

ArcelorMittal USA



ArcelorMittal

# Plate Specification Guide 2015-2016



*Stan Musial Veterans Memorial Bridge over the Mississippi River in St. Louis. (HPS 70W steel)*

# Burns Harbor & Gary, IN; Coatesville & Conshohocken, PA

## Capabilities Overview

### Plate Types

Carbon & HSLA  
Alloy – Commercial Grades, Military Armor,  
Aircraft Quality, Tool Steel  
Duracorr® (12% Chromium Stainless)  
Cut-To-Length Plate  
Floor Plate (Sure-Foot®)

### Range – Most Complete Size Range

Thickness  
Carbon/HSLA – 3/16" to 30"  
Alloy – 1/8" to 15"  
Widths – up to 195" wide  
Lengths – up to 1525" and longer  
Pattern weights – up to 100,000 lbs.  
Refer to size charts in back of this guide

### Multiple Rolling Locations

Burns Harbor, IN  
Coatesville and Conshohocken, PA

### Melting Facilities

Riverdale, IL, Indiana Harbor, IN,  
Cleveland, OH and Burns Harbor, IN  
Blast Furnaces/Basic Oxygen Furnaces  
6" or 10" Strand Cast Slabs  
Coatesville, PA  
Electric Furnace Melting  
9" or 12" Strand Cast Slabs; Bottom Poured Ingot Casting  
Ladle Refining/Low Sulfur Calcium Inclusion Shape Control  
Vacuum Degassing  
VOD Unit – Duracorr® Stainless Melting

### Rolling Mills

Burns Harbor, IN – 3/16" to 4", up to 150" wide  
TMCP (Thermal-Mechanical Controlled Processing)  
Precise Weight Plate  
Coatesville, PA – 3/16" to 30", up to 195" wide  
Conshohocken, PA  
1/8" to 1" Alloy and  
3/16" to 2" Carbon, up to 100" wide  
Discrete and Coil

### Heat Treatment

Normalizing, Normalize and Temper  
Quench & Temper  
Annealing, Spheroidize Anneal  
Stress Relieving  
Special Non-Standard Cycles

### Testing

Tensile, CVN Impacts, Drop Weight  
Through Gauge Testing, Dynamic Tear  
HIC Testing (Hydrogen Induced Cracking)  
Cleanliness (Aircraft Quality)  
Ultrasonic Testing, Step-Cooling  
Magnetic Particle Testing

### Quick Plate Program

Coatesville and Conshohocken, PA  
See Daily Inventory Listings

### Plate Coils

84" to 96" Wide  
3/16" to 5/8" Thick  
Carbon and HSLA

### Flame Cutting

Oxy-fuel and Plasma  
Circles, Rings, Sketches, Strips

### Special Plate And Flamecut Tolerances

Thickness  
Width and Length  
Camber  
Flatness

### Surface Preparation

Blasting  
Painting  
Oiling

### Mill Edge

Improved Customer Yields

### Certifications

ISO 9001:2008, ABS, PED  
ISO 14001:2004  
ISO 18001:2007

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## ArcelorMittal USA Carbon and Alloy Plate Steels

conforming to ASTM A6 or A20

### Introduction

This brochure briefly outlines the specified chemistry and mechanical properties of some commonly used plate steels. The information presented here is based on the latest published ASTM Specifications and ArcelorMittal USA's practices. This is not intended to be a complete guide. For example, some grades are available in heavier thicknesses or with improved properties for specialized applications. Other types of heat treatment may also be available to enhance the properties of the plate. ASTM A6 and A20 also specify additional requirements.

### Plate Dimensions Available from ArcelorMittal USA\*

(See Size Cards)

	Carbon	Alloy
Length	1525 in.	1030 in.
Width	195 in.	195 in.
Thickness	30 in.	15 in.
Heat Treated Length**	600 in.	600 in.

\* All dimensions listed are approximate maximums. Actual plate sizes available depend on the combination of length, width and thickness as well as material specification. Dimensions and specifications exceeding those listed may be available. For specific information, contact ArcelorMittal USA.

\*\* Refer for acceptance normalized lengths up to 875". Greater and lesser lengths for sample plates, see size cards inside.

### Abbreviations Used In This Guide

CT	Calcium Treated
C/G/P	Coarse Grain Practice
EF-VIP	Electric Furnace Quality-Vacuum Improved Plate
F/G/P	Fine Grain Practice
LCVN	Longitudinal Charpy-V-Notch Impact Test
N	Normalize
N&T	Normalize and Temper
PHT	Precipitation Heat Treatment
Q&T	Quench and Temper
TMCP	Thermo-Mechanical Controlled Process
TCVN	Transverse Charpy-V-Notch Impact Test

For more information or assistance regarding your plate steel needs, contact ArcelorMittal USA at 800-966-5352.

# ASTM Specifications

SPECIFICATION	A36	A36	A36	A36	A36	A131*
Type of Steel	Carbon	Carbon	Carbon	Carbon	Carbon	-
Requirements for Delivery	A6	A6	A6	A6	A6	-
Tensile Strength (ksi)	58/80	58/80	58/80	58/80	58/80	-
Yield Strength (Min. ksi) (Yield Point if designated YP)	36 YP	36 YP	36 YP	36 YP	36 YP over 4-8" incl.; 32 YP over 8"	-
Spec. Thickness (Max. in.)	¾	> ¾ to 1½	> 1½ to 2½	> 2½ to 4	over 4	-
ArcelorMittal USA Thickness (Max. in.)	¾	> ¾ to 1½	> 1½ to 2½	> 2½ to 4	30	-
Chemical Composition (%)	Unless a range is specified, individual values are maximums					
Carbon	.25	.25	.26	.27	.29	-
Manganese	-	.80/1.20**	.80/1.20**	.85/1.20**	.85/1.20**	-
Phosphorus	.030	.030	.030	.030	.030	-
Sulfur	.030	.030	.030	.030	.030	-
Silicon	.40	.40	.15/.40	.15/.40	.15/.40	-
Chromium	-	-	-	-	-	-
Nickel	-	-	-	-	-	-
Molybdenum	-	-	-	-	-	-
Copper	.20 Min. when specified	.20 Min. when specified	.20 Min. when specified	.20 Min. when specified	.20 Min. when specified	-
Other Elements	-	-	-	-	-	-
Heat Treatment Required	-	-	-	-	-	-

\* A131 Grades are similar to ABS Grades shown on page 28-32.

\*\* For each reduction of 0.01% below the carbon maximum, an increase of 0.06% manganese above the specified maximum is permitted, up to 1.35%.

# ASTM Specifications

continued

SPECIFICATION	A203 Grade A	A203 Grade B	A203 Grade D	A203 Grade E	A203 Grade F
Type of Steel	Alloy	Alloy	Alloy	Alloy	Alloy
Requirements for Delivery	A20	A20	A20	A20	A20
Tensile Strength (ksi)	65/85	70/90	65/85	70/90	80/100 to 2" incl.; 75/95 over 2"
Yield Strength (Min. ksi) (Yield Point if designated YP)	37	40	37	40	55 to 2" incl.; 50 over 2"
Spec. Thickness (Max. in.)	-	-	-	-	-
ArcelorMittal USA Thickness (Max. in.)	6	6	4	4	4
Chemical Composition (%)	Unless a range is specified, individual values are maximums				
Carbon	.17 to 2" incl.; .20 over 2-4" incl.; .23 over 4-6" incl.	.21 to 2" incl.; .24 over 2-4" incl.; .25 over 4-6" incl.	.17 to 2" incl.; .20 over 2-4" incl.	.20 to 2" incl.; .23 over 2-4" incl.	.20 to 2" incl.; .23 over 2-4" incl.
Manganese	.70 to 2" incl.; .80 over 2-6" incl.	.70 to 2" incl.; .80 over 2-6" incl.	.70 to 2" incl.; .80 over 2-4" incl.	.70 to 2" incl.; .80 over 2-4" incl.	.70 to 2" incl.; .80 over 2-4" incl.
Phosphorus	.025	.025	.025	.025	.025
Sulfur	.025	.025	.025	.025	.025
Silicon	.15/.40	.15/.40	.15/.40	.15/.40	.15/.40
Chromium	■	■	■	■	■
Nickel	2.10/2.50	2.10/2.50	3.25/3.75	3.25/3.75	3.25/3.75
Molybdenum	■	■	■	■	■
Copper	■	■	■	■	■
Other Elements	F/G/P	F/G/P	F/G/P	F/G/P	F/G/P
Heat Treatment Required	N	N	N	N	Q&T

■ Restricted to ASTM A20 limits for unspecified elements.

# ASTM Specifications

continued

SPECIFICATION	A204 Grade A	A204 Grade B	A204 Grade C	A242†▲ Type 1**
Type of Steel	Alloy	Alloy	Alloy	Carbon
Requirements for Delivery	A20	A20	A20	A6
Tensile Strength (ksi)	65/85	70/90	75/95	70 Min. to ¾" incl.; 67 Min. over ¾–1½" incl.; 63 Min. over 1½"
Yield Strength (Min. ksi) (Yield Point if designated YP)	37	40	43	50 YP to ¾" incl.; 46 YP over ¾–1½" incl.; 42 YP over 1½"
Spec. Thickness (Max. in.)	–	–	–	4
ArcelorMittal USA Thickness (Max. in.)	6	6	4	4
Chemical Composition (%)				
Carbon	.18 to 1" incl.; .21 over 1–2" incl.; .23 over 2–4" incl.; .25 over 4–6" incl.	.20 to 1" incl.; .23 over 1–2" incl.; .25 over 2–4" incl.; .27 over 4–6" incl.	.23 to 1" incl.; .26 over 1–2" incl.; .28 over 2–4" incl.	.15
Manganese	.90	.90	.90	1.00
Phosphorus	.025	.025	.025	.15***
Sulfur	.025	.025	.025	.05
Silicon	.15/.40	.15/.40	.15/.40	–
Chromium	■	■	■	–
Nickel	■	■	■	–
Molybdenum	.45/.60	.45/.60	.45/.60	–
Copper	■	■	■	.20 Min.
Other Elements	–	–	–	–
Heat Treatment Required	N over 1½**	N over 1½**	N over 1½**	–

\* ArcelorMittal USA requires  $N \leq 5/16$  inch.

\*\* ASTM G101 corrosion index minimum must also be met.

\*\*\* Coatesville produces to .04 Max. Phosphorus.

† Post-weld heat treatment may degrade heat-affected zone strength and toughness. Pretesting of specific welding and post-weld heat treating procedures is recommended to assure optimization of final property levels.

■ Restricted to ASTM A20 limits for unspecified elements.

▲ Also produced as Mayari-R.

# ASTM Specifications

continued

SPECIFICATION	A283 Grade C	A283 Grade D	A285 Grade A	A285 Grade B	A285 Grade C
Type of Steel	Carbon	Carbon	Carbon	Carbon	Carbon
Requirements for Delivery	A6	A6	A20	A20	A20
Tensile Strength (ksi)	55/75	60/80	45/65	50/70	55/75
Yield Strength (Min. ksi) (Yield Point if designated YP)	30 YP	33 YP	24	27	30
Spec. Thickness (Max. in.)	-	-	2	2	2
ArcelorMittal USA Thickness (Max. in.)	16	16	2	2	2
Chemical Composition (%)					
Carbon	.24	.27	.17	.22	.28
Manganese	.90	.90	.90	.90	.90
Phosphorus	.030	.030	.025	.025	.025
Sulfur	.030	.030	.025	.025	.025
Silicon	.40 to 1½" incl; .15/.40 over 1½"	.40 to 1½" incl; .15/.40 over 1½"	■	■	■
Chromium	-	-	■	■	■
Nickel	-	-	■	■	■
Molybdenum	-	-	■	■	■
Copper	.20 Min. when specified	.20 Min. when specified	Either .20/.35 or .25 when specified	Either .20/.35 or .25 when specified	Either .20/.35 or .25 when specified
Other Elements	-	-	-	-	-
Heat Treatment Required	-	-	-	-	-

■ Restricted to ASTM A20 limits for unspecified elements.

# ASTM Specifications

continued

SPECIFICATION	A299 Grade A	A299 Grade B	A302 Grade A	A302 Grade B	A302 Grade C	A302 Grade D
Type of Steel	Carbon	Carbon	Alloy	Alloy	Alloy	Alloy
Requirements for Delivery	A20	A20	A20	A20	A20	A20
Tensile Strength (ksi)	75/95	80/100	75/95	80/100	80/100	80/100
Yield Strength (Min. ksi) (Yield Point if designated YP)	42 to 1" incl; 40 over 1"	47 to 1" incl; 45 over 1"	45	50	50	50
Spec. Thickness (Max. in.)	-	-	-	-	-	-
ArcelorMittal USA Thickness (Max. in.)	8	8	6	6	10	12
Chemical Composition (%)	Unless a range is specified, individual values are maximums					
Carbon	.26 to 1" incl; .28 over 1"	.28 to 1" incl; .30 over 1"	.20 to 1" incl; .23 over 1-2" incl; .25 over 2"	.20 to 1" incl; .23 over 1-2" incl; .25 over 2"	.20 to 1" incl; .23 over 1-2" incl; .25 over 2"	.20 to 1" incl; .23 over 1-2" incl; .25 over 2"
Manganese	.90/1.40 to 1" incl; .90/1.50 over 1"	.90/1.40 to 1" incl; .90/1.50 over 1"	.95/1.30	1.15/1.50	1.15/1.50	1.15/1.50
Phosphorus	.025	.025	.025	.025	.025	.025
Sulfur	.025	.025	.025	.025	.025	.025
Silicon	.15/.40	.15/.40	.15/.40	.15/.40	.15/.40	.15/.40
Chromium	■	■	■	■	■	■
Nickel	■	■	■	■	.40/.70	.70/1.00
Molybdenum	■	■	.45/.60	.45/.60	.45/.60	.45/.60
Copper	-	-	-	■	■	■
Other Elements	F/G/P	F/G/P	F/G/P	F/G/P	F/G/P	F/G/P
Heat Treatment Required	N over 2"	N over 2"	N over 2"**	N over 2"**	N over 2"**	N over 2"**

\* ArcelorMittal USA requires N 1 inch and under.

■ Restricted to ASTM A20 limits for unspecified elements.



# ASTM Specifications

continued

SPECIFICATION	A353	A387* Grade 11 Class 1	A387 Grade 12 Class 1	A387 Grade 21 Class 1	A387 Grade 21L Class 1	A387 Grade 22 Class 1
Type of Steel	Alloy	Alloy	Alloy	Alloy	Alloy	Alloy
Requirements for Delivery	A20	A20	A20	A20	A20	A20
Tensile Strength (ksi)	100/120	60/85	55/80	60/85	60/85	60/85
Yield Strength (Min. ksi) (Yield Point if designated YP)	75	35	33	30	30	30
Spec. Thickness (Max. in.)	-	-	-	-	-	-
ArcelorMittal USA Thickness (Max. in.)	.75**	6**	12**	12**	12**	12**
Chemical Composition (%)						
Carbon	.13	.05/.17	.05/.17	.05/.15	.10	.05/.15
Manganese	.90	.40/.65	.40/.65	.30/.60	.30/.60	.30/.60
Phosphorus	.015	.025	.025	.025	.025	.025
Sulfur	.015	.025	.025	.025	.025	.025
Silicon	.15/.40	.50/.80	.15/.40	.50	.50	.50
Chromium	■	1.00/1.50	.80/1.15	2.75/3.25	2.75/3.25	2.00/2.50
Nickel	8.50/9.50	■	■	■	■	■
Molybdenum	■	.45/.65	.45/.60	.90/1.10	.90/1.10	.90/1.10
Copper	■	■	■	■	■	■
Other Elements	-	-	-	-	-	-
Heat Treatment Required	NN&T	Annealed or N&T	Annealed or N&T	Annealed or N&T	Annealed or N&T	Annealed or N&T
Remarks	Mandatory TCVN	-	-	-	-	-

\* Consult ArcelorMittal USA for other A387 Grades not shown.

\*\* Consult ArcelorMittal USA for plates over thickness listed.

■ Restricted to ASTM A20 limits for unspecified elements.

[A387 Brochure](#)

# ASTM Specifications

## continued

SPECIFICATION	A387* Grade 22L Class 1	A387 Grade 5 Class 1	A387 Grade 9 Class 1	A387 Grade 11 Class 2	A387 Grade 12 Class 2	A387 Grade 21 Class 2	A387 Grade 22 Class 2	A387 Grade 5 Class 2
Type of Steel	Alloy	Alloy	Alloy	Alloy	Alloy	Alloy	Alloy	Alloy
Requirements for Delivery	A20	A20	A20	A20	A20	A20	A20	A20
Tensile Strength (ksi)	60/85	60/85	60/85	75/100	65/85	75/100	75/100	75/100
Yield Strength (Min. ksi) (Yield Point if designated YP)	30	30	30	45	40	45	45	45
Spec. Thickness (Max. in.)	-	-	-	-	-	-	-	-
ArcelorMittal USA Thickness (Max. in.)	12**	6**	2½**	6**	6**	12**	12**	6**
Chemical Composition (%)	Unless a range is specified, individual values are maximums							
Carbon	.10	.15	.15	.05/.17	.05/.17	.05/.15	.05/.15	.15
Manganese	.30/.60	.30/.60	.30/.60	.40/.65	.40/.65	.30/.60	.30/.60	.30/.60
Phosphorus	.025	.025	.025	.025	.025	.025	.025	.025
Sulfur	.025	.025	.025	.025	.025	.025	.025	.025
Silicon	.50	.50	1.00	.50/.80	.15/.40	.50	.50	.50
Chromium	2.00/2.50	4.00/6.00	8.00/10.00	1.00/1.50	.80/1.15	2.75/3.25	2.00/2.50	4.00/6.00
Nickel	■	■	■	■	■	■	■	■
Molybdenum	.90/1.10	.45/.65	.90/1.10	.45/.65	.45/.60	.90/1.10	.90/1.10	.45/.65
Copper	■	■	■	■	■	■	■	■
Other Elements	-	-	-	-	-	-	-	-
Heat Treatment Required	Annealed or N&T	Annealed or N&T	Annealed or N&T	N&T	N&T	N&T	N&T	N&T

\* Consult ArcelorMittal USA for other A387 grades not listed.

\*\* Consult ArcelorMittal USA for plates over thickness listed.

■ Restricted to ASTM A20 limits for unspecified elements.

[A387 Brochure](#)

# ASTM Specifications

continued

SPECIFICATION	A387* Grade 9 Class 2	A387* Grade 91 Class 2	A455	A514†† Grade B	A514† Grade E	A514†† Grade F	A514†† Grade H
Type of Steel	Alloy	Alloy	Carbon	Alloy	Alloy	Alloy	Alloy
Requirements for Delivery	A20	A20	A20	A6	A6	A6	A6
Tensile Strength (ksi)	75/100	85/110	75/95 to .375" incl.; 73/93 over .375-.580" incl.; 70/90 over .580-.750" incl.	110/130	110/130 to 2½" incl.; 100/130 over 2½- 6" incl.	110/130	110/130
Yield Strength (Min. ksi) (Yield Point if designated YP)	45	60	38 to .375" incl.; 37 over .375- .580" incl.; 35 over .580- .750" incl.	100	100 to 2½" incl.; 90 over 2½-6" incl.	100	100
Spec. Thickness (Max. in.)	-	-	¾	1¼	6	2½	2
ArcelorMittal USA Thickness (Max. in.)	2½**	6**	¾	1¼	6	2½	2
Chemical Composition (%)	Unless a range is specified, individual values are maximums						
Carbon	.15	.08/.12	.33**	.12/.21	.12/.20	.10/.20	.12/.21
Manganese	.30/.60	.30/.60	.85/1.20	.70/1.00	.40/.70	.60/1.00	.95/1.30
Phosphorus	.025	.020	.025	.030	.030	.030	.030
Sulfur	.025	.010	.025	.030	.030	.030	.030
Silicon	1.00	.20/.50	.10***	.20/.35	.20/.40	.15/.35	.20/.35
Chromium	8.00/10.00	8.00/9.50	■	.40/.65	1.40/2.00	.40/.65	.40/.65
Nickel	■	.40	■	-	-	.70/1.00	.30/.70
Molybdenum	.90/1.10	.85/1.05	■	.15/.25	.40/.60	.40/.60	.20/.30
Copper	■	■	■	-	-	.15/.50	-
Other Elements	-	.18/.25 V .06/.10 Cb .030/.070 N .02 Al .01 Zr	-	.03/.08 V .01/.10 Ti .0005/.005 B	.01/.10 Ti .001/.005 B	.03/.08 V .0005/.006 B	.03/.08 V .0005/.005 B
Heat Treatment Required	N&T	N&T	-	Q&T	Q&T	Q&T	Q&T
Remarks	-	-	-	235-293 HBW▲	235-293 HBW▲	235-293 HBW▲	235-293 HBW▲

\* Consult ArcelorMittal USA for other A387 grades not listed.

\*\* Consult ArcelorMittal USA for plates over thickness listed; ¼ inch min. thickness.

\*\*\* When the silicon is higher than 0.10%, the carbon max. shall be 0.28%. At the purchaser's or the producer's option, silicon may be .40% max. on heat analysis, 0.45% max. on product analysis.

† Post-weld heat treatment may degrade heat-affected zone strength and toughness. Pretesting of specific welding and post-weld heat treating procedures is recommended to assure optimization of final property levels.

†† It is important to note that this grade of steel may be susceptible to cracking in the heat-affected zone of welds during post-weld heat treatment (stress relief). Therefore, ArcelorMittal USA recommends that careful consideration be given to this phenomenon by competent welding engineers before stress relieving is applied to weldments of this grade. Also, it is not recommended for service at temperatures lower than -50°F or higher than 800°F.

■ Restricted to ASTM A20 limits for unspecified elements.

▲ Brinell hardness may be used in lieu of tensile test for plate ≤.375 inch thick.

[A387 Brochure](#)

[A514/T-1 Brochure](#)

# ASTM Specifications

continued

SPECIFICATION	A514† Grade P	A514†† Grade Q	A514 Grade S	A515 Grade 60	A515 Grade 65	A515 Grade 70
Type of Steel	Alloy	Alloy	Alloy	Carbon	Carbon	Carbon
Requirements for Delivery	A6	A6	A6	A20	A20	A20
Tensile Strength (ksi)	110/130 to 2½" incl.; 100/130 over 2½–6" incl.	110/130 to 2½" incl.; 100/130 over 2½–6" incl.	110/130	60/80	65/85	70/90
Yield Strength (Min. ksi) (Yield Strength designated YP)	100 to 2½" incl.; 90 over 2½–6" incl.	100 to 2½" incl.; 90 over 2½–6" incl.	100	32	35	38
Spec. Thickness (Max. in.)	6	6	2½"	–	–	–
ArcelorMittal USA Thickness (Max. in.)	4	8	2½"	15	15	15
Chemical Composition (%)	Unless a range is specified, individual values are maximums					
Carbon	.12/.21	.14/.21	.11/.21	.24 to 1" incl.; .27 over 1–2" incl.; .29 over 2–4" incl.; .31 over 4"	.28 to 1" incl.; .31 over 1–2" incl.; .33 over 2"	.31 to 1" incl.; .33 over 1–2" incl.; .35 over 2"
Manganese	.45/.70	.95/1.30	1.10/1.50	.90*	.90*	1.20*
Phosphorus	.030	.030	.030	.025	.025	.025
Sulfur	.030	.030	.020	.025	.025	.025
Silicon	.20/.35	.15/.35	.15/.45	.15/.40	.15/.40	.15/.40
Chromium	.85/1.20	1.00/1.50	–	■	■	■
Nickel	1.20/1.50	1.20/1.50	–	■	■	■
Molybdenum	.45/.60	.40/.60	.10/.60	■	■	■
Copper	–	–	–	■	■	■
Other Elements	.001/.005 B	.03/.08 V	.06 V .06 Ti .001/.005 B .06 Cb	C/G/P	C/G/P	C/G/P
Heat Treatment Required	Q&T	Q&T	Q&T	N over 2"	N over 2"	N over 2"
Remarks	235–293 HBW▲	235–293 HBW▲	235–293 HBW▲	–	–	–

\* Mn of 1.50 Max. is permitted with reduction of Carbon Max. of 0.01% for each 0.06% increase in Mn.

† Post-weld heat treatment may degrade heat-affected zone strength and toughness. Pretesting of specific welding and post-weld heat treating procedures is recommended to assure optimization of final property levels.

†† It is important to note that this grade of steel may be susceptible to cracking in the heat-affected zone of welds during post-weld heat treatment (stress relief). Therefore, ArcelorMittal USA recommends that careful consideration be given to this phenomenon by competent welding engineers before stress relieving is applied to weldments of this grade. Also, it is not recommended for service at temperatures lower than –50°F or higher than 800°F.

■ Restricted to ASTM A20 limits for unspecified elements.

▲ Brinell hardness may be used in lieu of tensile test for plate ≤.375 inch thick.

[A514/T-1 Brochure](#)

# ASTM Specifications

## continued

SPECIFICATION	A516 Grade 55	A516 Grade 60	A516 Grade 65	A516 Grade 70	A517†† Grade B	A517† Grade E
Type of Steel	Carbon	Carbon	Carbon	Carbon	Alloy	Alloy
Requirements for Delivery	A20	A20	A20	A20	A20	A20
Tensile Strength (ksi)	55/75	60/80	65/85	70/90	115/135	115/135 to 2½" incl.; 105/135 over 2½–6" incl.
Yield Strength (Min. ksi) (Yield Point if designated YP)	30	32	35	38	100	100 to 2½" incl.; 90 over 2½–6" incl.
Spec. Thickness (Max. in.)	–	–	–	–	1¼	6
ArcelorMittal USA Thickness (Max. in.)	15	15	15	15	1¼	6
Chemical Composition (%)	Unless a range is specified, individual values are maximums					
Carbon	.18 to ½" incl.; .20 over ½–2" incl.; .22 over 2–4" incl.; .24 over 4–8" incl.; .26 over 8"	.21 to ½" incl.; .23 over ½–2" incl.; .25 over 2–4" incl.; .27 over 4"	.24 to ½" incl.; .26 over ½–2" incl.; .28 over 2–4" incl.; .29 over 4"	.27 to ½" incl.; .28 over ½–2" incl.; .30 over 2–4" incl.; .31 over 4"	.15/.21	.12/.20
Manganese	.60/.90 to ½" incl.*; .60/1.20 over ½" *	.85/1.20*	.85/1.20*	.85/1.20*	.70/1.00	.40/.70
Phosphorus	.025	.025	.025	.025	.025	.025
Sulfur	.025	.025	.025	.025	.025	.025
Silicon	.15/.40	.15/.40	.15/.40	.15/.40	.15/.35	.10/.40
Chromium	■	■	■	■	.40/.65	1.40/2.00
Nickel	■	■	■	■	■	■
Molybdenum	■	■	■	■	.15/.25	.40/.60
Copper	■	■	■	■	■	■
Other Elements	F/G/P	F/G/P	F/G/P	F/G/P	.03/.08 V .0005/.005 B .01/.03 Ti	.01/.10 Ti .001/.005 B
Heat Treatment Required	N over 1½" or when Impact Tests required**	N over 1½" or when Impact Tests required**	N over 1½" or when Impact Tests required**	N over 1½" or when Impact Tests required**	Q&T	Q&T
Remarks	–	–	–	–	TCVN	TCVN

\* Mn of 1.50 Max. is permitted with reduction of Carbon Max. of 0.01% for each 0.06% increase in Mn.

\*\* Unless otherwise specified by the purchaser and approved by ArcelorMittal USA.

† Post-weld heat treatment may degrade heat-affected zone strength and toughness. Pretesting of specific welding and post-weld heat treating procedures is recommended to assure optimization of final property levels.

†† It is important to note that this grade of steel may be susceptible to cracking in the heat-affected zone of welds during post-weld heat treatment (stress relief). Therefore, ArcelorMittal USA recommends that careful consideration be given to this phenomenon by competent welding engineers before stress relieving is applied to weldments of this grade. Also, it is not recommended for service at temperatures lower than –50°F or higher than 800°F.

■ Restricted to ASTM A20 limits for unspecified elements.

[A517 Brochure](#)

# ASTM Specifications

continued

SPECIFICATION	A517†† Grade F	A517†† Grade H	A517† Grade P	A517†† Grade Q	A533 Type A Class 1	A533 Type B Class 1
Type of Steel	Alloy	Alloy	Alloy	Alloy	Alloy	Alloy
Requirements for Delivery	A20	A20	A20	A20	A20	A20
Tensile Strength (ksi)	115/135	115/135	115/135 to 2½" incl.; 105/135 over 2½–3.33" incl.	115/135 to 2½" incl.; 105/135 over 2½–6" incl.	80/100	80/100
Yield Strength (Min. ksi) (Yield Point if designated YP)	100	100	100 to 2½" incl.; 90 over 2½–3.33" incl.	100 to 2½" incl.; 90 over 2½–6" incl.	50	50
Spec. Thickness (Max. in.)	2½	2	4	6	–	–
ArcelorMittal USA Thickness (Max. in.)	2½	2	3.33	8	6	12
Chemical Composition (%)	Unless a range is specified, individual values are maximums					
Carbon	.10/.20	.12/.21	.12/.21	.14/.21	.25	.25
Manganese	.60/1.00	.95/1.30	.45/.70	.95/1.30	1.15/1.50	1.15/1.50
Phosphorus	.025	.025	.025	.025	.025	.025
Sulfur	.025	.025	.025	.025	.025	.025
Silicon	.15/.35	.15/.35	.20/.35	.15/.35	.15/.40	.15/.40
Chromium	.40/.65	.40/.65	.85/1.20	1.00/1.50	■	■
Nickel	.70/1.00	.30/.70	1.20/1.50	1.20/1.50	■	.40/.70
Molybdenum	.40/.60	.20/.30	.45/.60	.40/.60	.45/.60	.45/.60
Copper	.15/.50	■	■	■	■	■
Other Elements	.0005/.006 B .03/.08 V .10 Ti	.0005 Min. B .03/.08 V .10 Ti	.001/.005 B .10 Ti	.03/.08 V	F/G/P	F/G/P
Heat Treatment Required	Q&T	Q&T	Q&T	Q&T	Q&T	Q&T
Remarks	TCVN	TCVN	TCVN	TCVN	–	–

- † Post-weld heat treatment may degrade heat-affected zone strength and toughness. Pretesting of specific welding and post-weld heat treating procedures is recommended to assure optimization of final property levels.
- †† It is important to note that this grade of steel may be susceptible to cracking in the heat-affected zone of welds during post-weld heat treatment (stress relief). Therefore, ArcelorMittal USA recommends that careful consideration be given to this phenomenon by competent welding engineers before stress relieving is applied to weldments of this grade. Also, it is not recommended for service at temperatures lower than –50°F or higher than 800°F.
- Restricted to ASTM A20 limits for unspecified elements.

[A516 Brochure](#)

[A517 Brochure](#)

# ASTM Specifications

continued

SPECIFICATION	A533 Type C Class 1	A533 Type D Class 1	A533 Type A Class 2	A533 Type B Class 2	A533 Type C Class 2	A533 Type D Class 2	A533 Type A Class 3
Type of Steel	Alloy	Alloy	Alloy	Alloy	Alloy	Alloy	Alloy
Requirements for Delivery	A20	A20	A20	A20	A20	A20	A20
Tensile Strength (ksi)	80/100	80/100	90/115	90/115	90/115	90/115	100/125
Yield Strength (Min. ksi) (Yield Point if designated YP)	50	50	70	70	70	70	83
Spec. Thickness (Max. in.)	-	-	-	-	-	-	2½
ArcelorMittal USA Thickness (Max. in.)	12	6	6	8	10	6	2½
Chemical Composition (%)	Unless a range is specified, individual values are maximums						
Carbon	.25	.25	.25	.25	.25	.25	.25
Manganese	1.15/1.50	1.15/1.50	1.15/1.50	1.15/1.50	1.15/1.50	1.15/1.50	1.15/1.50
Phosphorus	.025	.025	.025	.025	.025	.025	.025
Sulfur	.025	.025	.025	.025	.025	.025	.025
Silicon	.15/.40	.15/.40	.15/.40	.15/.40	.15/.40	.15/.40	.15/.40
Chromium	■	■	■	■	■	■	■
Nickel	.70/1.00	.20/.40	-	.40/.70	.70/1.00	.20/.40	-
Molybdenum	.45/.60	.45/.60	.45/.60	.45/.60	.45/.60	.45/.60	.45/.60
Copper	■	■	■	■	■	■	■
Other Elements	F/G/P	F/G/P	F/G/P	F/G/P	F/G/P	F/G/P	F/G/P
Heat Treatment Required	Q&T	Q&T	Q&T	Q&T	Q&T	Q&T	Q&T

■ Restricted to ASTM A20 limits for unspecified elements.

# ASTM Specifications

continued

SPECIFICATION	A533 Type B Class 3	A533 Type C Class 3	A533 Type D Class 3	A537* Class 1▲	A537* Class 2▲▲	A537* Class 3
Type of Steel	Alloy	Alloy	Alloy	Carbon	Carbon	Carbon
Requirements for Delivery	A20	A20	A20	A20	A20	A20
Tensile Strength (ksi)	100/125	100/125	100/125	70/90 to 2½" incl.; 65/85 over 2½-4" incl.	80/100 to 2½" incl.; 75/95 over 2½-4" incl.; 70/90 over 4-6" incl.	80/100 to 2½" incl.; 75/95 over 2½-4" incl.; 70/90 over 4-6" incl.
Yield Strength (Min. ksi) (Yield Point if designated YP)	83	83	83	50 to 2½" incl.; 45 over 2½- 4" incl.	60 to 2½" incl.; 55 over 2½- 4" incl.; 46 over 4-6" incl.	55 to 2½" incl.; 50 over 2½-4" incl.; 40 over 4-6" incl.
Spec. Thickness (Max. in.)	2½	2½	2½	4	6	6
ArcelorMittal USA Thickness (Max. in.)	2½	2½	2½	4	6	6
Chemical Composition (%)	Unless a range is specified, individual values are maximums					
Carbon	.25	.25	.25	.24	.24	.24
Manganese	1.15/1.50	1.15/1.50	1.15/1.50	.70/1.35 to 1½" incl.; 1.00/1.60 over 1½"	.70/1.35 to 1½" incl.; 1.00/1.60 over 1½"	.70/1.35 to 1½" incl.; 1.00/1.60 over 1½"
Phosphorus	.025	.025	.025	.025	.025	.025
Sulfur	.025	.025	.025	.025	.025	.025
Silicon	.15/.40	.15/.40	.15/.40	.15/.50	.15/.50	.15/.50
Chromium	■	■	■	.25	.25	.25
Nickel	.40/.70	.70/1.00	.20/.40	.25	.25	.25
Molybdenum	.45/.60	.45/.60	.45/.60	.08	.08	.08
Copper	■	■	■	.35	.35	.35
Other Elements	F/G/P	F/G/P	F/G/P	F/G/P	F/G/P	F/G/P
Heat Treatment Required	Q&T	Q&T	Q&T	N	Q&T	Q&T

\* When  $CE = C + \frac{Mn}{6} + \frac{Cr}{5} + \frac{Mo}{5} + \frac{V}{15} + \frac{Ni}{15} + \frac{Cu}{15}$  is 0.57 or less, manganese maximum is 1.60% and Nickel maximum is 0.50%.

▲ Also produced as RQC-60 (N).

▲▲ Also produced as RQC-60 (Q&T).

■ Restricted to ASTM A20 limits for unspecified elements.



# ASTM Specifications

continued

SPECIFICATION	A542 Type A Class 1	A542 Type B Class 1	A542† Type C Class 1	A542† Type D Class 1	A542 Type A Class 3	A542 Type B Class 3
Type of Steel	Alloy	Alloy	Alloy	Alloy	Alloy	Alloy
Requirements for Delivery	A20	A20	A20	A20	A20	A20
Tensile Strength (ksi)	105/125	105/125	105/125	105/125	95/115	95/115
Yield Strength (Min. ksi) (Yield Point if designated YP)	85	85	85	85	75	75
Spec. Thickness (Max. in.)	-	-	-	-	-	-
ArcelorMittal USA Thickness (Max. in.)	8	8	8	8	8	8
Chemical Composition (%)	Unless a range is specified, individual values are maximums					
Carbon	.15	.11/.15	.10/.15	.11/.15	.15	.11/.15
Manganese	.30/.60	.30/.60	.30/.60	.30/.60	.30/.60	.30/.60
Phosphorus	.025	.015	.025	.015	.025	.015
Sulfur	.025	.015	.025	.010	.025	.015
Silicon	.50	.50	.13	.10	.50	.50
Chromium	2.00/2.50	2.00/2.50	2.75/3.25	2.00/2.50	2.00/2.50	2.00/2.50
Nickel	.40	.25	.25	.25	.40	.25
Molybdenum	.90/1.10	.90/1.10	.90/1.10	.90/1.10	.90/1.10	.90/1.10
Copper	.40	.25	.25	.20	.40	.25
Other Elements	.03 V	.02 V	.20/.30 V .015/.035 Ti .001/.003 B	.25/.35 V .030 Ti .002 B .07 Cb	.03 V	.02 V
Heat Treatment Required	Q&T, QQ&T, or NQ&T over 4"	Q&T, QQ&T or NQ&T over 4"	Q&T, QQ&T or NQ&T over 4"	Q&T, QQ&T, or NQ&T over 4"	Q&T, QQ&T or NQ&T over 4"	Q&T, QQ&T or NQ&T over 4"

† Post-weld heat treatment may degrade heat-affected zone strength and toughness. Pretesting of specific welding and post-weld heat treating procedures is recommended to assure optimization of final property levels.

# ASTM Specifications

continued

SPECIFICATION	A542† Type C Class 3	A542† Type D Class 3	A542 Type A Class 4	A542 Type B Class 4	A542† Type C Class 4	A542† Type D Class 4	A542† Type E Class 4
Type of Steel	Alloy	Alloy	Alloy	Alloy	Alloy	Alloy	Alloy
Requirements for Delivery	A20	A20	A20	A20	A20	A20	A20
Tensile Strength (ksi)	95/115	95/115	95/115	85/110	85/110	85/110	85/110
Yield Strength (Min. ksi) (Yield Point if designated YP)	75	75	75	75	55	55	55
Spec. Thickness (Max. in.)	-	-	-	-	-	-	-
ArcelorMittal USA Thickness (Max. in.)	8	8	8	8	8	8	8
Chemical Composition (%)	Unless a range is specified, individual values are maximums						
Carbon	.10/.15	.11/.15	.15	.11/.15	.10/.15	.11/.15	.10/.15
Manganese	.30/.60	.30/.60	.30/.60	.30/.60	.30/.60	.30/.60	.30/.60
Phosphorus	.025	.015	.025	.015	.025	.015	.025
Sulfur	.025	.010	.025	.015	.025	.010	.010
Silicon	.13	.10	.50	.50	.13	.10	.15
Chromium	2.75/3.25	2.00/2.50	2.00/2.50	2.00/2.50	2.75/3.25	2.00/2.50	2.75/3.25
Nickel	.25	.25	.40	.25	.25	.25	.25
Molybdenum	.90/1.10	.90/1.10	.90/1.10	.90/1.10	.90/1.10	.90/1.10	.90/1.10
Copper	.25	.20	.40	.25	.25	.20	.25
Other Elements	.20/.30 V .015/.035 Ti .001/.003 B	.25/.35 V .030 Ti .002 B .07 Cb	.03 Max. V	.02 V	.20/.30 V .015/.035 Ti .001/.003 B	.25/.35 V .030 Ti .002 B .07 Cb	.20/.30 V .015/.07 Cb
Heat Treatment Required	Q&T, QQ&T or NQ&T over 4"	Q&T, QQ&T, or NQ&T over 4"	Q&T, QQ&T or NQ&T over 4"	Q&T, QQ&T or NQ&T over 4"	Q&T, QQ&T or NQ&T over 4"	Q&T, QQ&T or NQ&T over 4"	Q&T, QQ&T or NQ&T over 4"
Remarks	-	-	Mandatory TCVN	Mandatory TCVN	Mandatory TCVN	Mandatory TCVN	Mandatory TCVN

† Post-weld heat treatment may degrade heat-affected zone strength and toughness. Pretesting of specific welding and post-weld heat treating procedures is recommended to assure optimization of final property levels.

# ASTM Specifications

continued

SPECIFICATION	A542 Type A Class 4a	A542 Type B Class 4a	A542† Type C Class 4a	A542† Type D Class 4a	A542† Type E Class 4a
Type of Steel	Alloy	Alloy	Alloy	Alloy	Alloy
Requirements for Delivery	A20	A20	A20	A20	A20
Tensile Strength (ksi)	85/110	85/110	85/110	85/110	85/110
Yield Strength (Min. ksi) (Yield Point if designated YP)	60	60	60	60	60
Spec. Thickness (Max. in.)	-	-	-	-	-
ArcelorMittal USA Thickness (Max. in.)	8	8	8	8	8
Chemical Composition (%)	Unless a range is specified, individual values are maximums				
Carbon	.15	.11/.15	.10/.15	.11/.15	.10/.15
Manganese	.30/.60	.30/.60	.30/.60	.30/.60	.30/.60
Phosphorus	.025	.015	.025	.015	.025
Sulfur	.025	.015	.025	.010	.010
Silicon	.50	.50	.13	.10	.15
Chromium	2.00/2.50	2.00/2.50	2.75/3.25	2.00/2.50	2.75/3.25
Nickel	.40	.25	.25	.25	.25
Molybdenum	.90/1.10	.90/1.10	.90/1.10	.90/1.10	.90/1.10
Copper	.40	.25	.25	.20	.25
Other Elements	.03 V	.02 V	.20/.30 V .015/.035 Ti .001/.003 B	.25/.35 V .030 Ti .002 B .07 Cb	.20/.30 V .015/.07 Cb
Heat Treatment Required	Q&T, QQ&T or NQ&T over 4"	Q&T, QQ&T or NQ&T over 4"	Q&T, QQ&T or NQ&T over 4"	Q&T, QQ&T or NQ&T over 4"	Q&T, QQ&T or NQ&T over 4"
Remarks	Mandatory TCVN	Mandatory TCVN	Mandatory TCVN	Mandatory TCVN	Mandatory TCVN

† Post-weld heat treatment may degrade heat-affected zone strength and toughness. Pretesting of specific welding and post-weld heat treating procedures is recommended to assure optimization of final property levels.

# ASTM Specifications

continued

SPECIFICATION	A543 Type B Class 1	A543 Type C Class 1	A543 Type B Class 2	A543 Type C Class 2	A543 Type B Class 3	A543 Type C Class 3	A553 Type I	A553 Type II
Type of Steel	Alloy	Alloy	Alloy	Alloy	Alloy	Alloy	Alloy	Alloy
Requirements for Delivery	A20	A20	A20	A20	A20	A20	A20	A20
Tensile Strength (ksi)	105/125	105/125	115/135	115/135	90/115	90/115	100/120	100/120
Yield Strength (Min. ksi) (Yield Point if designated YP)	85	85	100	100	70	70	85	85
Spec. Thickness (Max. in.)	-	-	-	-	-	-	-	-
ArcelorMittal USA Thickness (Max. in.)	8*	8*	6*	6*	10*	10*	2*	2*
Chemical Composition (%)	Unless a range is specified, individual values are maximums							
Carbon	.20	.18	.20	.18	.20	.18	.13	.13
Manganese	.40	.40	.40	.40	.40	.40	.90	.90
Phosphorus	.020	.020	.020	.020	.020	.020	.015	.015
Sulfur	.020	.020	.020	.020	.020	.020	.015	.015
Silicon	.15/.40	.15/.40	.15/.40	.15/.40	.15/.40	.15/.40	.15/.40**	.15/.40**
Chromium	1.00/1.90	1.00/1.90	1.00/1.90	1.00/1.90	1.00/1.90	1.00/1.90	■	■
Nickel	2.25/4.00	2.00/3.50	2.25/4.00	2.00/3.50	2.25/4.00	2.00/3.50	8.50/9.50	7.50/8.50
Molybdenum	.20/.65	.20/.65	.20/.65	.20/.65	.20/.65	.20/.65	■	■
Copper	■	■	■	■	■	■	■	■
Other Elements	.03 V	.03 V	.03 V	.03 V	.03 V	.03 V	■	■
Heat Treatment Required	Q&T to 4" incl.; double Q&T or N and Q&T required over 4"	Q&T to 4" incl.; double Q&T or N and Q&T required over 4"	Q&T to 4" incl.; double Q&T or N and Q&T required over 4"	Q&T to 4" incl.; double Q&T or N and Q&T required over 4"	Q&T to 4" incl.; double Q&T or N and Q&T required over 4"	Q&T to 4" incl.; double Q&T or N and Q&T required over 4"	Q&T	Q&T
Remarks	-	-	-	-	-	-	TCVN	TCVN

\* Consult ArcelorMittal USA for plates over thickness listed.

\*\* Silicon may be less than 0.15% provided total aluminum is 0.030% or greater.

■ Restricted to ASTM A20 limits for unspecified elements.

# ASTM Specifications

continued

SPECIFICATION	A553 Type III	A562	A572† Grade 42 Type 2#	A572† Grade 50 Type 2#	A572† Grade 55 Type 2#	A572† Grade 60 Type 2#	A572† Grade 65 Type 2#
Type of Steel	Alloy	Alloy	HSLA	HSLA	HSLA	HSLA	HSLA
Requirements for Delivery	A20	A20	A6	A6	A6	A6	A6
Tensile Strength (ksi)	100/120	55/75	60 Min.	65 Min.	70 Min.	75 Min.	80 Min.
Yield Strength (Min. ksi) (Yield Point if designated YP)	85	30	42 YP	50 YP	55 YP	60 YP	65 YP
Spec. Thickness (Max. in.)	-	2	6	4	2	1¼	1¼
ArcelorMittal USA Thickness (Max. in.)	2*	2	refer to 28	refer to 28	refer to 12	refer to 8	refer to 8
Chemical Composition (%)	Unless a range is specified, individual values are maximums						
Carbon	.13	.12	.21	.23	.25	.26	.26 to ½" incl.; .23 over ½–1¼" incl.
Manganese	.90	1.20	1.35*	1.35*	1.35*	1.35	1.35 Max.** to ½" incl.; 1.65 Max. over ½–1¼" incl.
Phosphorus	.010	.025	.030	.030	.030	.030	.030
Sulfur	.010	.025	.030	.030	.030	.030	.030
Silicon	.15/.30**	.15/.50	.40 to 1½" incl.; .15/.40 over 1½"	.40 to 1½" incl.; .15/.40 over 1½"	.40 to 1½" incl.; .15/.40 over 1½"	.40	.40
Chromium	■	■	-	-	-	-	-
Nickel	6.50/7.50	■	-	-	-	-	-
Molybdenum	.10/.30	■	-	-	-	-	-
Copper	■	.15	-	-	-	-	-
Other Elements	.03 Cb	4XC Min. Ti	.01/.15 V	.01/.15 V	.01/.15 V	.01/.15 V	.01/.15 V
Heat Treatment Required	Q&T	N	-	-	-	-	Q&T >1.25"
Remarks	TCVN	-	-	-	-	-	-

\* For each 0.01% reduction below the specified maximum for carbon, an increase of 0.06% manganese above the specified maximum is permitted up to 1.60%.

\*\* 1.65 Max. Mn permissible with reduction of carbon to .21 maximum.

† Post-weld heat treatment may degrade heat-affected zone strength and toughness. Pretesting of specific welding and post-weld heat treating procedures is recommended to assure optimization of final property levels.

# May also be produced as Type 1 with V replaced by .005/.05 Cb. Inquire with ArcelorMittal USA for Types 3 and 5.

■ Restricted to ASTM A20 limits for unspecified elements.

# ASTM Specifications

continued

SPECIFICATION	A573 Grade 58	A573 Grade 65	A573 Grade 70	A588†▲# Grade A	A588†▲▲# Grade B	A612†
Type of Steel	Carbon	Carbon	Carbon	HSLA	HSLA	Carbon
Requirements for Delivery	A6	A6	A6	A6	A6	A20
Tensile Strength (ksi)	58/71	65/77	70/90	70 Min. to 4" incl.; 67 Min. over 4-5" incl.; 63 Min. over 5-8" incl.	70 Min. to 4" incl.; 67 Min. over 4-5" incl.; 63 Min. over 5-8" incl.	83/105 to ½" incl.; 81/101 over ½ - 1" incl.
Yield Strength (Min. ksi) (Yield Point if designated YP)	32 YP	35 YP	42 YP	50 YP to 4" incl.; 46 YP over 4-5" incl.; 42 YP over 5-8" incl.	50 YP to 4" incl.; 46 YP over 4-5" incl.; 42 YP over 5-8" incl.	50
Spec. Thickness (Max. in.)	1½	1½	1½	8	8	1
ArcelorMittal USA Thickness (Max. in.)	1½	1½	1½	refer to 28	refer to 28	1
Chemical Composition (%)	Unless a range is specified, individual values are maximums					
Carbon	.23	.24 to ½" incl.; .26 over ½-1½" incl.	.27 to ½" incl.; .28 over ½-1½" incl.	.19	.20	.25
Manganese	.60/.90*	.85/1.20*	.85/1.20**	.80/1.25*	.75/1.35*	1.00/1.50
Phosphorus	.030	.030	.030	.030	.030	.025
Sulfur	.030	.030	.030	.030	.030	.025
Silicon	.10/.35	.15/.40	.15/.40	.30/.65	.15/.50	.15/.50
Chromium	-	-	-	.40/.65	.40/.70	.25
Nickel	-	-	-	.40	.50	.25
Molybdenum	-	-	-	-	-	.08
Copper	-	-	-	.25/.40	.20/.40	.35
Other Elements	-	-	-	.02/.10 V	.01/.10 V	.08 V
Heat Treatment Required	-	-	-	-	-	-

\* For each 0.01% reduction below the specified maximum for carbon, an increase of 0.06% manganese above the specified maximum is permitted up to 1.50%.

\*\* For each 0.01% reduction below the specified maximum for carbon, an increase of 0.06% manganese above the specified maximum is permitted up to 1.60%.

† Post-weld heat treatment may degrade heat-affected zone strength and toughness. Pretesting of specific welding and post-weld heat treating procedures is recommended to assure optimization of final property levels.

▲ Also produced as Cor-Ten® B.

▲▲ Also produced as Mayari-R50 and R60; refer other A588 grades to ArcelorMittal USA.

# ASTM G101 corrosion index minimum must also be met.

# ASTM Specifications

continued

SPECIFICATION	A633† Grade A	A633† Grade C	A633 Grade D	A633† Grade E	A656† Grade 50 Type 3	A656†▲ Grade 50 Type 7	A656†▲ Grade 60 Type 7
Type of Steel	HSLA	HSLA	HSLA	HSLA	HSLA	HSLA	HSLA
Requirements for Delivery	A6	A6	A6	A6	A6	A6	A6
Tensile Strength (ksi)	63/83	70/90 to 2½" incl.; 65/85 over 2½-4" incl.	70/90 to 2½" incl.; 65/85 over 2½-4" incl.	80/100 to 4" incl.; 75/95 over 4-6" incl.	60 Min.	60 Min.	70 Min.
Yield Strength (Min. ksi) (Yield Point if designated YP)	42 YP	50 YP to 2½" incl.; 46 YP over 2½-4" incl.	50 YP to 2½" incl.; 46 YP over 2½-4" incl.	60 YP to 4" incl.; 55 YP over 4-6" incl.	50 YP	50 YP	60 YP
Spec. Thickness (Max. in.)	-	-	-	-	2	2	1½
ArcelorMittal USA Thickness (Max. in.)	4	refer to 18	4	6	2	2	1½
Chemical Composition (%)	Unless a range is specified, individual values are maximums						
Carbon	.18	.20	.20	.22	.18	.18	.18
Manganese	1.00/1.35	1.15/1.50; 1.60 if C is .18 Max.	.70/1.35 to 1½" incl.; 1.00/1.60 over 1½-4" incl.	1.15/1.50	1.65	1.65	1.65
Phosphorus	.030	.030	.030	.030	.025	.025	.025
Sulfur	.030	.030	.030	.030	.030	.030	.030
Silicon	.15/.50	.15/.50	.15/.50	.15/.50	.60	.60	.60
Chromium	-	-	.25	-	-	-	-
Nickel	-	-	.25	-	-	-	-
Molybdenum	-	-	.08	-	-	-	-
Copper	-	-	.35	-	-	-	-
Other Elements	.05 Cb	.01/.05 Cb	-	.04/.11 V .03 N .01/.05 Cb	.08 V .008/.15 Cb .020 N	.008/.15 V .008/.10 Cb .020 N .20 (Cb+V)	.008/.15 V .008/.10 Cb .020 N .20 (Cb+V)
Heat Treatment Required	N	N	N	N&T to ½" Double N over 3"	-	-	-

† Post-weld heat treatment may degrade heat-affected zone strength and toughness. Pretesting of specific welding and post-weld heat treating procedures is recommended to assure optimization of final property levels.

▲ Also produced as BethStar.®

[BethStar Brochure](#)

# ASTM Specifications

continued

SPECIFICATION	A656†▲ Grade 70 Type 7	A656†▲ Grade 80 Type 3	A656†▲ Grade 80 Type 7	A662 Grade A	A662 Grade B	A662 Grade C
Type of Steel	HSLA	HSLA	HSLA	Carbon	Carbon	Carbon
Requirements for Delivery	A6	A6	A6	A20	A20	A20
Tensile Strength (ksi)	80 Min.	90 Min.	90 Min.	58/78	65/85	70/90
Yield Strength (Min. ksi) (Yield Point designated YP)	70 YP	80 YP	80 YP	40	40	43
Spec. Thickness (Max. in.)	1	1	1	-	-	-
ArcelorMittal USA Thickness (Max. in.)	1	1	1	2	2	2
Chemical Composition (%)	Unless a range is specified, individual values are maximums					
Carbon	.18	.18	.18	.14	.19	.20
Manganese	1.65	1.65	1.65	.90/1.35	.85/1.50	1.00/1.60
Phosphorus	.025	.025	.025	.025	.025	.025
Sulfur	.030	.030	.030	.025	.025	.025
Silicon	.60	.60	.60	.15/.40	.15/.40	.15/.50
Chromium	-	-	-	■	■	■
Nickel	-	-	-	■	■	■
Molybdenum	-	-	-	■	■	■
Copper	-	-	-	■	■	■
Other Elements	.008/.15 V .008/.10 Cb .020 N .20 (Cb+V)	.08 V .008/.10 Cb .020 N .20 (Cb+V)	.008/.15 V .008/.10 Cb .020 N .20 (Cb+V)	-	-	-
Heat Treatment Required	-	-	-	N	N over 1½"	N over 1½"
Remarks	-	-	-	-	-	-

† Post-weld heat treatment may degrade heat-affected zone strength and toughness. Pretesting of specific welding and post-weld heat treating procedures is recommended to assure optimization of final property levels.

▲ Also produced as BethStar.®

■ Restricted to ASTM A20 limits for unspecified elements.

[BethStar Brochure](#)



# ASTM Specifications

continued

SPECIFICATION	A709* Grades	A709† Grade HPS 50W#	A709† Grade HPS 70W#	A709†† Grade HPS 100W#	A710†† Grade A Class 3
Type of Steel	-	HSLA	HSLA	Alloy	Alloy
Requirements for Delivery	-	A6	A6	A6	A6
Tensile Strength (ksi)	-	70 Min.	85/110	110/130	85 Min. to 2" incl.; 75 Min. over 2-4" incl.; 70 Min. over 4-8" incl.
Yield Strength (Min. ksi) (Yield Point if designated YP)	-	50	70	100	80 to 1¼"; 75 over 1¼- 2" incl.; 65 over 2-4" incl.; 60 over 4-8" incl.
Spec. Thickness (Max. in.)	-	4	4	4	-
ArcelorMittal USA Thickness (Max. in.)	-	4	4	4	8
Chemical Composition (%)	Unless a range is specified, individual values are maximums				
Carbon	-	.11	.11	.08	.07
Manganese	-	1.10/1.35**	1.10/1.35**	.95/1.50	.40/.70
Phosphorus	-	.020	.020	.015	.025
Sulfur	-	.006	.006	.006	.025
Silicon	-	.30/.50	.30/.50	.15/.35	.40
Chromium	-	.45/.70	.45/.70	.40/.65	.60/.90
Nickel	-	.25/.40	.25/.40	.65/1.00	.70/1.00
Molybdenum	-	.02/.08	.02/.08	.40/.65	.15/.25
Copper	-	.25/.40	.25/.40	.90/1.20	1.00/1.30
Other Elements	-	.04/.08 V .010/.040 Al .015 N CT	.04/.08 V .010/.040 Al .015 N CT	.01/.03 Cb .04/.08 V .020/.050 Al .015 N CT	.02 Min. Cb
Heat Treatment Required	-	-	Q&T▲	Q&T	Q&PHT < 2" Q&PHT > 2"

\* See listing of all Bridge steel grades on page 46.

\*\* 1.50 maximum for plates thicker than 2½ inches.

† Post-weld heat treatment may degrade heat-affected zone strength and toughness. Pretesting of specific welding and post-weld heat treating procedures is recommended to assure optimization of final property levels.

†† It is important to note that this grade of steel may be susceptible to cracking in the heat-affected zone of welds during post-weld heat treatment (stress relief) or elevated temperature service. Also, post-weld heat treatment or elevated temperature service may degrade heat affected zone toughness. Therefore, ArcelorMittal USA recommends that careful consideration be given to these phenomena by competent welding engineers before application.

▲ Is available as non-Q&T (TMCP) refer to ArcelorMittal USA.

# ASTM G101 corrosion index minimum also must be met.

[Spartan Brochure](#)

[HPS 50W Brochure](#)

[HPS 70W Brochure](#)

[HPS 100W Brochure](#)

# ASTM Specifications

continued

SPECIFICATION	A724† Grade A	A724† Grade B	A724† Grade C	A736†† Grade A Class 3	A737† Grade B	A737† Grade C
Type of Steel	Carbon	Carbon	Carbon	Alloy	HSLA	HSLA
Requirements for Delivery	A20	A20	A20	A20	A20	A20
Tensile Strength (ksi)	90/110	95/115	90/110	85/105 to 2" incl.; 75/95 over 2-4" incl.; 70/90 over 4-8" incl.	70/90	80/100
Yield Strength (Min. ksi) (Yield Point if designated YP)	70	75	70	75 to 2" incl.; 65 over 2-4" incl.; 60 over 4-8" incl..	50	60
Spec. Thickness (Max. in.)	-	-	-	-	-	-
ArcelorMittal USA Thickness (Max. in.)	1	1	2	8	4	4
Chemical Composition (%)	Unless a range is specified, individual values are maximums					
Carbon	.18	.20	.22	.07	.20	.22
Manganese	1.00/1.60	1.00/1.60	1.10/1.60	.40/.70	1.15/1.50, 1.60 Max. if C is .18 Max.	1.15/1.50
Phosphorus	.025	.025	.025	.025	.025	.025
Sulfur	.025	.025	.025	.025	.025	.025
Silicon	.55	.50	.20/.60	.40	.15/.50	.15/.50
Chromium	.25	.25	.25	.60/.90	■	■
Nickel	.25	.25	.25	.70/1.00	■	■
Molybdenum	.08	.08	.08	.15/.25	■	■
Copper	.35	.35	.35	1.00/1.30	■	■
Other Elements	.08 V	.08 V	.08 V .005 B	.02 Min. Cb	.05 Cb	.04/.11 V .03 N .05 Max. Cb permitted
Heat Treatment Required	Q&T	Q&T	Q&T	Q&PHT	N	N
Remarks	-	-	-	TCVN	-	-

† Post-weld heat treatment may degrade heat-affected zone strength and toughness. Pretesting of specific welding and post-weld heat treating procedures is recommended to assure optimization of final property levels.

†† It is important to note that this grade of steel may be susceptible to cracking in the heat-affected zone of welds during post-weld heat treatment (stress relief) or elevated temperature service. Also, post-weld heat treatment or elevated temperature service may degrade heat affected zone toughness. Therefore, ArcelorMittal USA recommends that careful consideration be given to these phenomena by competent welding engineers before application.

■ Restricted to ASTM A20 limits for unspecified elements.

# ASTM Specifications

continued

SPECIFICATION	A738† Grade A	A738† Grade B	A738 Grade C	A738** Grade E	A829 & A830*	A841† Grade A Class 1	A841† Grade B Class 1	A841† Grade A Class 2	A841† Grade B Class 2
<b>Type of Steel</b>	Carbon	Carbon	Carbon	Carbon	–	HSLA	HSLA	HSLA	HSLA
<b>Requirements for Delivery</b>	A20	A20	A20	A20	–	A20	A20	A20	A20
<b>Tensile Strength (ksi)</b>	75/95	85/102	80/100 to 2½" incl.; 75/95 over 2½–4" incl.; 70/90 over 4"	90/110	–	70/90 to 2½" incl.; 65/85 over 2½–4"	70/90 to 2½" incl.; 65/85 over 2½–4"	80/100 to 2½" incl.; 75/95 over 2½–4"	80/100 to 2½" incl.; 75/95 over 2½–4"
<b>Yield Strength (Min. ksi) (Yield Point if designated YP)</b>	45	60	60 to 2½" incl.; 55 over 2½–4" incl.; 46 over 4"	75	–	50 to 2½" incl.; 45 over 2½–4"	50 to 2½" incl.; 45 over 2½–4"	60 to 2½" incl.; 55 over 2½–4"	60 to 2½" incl.; 55 over 2½–4"
<b>Spec. Thickness (Max. in.)</b>	6	4	6	1½	–	4	4	4	4
<b>ArcelorMittal USA Thickness (Max. in.)</b>	6	4	6	1½	–	4	4	4	4
<b>Chemical Composition (%)</b>	Unless a range is specified, individual values are maximums								
<b>Carbon</b>	.24	.20	.20	.12	–	.20	.15	.20	.15
<b>Manganese</b>	1.50 to 2½" incl.; 1.60 over 2½"	.90/1.50	1.50 to 2½" incl.; 1.60 over 2½"	1.10/1.60 **	–	.70/1.35 to 1½" incl.; 1.00/1.60 over 1½–4"	.70/1.35 to 1½" incl.; 1.00/1.60 over 1½–4"	.70/1.35 to 1½" incl.; 1.00/1.60 over 1½–4"	.70/1.35 to 1½" incl.; 1.00/1.60 over 1½–4"
<b>Phosphorus</b>	.025	.025	.025	.015	–	.030	.030	.030	.030
<b>Sulfur</b>	.025	.025	.025	.006	–	.030	.025	.030	.025
<b>Silicon</b>	.15/.50	.15/.55	.15/.50	.15/.50	–	.15/.50	.15/.50	.15/.50	.15/.50
<b>Chromium</b>	.25	.30	.25	.30	–	.25	.25	.25	.25
<b>Nickel</b>	.50	.60	.50	.70	–	.25	.60	.25	.60
<b>Molybdenum</b>	.08	.20 to 1½" incl.; 30 Max. over 1½"	.08	.35	–	.08	.30	.08	.30
<b>Copper</b>	.35	.35	.35	.35	–	.35	.35	.35	.35
<b>Other Elements</b>	When specified .07 V .04 Cb .08 (V+Cb)	When specified .07 V .04 Cb .08 (V+Cb)	.05 V	.09 V .05 Cb .12 V+Cb .0007 B .015 min Al(acid-sol)	–	.06 V .03 Cb .02 Min. Al	.06 V .03 Cb .02 Min. Al	.06 V .03 Cb .02 Min. Al	.06 V .03 Cb
<b>Heat Treatment Required</b>	N or Q&T to 2½" incl.; Q&T over 2½"	Q&T	Q&T	Q&T	–	TMCP	TMCP	TMCP	TMCP
<b>Remarks</b>	–	–	–	–	–	LCVN	LCVN	LCVN	LCVN

\* SAE or ASTM Grades, see pages 34–36.

† Post-weld heat treatment may degrade heat-affected zone strength and toughness. Pretesting of specific welding and post-weld heat treating procedures is recommended to assure optimization of final property levels.

\*\* For each 0.01% reduction below the specified maximum carbon, an increase of 0.06% manganese above the specified maximum is permitted up to 1.85%.

# ASTM Specifications

continued

SPECIFICATION	A871†** Grade 60 Type II#	A871†** Grade 65 Type II#	A945† Grade 50	A945†▲ Grade 65	A1010▲▲ Grade 40	A1010▲▲ Grade 50
Type of Steel	HSLA	HSLA	HSLA	HSLA	Stainless	Stainless
Requirements for Delivery	A6	A6	A6	A6	A480	A480
Tensile Strength (ksi)	75 Min.	80 Min.	70/90	78/100	66 Min.	70 Min.
Yield Strength (Min. ksi) (Yield Point if designated YP)	60	65	50	65	40	50
Spec. Thickness (Max. in.)	-	-	2	2½	1	1
ArcelorMittal USA Thickness (Max. in.)	4½	4	2	2½	2	2
Chemical Composition (%)						
Carbon	.20	.20	.10	.10	.030	.030
Manganese	.75/1.35*	.75/1.35*	1.10/1.65	1.10/1.65	1.50	1.50
Phosphorus	.030	.030	.025	.025	.040	.040
Sulfur	.030	.030	.010	.010	.010	.010
Silicon	.15/.50	.15/.50	.10/.40	.10/.40	1.00	1.00
Chromium	.40/.70	.40/.70	.20	.20	10.5/12.5	10.5/12.5
Nickel	.50	.50	.40	.40 to 1¼ .50/1.00 over 1¼	1.50	1.50
Molybdenum	-	-	.08	.08	-	-
Copper	.20/.40	.20/.40	.35	.35	-	-
Other Elements	.01/.10 V F/G/P	.01/.10 V F/G/P	.10 V .05 Cb .08 Al F/G/P	.10 V .05 Cb .08 Al .007/.020 Ti .012 N F/G/P	.030 N	.030 N
Heat Treatment Required	Q&T > ¾"	Q&T > ¾"	Coatesville may require N or Q&T	Coatesville may require Q&T	N&T	N&T
Remarks	LCVN	LCVN	LCVN	TCVN	-	-

\* For each 0.01% reduction below the specified maximum for carbon, an increase of 0.06% manganese above the specified maximum is permitted up to 1.50%.

† Post-weld heat treatment may degrade heat-affected zone strength and toughness. Pretesting of specific welding and post-weld heat treating procedures is recommended to assure optimization of final property levels.

• Also available as Type I, III, IV. Inquire with ArcelorMittal USA.

▲ Provided to the U.S. Navy as HSLA-65 with TCVN and additional chemical and mechanical requirements.

▲▲ Also available as Duracorr,® See page 39.

# ASTM G101 corrosion index minimum also must be met

# Aircraft Quality Steel

SPECIFICATION	AMS 6345 (4130)	AMS 6350 (4130)	AMS 6351 (4130)	AMS 6385 (4130 Mod.)	AMS 6395 (4140)	AMS 6359 (4340)
Type of Steel	Alloy	Alloy	Alloy	Alloy	Alloy	Alloy
Requirements for Delivery	-	-	-	-	-	-
Tensile Strength (ksi)	95 < $\frac{3}{16}$ ", 90 $\geq \frac{3}{16}$ "	-	-	135 Min. Normalized & tempered*	-	-
Yield Strength (Min. ksi) (Yield Point if designated YP)	75 < $\frac{3}{16}$ ", 70 $\geq \frac{3}{16}$ "	-	-	115 Normalized & tempered*	-	-
Spec. Thickness (Max. in.)	2	2	2	-	-	-
ArcelorMittal USA Thickness (Max. in.)	6	6	6	2	6	6
Chemical Composition (%)	Unless a range is specified, individual values are maximums					
Carbon	.28/.33	.28/.33	.28/.33	.27/.33	.38/.43	.38/.43
Manganese	.40/.60	.40/.60	.40/.60	.45/.65	.75/1.00	.60/.85
Phosphorus	.025	.025	.025	.025	.025	.025
Sulfur	.025	.025	.025	.025	.025	.025
Silicon	.15/.35	.15/.35	.15/.35	.55/.75	.15/.35	.15/.35
Chromium	.80/1.10	.80/1.10	.80/1.10	1.00/1.50	.80/1.10	.70/.90
Nickel	.25	.25	.25	.25	.25	1.65/2.00
Molybdenum	.15/.25	.15/.25	.15/.25	.40/.60	.15/.25	.20/.30
Copper	-	-	-	.35	.35	.35
Other Elements	CT	CT	CT	.20/.30 V, CT	CT	CT
Heat Treatment Required	Normalized $\leq \frac{3}{4}$ ", Q&T $> \frac{3}{4}$ "	Heat Treated, if necessary	Spheroidize Annealed	Heat Treated, if necessary	Heat Treated, if necessary	Heat Treated, if necessary
Surface Brinell Hardness (HBW)	-	248 Max. (25 Max. Rc)	167 Max. (85 Max. Rb)	241 Max. (24 Max. Rc)	248 Max. (25 Max. Rc)	248 Max. (25 Max. Rc)
Melting Practice	F/G/P	F/G/P	F/G/P	F/G/P	F/G/P	F/G/P
Remarks	Will meet AMS 2301	Will meet AMS 2301	Will meet AMS 2301	Will meet AMS 2301	Will meet AMS 2301	Will meet AMS 2301

\* Of capability test coupon.

# American Bureau of Shipping Specifications\*

SPECIFICATION	ABS▲ Grade A	ABS▲ Grade B	ABS▲ Grade D	ABS▲ Grade E	ABS▲ AH32
Type of Steel	Carbon	Carbon	Carbon	Carbon	Carbon
Requirements for Delivery	A6	A6	A6	A6	A6
Tensile Strength (ksi)	58/75	58/75	58/75	58/75	64/85
Yield Strength (Min. ksi) (Yield Point if designated YP)	34	34	34	34	46
Spec. Thickness (Max. in.)	-	-	-	-	-
ArcelorMittal USA Thickness (Max. in.)	6½	6½	6½	6½	8
Chemical Composition (%)	Unless a range is specified, individual values are maximums				
Carbon	.21**	.21**	.21**	.18**	.18
Manganese	2½ x C Min.	.60 Min.	.60 Min.	.70 Min.	.90/1.60
Phosphorus	.035	.035	.035	.035	.035
Sulfur	.035	.035	.035	.035	.035
Silicon	.50	.35	.10/.35	.10/.35	.10/.50
Chromium	-	-	-	-	.20
Nickel	-	-	-	-	.40
Molybdenum	-	-	-	-	.08
Copper	-	-	-	-	.35
Other Elements	F/G/P>2"	F/G/P>1"	F/G/P	F/G/P	.02 Ti .02/.05 Cb
Heat Treatment Required	N over 2"	N over 2"	N	N	N over ½" Q&T over 6 to 8"
Remarks	-	TCVN over 1"	TCVN .24" and over	TCVN .24" and over	TCVN .24" and over

\* Please contact ABS for review and approval for hull applications over 4" thick. For hull steel applications over 4" thick, impact transition curves and additional tensile tests may be required.

\*\* C + Mn/6 = .40 max.

▲ Similar to ASTM A131.

# American Bureau of Shipping Specifications\*

continued

SPECIFICATION	ABS▲ DH32	ABS▲ EH32	ABS▲ AH36	ABS▲ DH36	ABS▲ EH36
Type of Steel	Carbon	Carbon	Carbon	Carbon	Carbon
Requirements for Delivery	A6	A6	A6	A6	A6
Tensile Strength (ksi)	64/85	64/85	71/90	71/90	71/90
Yield Strength (Min. ksi) (Yield Point if designated YP)	46	46	51	51	51
Spec. Thickness (Max. in.)	–	–	–	–	–
ArcelorMittal USA Thickness (Max. in.)	8	6	8	8	6
Chemical Composition (%)	Unless a range is specified, individual values are maximums				
Carbon	.18	.18	.18	.18	.18
Manganese	.90/1.60	.90/1.60	.90/1.60	.90/1.60	.90/1.60
Phosphorus	.035	.035	.035	.035	.035
Sulfur	.035	.035	.035	.035	.035
Silicon	.10/.50	.10/.50	.10/.50	.10/.50	.10/.50
Chromium	.20	.20	.20	.20	.20
Nickel	.40	.40	.40	.40	.40
Molybdenum	.08	.08	.08	.08	.08
Copper	.35	.35	.35	.35	.35
Other Elements	.02 Ti .02/.05 Cb F/G/P	.02 Ti .02/.05 Cb F/G/P	.02 Ti .02/.05 Cb F/G/P	.02 Ti .02/.05 Cb F/G/P	.02 Ti .02/.05 Cb F/G/P
Heat Treatment Required	N over ½"	As rolled ≤ ½" N to 6"	As rolled ≤ ½" N > ½" to 6" Q&T over 6 to 8"	As rolled ≤ ½" N > ½" to 6" Q&T over 6 to 8"	As rolled ≤ ½" N to 6"
Remarks	TCVN	TCVN	TCVN	TCVN	TCVN

\* Please contact ABS for review and approval for hull applications over 4" thick. For hull steel applications over 4" thick, impact transition curves and additional tensile tests may be required.

▲ Similar to ASTM A131.

# American Bureau of Shipping Specifications

continued

## MODU (Mobile Offshore Drilling Unit Grades)

SPECIFICATION	ABS AQ43	ABS DQ43	ABS EQ43	ABS AQ47	ABS DQ47	ABS EQ47
Type of Steel	Carbon	Carbon	Carbon	Carbon	Carbon	Carbon
Requirements for Delivery	A6	A6	A6	A6	A6	A6
Tensile Strength (ksi)	77/98	77/98	77/98	83/104	83/104	83/104
Yield Strength (Min. ksi) (Yield Point if designated YP)	61	61	61	67	67	67
Spec. Thickness (Max. in.)	2	2	2	2	2	2
ArcelorMittal USA Thickness (Max. in.)	2	2	2	2	2	2
Chemical Composition (%)	Unless a range is specified, individual values are maximums					
Carbon	.21	.20	.20	.21	.20	.20
Manganese	1.70	1.70	1.70	1.70	1.70	1.70
Phosphorus	.035	.030	.030	.035	.030	.030
Sulfur	.035	.030	.030	.035	.030	.030
Silicon	.55	.55	.55	.55	.55	.55
Chromium	-	-	-	-	-	-
Nickel	-	-	-	-	-	-
Molybdenum	-	-	-	-	-	-
Copper	-	-	-	-	-	-
Other Elements	.02 N	.02 N	.02 N	.02 N	.02 N	.02 N
Heat Treatment Required	Q&T	Q&T	Q&T	Q&T	Q&T	Q&T
Melting Practice	F/G/P, CT	F/G/P, CT	F/G/P, CT	F/G/P, CT	F/G/P, CT	F/G/P, CT
Remarks	TCVN	TCVN	TCVN	TCVN	TCVN	TCVN



# American Bureau of Shipping Specifications\*

continued

## MODU (Mobile Offshore Drilling Unit Grades)

SPECIFICATION	ABS AQ51	ABS DQ51	ABS EQ51	ABS AQ56	ABS DQ56	ABS EQ56
Type of Steel	Carbon	Carbon	Carbon	Carbon	Carbon	Carbon
Requirements for Delivery	A6	A6	A6	A6	A6	A6
Tensile Strength (ksi)	88/112	88/112	88/112	97/120	97/120	97/120
Yield Strength (Min. ksi) (Yield Point if designated YP)	73	73	73	80	80	80
Spec. Thickness (Max. in.)	2	2	2	6½	6½	6½
ArcelorMittal USA Thickness (Max. in.)	2	2	2	6½	6½	6½
Chemical Composition (%)	Unless a range is specified, individual values are maximums					
Carbon	.21	.20	.20	.21	.20	.20
Manganese	1.70	1.70	1.70	1.70	1.70	1.70
Phosphorus	.035	.030	.030	.035	.030	.030
Sulfur	.035	.030	.030	.035	.030	.030
Silicon	.55	.55	.55	.55	.55	.55
Chromium	-	-	-	-	-	-
Nickel	-	-	-	-	-	-
Molybdenum	-	-	-	-	-	-
Copper	-	-	-	-	-	-
Other Elements	.02 N	.02 N	.02 N	.02 N	.02 N	.02 N
Heat Treatment Required	Q&T	Q&T	Q&T	Q&T	Q&T	Q&T
Melting Practice	F/G/P, CT	F/G/P, CT	F/G/P, CT	F/G/P, CT	F/G/P, CT	F/G/P, CT
Remarks	TCVN	TCVN	TCVN	TCVN	TCVN	TCVN

\* Please contact ABS for review and approval for hull applications over 4" thick. For hull steel applications over 4" thick, impact transition curves and additional tensile tests may be required.

# American Bureau of Shipping Specifications\*

continued

## MODU (Mobile Offshore Drilling Unit Grades)

SPECIFICATION	ABS AQ63	ABS DQ63	ABS EQ63	ABS AQ70	ABS DQ70	ABS EQ70
Type of Steel	Carbon	Carbon	Carbon	Carbon	Carbon	Carbon
Requirements for Delivery	A6	A6	A6	A6	A6	A6
Tensile Strength (ksi)	104/129	104/129	104/129	112/136	112/136	112/136
Yield Strength (Min. ksi) (Yield Point if designated YP)	90	90	90	100	100	100
Spec. Thickness (Max. in.)	6½	6½	6½	6½	6½	6½
ArcelorMittal USA Thickness (Max. in.)	6½	6½	6½	6½	6½	6½
Chemical Composition (%)	Unless a range is specified, individual values are maximums					
Carbon	.21	.20	.20	.21	.20	.20
Manganese	1.70	1.70	1.70	1.70	1.70	1.70
Phosphorus	.035	.030	.030	.035	.030	.030
Sulfur	.035	.030	.030	.035	.030	.030
Silicon	.55	.55	.55	.55	.55	.55
Chromium	-	-	-	-	-	-
Nickel	-	-	-	-	-	-
Molybdenum	-	-	-	-	-	-
Copper	-	-	-	-	-	-
Other Elements	.02 N	.02 N	.02 N	.02 N	.02 N	.02 N
Heat Treatment Required	Q&T	Q&T	Q&T	Q&T	Q&T	Q&T
Melting Practice	F/G/P, CT	F/G/P, CT	F/G/P, CT	F/G/P, CT	F/G/P, CT	F/G/P, CT
Remarks	TCVN	TCVN	TCVN	TCVN	TCVN	TCVN

\* Please contact ABS for review and approval for hull applications over 4" thick. For hull steel applications over 4" thick, impact transition curves and additional tensile tests may be required.

# American Petroleum Institute Specifications

(Supplementary Requirements available)

SPECIFICATION	API 2H† Grade 42	API 2H† Grade 50	API 2Y†**▲ Grade 50	API 2Y†▲ Grade 60	API-2MT-1†
Type of Steel	HSLA	HSLA	HSLA	HSLA	HSLA
Requirements for Delivery	A6	A6	A6	A6	A6
Tensile Strength (ksi)	62/82	70/90	65 Min.	75 Min.	70/90
Yield Strength (Min. ksi) (Yield Point if designated YP)	42	50 to 2½" incl.; 47 over 2½"	50/75 to 1" incl.; 50/70 over 1"	60/90 to 1" incl.; 60/85 over 1"	50
Spec. Thickness (Max. in.)	4	4	6	4	2½
ArcelorMittal USA Thickness (Max. in.)	4	4	6	4	2½
Chemical Composition (%)	Unless a range is specified, individual values are maximums				
Carbon	.18	.18	.16	.16	.15
Manganese	.90/1.60	1.15/1.60	1.15/1.60	1.15/1.60	1.15/1.60
Phosphorus	.030	.030	.030	.030	.030
Sulfur	.010	.010	.010	.010	.010
Silicon	.05/.40	.05/.40	.15/.50	.15/.50	.15/.40
Chromium	*	*	.25	.25	-
Nickel	*	*	.75	1.0	-
Molybdenum	*	*	.08	.15	-
Copper	*	*	.35	.35	-
Other Elements	.020/.06 Al .04 Cb .020 Ti .012 N .0100 Ce Ce, N, B, V, Zr not intentionally added F/G/P	.020/.06 Al .01/.04 Cb .020 Ti .012 N .0100 Ce Ce, N, B, V, Zr not intentionally added F/G/P	.020/.06 Al .03 Cb .012 N .003/.02 Ti (based on N) N, B, V, Zr, Ce not intentionally added F/G/P	.020/.06 Al .03 Cb .012 N .003/.02 Ti (based on N) N, B, V, Zr, Ce not intentionally added F/G/P	.010/.040 Cb .020/.060 Al .080 V .020 Ti .012 N .010 Ce N, Zr or B not intentionally added
Heat Treatment Required	N	N	Q&T	Q&T	As rolled, N or Q&T
Remarks	CE .43 to 2½" incl.; .45 over 2½" TCVN Req.	CE .43 to 2½" incl.; .45 over 2½" TCVN Req.	CE .39 to 1½" incl.; .41 to 3½" incl.; .43 to 6" TCVN Req.	CE .42 to 1½" incl.; .45 to 4" TCVN Req.	CE .43 to 2" incl.; .45 to 2½"

\* Residuals must be reported.

\*\* A Grade 42 is also available with properties and chemistry of API-2W Grade 42.

† Post-weld heat treatment may degrade heat-affected zone strength and toughness. Pretesting of specific welding and post-weld heat treating procedures is recommended to assure optimization of final property levels.

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

▲ The Coatesville mill is prequalified to API RP-2Z with Supplement S11 to 3 inches thick.

Supplementary Requirements from Appendix A in 2H and 2Y

S1	Ultrasonic Examination	S8	Strain-Aged Charpy V-Notch Impact Tests
S2	Notch Toughness at Lower Temperature	2Y S9	Simulations of Postweld Heat Treatment
2H S3	Individual Plate Testing	2Y S10	Hardness Testing
2Y S3	Additional Tension Test	2Y S11	Preproduction Qualification (available only for Coatesville product to 3" max.)
S4	Through-Thickness (Z-Direction) Testing	2H S12	Notch Toughness Using Drop Weight
S5	Low Sulfur Steel for Improved Through-Thickness Properties	2Y S12	Notch Toughness Using Drop-Weight Testing
2H S7	Low Nitrogen Content For Improved Notch Toughness in Strain-Hardened Condition	S13	Surface Quality
2Y S7	Low Nitrogen Content For Improved Notch Toughness in Strain-Aged Condition	S14	Thickness Tolerance

[API Steels Brochure](#)

# ASTM CHEMISTRY-ONLY STEELS

[Covered by A829 (Alloy), A830 (Carbon)]

No mechanical testing is required for delivery of chemistry-only steels. They meet only the chemical and dimensional limits specified by the customer. These steels were previously known as AISI Chemistry-Only Grades. These steels are also nearly identical to the SAE grades of the same name.

The designation number of a chemistry-only steel indicates the chemical composition of that grade. The first two digits establish the family by alloy content. For example:

- 10XX — carbon steels
- 41XX — chromium-molybdenum steels
- 43XX — nickel-chromium-molybdenum steels
- 61XX — chromium-vanadium steels
- 86XX — nickel-chromium-molybdenum steels
- EXXX — E designates electric furnace quality

The last two digits in the grade designation indicate the mid-point of the carbon range. For example, 4130 is a chrome-moly steel that has an approximate mid-point of .30% carbon in the specified carbon range.

The following is a more detailed analysis of the commonly used chemistry-only steels, including ArcelorMittal USA's thickness limits. Other chemical compositions are available upon request.

SPECIFICATION	A830 1006	A830 1008	A830 1009*	A830 1010	A830 1012	A830 1015	A830 1017
Type of Steel	Carbon	Carbon	Carbon	Carbon	Carbon	Carbon	Carbon
ArcelorMittal USA Thickness (Max. in.)	30	30	30	30	30	30	30
Chemical Composition (%)	Unless a range is specified, individual values are maximums						
Carbon	.08	.10	.15	.08/.13	.10/.15	.13/.18	.15/.20
Manganese	.45	.50	.60	.30/.60	.30/.60	.30/.60	.30/.60
Phosphorus	.030	.030	.030	.030	.030	.030	.030
Sulfur	.030	.030	.030	.030	.030	.030	.030
Silicon	-	-	-	-	-	-	-
Molybdenum	-	-	-	-	-	-	-
Chromium	-	-	-	-	-	-	-
Nickel	-	-	-	-	-	-	-
Other Elements	-	-	-	-	-	-	-
Remarks	Also available as ArcelorMittal USA HP Magnet Steel	-	-	-	-	-	-

\* Also available as ASTM A827 for forging and similar applications with .030 Max. Phosphorus, .030 Max. Sulfur.

[HP Magnet Steel Brochure](#)

# ASTM CHEMISTRY-ONLY STEELS

[Covered by A829 (Alloy), A830 (Carbon)]

continued

SPECIFICATION	A830 1020*	A830 1023	A830 1025	A830 1030	A830 1035*	A830 1040*
Type of Steel	Carbon	Carbon	Carbon	Carbon	Carbon	Carbon
ArcelorMittal USA Thickness (Max. in.)	30	30	30	18	18	18
Chemical Composition (%)	Unless a range is specified, individual values are maximums					
Carbon	.18/.23	.20/.25	.22/.28	.28/.34	.32/.38	.37/.44
Manganese	.30/.60	.30/.60	.30/.60	.60/.90	.60/.90	.60/.90
Phosphorus	.030	.030	.030	.030	.030	.030
Sulfur	.030	.030	.030	.030	.030	.030
Silicon	**	**	**	**	**	.15/.40
Molybdenum	-	-	-	-	-	-
Chromium	-	-	-	-	-	-
Nickel	-	-	-	-	-	-
Other Elements	-	-	-	-	-	-
Remarks	-	-	-	-	-	-

SPECIFICATION	A830 1045*	A830 1060	A829 4130	A829 4140	A829 4142	A829 4150	A829 E4340
Type of Steel	Carbon	Carbon	Alloy	Alloy	Alloy	Alloy	Alloy
ArcelorMittal USA Thickness (Max. in.)	18	10	16	16	16	6½	12
Chemical Composition (%)	Unless a range is specified, individual values are maximums						
Carbon	.43/.50	.55/.65	.28/.33	.36/.44	.38/.46	.48/.53	.38/.43
Manganese	.60/.90	.60/.90	.40/.60	.75/1.00	.75/1.00	.75/1.00	.65/.85
Phosphorus	.030	.030	.030	.030	.030	.030	.025
Sulfur	.030	.030	.040	.040	.040	.040	.025
Silicon	.15/.40	.15/.40	.15/.35	.15/.35	.15/.35	.15/.35	.15/.35
Molybdenum	-	-	.15/.25	.15/.25	.15/.25	.15/.25	.20/.30
Chromium	-	-	.80/1.10	.80/1.10	.80/1.10	.80/1.10	.70/.90
Nickel	-	-	-	-	-	-	1.65/2.00
Other Elements	-	-	-	-	-	-	-
Remarks	-	CT	-	-	-	-	-

\* Also available as ASTM A827 for forging and similar applications with .030 Max. Phosphorus, .030 Max. Sulfur.

\*\* When silicon required, range should be .15/.40 unless otherwise specified.

# ASTM CHEMISTRY-ONLY STEELS

[Covered by A829 (Alloy), A830 (Carbon)]

continued

SPECIFICATION	A829 6150	A829 8615	A829 8617	A829 8620	A829 8625	A829 8630
Type of Steel	Alloy	Alloy	Alloy	Alloy	Alloy	Alloy
ArcelorMittal USA Thickness (Max. in.)	6	8	8	8	8	8
Chemical Composition (%)	Unless a range is specified, individual values are maximums					
Carbon	.48/.53	.13/.18	.15/.20	.18/.23	.21/.28	.28/.33
Manganese	.70/.90	.70/.90	.70/.90	.70/.90	.70/.90	.70/.90
Phosphorus	.030	.030	.030	.030	.030	.030
Sulfur	.040	.040	.040	.040	.040	.040
Silicon	.15/.35	.15/.35	.15/.35	.15/.35	.15/.35	.15/.35
Molybdenum	-	.15/.25	.15/.25	.15/.25	.15/.25	.15/.25
Chromium	.80/1.10	.40/.60	.40/.60	.40/.60	.40/.60	.40/.60
Nickel	-	.40/.70	.40/.70	.40/.70	.40/.70	.40/.70
Other Elements	.15 Min. V	-	-	-	-	-

## ArcelorMittal USA Free Machining Steels

	Clean-Cut® 20	Clean-Cut® 45	C1119™ x	C1144™ x
ArcelorMittal USA Thickness (Max. in.)	15	15	12	12
Chemical Composition (%)	Unless a range is specified, individual values are maximums			
Carbon	.14/.22	.42/.50	.17/.23	.40/.50
Manganese	1.20/1.50	1.20/1.50	1.00/1.30	1.00/1.30
Phosphorus	.04	.04	.04	.03
Sulfur	.06/.12	.06/.12	.20/.33	.20/.33
Silicon	.10/.40	.10/.40	.30	.30
Heat Treatment Required	-	Stress relieved over 6" as cut edge; over 8" as mill edge	-	Stress relieved over 6" as cut edge; over 8" as mill edge

### Clean-Cut® Alloy Steels

The following steels are produced with specification sulfur .02/.04.

See other chemistry/mechanical properties/heat treatment listed in this brochure.

ASTM A829 Grades 4140, 4142, 4150, 8620 ArcelorMittal USA MTD® #1, #2, and #4.

x Variable Length applies ±5%

[Free-Machining Brochure](#)

# ArcelorMittal USA

## Proprietary Grades

SPECIFICATION	SPA-90††	T-1®††	T-1® Type A††	T-1® Type B††	T-1® Type C††	LQ-130††	LQ-140††
Type of Steel	Alloy	Alloy	Alloy	Alloy	Alloy	Alloy	Alloy
Requirements for Delivery	A6, A20*	A6, A20*	A6, A20*	A6, A20*	A6, A20*	A6	A6
Tensile Strength (ksi)	110/130 to 2½" incl.; 100/130 over 2½"	110/130	110/130	110/130	110/130 to 2½" incl.; 100/130 over 2½"	Info. only	Info. only
Yield Strength (Min. ksi) (Yield Point if designated YP)	100 to 2½" incl.; 90 over 2½"	100	100	100	100 to 2½" incl.; 90 over 2½"	130**	140
Spec. Thickness (Max. in.)	9½	2½	1¼	2	6	5	2
ArcelorMittal USA Thickness (Max. in.)	9½	2½	1¼	2	6	Refer over 5	2
Chemical Composition (%)	Unless a range is specified, individual values are maximums						
Carbon	.14/.21	.10/.20	.12/.21	.12/.21	.14/.21	.12/.18	.12/.18
Manganese	.95/1.30	.60/1.00	.70/1.00	.95/1.30	.95/1.30	1.55	1.55
Phosphorus	.030	.035	.035	.035	.035	.015	.015
Sulfur	.030	.040	.040	.040	.040	.003	.003
Silicon	.15/.35	.15/.35	.20/.35	.20/.35	.15/.35	.15/.55	.15/.55
Chromium	1.00/1.50	.40/.65; .80 if approved by customer	.40/.65	.40/.65	1.00/1.50	.70	.70
Nickel	1.20/1.50	.70/1.00	-	.30/.70	1.20/1.50	1.50	1.50
Molybdenum	.40/.60	.40/.60	.15/.25	.20/.30	.40/.60	.70	.70
Copper	■	.15/.50, if specified	.20/.40, if specified	.20/.40	■	-	-
Other Elements	.03/.08 V	.03/.08 V .0005/.006 B	.03/.08 V	.03/.08 V .01/.03 Ti	.03/.08 V .0005/.005 B	.08 V .04 Cb .005 B CT	.08 V .04 Cb .005 B CT
Heat Treatment Required	Q&T	Q&T	Q&T	Q&T	Q&T	Q&T	Q&T
Remarks	-	-	-	-	-	LCVN	LCVN

\* A20: Raise tensile strength range by 5 ksi.

\*\* 120 ksi min. for over 2.0 inches.

†† It is important to note that this grade of steel may be susceptible to cracking in the heat-affected zone of welds during post-weld heat treatment (stress relief). Therefore, ArcelorMittal USA recommends that careful consideration be given to this phenomenon by competent welding engineers before stress relieving is applied to weldments of this grade. Also, it is not recommended for service at temperatures lower than -50°F or higher than 800°F.

■ Restricted to ASTM A20 limits for unspecified elements.

[A514/T-1 Brochure](#)

[LQ-130 Brochure](#)

# ArcelorMittal USA

## Proprietary Grades

continued

SPECIFICATION	Spartan®I††	Spartan®II††	Spartan®III††	Spartan®IV††	Spartan®V††
Type of Steel	Alloy	Alloy	Alloy	Alloy	Alloy
Requirements for Delivery	A6, A20	A6, A20	A6, A20	A6, A20	A6, A20
Tensile Strength (ksi)	60/110* available	90/110* available	100/130* available	100/130* available	90/110* available
Yield Strength (Min. ksi) (Yield Point if designated YP)	50/100* available	80/100* available	90/120* available	90/120* available	80/100* available
Spec. Thickness (Max. in.)	-	-	-	-	-
ArcelorMittal USA Thickness (Max. in.)	4**	4**	4**	4**	4**
Chemical Composition (%)	Unless a range is specified, individual values are maximums				
Carbon	.07	.07	.07	.07	.08
Manganese	.40/.70	.75/1.15	.75/1.15	.75/1.15	.90/1.50
Phosphorus	.015	.015	.015	.015	.015
Sulfur	.005	.005	.005	.005	.005
Silicon	.40	.40	.40	.40	.40
Chromium	.60/.90	.45/.75	.45/.75	.45/.75	.45/.65
Nickel	.70/1.00	1.50/2.00	3.35/3.65	2.40/3.00	.65/1.00
Molybdenum	.15/.25	.30/.55	.55/.65	.45/.65	.40/.65
Copper	1.00/1.30	1.00/1.30	1.15/1.75	1.00/1.30	.90/1.20
Other Elements	.02/.06 Cb CT	.02/.06 Cb CT	.02/.06 Cb CT	.02/.06 Cb CT	.01/.03 Cb .05/.07 V CT
Heat Treatment Required	Q&PHT	Q&PHT	Q&PHT	Q&PHT	Q&PHT

\* These minimum strength levels are available depending on heat treatment, thickness and toughness requirements. Consult ArcelorMittal USA for specific available requirements.

\*\* Consult ArcelorMittal USA for plates over thickness noted or additional chemistries.

†† It is important to note that this grade of steel may be susceptible to cracking in the heat-affected zone of welds during post-weld heat treatment (stress relief) or elevated temperature service. Also, post-weld heat treatment or elevated temperature service may degrade heat affected zone toughness. Therefore, ArcelorMittal USA recommends that careful consideration be given to these phenomena by competent welding engineers before application.

[Spartan Brochure](#)



# ArcelorMittal USA

## Proprietary Grades

continued

SPECIFICATION	Duracorr®▲ Grade 40	Duracorr®▲ Grade 50	Duracorr® 300
Type of Steel	Stainless	Stainless	Stainless
Requirements for Delivery	A480	A480	A480
Tensile Strength (ksi)	66 Min.	70 Min.	-
Yield Strength (Min. ksi) (Yield Point if designated YP)	40	50	-
Spec. Thickness (Max. in.)	-	-	-
ArcelorMittal USA Thickness (Max. in.)	2	2	2
Chemical Composition (%)	Unless a range is specified, individual values are maximums		
Carbon	.025	.025	.025
Manganese	1.50	1.50	1.50
Phosphorus	.040	.040	.040
Sulfur	.010	.010	.010
Silicon	.70	.70	.70
Chromium	11.0/12.5	11.0/12.5	11.0/12.5
Nickel	1.00	1.00	1.00
Copper	-	-	-
Other Elements	.030 N, .20/.35 Mo	.030 N, .20/.35 Mo	.030 N, .20/.35 Mo
Heat Treatment Required	N&T	N&T	-
Remarks	223 Max. Surf. HB	223 Max. Surf. HB	260/360 HB

▲ Also available as ASTM A1010.

[Duracorr Brochure](#)

[Duracorr 300 Brochure](#)

# ArcelorMittal USA

## Proprietary Grades

continued

SPECIFICATION	BethStar® Grade 50	BethStar® Grade 60	BethStar® Grade 70	BethStar® Grade 80
Type of Steel	HSLA	HSLA	HSLA	HSLA
Requirements for Delivery	A6	A6	A6	A6
Tensile Strength (ksi)	60 Min.	70 Min.	80 Min.	90 Min.
Yield Strength (Min. ksi) (Yield Point if designated YP)	50	60	70	80
Spec. Thickness (Max. in.)	-	-	-	-
ArcelorMittal USA Thickness (Max. in.)	2½	1½	1	¾
Chemical Composition (%)	Unless a range is specified, individual values are maximums			
Carbon	.10	.10	.10	.16
Manganese	1.65	1.65	1.65	1.65
Phosphorus	.025	.025	.025	.025
Sulfur	.010	.010	.010	.010
Silicon	.35	.35	.35	.40
Vanadium	.10	.10	.10	.10
Columbium	.06	.06	.10	.10
Titanium	-	-	-	-
CE (IIW)	.35	.36	.38	.42
P <sub>CM</sub>	.20	.20	.22	.24

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

$$P_{CM} = C + (Mn+Cu+Cr)/20 + Mo/15 + V/10 + Si/30 + Ni/60 + 5B$$

\* Also available as A572 Type 5.

[BethStar Brochure](#)

# ArcelorMittal USA

## Military Alloy Steels

### NAVSEA Tech. Pub. HY-80/100 and HSLA-80/100 - Rev. 2▲

ArcelorMittal USA Proprietary grades SPECIFICATION	Appendix A (24645)†† HSLA-80 Class 3	Appendix A (24645)†† HSLA-100 Class 3	Appendix B (16216) HY-80	Appendix B (16216) HY-100
Type of Steel	Alloy	Alloy	Alloy	Alloy
Requirements for Delivery	A20	A20	A20	A20
Tensile Strength (ksi)	Report info. only	Report info. only	Report info. only	Report info. only
Yield Strength (Min. ksi) (Yield Point if designated YP)	80/110 to ¼" excl.; 80/100 ¼" and over	100/130 to ¾" incl.; 100/125 over ¾", 95/125 over 4"	80/100 to ¾" incl.; 80/99.5 over ¾"	100/120
Spec. Thickness (Max. in.)	1¼	6	8	6
ArcelorMittal USA Thickness (Max. in.)	1¼	6	8	6
Chemical Composition (%)	Unless a range is specified, individual values are maximums			
Carbon	.06	.06	.10/.18 to 1¼" incl.; .13/.18 over 1¼"	.10/.18 to 1¼" incl.; .14/.20 over 1¼"
Manganese	.40/.70	.75/1.15	.10/.40	.10/.40
Phosphorus	.020	.020	.015	.015
Sulfur	.004	.004	.004	.004
Silicon	.40	.40	.15/.38, May be .08 Min. when vacuum carbon deoxidized	.15/.38, May be .08 Min. when vacuum carbon deoxidized
Chromium	.60/.90	.45/.75	1.00/1.80 to 1¼" incl.; 1.40/1.80 over 1¼-3" incl.; 1.50/1.90 over 3"	1.00/1.80 to 1¼" incl.; 1.40/1.80 over 1¼-3" incl.; 1.50/1.90 over 3"
Nickel	.70/1.00	1.50/2.00 to 1" incl.; 2.50/3.00 over 1"-1½" incl.; 3.35/3.65 over 1½"	2.00/3.25 to 1¼" incl.; 2.50/3.50 over 1¼-3" incl.; 3.00/3.50 over 3"	2.25/3.50 to 1¼" incl.; 2.75/3.50 over 1¼-3" incl.; 3.00/3.50 over 3"
Molybdenum	.15/.25	.30/.55 to 1" incl.; 45/.60 over 1"-1½" incl.; .55/.65 over 1½"	.20/.60 to 1¼"; 35/.60 over 1¼-3" incl.; 50/.65 over 3"	.20/.60 to 1¼"; 35/.60 over 1¼-3" incl.; 50/.65 over 3"
Copper	1.00/1.30 to 1½" incl.	1.00/1.30 to 1½" incl.; 1.15/1.75 over 1½"	.25	.25
Other Elements	.02/.06 Cb CT Other residuals per specification	.02/.06 Cb CT Other residuals per specification	.02 Ti .03 V Var. others	.02 Ti .03 V Var. others
Heat Treatment Required	Q&PHT	Q&PHT	Q&T	Q&T

▲ Currently the HY and HSLA Navy Alloy grades are specified by the NAVSEA Technical Publication T9074-BD-GIB-010/0300 Rev. 2 replacing the MIL-S Specifications. The information given here is from this new document. Certification to the MIL-S-24645 or MIL-S-16216 is available, if necessary.

†† It is important to note that this grade of steel may be susceptible to cracking in the heat-affected zone of welds during post-weld heat treatment (stress relief). Therefore, ArcelorMittal USA recommends that careful consideration be given to this phenomenon by competent welding engineers before stress relieving is applied to weldments of this grade. Also, it is not recommended for service at temperatures lower than -50°F or higher than 800°F. Certification to the MIL-S-24645 or MIL-S-16216 are available if necessary.

[Military Alloy Brochure](#)

# ArcelorMittal USA

## Abrasion Resistant T-1® Steels

A family of quenched and tempered alloy, fine grained plate steels used primarily for abrasion resistance.

The grades vary in surface hardness, toughness, formability and weldability.

SPECIFICATION	T-1® Grade 321 HB††	T-1® Grade 340 HB††	T-1® Grade 360 HB††	T-1® Type A Grade 321 HB††	T-1® Type A Grade 340 HB††	T-1® Type A Grade 360 HB††
Type of Steel	Alloy	Alloy	Alloy	Alloy	Alloy	Alloy
ArcelorMittal USA Thickness (Max. in.)	2½	2	1½	1¼	1	¾
Chemical Composition (%)	Unless a range is specified, individual values are maximums					
Carbon	.10/.20	.10/.20	.10/.20	.12/.21	.12/.21	.12/.21
Manganese	.60/1.00	.60/1.00	.60/1.00	.70/1.00	.70/1.00	.70/1.00
Phosphorus	.035	.035	.035	.035	.035	.035
Sulfur	.040	.040	.040	.040	.040	.040
Silicon	.15/.35	.15/.35	.15/.35	.20/.35	.20/.35	.20/.35
Chromium	.40/.65	.40/.65	.40/.65	.40/.65	.40/.65	.40/.65
Molybdenum	.40/.60	.40/.60	.40/.60	.15/.25	.15/.25	.15/.25
Vanadium	.03/.08	.03/.08	.03/.08	.03/.08	.03/.08	.03/.08
Boron	.0005/.006	.0005/.006	.0005/.006	.0005/.005	.0005/.005	.0005/.005
Titanium	-	-	-	.01/.03	.01/.03	.01/.03
Copper	.15/.50	.15/.50	.15/.50	-	-	-
Nickel	.70/1.00	.70/1.00	.70/1.00	-	-	-
Heat Treatment Required	Q&T	Q&T	Q&T	Q&T	Q&T	Q&T
Surface Brinell Hardness (HB)	321 Min.	340 Min.	360 Min.	321 Min.	340 Min.	360 Min.
Melting Practice	F/G/P	F/G/P	F/G/P	F/G/P	F/G/P	F/G/P

†† It is important to note that this grade of steel may be susceptible to cracking in the heat-affected zone of welds during post-weld heat treatment (stress relief). Therefore, ArcelorMittal USA recommends that careful consideration be given to this phenomenon by competent welding engineers before stress relieving is applied to weldments of this grade. Also, it is not recommended for service at temperatures lower than -50°F or higher than 800°F.

[A514/T-1 Brochure](#)

# Abrasion Resistant T-1® Steels

continued

SPECIFICATION	T-1® Type B Grade 321 HB††	T-1® Type B Grade 340 HB††	T-1® Type B Grade 360 HB††	T-1® Type C Grade 321 HB††	T-1® Type C Grade 340 HB††	T-1® Type C Grade 360 HB††
Type of Steel	Alloy	Alloy	Alloy	Alloy	Alloy	Alloy
ArcelorMittal USA Thickness (Max. in.)	2	1½	1	6	2	1½
Chemical Composition (%)	Unless a range is specified, individual values are maximums					
Carbon	.12/.21	.12/.21	.12/.21	.14/.21	.14/.21	.14/.21
Manganese	.95/1.30	.95/1.30	.95/1.30	.95/1.30	.95/1.30	.95/1.30
Phosphorus	.035	.035	.035	.035	.035	.035
Sulfur	.040	.040	.040	.040	.040	.040
Silicon	.20/.35	.20/.35	.20/.35	.15/.35	.15/.35	.15/.35
Chromium	.40/.65	.40/.65	.40/.65	1.00/1.50	1.00/1.50	1.00/1.50
Molybdenum	.20/.30	.20/.30	.20/.30	.40/.60	.40/.60	.40/.60
Vanadium	.03/.08	.03/.08	.03/.08	.03/.08	.03/.08	.03/.08
Boron	.0005/.005	.0005/.005	.0005/.005	-	-	-
Titanium	-	-	-	-	-	-
Copper	-	-	-	-	-	-
Nickel	.30/.70	.30/.70	.30/.70	1.20/1.50	1.20/1.50	1.20/1.50
Heat Treatment Required	Q&T	Q&T	Q&T	Q&T	Q&T	Q&T
Surface Brinell Hardness (HB)	321 Min.	340 Min.	360 Min.	321 Min.	340 Min.	360 Min.
Melting Practice	F/G/P	F/G/P	F/G/P	F/G/P	F/G/P	F/G/P

†† It is important to note that this grade of steel may be susceptible to cracking in the heat-affected zone of welds during post-weld heat treatment (stress relief). Therefore, ArcelorMittal USA recommends that careful consideration be given to this phenomenon by competent welding engineers before stress relieving is applied to weldments of this grade. Also, it is not recommended for service at temperatures lower than -50°F or higher than 800°F.

[A514/T-1 Brochure](#)

# ArcelorMittal USA

## Premium Abrasion Resistant Alloy Steels\*

\*Premium grades exhibiting through-hardening, improved forming and welding capabilities.  
Grades with hardness minimums not noted below are also available. Contact ArcelorMittal USA for details.

SPECIFICATION	Hardwear® 400F	Hardwear® 450F	Hardwear® 500F	Hardwear® 550F	Creusabro® 4800
Type of Steel	Alloy	Alloy	Alloy	Alloy	Alloy
ArcelorMittal USA Thickness (Max. in.)	3	3	3	3/8	0.8
Chemical Composition (%)	Unless a range is specified, individual values are maximums				
Carbon	.12/.16	.20/.25	.25/.31	.30/.36	≤ .20
Manganese	1.55	1.35	0.95	0.95	≤ 1.60
Phosphorus	.025	.025	.025	.025	≤ .018
Sulfur	.005	.005	.005	.005	≤ .005
Silicon	.35/.55	.35/.55	.35/.55	.35/.55	-
Chromium	.55	.55	.75	.75	≤ 1.90
Nickel	1.00	1.00	1.00	1.00	≤ .30
Molybdenum	.55	.65	.65	.65	≤ .40
Vanadium	-	-	-	-	-
Boron	.0005/.005	.0005/.005	.0005/.005	.0005/.005	-
Heat Treatment Required	Q&T**	Q&T	Q&T	Q&T	TMCP
Surface Brinell Hardness (HB)	360/444	429/495	460/544	510/590	340/400
Melting Practice	F/G/P, CT	F/G/P, CT	F/G/P, CT	F/G/P, CT	F/G/P, CT

\*\* Thin 400F may be produced un-tempered.

[Hardwear Brochure](#)

# ArcelorMittal USA

## Abrasion Resistant Steels\*\*\*

\*\*\*Standard grades intended for applications with minimum forming; often require preheat during welding and thermal cutting.

SPECIFICATION	AR200	AR235	MITTAL 400	MITTAL 450	MITTAL 500	MITTAL 550
Type of Steel	Carbon	Carbon	Alloy	Alloy	Alloy	Alloy
ArcelorMittal USA Thickness (Max. in.)	1	1	>3 to 4	>3 to 4	>3 to 4	>3/8 to 4
Chemical Composition (%)	Unless a range is specified, individual values are maximums					
Carbon	.32/.36	.40/.50	.19	.26	.32	.36
Manganese	.90/1.30	.60/.90	1.55	1.35	.95	1.00
Phosphorus	.040	.040	.025	.025	.025	.025
Sulfur	.035	.050	.005	.005	.005	.005
Silicon	.35	.10/.40	.55	.55	.55	.65
Chromium	.25	-	.55	.55	.75	1.00
Nickel	.25	-	1.00	1.00	1.00	1.00
Molybdenum	-	-	.55	.65	.65	.75
Copper	-	-	-	-	-	-
Vanadium	-	-	-	-	-	-
Boron	-	-	.0005/.005	.0005/.005	.0005/.005	.0005/.005
Heat Treatment Required	-	-	Q&T	Q&T	Q&T	Q&T
Surface Brinell Hardness (HB)	~ 200 Nom.	~ 235 Nom.	360/444	429/495	460/544	514/600
Melting Practice	Killed	Killed	F/G/P, CT	F/G/P, CT	F/G/P, CT	F/G/P, CT

# ArcelorMittal USA MTD® Steels

A prehardened family of alloy plate steels used primarily for mold, tool and die (MTD®) applications.

SPECIFICATION	MTD 1	MTD 2	MTD 3	MTD 4	MTD P20
ArcelorMittal USA Thickness (Max. in.)	½ to 8½	½ to 12	¾ to 12	½ to 6½	1.0 to 7*
Chemical Composition (%)	Unless a range is specified, individual values are maximums				
Carbon	.38/.46	.27/.33	.24/.35	.48/.53	.28/.40
Manganese	.70/1.00	.90/1.30	.75/1.00	.75/1.10	.75/1.00
Phosphorus	.030	.030	.025	.030	.025
Sulfur	.030	.030	.005	.030	.005
Silicon	.15/.40	.15/.40	.15/.40	.15/.40	.20/.50
Chromium	.80/1.15	.60/.90	.90/1.20	.80/1.10	1.40/2.00
Molybdenum	.15/.25	.15/.25	.45/.65	.15/.25	.30/.55
Vanadium (Min.)	.03	.02	.04	-	.05/.10
Other Elements	-	-	-	-	-
Heat Treatment Required	N&T	Q&T	Q&T	N&T	Q&T
Surface Brinell Hardness (HB)	262/321 to 3" incl.; 241/321 over 3" to 8½" incl.	262/321	262/321	262/321 to 3" incl.; 241/321 over 3" to 6½" incl.	285/331
Melting Practice	F/G/P	F/G/P	F/G/P, CT	F/G/P	F/G/P, CT

\* Refer other sizes.

[MTD Brochure](#)

# ArcelorMittal USA Tool Steels\*\*

## High Carbon, High Alloy Steels

SPECIFICATION	A2	A8 Mod.	O1	S5	S7
ArcelorMittal USA Thickness (Max. in.)	5½	2¾	5½	2¾	4½
Chemical Composition (%)	Unless a range is specified, individual values are maximums				
Carbon	.95/1.00	.48/.55	.85/1.00	.50/.65	.45/.55
Manganese	.40/1.00	.20/.50	1.00/1.40	.60/1.00	.20/.90
Phosphorus	.030	.030	.030	.030	.030
Sulfur	.010	.010	.010	.010	.010
Silicon	.10/.50	.75/1.05	.10/.50	1.75/2.25	.20/1.00
Chromium	4.70/5.50	7.50/8.40	.40/.60	.10/.50	3.00/3.50
Molybdenum	.90/1.40	1.30/1.60	-	.20/1.35	1.30/1.80
Vanadium	.15/.50	.30/.55	.30	.15/.35	.35
Tungsten	-	-	.40/.60	-	-
Nickel	***	***	***	***	***
Copper	***	***	***	***	***
Hardness-HB Max. in Annealed Condition	235	241	212	235	223

\*\* Refer for size availability.

\*\*\* Nickel and Copper .75% Max. unless otherwise specified.

[Tool Steel Brochure](#)

# AASHTO\* Bridge Steel Specifications

**\*American Association of State Highway and Transportation Officials**

**Bridge steels can be ordered to the main AASHTO Specification M270, and to ASTM A709. The following cross reference is provided to associate the grades. See individual ASTM grades for chemical composition.**

<b>AASHTO M270 (M) Grade**</b>	<b>ASTM A709 (M) Grade**</b>	<b>Similar ASTM Grade***</b>	<b>Yield Strength (min., ksi)</b>	<b>Tensile Strength (min., ksi)</b>	<b>Plate Thicknesses Available</b>
36	36	A36	36	58	To 4" incl.
50 (345)	50 (345)	A572	50	65	To 4" incl.
50W (345W)	50W (345W)	A588	50	70	To 4" incl.
HPS 50W (345W)	HPS 50W (345W)	-	50	70	To 4" incl.
HPS 70W (485W)	HPS 70W (485W)	-	70	85/110	To 4" incl.
HPS 100W (690W)	HPS 100W (690W)	-	100	110/130	To 2½" incl.
HPS 100W (690W)	HPS 100W (690W)	-	90	100/130	Over 2½" to 4" incl.

\*\* Toughness testing mandatory for tension components unless otherwise specified. Should be ordered as T(Non-fracture Critical) or F (Fracture Critical) with Zone 1, 2 or 3 specified.

\*\*\* Similar in chemistry and tensile properties. Toughness testing optional per supplementary paragraphs.

[HPS 50W Brochure](#)

[HPS 70W Brochure](#)

[HPS 100W Brochure](#)

## ArcelorMittal USA Weathering Steels

**Weathering steels contain modest amounts of alloy additives and resist atmospheric corrosion when used properly. The following ASTM and ArcelorMittal USA grades are considered "weathering" per ASTM G101.**

**A242 (Mayari-R)  
A514 Grades E, F, P, Q  
A517 Grades E, F, P, Q  
Spartan® Grades I, II, III, IV, V**

**A588 (Mayari-R50, Cor-Ten® B)  
A709 Grades 50W, HPS 50W, HPS 70W, HPS 100W  
A710 Grade A  
A736 Grade A  
A871 (Mayari-R60)**

[Weathering Steels Brochure](#)



# Cross Reference Of Popular International Specifications

# Cross Reference Of Canadian Structural Steels\*

## Similar Chemistry Only Grades

ASTM Spec	EN Spec
1020	10083-2 C22
1030	10083-2 C30
1040	10083-2 C40
1045	10083-2 C45
4130	10083-1 34CrMo4
4140	10083-1 42CrMo4
4340	10083-1 39NiCrMo3

## Similar Structural Grades

ASTM Spec	EN Spec
A36/A283-B	10025-2 S235
A36	10025-2 S275
A572-50/A633-C	10025-2 S355
A633-E	10025-3 S420
A633-E	10025-3 S460
API-2Y-60/A533-B-2**	10025-6 S500Q
A533-B-2	10025-6 S550Q
A514*	10025-6 S690Q
LQ-130***	10025-6 S890Q
LQ-140***	10025-6 S960Q

## Similar Pressure Vessel Grades

ASTM Spec	EN Spec
A204-A	10028-2 16Mo3
A225-D	10028-3 P460
A387-12-2	10028-2 13CrMo4-5
A387-22-2	10028-2 10CrMo9-10
A516-55	10028-2 P235
A516-55	10028-3 P275
A516-60	10028-2 P265
A516-65	10028-2 P295
A537-1	10028-2 P355
A737-B	10028-3 P355

**Exact substitution is often not possible; review specification of interest before ordering.**

**ArcelorMittal USA will accept orders to popular specifications independent of origin.**

- \* Various Grades and/or Classes available.
- \*\* Not ASTM Specs., see page 32.
- \*\*\* Not ASTM Specs., see page 37.

## \* CSA G40.21.-04

Metric Grade	Imperial Grade	ASTM Equivalent
260WT	38WT	A36 / A516-60
300WT	44WT	A572-42
350WT	50WT	A572-50 / A633-C
380WT	55WT	A572-55
350AT	50AT	A588-A/B
400WT	60WT	A572-60 / A633-E
400AT	60AT	A871-60
480WT	70WT	A572-65 (70min YS) / A709-HPS 70W
480AT	70AT	A709-HPS 70W
700QT	100QT	A514 **
260W	38W	A36
300W	44W	A572-42
350W	50W	A572-50
350A	50A	A588-A/B
400W	60W	A572-60
400A	60A	A871-60
480W	70W	A709-HPS 70W
480A	70A	A709-HPS 70W
700Q	100Q	A514 **

## Types

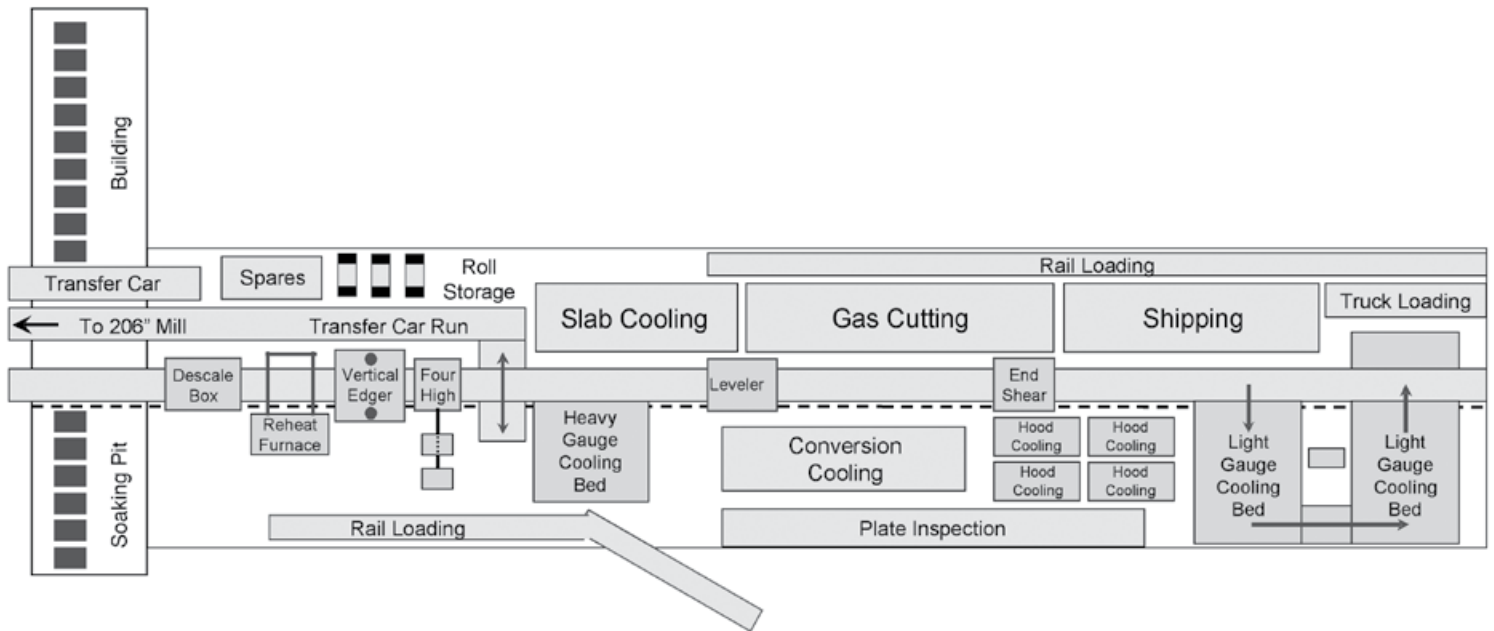
W	Weldable
WT	Weldable Notch-Tough
R	Atmospheric Corrosion-Resistant
A	Atmospheric Corrosion-Resistant Weldable
AT	Atmospheric Corrosion-Resistant Weldable Notch-Tough
Q	Quenched & Tempered Low Alloy
QT	Quenched & Tempered Low Alloy Notch-Tough

**When Notch-Tough (T) Grades are ordered, please specify Category:**

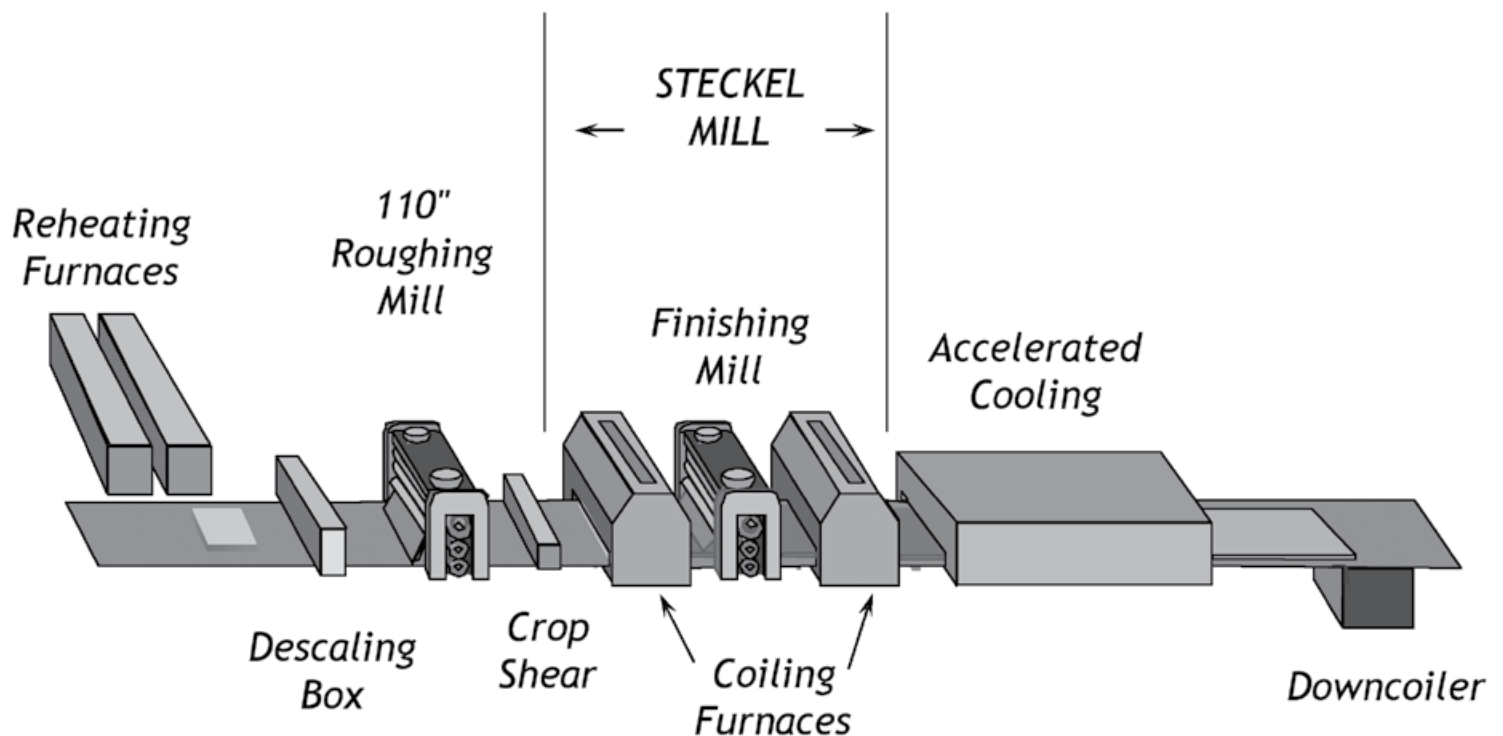
Category	Impact Test Temperature
Cat 1	0 C (32 F)
Cat 2	-20 C (0 F)
Cat 3	-30 C (-20 F)
Cat 4	-45 C (-50 F)
Cat 5	Test Temperature determined by Customer

- \*\* Various Grades available.

# Coatesville's 140" Rolling Mill Complex



# Conshohocken's SMART® Facility (Steckel Mill Advanced Rolling Technology)



## Coatesville/Conshohocken Plants

# Plate Size Charts

### **Note:**

The thickness of many grades is limited by the specification.  
Use these tables to the limiting thickness of the grade you are specifying.

**Click on the link below to advance to the proper page**

[TABLE A – Carbon Plate Steel Sizes Maximum Dimensions](#)

[TABLE B – Alloy Plate Steel Sizes Maximum Dimensions](#)

[TABLE C – Carbon Plate Steel Sizes Maximum Piece Weight](#)

[TABLE D – Alloy Plate Steel Sizes Maximum Piece Weight](#)

## Carbon Plate Steel Sizes Maximum Dimensions in inches

TABLE A

Thickness	Width												
	48	54	60	66	72	78	84	90	96	102	108	114	120
3/16	720	720	720	720	720	720	720	720	720				
1/4	720	720	720	720	720	720	720	720	720		INQUIRE		
5/16	720	720	720	720	720	720	720	720	720				
3/8	1,030	1,030	1,030	1,030	1,030	1,030	1,030	1,030	1,030	800			
7/16	1,030	1,030	1,030	1,030	1,030	1,030	1,030	1,030	1,030	1,000	1,000	680	680
1/2	1,030	1,030	1,030	1,030	1,030	1,030	1,030	1,030	1,030	1,000	1,000	680	680
9/16	1,030	1,030	1,030	1,120	1,250	1,250	1,250	1,250	1,250	1,120	1,120	680	680
5/8	1,440	1,480	1,500	1,500	1,525	1,525	1,525	1,480	1,400	960	960	680	680
11/16	1,440	1,480	1,500	1,500	1,525	1,525	1,525	1,350	1,350	960	960	680	680
3/4	1,440	1,480	1,500	1,500	1,525	1,525	1,525	1,350	1,350	1,030	980	680	680
7/8	1,440	1,480	1,500	1,500	1,525	1,525	1,525	1,340	1,250	1,030	980	680	680
1	1,440	1,480	1,500	1,500	1,525	1,525	1,525	1,350	1,350	1,030	980	680	680
1 1/8	1,440	1,440	1,440	1,440	1,440	1,440	1,400	1,290	1,200	945	890	680	680
1 1/4	1,440	1,320	1,440	1,440	1,440	1,360	1,350	1,350	1,350	1,090	790	680	680
1 3/8	1,320	1,190	1,440	1,440	1,440	1,350	1,350	1,350	1,350	1,055	720	680	680
1 1/2	1,230	1,160	1,440	1,350	1,350	1,350	1,350	1,350	1,350	1,035	720	680	680
1 3/4	1,050	925	1,220	1,120	1,350	1,350	1,270	1,270	1,270	995	720	680	680
2	905	800	1,060	960	1,300	1,200	1,120	1,220	1,140	930	720	680	680
2 1/4	790	725	930	870	1,160	1,080	980	1,090	1,010	865	720	680	680
2 1/2	725	680	830	1,090	1,180	1,100	1,310	1,220	1,140	930	720	680	680
2 3/4	665	720	750	990	1,070	1,010	1,180	1,110	1,030	720	720	680	680
3	610	720	710	900	970	910	1,080	1,020	940	720	720	680	680
3 1/4	570	635	670	830	900	840	980	920	870	635	635	635	635
3 1/2	530	635	620	770	830	770	920	860	800	670	635	620	600
3 3/4	490	625	580	720	770	720	860	800	740	670	610	600	600
4	465	590	540	720	720	720	800	750	685	670	600	600	600
4 1/2	415	525	495	630	635	635	635	635	635	600	600	600	600
5	365	470	445	565	620	635	635	635	625	600	600	600	581
5 1/2	330	425	405	515	565	635	635	605	570	600	587	556	528
6	305	385	365	470	515	620	595	550	515	569	538	509	484
6 1/2	275	355	335	435	470	565	550	505	470	526	496	470	447
7	255	330	310	400	435	525	510	465	435	488	461	437	415
7 1/2	240	305	285	375	405	485	470	430	400	455	430	407	387
8	225	280	265	350	380	455	440	410	375	427	403	382	363
9	195	250	235	310	335	405	390	360	340	379	358	339	322
10	175	225	215	275	300	360	350	325	310	341	322	301	286
11	155	200	190	250	265	325	320	290	275	306	289	274	260
12	145	180	175	220	235	300	285	265	260	281	265	251	238
13	133	169	163	205	215	275	260	240	225	259	245	232	217
14	123	157	150	190	202	255	235	220	205	240	224	212	201
15	114	146	140	176	187	233	218	205	195	221	209	198	188
16		136	131	166	175	216	205	160	160	160	136	129	
17		128	123	156	165	200	195	160	160	160	128	116	
18		120	116	148	155	190	185	160	160	160	120		
19		113	110	140	146	180	176	160	160	160	110		
20		107	104	133	140	170	167	160	160	160			
21		102	99	126	133	164	159	149	139	153			
22		96	92	119	126	158	152	142	132	146			
23		92	89	113	119	152	145	135	126	140			
24		88	85	108	113	146	138	128	119	134			
25		84	83	104	108	140	132	124	114	129			
26				105	115	110	119	111	123				
27				101	111	106	115	107	118				
28				99	108	103	111	102	114				

Note: The lengths in the shaded areas from 5/8 inches through 2-1/4 inches thick and less than or equal to 96 inches wide apply to mild carbon grades such as ASTM A830 Grades 1006 through 1023, A36, A131 Grade A, A283 and A285. For grades other than these, the maximum length available is 80% of the length shown unless otherwise approved.

# Carbon Plate Steel Sizes Maximum Dimensions in inches

continued

**TABLE A**

TABLE A	Width												
Thickness	126	132	138	144	150	156	162	168	174	180	186	192	195
3/16													
1/4	INQUIRE												
5/16													
3/8													
7/16	624	624					INQUIRE						
1/2	624	624											
9/16	624	624											
5/8	624	624	550	550	550	468	486						
11/16	624	624	550	550	550	468	486						
3/4	624	624	550	550	550	468	486						
7/8	624	624	600	600	600	468	486						
1	624	624	600	600	600	468	486						
1 1/8	624	624	600	600	600	600	600						
1 1/4	624	624	600	600	600	600	600						
1 3/8	624	600	600	600	600	600	600			INQUIRE			
1 1/2	624	600	600	600	600	600	600						
1 3/4	624	600	600	600	600	600	600						
2	624	600	600	600	600	600	600						
2 1/4	624	600	600	600	600	600	600						
2 1/2	624	600	600	600	600	600	600						
2 3/4	624	600	600	600	600	600	600						
3	624	600	600	600	600	600	600						
3 1/4	605	600	600	600	600	600	600						
3 1/2	600	600	600	600	600	600	600						
3 3/4	600	600	600	600	600	600	575						
4	600	600	600	600	585	562	542						
4 1/2	600	591	565	542	520	500	481						
5	557	532	508	487	468	450	433						
5 1/2	506	483	462	443	425	409	394						
6	464	443	424	406	390	375	361						
6 1/2	428	409	391	375	360	346	333						
7	398	380	363	348	334	321	309						
7 1/2	371	354	339	325	312	300	289						
8	348	332	316	304	292	281	271						
9	307	293	280	271	260	250	240						
10	276	264	252	243	234	223	215						
11	251	240	226	220	211	203	195						
12	227	217	207	201	193	186	179						
13	210	200	191	186	178	172							
14	195	186	178	173	161								
15	182	173	161	157									

**Please inquire for:**

1. Additional sizes not shown on this card and sizes in areas shaded and labeled "INQUIRE".
2. Maximum lengths available on plates with thicknesses and/or widths between the increments shown.
3. Plates 4 inches thick and less requiring heat treatment where lengths exceed 540 inches and plates over 4 inches or less than 3/8 inch thick that exceed 480 inches long.
4. Plate widths under 48 inches when number of pieces and lengths can be nested and cut within above size card.
5. HSLA Bridge Plate (e.g. A709 Grades 50 and 50W) which are both over 700 inches long and over 25,000 pounds pattern weight.
6. Plates over 15 inches when 1.5 times ASTM A6 flatness tolerances is not acceptable.
7. Plates of 75,500 pounds pattern weight and greater.
8. Plates over 600 inches when not produced as mill edge plate.
9. Nested patterns from plates 6 inches thick and greater.
10. Plate quantities of over 8 and wider than 150 inches.
11. Single pattern less than 10,000 pounds and 138 inches wide and greater.
12. Use of mill edge on 206" Mill plates (widths over 132 inches wide).
13. ArcelorMittal USA Plate recommends heat treating steel plate over 13 inches thick if extensive thermal cutting is intended.
14. Plates over 130 inches wide when 2 times ASTM A6 flatness and thickness tolerances are not acceptable.

Note: The lengths in the shaded areas from 5/8 inch through 2-1/4 inches thick apply to mild carbon grades such as ASTM A830 Grades 1006 through 1023, A36, A131 Grade A, A283 and A285. For grades other than these, the maximum length available is 80% of the length shown unless otherwise approved.

## Alloy Plate Steel Sizes Maximum Dimensions in inches

TABLE B

Thickness	Width												
	48	54	60	66	72	78	84	90	96	102	108	114	120
<b>3/16</b>	625	720	720	648	648	648	600	480	480				
<b>1/4</b>	720	720	720	720	600	600	600	600	600		INQUIRE		
<b>5/16</b>	720	720	720	800	800	800	720	720	648				
<b>3/8</b>	720	720	720	960	960	960	960	960	960	960			
<b>7/16</b>	720	720	720	960	960	960	960	960	960	960	960	680	680
<b>1/2</b>	850	850	850	960	960	960	960	960	960	960	960	680	680
<b>9/16</b>	850	850	850	960	960	960	960	960	960	960	960	680	680
<b>5/8</b>	960	960	960	960	960	960	960	960	960	955	900	680	680
<b>11/16</b>	960	960	960	960	960	960	960	960	915	865	815	680	680
<b>3/4</b>	960	960	960	1,030	1,030	1,030	1,030	1,030	1,030	1,030	980	680	680
<b>7/8</b>	960	960	960	1,030	1,030	1,030	1,030	1,030	1,030	1,030	980	680	680
<b>1</b>	960	960	960	950	1,030	1,030	1,030	1,030	1,030	1,030	980	680	680
<b>1 1/8</b>	930	860	850	830	1,030	1,030	1,030	1,030	995	945	890	680	680
<b>1 1/4</b>	835	775	750	750	1,030	1,030	1,025	955	895	840	790	680	680
<b>1 3/8</b>	740	720	720	720	1,030	980	930	855	800	760	720	680	680
<b>1 1/2</b>	720	720	720	720	975	900	840	785	735	720	720	680	680
<b>1 3/4</b>	720	720	720	720	820	760	720	720	720	720	720	680	680
<b>2</b>	720	720	720	720	720	720	720	720	720	720	720	680	680
<b>2 1/4</b>	720	720	720	720	720	720	720	720	720	720	720	680	680
<b>2 1/2</b>	720	720	720	720	720	720	720	720	720	720	720	680	680
<b>2 3/4</b>	665	720	720	720	720	720	720	720	720	720	720	680	680
<b>3</b>	610	720	720	720	720	720	720	720	720	720	710	670	640
<b>3 1/4</b>	595	635	635	635	635	635	635	635	635	635	635	635	620
<b>3 1/2</b>	550	635	635	635	635	635	635	635	635	635	635	605	575
<b>3 3/4</b>	515	635	620	635	635	635	635	635	635	635	595	565	535
<b>4</b>	480	635	580	635	635	635	635	635	635	605	600	600	600
<b>4 1/2</b>	430	560	515	635	635	635	635	610	600	600	600	600	600
<b>5</b>	380	505	460	555	635	635	600	600	575	600	600	600	581
<b>5 1/2</b>	350	460	420	505	635	600	595	555	520	600	587	556	528
<b>6</b>	315	415	380	460	635	585	545	505	475	569	538	509	484
<b>6 1/2</b>	290	390	355	425	510	540	500	470	440	526	496	470	447
<b>7</b>	270	360	325	395	470	500	465	430	405	488	461	437	415
<b>7 1/2</b>	250	335	300	370	440	470	430	405	380	455	430	407	387
<b>8</b>	235	310	285	345	410	435	405	374	355	427	403	382	363
<b>9</b>	210	270	250	305	370	385	360	335	315	379	358	339	322
<b>10</b>	190	240	220	275	325	350	325	300	280	341	322	301	286
<b>11</b>	170	225	205	250	295	315	290	270	255	306	289	274	260
<b>12</b>	155	205	185	230	270	240	265	250	235	281	265	251	238
<b>13</b>	145	185	170	210	250	265	245	225	215	259	245	232	217
<b>14</b>	135	170	160	195	230	245	225	210	195	240	224	212	201
<b>15</b>	125	160	145	180	215	225	210	195	185	221	209	198	188

# Alloy Plate Steel Sizes Maximum Dimensions in inches

continued

TABLE B	Width													
	Thickness	126	132	138	144	150	156	162	168	174	180	186	192	195
3/16														
1/4	INQUIRE													
5/16														
3/8														
7/16	624	624												
1/2	624	624												
9/16	624	624		INQUIRE										
5/8	624	624												
11/16	624	624	550	550	550	550	540							
3/4	624	624	550	550	550	550	550							
7/8	624	624	600	600	600	600	600							
1	624	624	600	600	600	600	600							
1 1/8	624	624	600	600	600	600	600							
1 1/4	624	624	600	600	600	600	600							
1 3/8	624	600	600	600	600	600	600							
1 1/2	624	600	600	600	600	600	600							
1 3/4	624	600	600	600	600	600	600			INQUIRE				
2	624	600	600	600	600	600	600							
2 1/4	624	600	600	600	600	600	600							
2 1/2	624	600	600	600	600	600	590	550						
2 3/4	624	600	600	585	560	540	500							
3	615	585	560	535	515	495	460							
3 1/4	595	540	515	495	475	455	425							
3 1/2	550	500	480	460	440	420	395							
3 3/4	515	465	445	425	410	380	365							
4	600	600	600	600	585	562	542							
4 1/2	600	591	565	542	520	500	481							
5	557	532	509	487	468	450	433							
5 1/2	506	483	462	443	425	409	394							
6	464	443	424	406	390	375	361							
6 1/2	428	409	391	375	360	346	333							
7	398	380	363	348	334	321	309							
7 1/2	371	354	339	325	312	300	289							
8	348	332	316	304	292	281	271							
9	307	293	280	271	260	250	240							
10	276	264	252	243	234	223	215							
11	251	240	226	220	211	203	195							
12														
13														
14														
15														

## Please inquire for:

1. Additional sizes not shown on this card and sizes in areas shaded and labeled "INQUIRE".
2. Maximum lengths available on plates with thicknesses and/or widths between the increments shown.
3. Plates 4 inches thick and less requiring heat treatment where lengths exceed 540 inches and plates over 4 inches or less than 3/8 inch thick that exceed 480 inches long.
4. Plate widths under 48 inches when number of pieces and lengths can be nested and cut within above size card.
5. Plates over 15 inches when 1.5 times ASTM A6 flatness tolerances is not acceptable.
6. Plates of 75,500 pounds pattern weight and greater.
7. Plates over 600 inches when not produced as mill edge plate.
8. Nested patterns from plates 6 inches thick and greater.
9. Plate quantities of over 8 and wider than 150 inches.
10. Single pattern less than 10,000 pounds and 138 inches wide and greater.
11. Use of mill edge on 206" Mill plates (widths over 132 inches wide).
12. Use of mill edge on Navy alloy plates.
13. ArcelorMittal USA Plate recommends heat treating steel plate over 13 inches thick if extensive thermal cutting is intended.
14. Plates over 130 inches wide when 2 times ASTM A6 flatness and thickness tolerances are not acceptable.

## Carbon Plate Steel Sizes Maximum Piece Weight in pounds

TABLE C

TABLE C	Width												
Thickness	48	54	60	66	72	78	84	90	96	102	108	114	120
3/16	1,838	2,067	2,297	2,527	2,757	2,986	3,216	3,446	3,675				
1/4	2,450	2,757	3,063	3,369	3,675	3,982	4,288	4,594	4,901		INQUIRE		
5/16	3,063	3,446	3,829	4,211	4,594	4,977	5,360	5,743	6,126				
3/8	5,258	5,915	6,572	7,230	7,887	8,544	9,201	9,859	10,516	8,678			
7/16	6,134	6,901	7,668	8,435	9,201	9,968	10,735	11,502	12,269	12,656	13,400	9,618	10,125
1/2	7,011	7,887	8,763	9,640	10,516	11,392	12,269	13,145	14,021	14,464	15,314	10,992	11,571
9/16	7,887	8,873	9,859	11,792	14,357	15,554	16,750	17,947	19,143	18,224	19,296	12,366	13,017
5/8	12,252	14,166	15,953	17,548	19,462	21,084	22,706	23,610	23,822	17,356	18,377	13,740	14,464
11/16	13,477	15,582	17,548	19,303	21,408	23,192	24,976	23,689	25,269	19,092	20,215	15,114	15,910
3/4	14,702	16,999	19,143	21,057	23,354	25,301	27,247	25,843	27,566	22,346	22,512	16,489	17,356
7/8	17,152	19,832	22,334	24,567	27,247	29,517	31,788	29,927	29,778	26,071	26,264	19,237	20,249
1	19,602	22,665	25,524	28,076	31,139	33,734	36,329	34,457	36,755	29,795	30,016	21,985	23,142
1 1/8	22,053	24,809	27,566	30,323	33,079	35,836	37,520	37,042	36,755	30,753	30,667	24,733	26,034
1 1/4	24,503	25,269	30,629	33,692	36,755	37,605	40,200	43,072	45,943	39,413	30,246	27,481	28,927
1 3/8	24,707	25,058	33,692	37,061	40,430	41,062	44,220	47,379	50,538	41,963	30,323	30,229	31,820
1 1/2	25,116	26,647	36,755	37,903	41,349	44,795	48,240	51,686	55,132	44,909	33,079	32,977	34,713
1 3/4	25,014	24,790	36,329	36,686	48,240	52,260	52,945	56,727	60,509	50,369	38,592	38,473	40,498
2	24,639	24,503	36,074	35,938	53,090	53,090	53,362	62,279	62,074	53,805	44,105	43,969	46,284
2 1/4	24,197	24,982	35,606	36,640	53,294	53,754	52,528	62,598	61,870	56,300	49,619	49,466	52,069
2 1/2	24,673	26,034	35,308	51,005	60,237	60,832	78,018	77,848	77,593	67,256	55,132	54,962	57,854
2 3/4	24,894	30,323	35,096	50,959	60,083	61,441	77,304	77,912	77,117	57,276	60,645	60,458	63,640
3	24,911	33,079	36,244	50,538	59,420	60,390	77,185	78,103	76,776	62,483	66,158	65,954	69,425
3 1/4	25,218	31,605	37,052	50,491	59,726	60,390	75,874	76,317	76,980	59,699	63,210	66,722	70,234
3 1/2	25,252	34,036	36,925	50,444	59,318	59,616	76,708	76,827	76,232	64,291	68,073	70,157	71,467
3 3/4	25,014	35,893	37,010	50,538	58,960	59,726	76,827	76,572	75,551	68,883	70,063	72,743	76,572
4	25,320	36,142	36,755	53,907	58,807	63,708	76,232	76,572	74,598	70,004	73,509	77,593	81,677
4 1/2	25,422	36,180	37,903	53,064	58,348	63,210	68,073	72,935	77,797	78,103	82,698	87,292	91,886
5	24,843	35,989	37,861	52,877	63,300	70,234	75,636	81,039	85,080	86,782	91,886	96,991	98,863
5 1/2	24,707	35,797	37,903	53,018	63,453	77,257	83,200	84,931	85,352	95,460	98,885	98,866	98,829
6	24,911	35,376	37,265	52,784	63,095	82,289	85,046	84,229	84,127	98,757	98,870	98,737	98,829
6 1/2	24,333	35,338	37,052	52,924	62,381	81,239	85,165	83,783	83,174	98,902	98,747	98,769	98,880
7	24,299	35,376	36,925	52,409	62,176	81,294	85,046	83,081	82,902	98,815	98,839	98,899	98,863
7 1/2	24,503	35,032	36,372	52,643	62,023	80,464	83,974	82,315	81,677	98,714	98,778	98,689	98,778
8	24,503	34,304	36,074	52,409	62,074	80,520	83,855	83,719	81,677	98,815	98,747	98,802	98,829
9	23,890	34,457	35,989	52,222	61,564	80,630	83,617	82,698	83,310	98,671	98,686	98,640	98,625
10	23,822	34,457	36,584	51,473	61,258	79,635	83,378	82,953	84,399	98,642	98,625	97,315	97,332
11	23,210	33,692	35,563	51,473	59,522	79,082	83,855	81,422	82,357	97,369	97,369	97,444	97,332
12	23,686	33,079	35,734	49,414	57,582	79,635	81,473	81,166	84,944	97,543	97,400	97,379	97,195
13	23,537	33,646	36,057	49,882	57,072	79,082	80,520	79,635	79,635	97,398	97,553	97,508	96,004
14	23,441	33,661	35,734	49,789	57,745	78,971	78,376	78,614	78,137	97,195	96,052	95,957	95,766
15	23,278	33,539	35,734	49,414	57,276	77,312	77,899	78,486	79,635	95,894	96,021	96,021	95,970
16		33,324	35,666	49,714	57,174	76,449	78,137	65,341	69,698	74,054	66,648	66,730	
17		33,324	35,580	49,639	57,276	75,211	78,971	69,425	74,054	78,682	66,648	63,756	
18		33,079	35,529	49,864	56,970	75,653	79,329	73,509	78,410	83,310	66,158		
19		32,880	35,563	49,789	56,643	75,653	79,662	77,593	82,766	87,939	64,014		
20		32,773	35,393	49,789	57,174	75,211	79,567	81,677	87,122	92,567			
21		32,803	35,376	49,527	57,031	76,184	79,543	79,865	79,472	92,943			
22		32,344	34,440	49,003	56,602	76,892	79,662	79,737	79,063	92,914			
23		32,405	34,832	48,647	55,887	77,334	79,448	79,252	78,900	93,146			
24		32,344	34,713	48,516	55,377	77,511	78,900	78,410	77,756	93,030			
25		32,160	35,308	48,666	55,132	77,423	78,614	79,124	77,593	93,290			
26				51,099	61,053	63,265	73,707	73,662	87,067				
27				51,043	61,196	63,310	73,969	73,739	86,741				
28				51,885	61,748	63,796	74,040	72,897	86,904				

Note: the weights in the shaded areas from 5/8 inch through 2-1/4 inches thick and less than or equal to 96 inches wide apply to mild carbon grades such as ASTM A830 Grades 1006 through 1023, A36, A131 Grade A, A283 and A285. For grades other than these, the maximum weights available are 80% of the weights shown unless otherwise approved.



Carbon Plate Steel Sizes Maximum Piece Weight in pounds  
continued

TABLE C		Width											
Thickness	126	132	138	144	150	156	162	168	174	180	186	192	195
3/16													
1/4	INQUIRE												
5/16													
3/8													
7/16	9,755	10,220					INQUIRE						
1/2	11,149	11,680											
9/16	12,542	13,140											
5/8	13,936	14,600	13,453	14,038	14,623	12,941	13,955						
11/16	15,330	16,060	14,799	15,442	16,085	14,235	15,351						
3/4	16,723	17,520	16,144	16,846	17,548	15,529	16,746						
7/8	19,511	20,440	20,547	21,440	22,334	18,117	19,537						
1	22,298	23,360	23,482	24,503	25,524	20,705	22,328						
1 1/8	25,085	26,280	26,417	27,566	28,715	29,863	31,012						
1 1/4	27,872	29,199	29,353	30,629	31,905	33,181	34,457						
1 3/8	30,659	30,884	32,288	33,692	35,096	36,499	37,903			INQUIRE			
1 1/2	33,447	33,692	35,223	36,755	38,286	39,817	41,349						
1 3/4	39,021	39,307	41,094	42,880	44,667	46,454	48,240						
2	44,596	44,922	46,964	49,006	51,048	53,090	55,132						
2 1/4	50,170	50,538	52,835	55,132	57,429	59,726	62,023						
2 1/2	55,744	56,153	58,705	61,258	63,810	66,362	68,915						
2 3/4	61,319	61,768	64,576	67,383	70,191	72,999	75,806						
3	66,893	67,383	70,446	73,509	76,572	79,635	82,698						
3 1/4	70,261	72,999	76,317	79,635	82,953	86,271	89,589						
3 1/2	75,041	78,614	82,187	85,761	89,334	92,907	96,481						
3 3/4	80,401	84,229	88,058	91,886	95,715	99,544	99,065						
4	85,761	89,844	93,928	98,012	99,544	99,455	99,605						
4 1/2	96,481	99,559	99,505	99,605	99,544	99,544	99,444						
5	99,518	99,578	99,407	99,442	99,544	99,544	99,467						
5 1/2	99,447	99,447	99,447	99,503	99,437	99,521	99,559						
6	99,482	99,503	99,564	99,482	99,544	99,544	99,513						
6 1/2	99,411	99,521	99,466	99,544	99,544	99,499	99,444						
7	99,554	99,578	99,447	99,482	99,459	99,411	99,375						
7 1/2	99,429	99,390	99,505	99,544	99,544	99,544	99,582						
8	99,482	99,428	98,938	99,319	99,373	99,455	99,605						
9	98,732	98,717	98,625	99,605	99,544	99,544	99,237						
10	98,625	98,829	98,625	99,237	99,544	98,659	98,778						
11	98,660	98,829	97,294	98,829	98,735	98,791	98,548						
12	97,338	97,481	97,216	98,502	98,523	98,747	98,686						
13	97,553	97,332	97,177	98,747	98,438	98,924							
14	97,553	97,481	97,529	98,911	95,885								
15	97,553	97,144	94,515	96,174									

## Please inquire for:

1. Additional sizes not shown on this card and sizes in areas shaded and labeled "INQUIRE".
2. Maximum lengths available on plates with thicknesses and/or widths between the increments shown.
3. Plates 4 inches thick and less requiring heat treatment where lengths exceed 540 inches and plates over 4 inches or less than 3/8 inch thick that exceed 480 inches long.
4. Plate widths under 48 inches when number of pieces and lengths can be nested and cut within above size card.
5. HSLA Bridge Plate (e.g. A709 Grades 50 and 50W) which are both over 700 inches long and over 25,000 pounds pattern weight.
6. Plates over 15 inches when 1.5 times ASTM A6 flatness tolerances is not acceptable.
7. Plates of 75,500 pounds pattern weight and greater.
8. Plates over 600 inches when not produced as mill edge plate.
9. Nested patterns from plates 6 inches thick and greater.
10. Plate quantities of over 8 and wider than 150 inches.
11. Single pattern less than 10,000 pounds and 138 inches wide and greater.
12. Use of mill edge on 206" Mill plates (widths over 132 inches wide).
13. ArcelorMittal USA Plate recommends heat treating steel plate over 13 inches thick if extensive thermal cutting is intended.
14. Plates over 130 inches wide when 2 times ASTM A6 flatness and thickness tolerances are not acceptable.

Note: the weights in the shaded areas from 5/8 inch through 2-1/4 inches thick apply to mild carbon grades such as ASTM A830 Grades 1006 through 1023, A36, A131 Grade A, A283 and A285. For grades other than these, the maximum weights available are 80% of the weights shown unless otherwise approved.

## Alloy Plate Steel Sizes Maximum Piece Weight in pounds

TABLE D

TABLE D	Width												
Thickness	48	54	60	66	72	78	84	90	96	102	108	114	120
3/16	1,595	2,067	2,297	2,274	2,481	2,688	2,680	2,297	2,450				
1/4	2,450	2,757	3,063	3,369	3,063	3,318	3,573	3,829	4,084		INQUIRE		
5/16	3,063	3,446	3,829	4,679	5,105	5,530	5,360	5,743	5,513				
3/8	3,675	4,135	4,594	6,738	7,351	7,963	8,576	9,189	9,801	10,414			
7/16	4,288	4,824	5,360	7,861	8,576	9,291	10,005	10,720	11,435	12,149	12,864	9,618	10,125
1/2	5,785	6,509	7,232	8,984	9,801	10,618	11,435	12,252	13,068	13,885	14,702	10,992	11,571
9/16	6,509	7,322	8,136	10,108	11,026	11,945	12,864	13,783	14,702	15,621	16,540	12,366	13,017
5/8	8,168	9,189	10,210	11,231	12,252	13,272	14,293	15,314	16,335	17,266	17,229	13,740	14,464
11/16	8,984	10,108	11,231	12,354	13,477	14,600	15,723	16,846	17,127	17,203	17,162	15,114	15,910
3/4	9,801	11,026	12,252	14,459	15,774	17,088	18,403	19,717	21,032	22,346	22,512	16,489	17,356
7/8	11,435	12,864	14,293	16,869	18,403	19,936	21,470	23,004	24,537	26,071	26,264	19,237	20,249
1	13,068	14,702	16,335	17,782	21,032	22,784	24,537	26,290	28,042	29,795	30,016	21,985	23,142
1 1/8	14,242	14,817	16,272	17,478	23,661	25,632	27,604	29,576	30,476	30,753	30,667	24,733	26,034
1 1/4	14,208	14,836	15,953	17,548	26,290	28,481	30,522	30,469	30,459	30,374	30,246	27,481	28,927
1 3/8	13,851	15,161	16,846	18,530	28,919	29,808	30,463	30,007	29,948	30,229	30,323	30,229	31,820
1 1/2	14,702	16,540	18,377	20,215	29,863	29,863	30,016	30,055	30,016	31,241	33,079	32,977	34,713
1 3/4	17,152	19,296	21,440	23,584	29,302	29,421	30,016	32,160	34,304	36,448	38,592	38,473	40,498
2	19,602	22,053	24,503	26,953	29,404	31,854	34,304	36,755	39,205	41,655	44,105	43,969	46,284
2 1/4	22,053	24,809	27,566	30,323	33,079	35,836	38,592	41,349	44,105	46,862	49,619	49,466	52,069
2 1/2	24,503	27,566	30,629	33,692	36,755	39,817	42,880	45,943	49,006	52,069	55,132	54,962	57,854
2 3/4	24,894	30,323	33,692	37,061	40,430	43,799	47,168	50,538	53,907	57,276	60,645	60,458	63,640
3	24,911	33,079	36,755	40,430	44,105	47,781	51,456	55,132	58,807	62,483	65,239	64,984	65,341
3 1/4	26,324	31,605	35,117	38,628	42,140	45,652	49,163	52,675	56,187	59,699	63,210	66,722	68,574
3 1/2	26,205	34,036	37,818	41,600	45,382	49,163	52,945	56,727	60,509	64,291	68,073	68,460	68,489
3 3/4	26,290	36,467	39,562	44,571	48,623	52,675	56,727	60,779	64,831	68,883	68,341	68,500	68,277
4	26,137	38,899	39,477	47,543	51,865	56,187	60,509	64,831	69,153	70,004	73,509	77,593	81,677
4 1/2	26,341	38,592	39,435	53,486	58,348	63,210	68,073	70,063	73,509	78,103	82,698	87,292	91,886
5	25,864	38,669	39,137	51,941	64,831	70,234	71,467	76,572	78,274	86,782	91,886	96,991	98,863
5 1/2	26,205	38,745	39,307	51,988	71,314	72,999	77,959	77,912	77,865	95,460	98,885	98,866	98,829
6	25,728	38,133	38,796	51,661	77,797	77,644	77,899	77,338	77,593	98,757	98,870	98,737	98,829
6 1/2	25,660	38,822	39,264	51,707	67,690	77,644	77,423	77,976	77,865	98,902	98,747	98,769	98,880
7	25,728	38,592	38,711	51,754	67,179	77,423	77,542	76,827	77,185	98,815	98,839	98,899	98,863
7 1/2	25,524	38,477	38,286	51,941	67,383	77,976	76,827	77,529	77,593	98,714	98,778	98,689	98,778
8	25,592	37,980	38,796	51,661	66,975	76,980	77,185	76,368	77,321	98,815	98,747	98,802	98,829
9	25,728	37,214	38,286	51,380	67,996	76,649	77,185	76,955	77,185	98,671	98,686	98,640	98,625
10	25,864	36,755	37,435	51,473	66,362	77,423	77,423	76,572	76,232	98,642	98,625	97,315	97,332
11	25,456	37,903	38,371	51,473	66,260	76,649	75,993	75,806	76,368	97,369	97,369	97,444	97,332
12	25,320	37,673	37,776	51,661	66,158	63,708	75,755	76,572	76,776	97,543	97,400	97,379	97,195
13	25,660	36,831	37,605	51,099	66,362	76,206	75,874	74,658	76,096	97,398	97,553	97,508	96,004
14	25,728	36,448	38,116	51,099	65,750	75,874	75,041	75,041	74,326	97,195	96,052	95,957	95,766
15	25,524	36,755	37,010	50,538	65,852	74,658	75,041	74,658	75,551	95,894	96,021	96,021	95,970

# Alloy Plate Steel Sizes Maximum Piece Weight in pounds

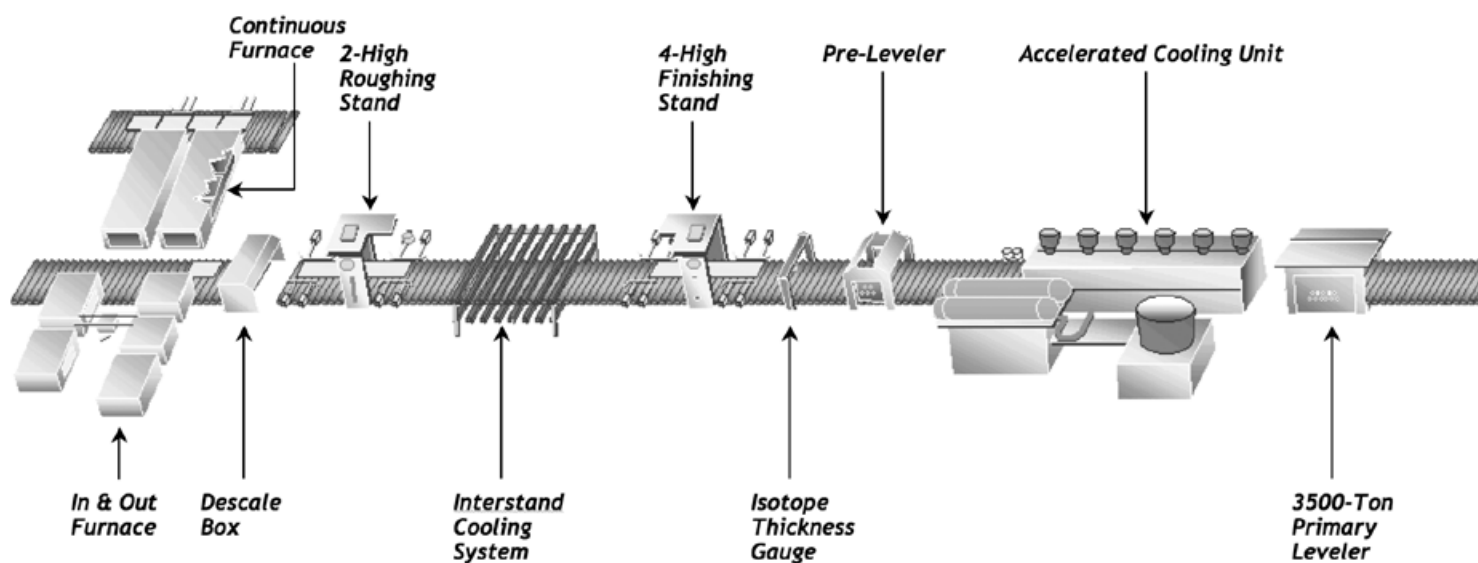
continued

TABLE D	Width													
	Thickness	126	132	138	144	150	156	162	168	174	180	186	192	195
3/16														
1/4	INQUIRE													
5/16														
3/8														
7/16	9,755	10,220												
1/2	11,149	11,680												
9/16	12,542	13,140		INQUIRE										
5/8	13,936	14,600												
11/16	15,330	16,060	14,799	15,442	16,085	16,729	17,056							
3/4	16,723	17,520	16,144	16,846	17,548	18,250	18,952							
7/8	19,511	20,440	20,547	21,440	22,334	23,227	24,120							
1	22,298	23,360	23,482	24,503	25,524	26,545	27,566							
1 1/8	25,085	26,280	26,417	27,566	28,715	29,863	31,012							
1 1/4	27,872	29,199	29,353	30,629	31,905	33,181	34,457							
1 3/8	30,659	30,884	32,288	33,692	35,096	36,499	37,903							
1 1/2	33,447	33,692	35,223	36,755	38,286	39,817	41,349							
1 3/4	39,021	39,307	41,094	42,880	44,667	46,454	48,240							
2	44,596	44,922	46,964	49,006	51,048	53,090	55,132			INQUIRE				
2 1/4	50,170	50,538	52,835	55,132	57,429	59,726	62,023							
2 1/2	55,744	56,153	58,705	61,258	63,810	65,256	63,172							
2 3/4	61,319	61,768	64,576	65,699	65,512	65,699	63,172							
3	65,928	65,699	65,750	65,546	65,724	65,699	63,402							
3 1/4	69,100	65,699	65,505	65,699	65,671	65,422	63,459							
3 1/2	68,787	65,512	65,750	65,750	65,512	65,035	63,516							
3 3/4	69,011	65,278	65,310	65,086	65,405	63,044	62,885							
4	85,761	89,844	93,928	98,012	99,544	99,455	99,605							
4 1/2	96,481	99,559	99,505	99,605	99,544	99,544	99,444							
5	99,518	99,578	99,603	99,442	99,544	99,544	99,467							
5 1/2	99,447	99,447	99,447	99,503	99,437	99,521	99,559							
6	99,482	99,503	99,564	99,482	99,544	99,544	99,513							
6 1/2	99,411	99,521	99,466	99,544	99,544	99,499	99,444							
7	99,554	99,578	99,447	99,482	99,459	99,411	99,375							
7 1/2	99,429	99,390	99,505	99,544	99,544	99,544	99,582							
8	99,482	99,428	98,938	99,319	99,373	99,455	99,605							
9	98,732	98,717	98,625	99,605	99,544	99,544	99,237							
10	98,625	98,829	98,625	99,237	99,544	98,659	98,778							
11	98,660	98,829	97,294	98,829	98,735	98,791	98,548							
12														
13														
14														
15														

## Please inquire for:

1. Additional sizes not shown on this card and sizes in areas shaded and labeled "INQUIRE".
2. Maximum lengths available on plates with thicknesses and/or widths between the increments shown.
3. Plates 4 inches thick and less requiring heat treatment where lengths exceed 540 inches and plates over 4 inches or less than 3/8 inch thick that exceed 480 inches long.
4. Plate widths under 48 inches when number of pieces and lengths can be nested and cut within above size card.
5. Plates over 15 inches when 1.5 times ASTM A6 flatness tolerances is not acceptable.
6. Plates of 75,500 pounds pattern weight and greater.
7. Plates over 600 inches when not produced as mill edge plate.
8. Nested patterns from plates 6 inches thick and greater.
9. Plate quantities of over 8 and wider than 150 inches.
10. Single pattern less than 10,000 pounds and 138 inches wide and greater.
11. Use of mill edge on 206" Mill plates (widths over 132 inches wide).
12. Use of mill edge on Navy alloy plates.
13. ArcelorMittal USA Plate recommends heat treating steel plate over 13 inches thick if extensive thermal cutting is intended.
14. Plates over 130 inches wide when 2 times ASTM A6 flatness and thickness tolerances are not acceptable.

# Burns Harbor 160" Plate Mill



# Burns Harbor

## Plate Size Charts

### Note:

Note: The thickness of many grades is limited by the specification.  
Use these tables to the limiting thickness of the grade you are specifying.

**Click on the link below to advance to the proper page**

### [Table E \(F1\) Hot Roll – As Rolled](#)

Structural Grades: ASTM A36, A283, A572, A573, A242, A588, A709 Gr 36, 50 & 50W  
PVQ Grades: ASTM A285, A299, A455, A516, A612 & A662  
Shipbuilding Grades: ABS, ASTM A131, MIL-S-22698, Gr A & B  
Chemistry Grades: Ordered to less than 0.39 Carbon

### [Table F \(F2\) Control Finish Temperature](#)

Structural Grades: Any Grade rolled by this process to improve Impact Toughness properties, such as ASTM A808.

### [Table G \(F3\) Control Rolled \$\leq\$ 65 ksi Yield Strength](#)

Any Grade rolled by this process to improve impact Toughness properties through 65 ksi Yield Strength, such as  
Structural Grades: ASTM A572 Gr 42, 50, 55, 60 & 65, A656 Gr 50-60, BethStar 50-60.  
Shipbuilding Grades: ABS, ASTM A131, MIL-S-22698, Gr AH & DH

### [Table H1 \(F4\) Control Rolled \$>\$ 65 ksi Yield Strength](#)

Structural Grades: Any Grade rolled by this process over 65 to  $<$  80 ksi Yield Strength, such as A656 Gr 70, BethStar 70

### [Table I \(F5\) Normalized](#)

All Grades which require Normalizing.  
Also Grades requiring Annealing or Stress Relieving subject to inquiry only.

### [Table J \(F6\) Q & T](#)

Structural Grades: ASTM A678, RQC60, 80, 90, 100, A514, Gr B & H, PVQ  
Grades: ASTM A517 Gr B & H, A537 Class 2

### [High Performance Steel](#)

AASHTO M270 Gr HPS 70W, TMCP  
ASTM A709 Gr HPS 70W, TMCP  
ASTM A709M Gr HPS 485W, TMCP

# Burns Harbor Plant

## Table E (F1) Hot Roll-As Rolled

Structural Grades: ASTM A36, A283, A572, A573, A242, A588, A709 Gr 36, 50 & 50W

PVQ Grades: ASTM A285, A299, A455, A516, A612 & A662

Shipbuilding Grades: ABS, ASTM A131, MIL-S-22698, Gr A & B

Chemistry Grades: Ordered to less than 0.39 Carbon

Thickness	Min Lgth*	Width																		
		40	42	45	48	51	54	57	60	63	66	69	72	75	78	81	84	87	90	93
0.1875	72				480	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480
0.2500	72				960	975	1,000	1,000	1,000	1,000	1,020	1,020	1,020	1,020	1,020	1,020	1,020	1,020	1,020	1,020
0.3125	72				960	1,020	1,080	1,170	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,175
0.3750	72				1,440	1,470	1,480	1,490	1,500	1,500	1,500	1,515	1,525	1,525	1,525	1,525	1,525	1,525	1,525	1,510
0.4375	72				1,440	1,470	1,480	1,490	1,500	1,500	1,500	1,515	1,525	1,525	1,525	1,525	1,525	1,525	1,525	1,510
0.5000	72				1,440	1,470	1,480	1,490	1,500	1,500	1,500	1,515	1,525	1,525	1,525	1,525	1,525	1,525	1,525	1,510
0.5625	72				1,440	1,470	1,480	1,490	1,500	1,500	1,500	1,515	1,525	1,525	1,525	1,525	1,525	1,525	1,525	1,510
0.6250	72				1,440	1,470	1,480	1,490	1,500	1,500	1,500	1,515	1,525	1,525	1,525	1,525	1,525	1,525	1,525	1,510
0.6875	72				1,440	1,470	1,480	1,490	1,500	1,500	1,500	1,515	1,525	1,525	1,525	1,525	1,525	1,525	1,525	1,510
0.7500	72				1,440	1,470	1,480	1,490	1,500	1,500	1,500	1,515	1,525	1,525	1,525	1,525	1,525	1,486	1,436	1,390
0.8125	72				1,440	1,470	1,480	1,490	1,500	1,500	1,500	1,515	1,525	1,525	1,525	1,473	1,420	1,371	1,326	1,283
0.8750	72				1,440	1,470	1,480	1,490	1,500	1,500	1,500	1,515	1,525	1,477	1,420	1,368	1,319	1,273	1,231	1,191
1.0000	72				1,440	1,470	1,480	1,490	1,500	1,500	1,500	1,515	1,525	1,292	1,243	1,197	1,154	1,114	1,077	1,042
1.1250	72	INQUIRE			1,440	1,440	1,440	1,440	1,440	1,440	1,440	1,440	1,437	1,149	1,105	1,064	1,026	990	957	926
1.2500	72				1,440	1,440	1,440	1,440	1,440	1,440	1,440	1,440	1,293	1,034	994	957	923	891	861	834
1.5000	72				1,440	1,440	1,440	1,440	1,440	1,440	1,440	1,440	1,077	861	828	798	769	743	718	695
1.7500	78				1,050	1,050	1,050	1,200	1,307	1,302	1,297	1,292	924	738	710	684	659	636	615	595
2.0000	78				1,000	1,000	1,000	1,149	1,144	1,139	1,134	1,130	808	646	621	598	577	557	538	521
2.2500	78				1,000	1,030	1,027	1,022	1,017	1,013	1,008	1,005	718	574	552	532	513	495	478	463
2.5000	78				936	930	925	920	915	911	908	904	646	517	497	478	461	445	430	417
2.7500	78				851	846	841	836	832	829	825	822	588	470	452	435	419	405	391	379
3.0000	78				780	775	771	766	763	760	756	754	539	430	414	399	384	371	359	347
3.2500	78				720	715	711	707	704	701	698	696	497	397	382	368	355	342	331	320
3.3333	78				702	698	693	690	686	684	681	678	485	387	372	359	346	334	323	312
3.5000**	78				669	664	660	657	654	651	648	646	462	369	355	342	329	318	307	297
3.7500**	78				624	620	616	613	610	608	605	603	431	344	331	319	307	297	287	278
4.0000**	78				585	581	578	575	572	570	567	565	404	323	310	299	288	278	269	260

\* If the mode of transportation is rail, the minimum length required is 120 inches.

\*\* = Over 3.3333" Thick 2:1 reduction ratio only - NO PVQ

Plates though 1-1/2 inches thick are in minimum lengths of 72 inches. Plates over 1-1/2 inches thick are in minimum lengths of 78 inches.

1/4 or less thick x 48 inches to 84 inches wide require minimum ordered weight of 6,500#.

For thicknesses and widths between the above values, use the shortest length bracketing your entry.

All the values shown may be modified under certain conditions, Inquire for more information.

# Burns Harbor Plant

## Table E (F1) Hot Roll-As Rolled continued

Structural Grades: ASTM A36, A283, A572, A573, A242, A588, A709 Gr 36, 50 & 50W

PVQ Grades: ASTM A285, A299, A455, A516, A612 & A662

Shipbuilding Grades: ABS, ASTM A131, MIL-S-22698, Gr A & B

Chemistry Grades: Ordered to less than 0.39 Carbon

	Width																			
	Min																			
Thickness	Lgth*	96	99	102	105	108	111	114	117	120	123	126	129	132	135	138**	141**	144**	147**	150**
0.1875	72	480	480	480	480	480	480	480	480	480	480	480	480	480						
0.2500	72	1,020	1,020	1,020	960	900	840	780	750	740	740	720	720	720	720	720	630	550		
0.3125	72	1,100	1,070	1,050	990	920	870	840	820	800	785	780	780	780	780	780	765	760	600	480
0.3750	72	1,500	1,470	1,450	1,390	1,350	1,320	1,300	1,270	1,250	1,250	1,250	1,160	1,050	900	780	770	760	600	480
0.4375	72	1,500	1,455	1,400	1,370	1,350	1,320	1,300	1,270	1,250	1,250	1,250	1,160	1,050	960	850	790	760	660	540
0.5000	72	1,500	1,455	1,400	1,370	1,350	1,320	1,300	1,270	1,250	1,220	1,200	1,140	1,100	1,010	900	870	850	790	750
0.5625	72	1,500	1,455	1,400	1,340	1,300	1,300	1,300	1,270	1,250	1,220	1,200	1,140	1,100	1,010	900	870	850	790	750
0.6250	72	1,500	1,455	1,400	1,340	1,300	1,300	1,300	1,270	1,250	1,220	1,200	1,140	1,100	1,070	1,050	975	900	825	750
0.6875	72	1,469	1,424	1,382	1,343	1,305	1,270	1,237	1,205	1,175	1,146	1,119	1,093	1,068	1,044	1,022	975	900	825	750
0.7500	72	1,346	1,305	1,267	1,231	1,197	1,164	1,134	1,105	1,077	1,051	1,026	1,002	979	957	936	916	897	825	750
0.8125	72	1,243	1,205	1,170	1,136	1,105	1,075	1,046	1,020	994	970	947	925	904	884	864	846	828	800	750
0.8750	72	1,154	1,119	1,086	1,055	1,026	998	972	947	923	900	879	859	839	820	803	785	769	753	738
1.0000	72	1,010	979	950	923	897	873	850	828	808	788	769	751	734	718	702	687	673	659	646
1.1250	72	897	870	845	820	798	776	756	736	718	700	684	668	652	638	624	611	598	586	574
1.2500	72	808	783	760	738	718	698	680	663	646	630	615	601	587	574	562	550	538	527	517
1.5000	72	673	652	633	615	598	582	567	552	538	525	513	501	489	478	468	458	448	439	430
1.7500	78	577	559	543	527	513	499	486	473	461	450	439	429	419	410	401	392	384	376	369
2.0000	78	505	489	475	461	448	436	425	414	404	394	384	375	367	359	351	343	336	329	323
2.2500	78	448	435	422	410	399	388	378	368	359	350	342	334	326	319	312	305	299	293	287
2.5000	78	404	391	380	369	359	349	340	331	323	315	307	300	293	287	281	275	269	263	258
2.7500	78	367	356	345	335	326	317	309	301	293	286	279	273	267	261	255	250	244	239	235
3.0000	78	336	326	316	307	299	291	283	276	269	262	256	250	244	239	234	229	224	219	215
3.2500	78	310	301	292	284	276	268	261	255	248	242	236	231	226	221	216	211	207	202	198
3.3333	78	303	293	285	277	269	262	255	248	242	236	230	225	220	215	210	206	202	197	193
3.5000***	78	288	279	271	263	256	249	243	236	230	225	219	214	209	205	200	196	192	188	184
3.7500***	78	269	261	253	246	239	232	226	221	215	210	205	200	195	191	187	183	179	175	172
4.0000***	78	252	244	237	230	224	218	212	207	202	197	192	187	183	179	175	171	168	164	161

\* If the mode of transportation is rail, the minimum length required is 120 inches.

\*\* If the mode of transportation is rail, an acceptable flat car route is required for lengths greater than 600 inches.

\*\*\* = Over 3.3333" Thick 2:1 reduction ratio only - NO PVQ

Plates though 1-1/2 inches thick are in minimum lengths of 72 inches. Plates over 1-1/2 inches thick are in minimum lengths of 78 inches.

1/4 or less thick x 48 inches to 84 inches wide require minimum ordered weight of 6,500#.

For thicknesses and widths between the above values, use the shortest length bracketing your entry.

All the values shown may be modified under certain conditions, Inquire for more information.

# Burns Harbor Plant

## Table F (F2) Control Finish Temp

Structural Grades: Any Grade rolled by this process to improve Impact Toughness properties, such as ASTM A808.

		Width																		
	Min																			
Thickness	Lgth*	40	42	45	48	51	54	57	60	63	66	69	72	75	78	81	84	87	90	93
0.1875	72				480	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480
0.2500	72				960	975	1,000	1,000	1,000	1,000	1,020	1,020	1020	1020	1020	1020	1020	1020	1020	1020
0.3125	72				960	1,020	1,080	1,170	1,250	1,250	1,250	1,250	1250	1250	1250	1250	1250	1250	1250	1175
0.3750	72				1,440	1,470	1,480	1,490	1,500	1,500	1,500	1,515	1525	1525	1525	1525	1525	1525	1525	1510
0.4375	72				1,440	1,470	1,480	1,490	1,500	1,500	1,500	1,515	1525	1525	1525	1525	1525	1525	1525	1510
0.5000	72				1,440	1,470	1,480	1,490	1,500	1,500	1,500	1,515	1525	1525	1525	1525	1525	1525	1525	1510
0.5625	72				1,440	1,470	1,480	1,490	1,500	1,500	1,500	1,515	1525	1525	1525	1525	1525	1525	1525	1510
0.6250	72				1,440	1,470	1,480	1,490	1,500	1,500	1,500	1,515	1525	1525	1525	1525	1525	1525	1525	1510
0.6875	72				1,440	1,470	1,480	1,490	1,500	1,500	1,500	1,515	1525	1525	1525	1525	1525	1525	1525	1510
0.7500	72				1,440	1,470	1,480	1,490	1,500	1,500	1,500	1,515	1525	1525	1525	1525	1525	1486	1436	1390
0.8125	72				1,440	1,470	1,480	1,490	1,500	1,500	1,500	1,515	1525	1525	1525	1473	1420	1371	1326	1283
0.8750	72				1,440	1,470	1,480	1,490	1,500	1,500	1,500	1,515	1525	1477	1420	1368	1319	1273	1231	1191
1.0000	72				1,440	1,470	1,480	1,490	1,500	1,500	1,500	1,515	1371	1292	1243	1197	1154	1114	1077	1042
1.1250	72	INQUIRE			1,440	1,440	1,440	1,440	1,440	1,440	1,440	1,440	1219	1149	1105	1064	1026	990	957	926
1.2500	72				1,440	1,440	1,440	1,440	1,440	1,440	1,440	1,440	1097	1034	994	957	923	891	861	834
1.5000	72				1,440	1,440	1,440	1,440	1,440	1,440	1,440	1,440	914	861	828	798	769	743	718	695
1.7500	78				1,050	1,050	1,050	1,200	1,307	1,302	1,297	1,292	784	738	710	684	659	636	615	595
2.0000	78				1,000	1,000	1,000	1,149	1,144	1,139	1,134	1,130	686	646	621	598	577	557	538	521
2.2500	78				1,000	1,030	1,027	1,022	1,017	1,013	1,008	1,005	609	574	552	532	513	495	478	463
2.5000	78				936	930	925	920	915	911	908	904	549	517	497	478	461	445	430	417
2.7500	78				851	846	841	836	832	829	825	822	499	470	452	435	419	405	391	379
3.0000	78				780	775	771	766	763	760	756	754	457	430	414	399	384	371	359	347
3.2500																				
3.3333																				
3.5000																				
3.7500																				
4.0000																				
Min Item total lgth		303	300	297	295	293	292	290	287	287	286	285	284	283	282	282	281	280	280	279

\* If the mode of transportation is rail, the minimum length required is 120 inches.

Plates though 1-1/2 inches thick are in minimum lengths of 72 inches. Plates over 1-1/2 inches thick are in minimum lengths of 78 inches.

1/4 or less thick x 48 inches to 84 inches wide require minimum ordered weight of 6,500#.

For thicknesses and widths between the above values, use the shortest length bracketing your entry.

All the values shown may be modified under certain conditions, Inquire for more information.



# Burns Harbor Plant

## Table F (F2) Control Finish Temp

### continued

Structural Grades: Any Grade rolled by this process to improve Impact Toughness properties, such as ASTM A808.

		Width																		
	Min																			
Thickness	Lgth*	96	99	102	105	108	111	114	117	120	123	126	129	132	135	138**	141**	144**	147**	150**
0.1875	72	480	480	480	480	480	480	480	480	480										
0.2500	72	1020	1020	1020	960	900	840	780	750	740	740	720	720	720						
0.3125	72	1100	1070	1050	990	920	870	840	820	800	785	780	780	780	780	780	765	760		
0.3750	72	1500	1470	1450	1390	1350	1320	1300	1270	1250	1250	1250	1160	1050	900	780	770	760	600	480
0.4375	72	1500	1455	1400	1370	1350	1320	1300	1270	1250	1250	1250	1160	1050	960	850	790	760	660	540
0.5000	72	1500	1455	1400	1370	1350	1320	1300	1270	1250	1220	1200	1140	1100	1010	900	870	850	790	750
0.5625	72	1500	1455	1400	1340	1300	1300	1300	1270	1250	1220	1200	1140	1100	1010	900	870	850	790	750
0.6250	72	1500	1455	1400	1340	1300	1300	1300	1270	1250	1220	1200	1140	1100	1070	1050	975	900	825	750
0.6875	72	1469	1424	1382	1343	1305	1270	1237	1205	1175	1146	1119	1093	1068	1044	1022	975	900	825	750
0.7500	72	1346	1305	1267	1231	1197	1164	1134	1105	1077	1051	1026	1002	979	957	936	916	897	825	750
0.8125	72	1243	1205	1170	1136	1105	1075	1046	1020	994	970	947	925	904	884	864	846	828	800	750
0.8750	72	1154	1119	1086	1055	1026	998	972	947	923	900	879	859	839	820	803	785	769	753	738
1.0000	72	1010	979	950	923	897	873	850	828	808	788	769	751	734	718	702	687	673	659	646
1.1250	72	897	870	845	820	798	776	756	736	718	700	684	668	652	638	624	611	598		
1.2500	72	808	783	760	738	718	698	680	663	646	630	615	601	587	574	562	550	538		
1.5000	72	673	652	633	615	598	582	567	552	538	525	513	501	489	478	468	458	448		
1.7500	78	577	559	543	527	513	499	486	473	461	450	439	429	419	410					
2.0000	78	505	489	475	461	448	436	425	414	404	394	384								
2.2500	78	448	435	422	410	399	388	378	368	359										
2.5000	78	404	391	380	369	359	349	340												
2.7500	78	367	356	345	335	326														
3.0000	78	336	326	316																
3.2500																				
3.3333																				
3.5000																				
3.7500																				
4.0000																				
Min Item total lgth		288	297	306	315	324	333	340	351	359	369	378	387	396	405	414	423	432	441	450

\* If the mode of transportation is rail, the minimum length required is 120 inches.

\*\* If the mode of transportation is rail, an acceptable flat car route is required for lengths greater than 600 inches.

Plates though 1-1/2 inches thick are in minimum lengths of 72 inches. Plates over 1-1/2 inches thick are in minimum lengths of 78 inches.

1/4 or less thick x 48 inches to 84 inches wide require minimum ordered weight of 6,500#.

For thicknesses and widths between the above values, use the shortest length bracketing your entry.

All the values shown may be modified under certain conditions, Inquire for more information.

# Burns Harbor Plant

## Table G (F3) Control Roll $\leq 65$ ksi Yield Strength

Any Grade rolled by this process to improve impact Toughness properties through 65 ksi Yield Strength, such as Structural Grades: ASTM A572 Gr 42, 50, 55, 60 & 65, A656 Gr 50-60, BethStar 50-60.  
Shipbuilding Grades: ABS, ASTM A131, MIL-S-22698, Gr AH & DH

		Width																		
	Min																			
Thickness	Lgth*	40	42	45	48	51	54	57	60	63	66	69	72	75	78	81	84	87	90	93
0.1875	78				480	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480
0.2500	78				960	975	1,000	1,000	1,000	1,000	1,020	1,020	1020	1020	1020	1020	1020	1020	1020	1020
0.3125	78				960	1,020	1,080	1,170	1,250	1,250	1,250	1,250	1250	1250	1250	1250	1250	1250	1250	1175
0.3750	78				1,440	1,470	1,480	1,490	1,500	1,500	1,500	1,515	1525	1525	1525	1525	1525	1525	1525	1510
0.4375	78				1,440	1,470	1,480	1,490	1,500	1,500	1,500	1,515	1525	1525	1525	1525	1525	1525	1525	1510
0.5000	78				1,440	1,470	1,480	1,490	1,500	1,500	1,500	1,515	1525	1525	1525	1525	1525	1525	1525	1510
0.5625	78				1,440	1,470	1,480	1,490	1,500	1,500	1,500	1,515	1525	1525	1525	1525	1525	1525	1525	1510
0.6250	78				1,440	1,470	1,480	1,490	1,500	1,500	1,500	1,515	1525	1525	1525	1525	1525	1525	1525	1510
0.6875	78				1,440	1,470	1,480	1,490	1,500	1,500	1,500	1,515	1525	1525	1525	1525	1525	1525	1525	1510
0.7500	78				1,440	1,470	1,480	1,490	1,500	1,500	1,500	1,515	1525	1525	1525	1525	1525	1486	1436	1390
0.8125	78				1,440	1,470	1,480	1,490	1,500	1,500	1,500	1,515	1525	1525	1525	1473	1420	1371	1326	1283
0.8750	78				1,440	1,470	1,480	1,490	1,500	1,500	1,500	1,515	1525	1477	1420	1368	1319	1273	1231	1191
1.0000	78				1,440	1,470	1,480	1,490	1,500	1,500	1,500	1,515	1371	1292	1243	1197	1154	1114	1077	1042
1.1250	78	INQUIRE			1,440	1,440	1,440	1,440	1,440	1,440	1,440	1,440	1219	1149	1105	1064	1026	990	957	926
1.2500	78				1,440	1,440	1,440	1,440	1,440	1,440	1,440	1,440	1097	1034	994	957	923	891	861	834
1.5000	78				1,440	1,440	1,440	1,440	1,440	1,440	1,440	1,440	914	861	828	798	769	743	718	695
1.7500	78				1,050	1,050	1,050	1,200	1,307	1,302	1,297	1,292	784	738	710	684	659	636	615	595
2.0000	78				1,000	1,000	1,000	1,149	1,144	1,139	1,134	1,130	686	646	621	598	577	557	538	521
2.2500																				
2.5000																				
2.7500																				
3.0000																				
3.2500																				
3.3333																				
3.5000																				
3.7500																				
4.0000																				
Min Item total lgth		303	300	297	295	293	292	290	287	287	286	285	284	283	282	282	281	280	280	279

\* If the mode of transportation is rail, the minimum length required is 120 inches.

Plates though 1-1/2 inches thick are in minimum lengths of 72 inches. Plates over 1-1/2 inches thick are in minimum lengths of 78 inches.

1/4 or less thick x 48 inches to 84 inches wide require minimum ordered weight of 6,500#.

For thicknesses and widths between the above values, use the shortest length bracketing your entry.

All the values shown may be modified under certain conditions, Inquire for more information.

# Burns Harbor Plant

## Table G (F3) Control Roll ≤ 65 ksi Yield Strength continued

Any Grade rolled by this process to improve impact Toughness properties through 65 ksi Yield Strength, such as  
Structural Grades: ASTM A572 Gr 42, 50, 55, 60 & 65, A656 Gr 50-60, BethStar 50-60.  
Shipbuilding Grades: ABS, ASTM A131, MIL-S-22698, Gr AH & DH

	Width																			
	Min																			
Thickness	Lgth*	96	99	102	105	108	111	114	117	120	123	126	129	132	135	138**	141**	144**	147**	150**
0.1875	78	480	480	480	480	480	480	480	480	480										
0.2500	78	1020	1020	1020	960	900	840	780	750	740	740	720	720	720						
0.3125	78	1100	1070	1050	990	920	870	840	820	800	785	780	780	780	780	780	765	760		
0.3750	78	1500	1470	1450	1390	1350	1320	1300	1270	1250	1250	1250	1160	1050	900	780	770	760	600	480
0.4375	78	1500	1455	1400	1370	1350	1320	1300	1270	1250	1250	1250	1160	1050	960	850	790	760	660	540
0.5000	78	1500	1455	1400	1370	1350	1320	1300	1270	1250	1220	1200	1140	1100	1010	900	870	850	790	750
0.5625	78	1500	1455	1400	1340	1300	1300	1300	1270	1250	1220	1200	1140	1100	1010	900	870	850	790	750
0.6250	78	1500	1455	1400	1340	1300	1300	1300	1270	1250	1220	1200	1140	1100	1070	1050	975	900	825	750
0.6875	78	1469	1424	1382	1343	1305	1270	1237	1205	1175	1146	1119	1093	1068	1044	1022	975	900	825	750
0.7500	78	1346	1305	1267	1231	1197	1164	1134	1105	1077	1051	1026	1002	979	957	936	916	897	825	750
0.8125	78	1243	1205	1170	1136	1105	1075	1046	1020	994	970	947	925	904	884	864	846	828	800	750
0.8750	78	1154	1119	1086	1055	1026	998	972	947	923	900	879	859	839	820	803	785	769	753	738
1.0000	78	1010	979	950	923	897	873	850	828	808	788	769	751	734	718	702	687	673	659	646
1.1250	78	897	870	845	820	798	776	756	736	718	700	684	668	652	638	624	611	598		
1.2500	78	808	783	760	738	718	698	680	663	646	630	615	601	587	574	562	550	538		
1.5000	78	673	652	633	615	598	582	567	552	538	525	513	501	489	478	468	458	448		
1.7500	78	577	559	543	527	513	499	486	473	461	450	439	429	419	410					
2.0000	78	505	489	475	461	448	436	425	414	404	394	384								
2.2500																				
2.5000																				
2.7500																				
3.0000																				
3.2500																				
3.3333																				
3.5000																				
3.7500																				
4.0000																				
Min Item total lgth		288	297	306	315	324	333	340	351	359	369	378	387	396	405	414	423	432	441	450

\* If the mode of transportation is rail, the minimum length required is 120 inches.

\*\* If the mode of transportation is rail, an acceptable flat car route is required for lengths greater than 600 inches.

Plates though 1-1/2 inches thick are in minimum lengths of 72 inches. Plates over 1-1/2 inches thick are in minimum lengths of 78 inches.

1/4 or less thick x 48 inches to 84 inches wide require minimum ordered weight of 6,500#.

For thicknesses and widths between the above values, use the shortest length bracketing your entry.

All the values shown may be modified under certain conditions, Inquire for more information.

# Burns Harbor Plant

## Table H1 (F4) Control Roll > 65 ksi Yield Strength

Structural Grades: Any Grade rolled by this process over 65, such as A656 Gr 70, BethStar 70, ASTM A656 Gr 80, and BethStar 80

Thickness	Min Lgth*	Width																			
		40	42	45	48	51	54	57	60	63	66	69	72	75	78	81	84	87	90	93	96
0.1875	78				480	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480
0.2500	78				960	975	1,000	1,000	1,000	1,000	1,020	1,020	1,020	1,020	1,020	1,020	1,020	1,020	1,020	1,020	960
0.3125	78				960	1,020	1,080	1,170	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,175	960
0.3750	78				1,440	1,470	1,480	1,490	1,248	1,248	1,248	1,248	1,248	1,248	1,248	1,248	1,248	1,248	1,248	1,248	960
0.4375	78				1,440	1,470	1,480	1,490	1,248	1,248	1,248	1,248	1,248	1,248	1,248	1,248	1,248	1,248	1,248	1,510	960
0.5000	78				1,440	1,470	1,480	1,490	1,248	1,248	1,248	1,248	1,248	1,248	1,248	1,248	1,248	1,248	1,248	1,510	960
0.5625	78				1,440	1,470	1,480	1,490	1,248	1,248	1,248	1,248	1,248	1,248	1,248	1,248	1,248	1,248	1,248	1,510	960
0.6250	78				1,440	1,470	1,480	1,490	1,248	1,248	1,248	1,248	1,248	1,248	1,248	1,248	1,248	1,248	1,248	1,510	960
0.6875	78				1,440	1,470	1,480	1,490	1,248	1,248	1,248	1,248	1,248	1,248	1,248	1,248	1,248	1,248	1,248	1,510	960
0.7500	78				1,440	1,470	1,480	1,490	1,248	1,248	1,248	1,248	1,248	1,248	1,248	1,248	1,248	1,248	1,248	1,390	960
0.8125	78				1,440	1,470	1,480	1,490	1,248	1,248	1,248	1,248	1,248	1,248	1,248	1,248	1,248	1,248	1,248	1,283	960
0.8750	78				1,440	1,470	1,480	1,490	1,248	1,248	1,248	1,248	1,248	1,248	1,248	1,248	1,248	1,248	1,248	1,231	960
1.0000	78				1,440	1,470	1,480	1,490	1,248	1,248	1,248	1,248	1,248	1,248	1,243	1,197	1,154	1,114	1,077	1,042	960
1.1250		INQUIRE																			
1.2500																					
1.5000																					
1.7500																					
2.0000																					
2.2500																					
2.5000																					
2.7500																					
3.0000																					
3.2500																					
3.3333																					
3.5000**																					
3.7500**																					
4.0000**																					
Min Item total lgth		303	300	297	295	293	292	290	287	287	286	285	284	283	282	282	281	280	280	279	288

\* If the mode of transportation is rail, the minimum length required is 120 inches.

\*\* = Over 3.3333 inches Thick 2:1 reduction ratio only - NO PVQ

Plates though 1-1/2 inches thick are in minimum lengths of 72 inches. Plates over 1-1/2 inches thick are in minimum lengths of 78 inches.

1/4 or less thick x 48 inches to 84 inches wide require minimum ordered weight of 6,500#.

For thicknesses and widths between the above values, use the shortest length bracketing your entry.

All the values shown may be modified under certain conditions, Inquire for more information.

# Burns Harbor Plant

## Table H1 (F4) Control Roll > 65 ksi Yield Strength continued

Structural Grades: Any Grade rolled by this process over 65, such as A656 Gr 70, BethStar 70, ASTM A656 Gr 80, and BethStar 80

Thickness	Width																			
	Min Lgth*	99	102	105	108	111	114	117	120											
<b>0.1875</b>	78	480	480	480	480	480	480	480	480											
<b>0.2500</b>	78	960	960	960	900	840	780	750	740											
<b>0.3125</b>	78	960	960	960	920	870	840	820	800											
<b>0.3750</b>	78	960	960	960	960	960	960	960	960											
<b>0.4375</b>	78	960	960	960	960	960	960	960	960											
<b>0.5000</b>	78	960	960	960	960	960	960	960	960											
<b>0.5625</b>	78	960	960	960	960	960	960	960	960											
<b>0.6250</b>	78	960	960	960	960	960	960	960	960											
<b>0.6875</b>	78	960	960	960	960	960	960	960	960											
<b>0.7500</b>	78	960	960	960	960	960	960	960	960											
<b>0.8125</b>	78	960	960	960	960	960	960	960	960											
<b>0.8750</b>	78	960	960	960	960	960	960	947	923											
<b>1.0000</b>	78	960	950	923	897	873	850	828	808											
<b>Min Item total lgth</b>		297	306	315	324	333	342	351	360											

\* If the mode of transportation is rail, the minimum length required is 120 inches.

Plates though 1-1/2 inches thick are in minimum lengths of 72 inches. Plates over 1-1/2 inches thick are in minimum lengths of 78 inches.

1/4 or less thick x 48 inches to 84 inches wide require minimum ordered weight of 6,500#.

For thicknesses and widths between the above values, use the shortest length bracketing your entry.

All the values shown may be modified under certain conditions, Inquire for more information.

# Burns Harbor Plant

## Table I (F5) Normalized

All Grades which require Normalizing.

Also Grades requiring Annealing or Stress Relieving subject to inquiry only.

		Width																		
	Min																			
Thickness	Lgth*	40	42	45	48	51	54	57	60	63	66	69	72	75	78	81	84	87	90	93
0.1875	72				480	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480
0.2500	72				650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650
0.3125	72				650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650
0.3750	72				650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650
0.4375	72				650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650
0.5000	72				650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650
0.5625	72				650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650
0.6250	72				650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650
0.6875	72				650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650
0.7500	72				650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650
0.8125	72				650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650
0.8750	72				650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650
1.0000	72				650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650
1.1250	72	INQUIRE			650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650
1.2500	72				650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650
1.5000	72				650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650
1.7500	78				650	650	650	650	650	650	650	650	650	650	650	650	650	636	615	595
2.0000	78				650	650	650	650	650	650	650	650	650	646	621	598	577	557	538	521
2.2500	78				650	650	650	650	650	650	650	650	650	574	552	532	513	495	478	463
2.5000	78				650	650	650	650	650	650	650	650	646	517	497	478	461	445	430	417
2.7500	78				650	650	650	650	650	650	650	650	588	470	452	435	419	405	391	379
3.0000	78				650	650	650	650	650	650	650	650	539	430	414	399	384	371	359	347
3.2500	78				650	650	650	650	650	650	650	650	497	397	382	368	355	342	331	320
3.3333	78				650	650	650	650	650	650	650	650	485	387	372	359	346	334	323	312
3.5000**	78				650	650	650	650	650	650	648	646	462	369	355	342	329	318	307	297
3.7500**	78				624	620	616	613	610	608	605	603	431	344	331	319	307	297	287	278
4.0000**	78				585	581	578	575	572	570	567	565	404	323	310	299	288	278	269	260

\* If the mode of transportation is rail, the minimum length required is 120 inches.

\*\* = Over 3.3333 inches Thick 2:1 reduction ratio only - NO PVQ

Plates though 1-1/2 inches thick are in minimum lengths of 72 inches. Plates over 1-1/2 inches thick are in minimum lengths of 78 inches.

1/4 or less thick x 48 inches to 84 inches wide require minimum ordered weight of 6,500#.

For thicknesses and widths between the above values, use the shortest length bracketing your entry.

All the values shown may be modified under certain conditions, Inquire for more information.

Surface critical applications requiring processing on LOI furnace restricted to 600 inches maximum length.

Inquire all requirements for lengths greater than lengths in table.

# Burns Harbor Plant

## Table I (F5) Normalized

continued

All Grades which require Normalizing.  
Also Grades requiring Annealing or Stress Relieving subject to inquiry only.

	Width																			
	Min																			
Thickness	Lgth*	96	99	102	105	108	111	114	117	120	123	126	129	132	135	138**	141**	144**	147**	150**
0.1875	72	480	480	480	480	480	480	480	480	480	480	480	480	480						
0.2500	72	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	630	550		
0.3125	72	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	600	480
0.3750	72	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	600	480
0.4375	72	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	540
0.5000	72	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650
0.5625	72	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650
0.6250	72	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650
0.6875	72	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650
0.7500	72	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650
0.8125	72	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650
0.8750	72	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650
1.0000	72	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	646
1.1250	72	650	650	650	650	650	650	650	650	650	650	650	650	650	638	624	611	598	586	574
1.2500	72	650	650	650	650	650	650	650	650	646	630	615	601	587	574	562	550	538	527	517
1.5000	72	650	650	633	615	598	582	567	552	538	525	513	501	489	478	468	458	448	439	430
1.7500	78	577	559	543	527	513	499	486	473	461	450	439	429	419	410	401	392	384	376	369
2.0000	78	505	489	475	461	448	436	425	414	404	394	384	375	367	359	351	343	336	329	323
2.2500	78	448	435	422	410	399	388	378	368	359	350	342	334	326	319	312	305	299	293	287
2.5000	78	404	391	380	369	359	349	340	331	323	315	307	300	293	287	281	275	269	263	258
2.7500	78	367	356	345	335	326	317	309	301	293	286	279	273	267	261	255	250	244	239	235
3.0000	78	336	326	316	307	299	291	283	276	269	262	256	250	244	239	234	229	224	219	215
3.2500	78	310	301	292	284	276	268	261	255	248	242	236	231	226	221	216	211	207	202	198
3.3333	78	303	293	285	277	269	262	255	248	242	236	230	225	220	215	210	206	202	197	193
3.5000***	78	288	279	271	263	256	249	243	236	230	225	219	214	209	205	200	196	192	188	184
3.7500***	78	269	261	253	246	239	232	226	221	215	210	205	200	195	191	187	183	179	175	172
4.0000***	78	252	244	237	230	224	218	212	207	202	197	192	187	183	179	175	171	168	164	161

- \* If the mode of transportation is rail, the minimum length required is 120 inches.
- \*\* If the mode of transportation is rail, an acceptable flat car route is required for lengths greater than 600 inches.
- \*\*\* = Over 3.3333" Thick 2:1 reduction ratio only - NO PVQ

Plates though 1-1/2 inches thick are in minimum lengths of 72 inches. Plates over 1-1/2 inches thick are in minimum lengths of 78 inches.  
1/4 or less thick x 48 inches to 84 inches wide require minimum ordered weight of 6,500#.  
For thicknesses and widths between the above values, use the shortest length bracketing your entry.  
All the values shown may be modified under certain conditions, Inquire for more information.  
Surface critical applications requiring processing on LOI furnace restricted to 600 inches maximum length.  
Inquire all requirements for lengths greater than lengths in table.

# Burns Harbor Plant

## Table J (F6) Q & T

Structural Grades: ASTM A678, RQC60, 80, 90, 100, A514 Gr B & H  
PVQ Grades: ASTM A517 Gr B & H, A537 Class 2, A709 Gr. HPS 70W

		Width																		
Thickness	Min Lgth*	40	42	45	48	51	54	57	60	63	66	69	72	75	78	81	84	87	90	93
0.1875	72																			
0.2500	72										INQUIRE									
0.3125	72																			
0.3750	72				650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650
0.4375	72				650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650
0.5000	72				650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650
0.5625	72				650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650
0.6250	72				650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650
0.6875	72				650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650
0.7500	72				650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650
0.8125	72				650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650
0.8750	72				650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650
1.0000	72				650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650
1.1250	72	INQUIRE			650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650
1.2500	72				650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650
1.5000	72				650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650
1.7500	78				650	650	650	650	650	650	650	650	650	650	650	650	650	636	615	595
2.0000	78				650	650	650	650	650	650	650	650	650	646	621	598	577	557	538	521
2.2500	78				650	650	650	650	650	650	650	650	650	574	552	532	513	495	478	463
2.5000	78				650	650	650	650	650	650	650	650	646	517	497	478	461	445	430	417
2.7500	78				650	650	650	650	650	650	650	650	588	470	452	435	419	405	391	379
3.0000	78				650	650	650	650	650	650	650	650	539	430	414	399	384	371	359	347
3.2500	78				650	650	650	650	650	650	650	650	497	397	382	368	355	342	331	320
3.3333	78				650	650	650	650	650	650	650	650	485	387	372	359	346	334	323	312
3.5000**	78				650	650	650	650	650	650	648	646	462	369	355	342	329	318	307	297
3.7500**	78				624	620	616	613	610	608	605	603	431	344	331	319	307	297	287	278
4.0000**	78				585	581	578	575	572	570	567	565	404	323	310	299	288	278	269	260

\* If the mode of transportation is rail, the minimum length required is 120 inches.

\*\* = Over 3.3333" Thick 2:1 reduction ratio only - NO PVQ

Plates though 1-1/2 inches thick are in minimum lengths of 72 inches. Plates over 1-1/2 inches thick are in minimum lengths of 78 inches.

For thicknesses and widths between the above values, use the shortest length bracketing your entry.

All the values shown may be modified under certain conditions, Inquire for more information.

Inquire all requirements for lengths greater than lengths in table.



# Burns Harbor Plant

## Table J (F6) Q & T

### continued

Structural Grades: ASTM A678, RQC60, 80, 90, 100, A514 Gr B & H  
PVQ Grades: ASTM A517 Gr B & H, A537 Class 2, A709 Gr. HPS 70W

Thickness	Min Lgth*	Width																		
		96	99	102	105	108	111	114	117	120	123	126	129	132	135	138**	141**	144**	147**	150**
<b>0.1875</b>	72																			
<b>0.2500</b>	72				INQUIRE															
<b>0.3125</b>	72																			
<b>0.3750</b>	72	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650				
<b>0.4375</b>	72	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	540
<b>0.5000</b>	72	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650
<b>0.5625</b>	72	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650
<b>0.6250</b>	72	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650
<b>0.6875</b>	72	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650
<b>0.7500</b>	72	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650
<b>0.8125</b>	72	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650
<b>0.8750</b>	72	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650
<b>1.0000</b>	72	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	646
<b>1.1250</b>	72	650	650	650	650	650	650	650	650	650	650	650	650	650	638	624	611	598	586	574
<b>1.2500</b>	72	650	650	650	650	650	650	650	650	646	630	615	601	587	574	562	550	538	527	517
<b>1.5000</b>	72	650	650	633	615	598	582	567	552	538	525	513	501	489	478	468	458	448	439	430
<b>1.7500</b>	78	577	559	543	527	513	499	486	473	461	450	439	429	419	410	401	392	384	376	369
<b>2.0000</b>	78	505	489	475	461	448	436	425	414	404	394	384	375	367	359	351	343	336	329	323
<b>2.2500</b>	78	448	435	422	410	399	388	378	368	359	350	342	334	326	319	312	305	299	293	287
<b>2.5000</b>	78	404	391	380	369	359	349	340	331	323	315	307	300	293	287	281	275	269	263	258
<b>2.7500</b>	78	367	356	345	335	326	317	309	301	293	286	279	273	267	261	255	250	244	239	235
<b>3.0000</b>	78	336	326	316	307	299	291	283	276	269	262	256	250	244	239	234	229	224	219	215
<b>3.2500</b>	78	310	301	292	284	276	268	261	255	248	242	236	231	226	221	216	211	207	202	198
<b>3.3333</b>	78	303	293	285	277	269	262	255	248	242	236	230	225	220	215	210	206	202	197	193
<b>3.5000***</b>	78	288	279	271	263	256	249	243	236	230	225	219	214	209	205	200	196	192	188	184
<b>3.7500***</b>	78	269	261	253	246	239	232	226	221	215	210	205	200	195	191	187	183	179	175	172
<b>4.0000***</b>	78	252	244	237	230	224	218	212	207	202	197	192	187	183	179	175	171	168	164	161

\* If the mode of transportation is rail, the minimum length required is 120 inches.

\*\* If the mode of transportation is rail, an acceptable flat car route is required for lengths greater than 600 inches.

\*\*\* = Over 3.3333" Thick 2:1 reduction ratio only - NO PVQ

Plates though 1-1/2 inches thick are in minimum lengths of 72 inches. Plates over 1-1/2 inches thick are in minimum lengths of 78 inches.

For thicknesses and widths between the above values, use the shortest length bracketing your entry.

All the values shown may be modified under certain conditions, Inquire for more information.

Inquire all requirements for lengths greater than lengths in table.

# Burns Harbor Plant

## High Performance Steel

AASHTO M270 Gr HPS 70W – ASTM A709 Gr HPS 70W – ASTM A709M Gr HPS 485W

Produced: Control Rolled

Thickness	Min Lgth	Width																			
		40	42	45	48	51	54	57	60	63	66	69	72	75	78	81	84	87	90	93	
0.1875																					
0.2500																					
0.3125																					
0.3750									INQUIRE												
0.4375																					
0.5000	500	<div>Note: Actual sizes accepted production are subject to inquiry</div>			1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	
0.5625	500				1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	
0.6250	500				1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,460	
0.6875	500				1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,475	1,450	1,425	1,400	1,375	1,335
0.7500	500				1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,450	1,400	1,520	1,486	1,436	1,390
0.8125	500				1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,420	1,395	1,345	1,310	1,420	1,371	1,326	1,283
0.8750	500				1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,340	1,477	1,420	1,368	1,319	1,273	1,231	1,191
1.0000	500				1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,360	1,292	1,243	1,197	1,154	1,114	1,077	1,042
1.1250	500				1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,225	1,149	1,105	1,064	1,026	990	957	926	
1.2500	500				1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,290	1,034	994	957	923	891	861	834	
1.5000																					
1.7500																					
2.0000																					
2.2500																					
2.5000																					
2.7500																					
3.0000																					
3.2500																					
3.3333																					
3.5000*																					
3.7500*																					
4.0000*																					

Note: Actual sizes accepted production are subject to inquiry

\* = See Table J – Q & T for sizes not available on this chart.

Sizes shown on this chart are produced Control Rolled. Minimum lengths of as shown. See Table J – Q&T for under the minimum.

For thicknesses and widths between the above values, use the shortest length bracketing your entry.

All the values shown may be modified under certain conditions, Inquire for more information.

# Burns Harbor Plant

## High Performance Steel

continued

AASHTO M270 Gr HPS 70W – ASTM A709 Gr HPS 70W – ASTM A709M Gr HPS 485W

Produced: Control Rolled

		Width																		
Thickness	Min Lgth	96	99	102	105	108	111	114	117	120	123	126	129	132	135	138	141	144	147	150
0.1875																				
0.2500																				
0.3125																				
0.3750									INQUIRE											
0.4375																				
0.5000	500	1,500	1,500	1,400	1,400	1,400	1,400	1,400	1,400	1,400										
0.5625	500	1,500	1,500	1,480	1,440	1,400	1,360	1,320	1,290	1,260										
0.6250	500	1,410	1,370	1,330	1,300	1,260	1,220	1,190	1,160	1,130										
0.6875	500	1,280	1,240	1,205	1,175	1,140	1,105	1,075	1,045	1,015										
0.7500	500	1,346	1,300	1,267	1,230	1,197	1,164	1,134	1,100	1,070										
0.8125	500	1,243	1,205	1,170	1,136	1,105	1,075	1,046	1,020	994										
0.8750	500	1,154	1,119	1,086	1,055	1,026	998	972	947	923										
1.0000	500	1,010	979	950	923	897	873	850	828	808										
1.1250	500	897	870	845	820	798	776	756	736	718										
1.2500	500	808	783	760	738	718	698	680	663	646										
1.5000																				
1.7500																				
2.0000																				
2.2500																				
2.5000																				
2.7500																				
3.0000																				
3.2500																				
3.3333																				
3.5000*																				
3.7500*																				
4.0000*																				

\* = See Table J – Q & T for sizes not available on this chart.

Sizes shown on this chart are produced Control Rolled. Minimum lengths of as shown. See Table J – Q&T for under the minimum.

For thicknesses and widths between the above values, use the shortest length bracketing your entry.

All the values shown may be modified under certain conditions, Inquire for more information.

# Physical Properties of Steel

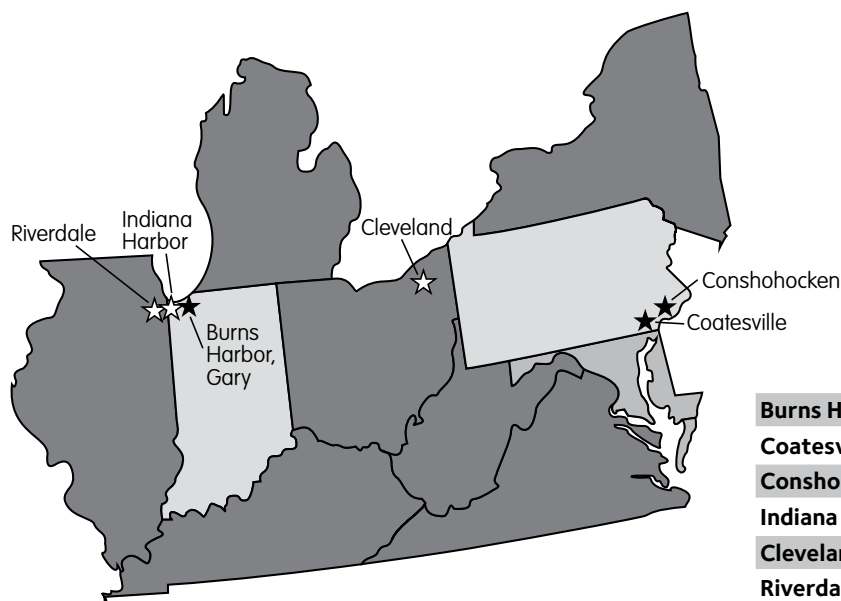
ITEM	ENGLISH UNITS	METRIC UNITS
Specific Gravity	7.9	7.9
Density	490 lb/ft <sup>3</sup> (.2836 lb/in <sup>3</sup> )	7850 kg/m <sup>3</sup>
Melting Point	2370°F–2640°F	1300°C–1450°C
Specific Heat	0.12 $\frac{\text{Btu}}{(\text{lb})(^{\circ}\text{F})}$	0.12 $\frac{(\text{Cal})}{(\text{gr})(^{\circ}\text{C})}$
Linear Coefficient of Thermal Expansion	$6.5 \times 10^{-6} \frac{1}{^{\circ}\text{F}}$	$(11.7) \times 10^{-6} \frac{1}{^{\circ}\text{C}}$
Volumetric Coefficient of Thermal Expansion	$19.5 \times 10^{-6} \frac{1}{^{\circ}\text{F}}$	$(35.1) \times 10^{-6} \frac{1}{^{\circ}\text{C}}$
Thermal Conductivity at 60°F	$\frac{34 (\text{Btu})}{(\text{hr})(\text{ft})(^{\circ}\text{F})}$	58.9W/(m)(K)
Electrical Resistivity at 60°F		$17 \times 10^{-8}$ (ohm-meters)
Speed of Sound through Steel	18,000 ft/sec	5490 m/sec
Young's Modulus of Elasticity	29,000,000 lb/(in) <sup>2</sup>	207,000 MPa
Poisson's Ratio, 0.3 in the elastic range and 0.5 in the plastic range		
Bulk Modulus	23,000,000 lb/(in) <sup>2</sup>	159,000 MPa
Shear Modulus	12,000,000 lb/(in) <sup>2</sup>	83,000 MPa
Emissivity of Polished Metal Surface	.07 @ 100°F .10 @ 500°F .14 @ 1000°F	.07 @ 38°C .10 @ 260°C .14 @ 540°C
Emissivity of Oxidized Steel Plate at 60°F	0.80	0.80

The properties listed above vary with the chemistry of the steel plate.

The values shown are typical for non-alloy plate grades.

If more accuracy is required, refer to a physics handbook.

## ArcelorMittal USA Plate Production Locations



	Steelmaking (Slab Supply)	Rolling	Heat Treatment
Burns Harbor	■	■	■
Coatesville	■	■	■
Conshohocken		■	■
Indiana Harbor	■		
Cleveland	■		
Riverdale	■	■	

# Hardness Conversion Table

Based on ASTM A370 Tables 2, 3 and 6

Diameter of Indentation of 10mm Ball, mm	HBW (3000 kgf)	Interpolated Tensile Strength (ksi)	Interpolated Rockwell C Scale	Interpolated Rockwell B Scale
2.50	601	329	57	
2.55	578	314	56	
2.60	555	298	55	
2.65	534	288	54	
2.70	514	275	52	
2.75	495	263	51	
2.80	477	252	50	
2.85	461	242	48	
2.90	444	230	47	
2.95	429	219	46	
3.00	415	212	45	
3.05	401	202	43	
3.10	388	193	42	
3.15	375	184	40	
3.20	363	178	39	
3.25	352	170	38	
3.30	341	164	37	
3.35	331	158	35	
3.40	321	153	34	
3.45	311	149	33	
3.50	302	146	32	
3.55	293	141	31	
3.60	285	138	30	
3.65	277	134	29	
3.70	269	130	28	
3.75	262	127	27	
3.80	255	124	25	
3.85	248	120	24	
3.90	241	116	23	100
3.95	235	114	22	99
4.00	229	111	21	98
4.05	223	105		97
4.10	217	101		96
4.15	212	99		95
4.20	207	98		94
4.25	201	95		93
4.30	197	93		92
4.35	192	91		91
4.40	187	89		90
4.45	183	89		90
4.50	179	88		89
4.55	174	85		88
4.60	170	83		86
4.65	167	83		86
4.70	163	81		84
4.75	159	80		83
4.80	156	77		82
4.85	152	73		81
4.90	149	71		80
4.95	146	70		79
5.00	143	69		78
5.05	140	68		77
5.10	137	66		75
5.15	134	65		74
5.20	131	64		73
5.25	128	62		71
5.30	126	62		71
5.35	123	60		69
5.40	121	59		68
5.45	118	58		67
5.50	116	56		65

\* This table gives the approximate interrelationships of hardness values and approximate tensile strength of steels. It is possible that steels of various compositions and processing histories will deviate in hardness-tensile strength relationship from the data presented in this table. The data in this table should not be used for austenitic stainless steels, but have been shown to be applicable for ferritic and martensitic stainless steels. The data in this table should not be used to establish a relationship between hardness values and tensile strength of hard drawn wire. Where more precise conversions are required, they should be developed specially for each steel composition, heat treatment, and part. Caution should be exercised if conversions from this table are used for acceptance or rejection of product. The approximate interrelationships may affect acceptance or rejection.

# Plate Markets and Products

## Markets

	Burns Harbor, IN/Gary, IN	Conshohocken, PA	Coatesville, PA
Bridges	■	■	■
Construction & Agricultural Machinery	■	■	■
Industrial Machinery	■	■	■
Mining Machinery	■	■	■
Offshore Platforms	■		■
Oil and Gas Pipelines	■		
Rail Car Industry	■	■	■
Shipbuilding (Barges, Navy Ships)	■	■	■
Storage Tanks	■	■	■
Transmission Poles	■		■
Wind Towers	■	■	■

## Products

Aircraft Quality Steels		■	■
ASTM Grades	■	■	■
Cryogenic Steels		■	■
Flame Cut Shapes		■	■
Free Machining Steels		■	■
General Purpose Heat Treat Products	■	■	■
General Purpose Structural Grades	■	■	■
High Strength Steels	■	■	■
Military Alloys		■	■
Mold, Tool and Die steels		■	■
Nuclear Grades	■	■	■
Premium Abrasion Steels		■	■
Proprietary Grades	■	■	■
Safety Floor Plate		■	
Weathering Steels	■	■	■

For more information about ArcelorMittal USA and continuous updates, visit our web site at: [usa.arcelormittal.com/plate/](http://usa.arcelormittal.com/plate/).

The following product brochures are available at [usa.arcelormittal.com/plate/](http://usa.arcelormittal.com/plate/) in the USA Flat Products Plate Brochure section of the website. If you need assistance in finding these brochures, please contact Customer Technical Service at 610-383-3372.

Abrasion Resistant Steels – 400 – 500 HB (Hardwear®)  
Abrasion Resistant Steels – As-Rolled 235 HB  
Abrasion Resistant Steels – Summary  
Control-Rolled High Strength Steels (BethStar®)  
Cryogenic Steels – 9% Nickel Steel  
Flame-Cut Products  
Free-Machining Steels (Clean-Cut® and C1119™/C1144™)  
High Performance Bridge Steels – 50 ksi (345 MPa) Y.S. (HPS 50W)  
High Performance Bridge Steels – 70 ksi (485 MPa) Y.S. (HPS 70W)  
High Performance Bridge Steels – 100 ksi (690 MPa) Y.S. (HPS 100W)  
High Performance Bridge Steels – Update  
High Strength Structural Steels – 100 ksi (690 MPa) Y.S. (A514, A517 and T-1®)  
High Strength Structural Steels – 130 ksi (900 MPa) Y.S. (LQ-130)  
High Strength Structural Steels – Improved Weldability (Spartan™)  
Laser Cutting Steels (LASEReady™)  
Linepipe Plate  
Low Sulfur, Clean Steels (Fineline®)  
Magnet Plate Steels  
Military Alloy Steels  
Mill Edge Plate  
Mold, Tool and Die Steels (MTD®)  
Offshore Platform Structural Steels (API)  
Physical Properties of Steel  
Plate Fabrication Guide  
Pipe Datasheet  
Pipe for Energy  
Pressure Vessel Steels – A516 and A387  
Safety, Floor Plate Steels (Sure-Foot®)  
Stainless Steel – 12% Chromium (Duracorr®)  
Stainless Steel – 12% Chromium – Abrasion Resistant Steels – 300 HB  
Stainless Steel – 12% Chromium – Fabrication Guidelines – Bridges  
Stainless Steel – 12% Chromium – Welding Guidelines  
Steckel Rolled Steels (SMART™)  
Weathering Steels (Cor-Ten®)  
Wind Tower Applications

The information contained herein has been obtained from current proprietary and published specifications and is accurate to the best of our knowledge. However, the characteristics described or implied here may not apply in all situations. Where specific plate properties are desired, please communicate with ArcelorMittal USA.

The specifier should recognize further that all mechanical and chemical tests, relating to a particular specification, will be in accordance with policy and test locations. Unless otherwise specified, test locations will be in accordance with those defined in the latest “Plates and Rolled Floor Plates: Carbon, High Strength Low Alloy and Alloy” (Steel Products Manual)\* and ArcelorMittal USA can certify the values stated in this bulletin for only the locations in which the material is tested.

Since the specifications and codes change frequently, this information should be checked against the latest standards to insure accuracy.

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