



# The Ultimate Guide to Body Armor

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2024 Edition



# The Five Most Important Factors of Body Armor

- Level of protection
- Comfort and fit
- Weight and mobility
- Material
- Cost

Reliable body armor is necessary for law enforcement and military personnel operating in dangerous situations. In this guide, we will discuss the five critical factors that you should consider when selecting body armor.

These five most important factors are:

**Level of protection:** The most critical factor to consider when choosing body armor is the level of protection it provides. Armor is rated according to the National Institute of Justice (NIJ) standards, which range from Level I to Level IV. Choose a threat level that is appropriate for your intended use.

**Comfort and fit:** Body armor plates should be comfortable to wear for extended periods and fit properly to provide adequate coverage. Proper fit and comfort are essential for the armor to provide the maximum protection level possible.

**Weight and mobility:** The weight and mobility of the body armor are important considerations. Armor that is too heavy or restrictive can impede movement and be uncomfortable to wear. Choose lightweight armor that allows maximum mobility while providing adequate protection.

**Material:** The durability and construction of the body armor are also important factors to consider. The armor should be made of high-quality materials that can withstand the rigors of use and last for an extended period.

**Pricing:** The cost of the armor is also an important consideration. Higher levels of protection and more advanced materials and construction methods can increase the cost of armor. Choose armor that provides the necessary level of protection while remaining within your budget.

# NIJ Levels of Protection



The National Institute of Justice (NIJ) establishes minimum performance standards for ballistic body armor, including specific testing requirements for each protection level. Here are the specific NIJ Certification testing requirements for each level:

**Level II: Soft Body Armor** - This level of protection is designed to stop higher-velocity 9mm and .357 Magnum rounds. To be NIJ Certified at this level, the armor must be able to stop a minimum of 6 rounds of 9mm or .357 Magnum at a velocity of 1175 fps.

**Level IIIA: Soft Body Armor** - This level is designed to stop higher-velocity .357 SIG and .44 Magnum rounds and lower-velocity rifle rounds. To be NIJ Certified at this level, the armor must be able to stop a minimum of 6 rounds of .357 SIG or .44 Magnum at a velocity of 1400 fps or a minimum of 3 rounds of 7.62mm NATO at a velocity of 2780 fps.

**Level III:** This level is designed to stop higher-velocity rifle rounds, including 5.56mm NATO and 7.62mm NATO. To be NIJ Certified at this level, the armor must be able to stop a minimum of 6 rounds of 7.62mm NATO at a velocity of 2780 fps.

**Level IV:** This level is designed to stop armor-piercing rifle rounds, including .30-06 M2AP and 7.62mm AP. To be NIJ Certified at this level, the armor must be able to stop a minimum of 1 round of .30-06 M2AP at a velocity of 2880 fps or a minimum of 1 round of 7.62mm AP at a velocity of 2780 fps. It's important to note that these are minimum performance standards and that armor that meets these standards may still fail in certain scenarios.

Additionally, the NIJ Certification testing does not account for factors such as the age or condition of the armor, or its ability to withstand wear and tear over time. It's always important to follow proper care and maintenance guidelines for your ballistic body armor to ensure it's continued.

# NIJ Requirements & Testing



## NIJ Requirements

The number of plates required to pass NIJ certification for plates depends on the specific NIJ standard being tested.

For NIJ Standard-0101.06 Level III and Level IV rifle plates, the NIJ requires a minimum of two plates to be tested from a single lot or production batch. The plates must undergo ballistic testing, environmental conditioning, and backface deformation testing to ensure they meet the performance requirements outlined in the standard.

Additionally, the NIJ requires ongoing quality control testing of the armor manufacturer's production process to ensure that the armor produced after the initial batch also meets the required performance standards.

It's important to note that the NIJ certification process is rigorous and designed to ensure that the body armor meets the necessary standards for protection against specific ballistic threats. Manufacturers must adhere to strict testing and quality control processes in order to achieve and maintain NIJ certification for their rifle plates.



## Here are the testing requirements to pass DoD 1st Article Testing as it relates to rifle plates:



- 1. Ballistic Testing:** The armor must undergo ballistic testing using a variety of test rounds, including 7.62mm M80 Ball, 7.62mm M61 AP, and .30-06 M2 AP. The armor must be able to stop a minimum of two rounds of each test type.
- 2. Environmental Conditioning:** The armor must undergo environmental conditioning to evaluate its performance in extreme temperatures and humidity levels. This includes testing the armor at temperatures ranging from  $-40^{\circ}\text{C}$  to  $70^{\circ}\text{C}$  ( $-40^{\circ}\text{F}$  to  $158^{\circ}\text{F}$ ) and at relative humidity levels ranging from 20% to 95%.
- 3. V50 Ballistic Limit Testing:** The armor must undergo V50 ballistic limit testing to determine the velocity at which a specific type of test round has a 50% probability of penetrating the armor. This testing is conducted using the same test rounds as ballistic testing.
- 4. Backface Deformation:** The armor must be tested for backface deformation, which measures the amount of indentation or deformation on the back surface of the armor caused by a test round impact. The maximum allowable backface deformation for DoD-approved armor is typically 44mm.
- 5. Drop Testing:** The armor must undergo drop testing to evaluate its ability to withstand impact forces that may occur during use. The armor is dropped from a height of at least 48 inches onto a hard surface and must not exhibit any signs of damage or failure.
- 6. Quality Control Testing:** The armor must undergo quality control testing to ensure that each plate meets the required performance standards. This includes visual inspections, thickness measurements, and weighing the armor to ensure that it meets the specified weight requirements.

In summary, the testing requirements to pass DoD 1st Article Testing as it relates to rifle plates includes ballistic testing, environmental conditioning, V50 ballistic limit testing, backface deformation testing, drop testing, and quality control testing. Armor that meets these testing requirements is considered suitable for use by military personnel.

A close-up photograph of a hand holding a dark-colored rifle plate. A white label with text and a logo is attached to the plate. The background is dark and out of focus.

# Comfort and Fit - SAPI, Shooters, Swimmers & Curvature

- Shape
- Weight
- Protection Level
- Cost

SAPI (Small Arms Protective Insert) and Shooter's Cut are two different designs of rifle plates that are commonly used for personal protection. Here are the main differences between the two:

**1. Shape:** SAPI plates are rectangular in shape, with the corners cut off at an angle. This allows them to fit into a plate carrier more easily and provide maximum coverage over the vital organs. Shooter's Cut plates have a more rounded top edge and a narrower bottom, which allows for a greater range of motion in the arms and shoulders, making them popular among shooters and snipers.

**2. Weight:** SAPI plates are typically heavier than Shooter's Cut plates of the same size and protection due to their larger coverage area and thicker build. This can make them less comfortable to wear for extended periods, especially in hot and humid environments. Shooter's Cut plates are often lighter and more streamlined, making them more comfortable for extended wear.

**3. Protection Level:** Both SAPI and Shooter's Cut plates are available in a variety of protection levels, ranging from Level III to Level IV. SAPI plates are often used in military and law enforcement applications where maximum protection is needed, while Shooter's Cut plates are designed to allow the shooter to easily shoulder his rifle.

**4. Pricing:** SAPI plates are generally slightly more expensive than Shooter's Cut plates due to their larger size. This can make them less accessible to budget-conscious buyers, while Shooter's Cut plates are often seen as a more affordable option.

Ultimately, the choice between SAPI and Shooter's Cut plates will depend on the user's specific needs and preferences. SAPI plates offer maximum coverage and protection, while Shooter's Cut plates provide greater mobility and comfort, which is why many people prefer to use Shooter's Cut. Both types of plates are effective at stopping high-velocity projectiles, and the decision of which to use will depend on the individual's priorities and intended use.

# Single Curve vs. Multi-Curve

Rifle plates are designed to provide protection against high-velocity projectiles and are typically used by military personnel, law enforcement officers, and others in high-risk situations. There are two main types of rifle plates: single-curve and multi-curve plates.

Single-curve rifle plates have a single curve across their surface, which is intended to match the natural curvature of the wearer's torso. However, single-curve plates may not provide as much coverage or protection as multi-curve plates, as they do not precisely conform to the body's shape in all areas. Additionally, single-curve rifle plates are less comfortable to wear and are made with less expensive materials.

Multi-curve rifle plates have multiple curves across their surface, which are intended to better match the complex curvature of the wearer's torso. This can provide a more comprehensive and secure fit, as the plate will conform more closely to the body's shape in all areas. Multi-curve rifle plates are more comfortable to wear, but keep in mind that additional curves may create pressure points or restrict certain movements.

Ultimately, the choice between a single curve and multi-curve rifle plates will depend on the individual's needs and preferences, as well as the specific situation in which they will be used. It's important to choose a plate that provides adequate protection while also being comfortable enough to wear for extended periods.



# Weight and Mobility

Polyethylene (PE) rifle plates have become increasingly popular in recent years due to their lightweight construction and impressive protective capabilities. Here are some reasons to consider using lightweight PE rifle plates over ceramic and steel rifle plates:

**Lighter Weight:** Polyethylene rifle plates are the lightest of the three materials, making them the most comfortable to wear for extended periods. This is especially important for individuals who need to maintain mobility and flexibility while wearing the plates.

**Reduced Fatigue:** - Wearing heavy plates for extended periods can cause fatigue and discomfort, which can affect performance and accuracy. With lightweight PE plates, the reduced weight can help to reduce fatigue, which can lead to better performance.

**Durability:** - Polyethylene rifle plates are extremely durable and can withstand multiple hits without losing their protective capability. This means that they can offer excellent protection against high-velocity projectiles for a longer period of time than other materials.

**Reduced Risk of Injury:** Unlike steel plates, polyethylene rifle plates do not spall or ricochet when struck by a projectile. This makes them safer to use in close-quarters combat situations, where the risk of injury to the wearer or others nearby is high.

Overall, lightweight PE rifle plates offer excellent protection, reduced weight and fatigue, durability, and a lower cost compared to ceramic and steel rifle plates. However, it's important to choose a plate that meets your specific needs and offers adequate protection for the intended use.

- Lighter weight
- Reduced fatigue
- Durability
- Reduced risk of injury

# Material

## Polyethylene Rifle Plates:

### Pros

- Polyethylene plates are the lightest of the three materials, which makes them the most comfortable and easiest to wear for extended periods
- They offer excellent protection against high-velocity projectiles and can stop multiple hits without losing their protective capability.
- Polyethylene plates do not spall or ricochet when struck by a projectile, which makes them safer to use in close-quarters combat situations.

### Cons

- Polyethylene plates are generally more expensive than steel and ceramic plates

## Ceramic Rifle Plates:

### Pros

- Ceramic plates are generally lighter than steel plates, which makes them more comfortable to wear for extended periods.
- They offer excellent protection against high-velocity projectiles.
- Ceramic plates are resistant to environmental factors such as extreme heat or cold, which makes them ideal for use in a variety of environments.

### Cons

- Ceramic plates are generally more expensive than steel.
- They lose protective capability after withstanding multiple hits
- They are more brittle than steel or polyethylene plates and can crack or break if dropped or struck with a hard object.

# Material, con't

## Steel Rifle Plates:

### Pros

- Steel plates are less expensive than ceramic or polyethylene plates.
- They are extremely durable and can withstand multiple hits without losing their protective capability.
- Steel plates are resistant to environmental factors such as extreme heat or cold, which makes them ideal for use in a variety of environments.

### Cons

- Steel plates are heavier than ceramic or polyethylene plates, which can make them less comfortable to wear for extended periods.
- Steel plates can spall or ricochet when struck by a projectile, which can cause serious injury to the wearer or others nearby.
- Steel plates can corrode over time if not properly cared for, which can compromise their protective capability.

Ultimately, the choice between steel, ceramic, and polyethylene plates will depend on the individual's specific needs and preferences. Steel plates offer durability and affordability, ceramic plates offer protection, and polyethylene plates offer the lightest weight and protection. It's important to choose a plate that provides adequate protection while also being comfortable enough to wear for extended periods.

## Pricing - Visible and Hidden

Polyethylene plates do cost more than ceramic and steel plates, but these plates generally have greater value due to the longer warranty period. There are PE plates that offer a 15-year warranty versus the standard 5 years on most plates.

The 15-year plate could be three times the cost of the 5-year plate minus 1 penny and would save money due to the administrative load figured into acquisition costs.



# EOD GEAR

Reliable body armor is necessary while operating in dangerous situations. Whether on the battlefield or patrolling the streets, your armor can mean the difference between life and death. Carefully consider the critical factors discussed in this guide when selecting your body armor, and by doing so, you'll be equipped with the best protection and increase your chances of a successful mission.

## Getting the best and lightest Body Armor is easy!

1. Just use "Add To Quote" located on each page of our website
2. Approve your quote with a Purchase Order or Credit Card
3. Suit up with lightweight and reliable Body Armor

Increase your command capabilities, speed, and success with the lightweight body armor to meet your budget with EOD Gear.

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