

EVRAZ North America produces a wide range of steel armor plate specifications for the defense and security industries. End uses include heavy, medium, and light military vehicles, add-on armor kits, VIP armored cars, personnel protection, and security structures.

SPECIFICATION

Armalloy 440T complies with MIL-DTL-12560J Class 4a and a variety of other military and commercial specifications.

DIMENSIONS AND TOLERANCES (other dimensions available upon request)

| | | |
|---|------------------|------------------|
| T | 0.140" to 2.000" | 3.6mm to 50.8mm |
| W | 48" to 102" | 1220mm to 2590mm |
| L | 96" to 480" | 2.4m to 12m |

1/2 ASTM A6/A6M thickness & flatness tolerances. All other tolerances per ASTM A6/A6M unless otherwise agreed.

CHEMICAL COMPOSITION (heat analysis - % maximum)

| C | Mn | P | S | Si | Ni | Cr | Mo | Al | B | CE* |
|------|------|------|-------|-----|-----|-----|-----|------|-------|-------|
| 0.26 | 1.50 | 0.02 | 0.005 | 0.5 | 1.0 | 1.0 | 0.5 | 0.05 | 0.003 | ~0.61 |

*Carbon Equivalence (CE) = $C + Mn/6 + (Cr + Mo + V)/5 + (Cu + Ni)/15$

Delivery condition: Water quenched and tempered

MECHANICAL PROPERTIES (typical values)

| Hardness | Yield | Tensile | Elongation | Toughness (CVN) | |
|-------------------|----------------------|----------------------|--------------------------|------------------------|-------------------|
| | | | | Transverse -40° | Longitudinal -40° |
| 420 to 480 BHN | 170 Ksi 1,175 MPa | 200 Ksi 1,380 MPa | 13% min. in 2" (50mm) | 16 ft-lbs 22 Joules | inquire |

BALLISTIC TESTING: As agreed per customer order

MATERIAL TEST REPORT: Chemical composition, BHN hardness, toughness (CVN) testing per heat lot

EDGE CONDITION: Mill edge or cut-edge as agreed

SURFACE CONDITION: Per ASTM A6/A6M Shot-blast and primer coating available upon request

HEAT TREATMENT: May not be heated above 400°F (225°C) during fabrication or the certified hardness cannot be maintained.

FABRICATION

COLD-FORMING: Due to the high hardness, EVRAZ recommends cold bending to be limited to:

| Direction | Radius | Die Opening |
|--------------------------------|--------|-------------|
| Transverse to Rolling (Easy) | 4 T | 12 T |
| Longitudinal to Rolling (Hard) | 5 T | 12 T |

FLAME CUTTING: Standard thermal cutting (oxy-fuel, plasma, laser, water jet) can be used. Plasma cutting under water can be used to 1.00" (25.4mm thickness). Preheating is recommended – refer to welding section below. The HAZ hardness will be softened by elevated heat input. The HAZ softening can be eliminated by using abrasive water jet cutting.

WELDING: Armalloy 440T is commonly welded using standard industry welding techniques. The potential for cracking increases with plate thickness; therefore it is recommended to preheat based on material thickness per the table below:

| Recommended Preheat Temperatures | | | | | |
|----------------------------------|-----------|-------|------------|-------------|-------------|
| Thickness | 0.140" | 0.50" | 1.00" | 1.50" | 2.00" |
| | 3.66mm | 13mm | 25mm | 35mm | 50mm |
| | 70°F/22°C | | 150°F/66°C | 200°F/100°C | 250°F/125°C |

When ambient temperature is below 50°F (10°C), the recommended preheat should be increased by 70°F (22°C). Please contact our sales service department for additional information on welding.

EVRAZ Portland
14400 N. Rivergate Blvd
Portland, OR 97203
800-468-8913 (tel)
503-240-5240 (tel)
503-240-5291 (fax)
steelplate@evrazna.com