



Specialized Steel Solutions for Ballistic Protection

www.astralloy.com





Armor V2®

Commercial Grade Ballistic Steel Plate

Armor V2 was developed for use in civilian and government applications where ballistic protection is required. Every shipment of Armor V2 steel plate has been certified to meet the National Institute of Justice (NIJ) standard which corresponds to the requested thickness of the plate.

Some gauges of Armor V2 can also be modified to meet other test specifications for MIL (Military Standards) and UL (Underwriters Laboratory).

Armor V2 is available in thicknesses ranging from 1/8" to 1/2".

| Chemical Composition* - % Weight | | | | | | Physical Properties |
|----------------------------------|------|------|-----|------|------|---------------------|
| C | Mn | S | Si | Ni | Cr | Minimum Hardness |
| .35 | 1.00 | .005 | .65 | 1.00 | 1.00 | 514 BHN |

| NJ Level Testing Specification by Gauge Met by Armor V2 | | | |
|---|-------------------|-------------------------|---------------|
| Size | Threat | NIJ Level (STD-0108.01) | Weapon Group |
| 1/8" | .22, .38/.357 | III-A | Most Handguns |
| | 9mm, .44 Magnum | III-A | Most Handguns |
| 3/16" | 7.62 x 39 Russian | III-A | AK-47 / AKM |
| 1/4" | 7.62 x 51 M80 | III | M-14, BM 59 |
| 5/16" | 7.62 x 51 M80 | III | M-14, BM 59 |
| 3/8" | 7.62 x 51 M80 | III | M-14, BM 59 |
| 1/2" | 7.62 x 51 M80 | III | M-14, BM 59 |

| Applications | |
|-------------------------|--|
| * Safes | * Vehicle Protection (Government & Civilian) |
| * Gunfire Range Targets | * Structural Armor Requirements |
| * Shields | |
| * Prison Guard Shacks | |

BP6:33®

BP6:33 is Astralloy Steel Products' proprietary grade of ballistic armor plate. With its unique metallurgical characteristics, it can be cut cold and welded using normal shop practices and still retain its high hardness. BP6:33 will defeat a wide range of commercial and military threats such as handguns, rifles, automatic weapons, and fragmentation.

BP6:33 is independently tested to meet the National Institute of Justice Standards 0108.01 (Level III) and is listed with the Underwriters Laboratories (Standard 752). BP6:33 can be modified to meet testing levels UL 6 & 7, as well as test level NIJ IV at customer's request on specific gauges. Please call us for additional information.

| Chemical Composition* - % Weight | | | | | | | | Physical Properties |
|----------------------------------|------|------|------|-----|------|------|-----|---------------------|
| C | Mn | P | S | Si | Ni | Cr | Mo | Minimum Hardness |
| .29 | 1.20 | .015 | .010 | .40 | 4.00 | 2.00 | .50 | 477 BHN |

| Benefits |
|---|
| * Higher hardness and toughness through chemistry |
| * Air hardenable - no heat treatment required after hot forming to return to minimum hardness |
| * Ease of forming |
| * Excellent ductility |
| * Resistant to atmospheric corrosion |

| Applications | |
|------------------------------|----------------------------|
| * Add-On Armor Packages | * Doors & Louvers |
| * Armored Cars/Limos | * Embassy Installations |
| * Armored Personnel Carriers | * Firing Ranges/Targets |
| * Armored Railroad Cars | * Guard Towers |
| * Armored Trucks/Trailers | * HMMVV Countermine Kits |
| * Bank Counters/Cages/Boxes | * Safe Rooms |
| * Body Armor Vest Inserts | * Security Vans |
| * Bullet Resistant Shields | * Security/Guard Buildings |
| * Computer/Instrument Rooms | * Nuclear Installations |
| | * Up-Armored HMMVVs |



MIL-DTL-46100E

MIL-DTL-46100E is a military-specified, high hardness armor steel. It is approved for use within the U. S. Department of the Army and is available for use by all departments and agencies of the U.S. Department of Defense. Typically, this grade of armor steel is utilized in protection against land mines or explosive structures, especially as it relates to vehicle armor. The surface hardness of this material is a minimum of 477 BHN.

Chemical Composition** - % Weight

| Thickness | C | Mn | P | S | Si | Ni | Cr | Mo |
|-----------------|-----|------|-----|------|----|------|------|-----|
| 0.1575" - 1.35" | .32 | 1.00 | .02 | .005 | .6 | .60 | .70 | .30 |
| 1.351" - 2.00" | .32 | 1.00 | .02 | .005 | .6 | 1.55 | 1.60 | .30 |

Physical Properties - Typical Values at 68°F

| BHN Hardness | Tensile Strength (ksi) | Yield Strength (ksi) | Elongation in 2" | LCVN - 40° (ft. lbs.) | TCVN - 40° (ft. lbs.) |
|--------------|------------------------|----------------------|------------------|-----------------------|-----------------------|
| 477 - 534 | 240 | 190 | 10% | 24 (33 Joules) | 20 (27 Joules) |

MIL-DTL-12560K

MIL-DTL-12560K is a military-specified armor steel plate that is approved by the Material Technology Laboratory, Department of the Army, for use in combat-vehicles and ammunition testing. This type of armor is intended for use on combat vehicles, and/or proof and acceptance testing of armor defeating ammunition. It is also applicable to armor for emplacements, shields, pill boxes, testing, and the like.

Typically, this grade of armor is used in the protection of land mines or explosive structures. It absorbs shock very well and therefore helps to keep shrapnel to a minimum. Each plate is tested to a Fragment Simulated Projectile standard which dictates the level of protection for which the plate will ultimately be used.

Chemical Composition* - % Weight

| C | Mn | P | S | Si | Ni | Cr | Mo | V | Physical Properties |
|-----|-----|------|------|-----|----|----|-----|-----|-----------------------------|
| .30 | .30 | .025 | .015 | .40 | .5 | .4 | .15 | .15 | Minimum Hardness 477 BHN |

| Min. Gauge | Max. Gauge | Class | BHN Range |
|------------|------------|-------|-----------|
| 0.098 | 0.249 | 1 | 360 - 410 |
| 0.250 | 0.624 | 1 | 340 - 390 |
| 0.625 | 1.125 | 1 & 3 | 330 - 380 |

Testing Standard

| Grade | MIL-DTL-12560K | MIL-DTL-46100E | UL6 | UL7 | NIJ III | NIJ IV |
|-----------------|----------------|----------------|-----|-----|---------|--------|
| Armor V2 | Yes | Yes | Yes | No | Yes | No |
| BP6:33 | Yes | Yes | Yes | No | Yes | No |
| BP6:33 (≤ 1/2") | Yes | Yes | Yes | Yes | Yes | Yes |
| MIL-DTL-46100E | No | Yes | No | No | No | No |
| MIL-DTL-12560K | Yes | No | No | No | No | No |
| AR500, tested | No | Yes | No | No | Yes | No |

Note: The data contained in this document is accurate at time of printing, and intended for use as a general guide. Intending buyers and users should satisfy themselves as to the suitability of the selected steel for their particular application.

For more than 50 years, Astralloy Steel Products has been providing innovative and cost effective wear, impact and abrasion resistant steel solutions. We offer superior customer service with readily available inventory of proprietary and quenched and tempered steel grades. Our success is driven by partnerships with our customers to improve their efficiency and profitability.

- * Extensive product line of abrasion resistant and specialty steel plate and bar
- * Unparalleled experience with thousands of applications across various markets and industries

At Astralloy, we develop innovative products for our customers by listening to and understanding their needs.

Processing Capabilities

- * 1,000 ton 20' press brake
- * 30" plate rolls capable of rolling 2" mild steel 10' wide
- * High definition plasma and precision oxyacetylene cutting
- * CAD/CAM and nesting software
- * Bar sawing capacity of 20" diameter

Quality Assurance

- * ISO 9001:2008 Certified
- * Original Certified Mill Test Reports



Astralloy Steel Products is a wholly-owned subsidiary of Nucor Corporation, the largest producer of steel in the United States. (05/18)