, and load of each charge and projectile are carefully measured and recorded.

The muzzle of the test firearm is positioned 15 feet from the test specimen and aimed to contact the specimen at 90 degrees vertically and horizontally. The firearm is discharged for a specified number of shots at a specified location or pattern. Both the protected side of the test specimen and the visual indicators are checked for any damage or penetration. Either of these constitutes a failure.

PERFORMANCE LEVELS:

Test requirements for Levels 1 through 8 are summarized here for reference. These Levels cover most ballistic attacks. Other numeric Levels are assigned to "military" applications using armor piercing projectiles or weapons not generally available to the public.

- **Level 1:** 3 shots from a Medium power handgun having a 9 mm full copper jacket with lead core and 124 grain load traveling at 1,175 ft/sec. Muzzle energy 380 to 460 foot-pounds.
- **Level 2:** 3 shots from a High power handgun having a .375 Magnum jacketed lead soft point and 158 grain load traveling at 1,250 ft/sec. Muzzle energy 548 to 663 foot-pounds.
- **Level 3:** 3 shots from a Super power handgun having a .44 Magnum lead semi wadcutter and 240 grain load traveling at 1,350 ft/sec. Muzzle energy 971 to 1,175 foot-pounds.
- **Level 4:** 1 shot from a High power rifle (such as 30-06) having a .30 caliber lead core soft point and 180 grain load traveling at 2,540 ft/sec. Muzzle energy 2580 to 3120 foot-pounds.
- **Level 5:** 1 shot from a military or hunting rifle (such as 308 Winchester) having a 7.62 mm or .30 caliber full copper jacket with military ball and 150 grain load traveling at 2,750 ft/sec. Muzzle energy 2519 to 3048 foot-pounds.
- **Level 6:** 5 shots from a submachine gun (such as Uzi) having a 9 mm full copper jacket with lead core and 124 grain load traveling at 1,400 ft/sec. Muzzle energy 540 to 653 foot-pounds.
- **Level 7:** 5 shots from a military assault rifle (such as an M16) having a 5.56 mm full copper jacket with lead core and 55 grain load traveling at 3,080 ft/sec. Muzzle energy 1158 to 1402 foot-pounds.
- **Level 8:** 5 shots from a military assault rifle (such as an M14) having a 7.62 mm full copper jacket with lead core and 150 grain load traveling at 2,750 ft/sec. Muzzle energy 2519 to 3048 foot-pounds.