MIL-DTL 12560J Armor Plate

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.

DIMENSIONS AND TOLERANCES

Class	Thickness (in.)	Width (in.)	Length (in.)	Thickness (mm)	Width (mm)	Length (m)
1	0.140 - 4.000	48 - 102	96 - 480	3.6 to 102	1220 to 2590	2.4 to 12.2
2	0.140 - 2.000	48 - 102	96 - 480	3.6 to 50.8	1220 to 2590	2.4 to 12.2
3	0.140 - 4.000	48 - 102	96 - 480	3.6 to 102	1220 to 2590	2.4 to 12.2
4A	0.140 - 2.000	48 - 102	96 - 480	3.6 to 50.8	1220 to 2590	2.4 to 12.2

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

CHEMICAL COMPOSITION (heat analysis - % maximum)

Thickness (in.)	Thickness (mm)	C	Mn	P	S	Si	Ni	Cr	Mo	B	CE*
0.140 - 1.125	3.6 - 28.5	0.28	1.45	0.02	0.005	0.40	0.50	0.30	0.45	0.003	0.62
1.126 - 2.500	28.6 - 63.5	0.28	0.65	0.02	0.005	0.40	1.55	1.60	0.35	0.003	0.75
2.501 - 4.000	63.6 - 102	0.30	0.50	0.02	0.005	0.40	2.50	1.40	0.37	0.003	0.80

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

Delivery condition: Water quenched and tempered

MECHANICAL PROPERTIES (typical values)

Class	Thickness (in.)	Thickness (mm)	Hardness (BHN)	Toughness (CVN) Transverse -40°	Toughness (CVN) Longitudinal -40°
2	0.140 - 2.000	3.6 to 50.8	262 - 302	35 - 55	inquire
1 & 3	0.140 - 0.624	3.6 to 15.9	363 - 400	16 - 17	
1 & 3	0.625 - 1.249	16 to 31.7	331 - 375	16 - 25	
1 & 3	1.250 - 2.000	31.8 to 50.8	302 - 341	22 - 35	
4A	0.140 - 2.000	3.6 to 50.8	420 - 460	16	

BALLISTIC PROPERTIES:	Complies with MIL-DTL-12560J
MATERIAL TEST REPORT:	Chemical composition, BHN hardness, Charpy impact testing per MIL-DTL-12560J
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 blending to be limited to:

Class	Direction	Radius	Die Opening
1 & 3	Both Directions (Easy & Hard)	5 T	12 T
2	Both Directions (Easy & Hard)	3 T	10 T
4A	Transverse to Rolling (Easy)	4 T	12 T
4A	Longitudinal to Rolling (Hard)	5 T	12 T

Bend radius recommendation valid up to 0.5" inclusive. Please inquire about other sizes.

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: MIL-DTL 12560J 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" 3.6mm	0.50" 13mm	1.00" 25mm	1.50" 35mm	2.00" 50mm	2.50"+ 65mm+
	70°F/22°C		150°F/66°C	200°F/100°C	250°F/125°C	300°F/150°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.

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