



Mars® 600

Mars® 600: Ultra high-hardness Armor (600 HB) for ballistic protection

Mars® 600 is an ultra high hard armour steel (600 HB) having both very high ballistic performances and integration possibilities similar to those of structural materials.

Mars® 600 is an innovative product from the Center Materials Research of Le Creusot and the result of Industeel rich expertise for over a quarter century on modern 600 HB materials.

Mars® 600 is a multipurpose 600HB with an impressive ballistic behavior in terms of deformation capacity and resistance to multi-impacts together with a workability (mainly bending) close to a 500HB steel.

Mars® 600 is the material of the future that will change armour designs meeting both light weight and integration requirements of manufacturers.

Its great properties suggest unlimited possibilities.

PROPERTIES

STANDARDS

INDUSTEEL: Mars® 600

Mars® 600 satisfies requirements of following specifications:

- > France **NF A36-800-1 THD4**
- > Germany **TL 2350-0000 Quality T**
- > UK **Def Stan 95-24 Class 5**
- > USA **MIL-DTL-32332 Class 1**

CHEMICAL ANALYSIS - WEIGHT %

C	S	P	Si	Mn	Ni	Cr	Mo
≤ .50	≤ .002	≤ .010	≤ 1	≤ 1	≤ 2.4	≤ .5	≤ .5

MECHANICAL PROPERTIES

Delivery conditions	Hardness	Yield Strength		UTS		Elongation	Charpy KV*	
	HB	MPa	ksi	MPa	ksi	5d(%)	-40° Transversal to rolling direction J	ft.lbs
Guarantees	578 - 655	≥ 1300	189	≥ 2000	≥ 290	≥ 7	≥ 16	≥ 12
Typical valued	601	1450	210	2150	312	10	23	17

* Standard specimen: 10 x 10 mm

HEAT TREATMENT

Mars® 600 is a quenched and low tempered armor steel. Mars® 600 may not be heated above 120°C (250°F) in order to maintain the guaranteed hardness

IN SERVICE CONDITIONS

BALLISTIC PROPERTIES

See our table of recommended minimum thicknesses for protection

DELIVERY CONDITIONS

SIZE AND TOLERANCES

Mars® 600 is supplied as tailor made mill plates, or standard sizes plates.

Sizes

Thickness range	3-50 mm (.118"- 2")
On request above 50 mm up to 80 mm (2.05 to 3.15")	
Width	< 2500 mm (98")
Length	< 8100 mm (318")

This thickness range is designed to reply to current market needs. Its extension to higher thicknesses is possible.

For other sizes, please contact us.

Thickness tolerances (quarto plates)

(Possibility of tighter tolerances on request)

Thickness		Tolerance for width ≤ 2000 mm (≤ 79")		Tolerance for 2000 < width ≤ 2500 mm (79" < w ≤ 98")	
mm	inch	mm	inch	mm	inch
≤ 12	≤ .47	0,8	.03	1	.04
> 12 to 20	≤ .47 to .79	1	.04	1.2	.047
> 20 to 35	≤ .79 to 1.38	1.2	.047	1.4	.055
> 35 to 50	≤ 1.38 to 1.97	1.6	.063	1.8	.071

Tight thickness tolerances (cut-to-length plates)

Thickness		Width		Tolerance
mm	in	mm	in	mm (in)
2,8 ≤ th < 3	0.110 < th < 0.118	1350	53.15	-0/+0,4 mm (-0/+0.016)
3 ≤ th < 3,3	0.118 ≤ th ≤ 0.130	1370	53.94	
3,3 ≤ th < 3,8	0.130 < th < 0.150	1400	55.12	
3,8 ≤ th < 4,2	0.150 ≤ th < 0.165	1650	64.96	
4,2 ≤ th < 4,8	0.165 ≤ th ≤ 0.189	1800	70.87	-0/+0,5 mm (-0/+0.020)
4,8 ≤ th ≤ 7,8	0.189 ≤ th ≤ 0.307	2000	78.74	
7,8 < th < 9,8	0.307 < th < 0.386	2000	78.74	

Flatness

Our product are delivered with a guaranteed flatness ≤ 3mm/m (1/8" in every 40").

95% of plates are delivered with a typical flatness ≤ 1.5 mm/m (1/16" in every 40").

DELIVERY CONDITIONS

PARTS - KIT OFFER

Mars® 600 is also supplied as cut parts by laser or waterjet (depending on thickness) up to finished complex parts and kits (formed, machined, painted options...): *contact us for your specific project.*



Mars® 600 - Cold bent parts
thickness 8,5 mm
(.34 ")
Mandrel radius 120 mm (407")

PLATE PROCESSING

For all information concerning machining, thermal cutting, forming or welding, see our userguide for Mars® protection steels.

As a general rule, when using Mars® protection steel, the increased mechanical characteristics of this material must be taken into account.

It is crucial to wear appropriate individual safety equipment and to equip machines with collective protection.

YOUR CONTACT

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Technical data and information are to the best of our knowledge at the time of printing. However, they may be subject to some slight variations due to our ongoing research programme on protection steels. Therefore, we suggest that information be verified at time of enquiry or order. Furthermore, in service, real conditions are specific for each application. The data presented here are only for the purpose of description, and considered as guarantees when written formal approval has been delivered by our company. Further information may be obtained from the address opposite.