



Indiana

Hot Rolled Sheet Products



Hot Rolled Sheet Product Offering

Hot Rolled Standard Product Offerings

ASTM A1011 / A1018 Commercial Steel (Type B)

ASTM A1011 Grade 36 (Type 1 & 2) / ASTM A36 Structural Steel

ASTM A1011 / A1018 HSLA Grade 50 / 50F (Class 1 & 2)

ASTM A1011 / A1018 HSLA Grade 55 / 55F (Class 1 & 2)

ASTM A1011 / A1018 HSLA Grade 60 / 60F (Class 1 & 2)

ASTM A1011 / A1018 Structural Steel Grade 30 & 50

ASTM A139 Grades A & B (Electric-Fusion (Arc)-Welded Steel Pipe NPS > 4)

ASTM A252 Grades 2 & 3 (Welded Steel Pipe Pilings)

ASTM A500 Grades B & C (Cold Formed Welded Structural Tubing – Rounds, Shapes)

ASTM A516 Grade 70 (PVQ)

ASTM A572 Grades 50 through 65 (HSLA Cb / V Structural Steel)

ASTM A606 Type 4 / A588 (Weathering Steel)

API 5L / 5CT – J55 & P110 (OCTG Line Pipe, Casing & Tubing)

ASTM A414 Grade G & Grade C (PVQ)

CSA G40.21 (Canadian Spec for Welded SQ Steel)

High Carbon Steels (SAE 1035 through 1095)

Alloy Steels (4130, 4140, 5120)

Manganese-Bearing Steels (15B23 heat treatable, 1526 & 1527)



Hot Rolled Sheet Product Offering

<i>ASTM Designation</i>	<i>SAE Designation</i>	<i>Hardness</i>	<i>Yield Strength</i>	<i>Tensile Strength</i>	<i>Elongation</i>	<i>Applied Grade</i>
-------------------------	------------------------	-----------------	-----------------------	-------------------------	-------------------	----------------------

HR Commercial Steels

A1011, A1018

Type A		75 RB Max	30 / 50 ksi	NA	25% Min	1008, 1012
Type B		75 RB Max	30 / 50 ksi	NA	25% Min	1008, 1012
Type C		75 RB Max	30 / 50 ksi	NA	25% Min	1008, 1012

HR Structural Steels

A1011, A1018, A635

Grade 30			30 ksi Min	49 ksi Min	21-25% Min	1008, 1010, 1012
Grade 33			33 ksi Min	52 ksi Min	18-23% Min	1008, 1010, 1012
Grade 36 (Type 1)			36 ksi Min	53 ksi Min	17-22% Min	1010, 1012
Grade 36 (Type 2)			36 ksi Min	58 / 80 ksi	16-21% Min	1012 - 1026
Grade 40			40 ksi Min	55 ksi Min	15-21% Min	1015, 1018, 1021
Grade 45			45 ksi Min	60 ksi Min	13-19% Min	1018, 1021
Grade 50			50 ksi Min	65 ksi Min	11-17% Min	1021
Grade 55			55 ksi Min	70 ksi Min	9-15% Min	1026

API Welded Line Pipe & Tube

American Petroleum Institute Specification 5L

API 5L X42			42 ksi Min			Inquire
API 5L X46			46 ksi Min			Inquire
API 5L X52			52 ksi Min			C572

API Welded Casing & Tubing

American Petroleum Institute Specification 5CT

API 5CT J55			55 / 80 ksi	75 ksi Min	See Spec	1022
-------------	--	--	-------------	------------	----------	------

Pressure Vessel Quality

A414

Grade C			33 ksi Min	55 / 70 ksi	19-22% Min	1010, 1012
Grade G			45 ksi Min	75 / 95 ksi	13-16% Min	1022



Hot Rolled Sheet Product Offering

<i>ASTM Designation</i>	<i>SAE Designation</i>	<i>Hardness</i>	<i>Yield Strength</i>	<i>Tensile Strength</i>	<i>Elongation</i>	<i>Applied Grade</i>
-------------------------	------------------------	-----------------	-----------------------	-------------------------	-------------------	----------------------

HR High Strength Low Alloy Steels (HSLAS)

A1011, A1018, A572 J1392 / J2340

Grade 45 (Class 1)	045YK		45 ksi Min	60 ksi Min	23-25% Min	Inquire
Grade 45 (Class 2)	045XK		45 ksi Min	55 ksi Min	23-25% Min	Inquire
Grade 50 (Class 1)	050YK		50 ksi Min	65 ksi Min	20-22% Min	V572, C572
Grade 50 (Class 2)	050XK		50 ksi Min	60 ksi Min	20-22% Min	V572, C050
Grade 55 (Class 1)	055YK		55 ksi Min	70 ksi Min	18-20% Min	V572, C572
Grade 55 (Class 2)	055XK		55 ksi Min	65 ksi Min	18-20% Min	V572, C572
Grade 60 (Class 2)	060XK		60 ksi Min	70 ksi Min	16-18% Min	V572, V080
Grade 70 (Class 2)	070XK		70 ksi Min	80 ksi Min	12-14% Min	V572

* Gr 70 limited on maximum capable gauge.

* A1018 applies > 48 in, 0.180 - 0.625 in.

HR High Strength Low Alloy Steels Improved Formability (HSLA-F)

A1011

As Above	YF, XF, YLF, XLF		As Above	As Above	As Above	As Above
----------	------------------	--	----------	----------	----------	----------

* Improved formability achieved via sulfur concentration (0.010 Max) or calcium treatment for inclusion shape control.

HSLA Columbium or Vanadium Structural Steel

A572

Grade 50			50 ksi Min	65 ksi Min	21% Min	C572, V572
Grade 55			55 ksi Min	70 ksi Min	20% Min	C572, V572
Grade 60			60 ksi Min	75 ksi Min	18% Min	C572, V572
Grade 65			65 ksi Min	80 ksi Min	17% Min	C572, V572

High Strength Low Alloy Steel with Improved Atmospheric Corrosion Resistance (Weathering Steel)

A588, A606

Grades A, B, & K			50 ksi Min	70 ksi Min	22% Min	V588
------------------	--	--	------------	------------	---------	------



Hot Rolled Sheet Product Offering

Hot Rolled Specialty Product Offerings

SAE 1050 / 1055 (HR and CR Applications)

C .50/.54 Mn .62/.72 Si .15/.25 S .010 Max Cr .10/.25

SAE 1070 / 1074 (HR and CR Applications)

C .70/.74 Mn .52/.62 Si .15/.25 S .010 Max Cr .10/.25

SAE 1095 (HR and CR Applications)

C .93/.98 Mn .30/.50 Si .15/.25 S .010 Max Cr .10/.25

SAE 4130 Alloy (Including product for CR Aircraft Quality Certification)

C .29/.32 Mn .45/.60 Si .15/.30 S .010 Max Cr .80/1.10 Mo .15/.25

SAE 4140 Alloy (HR and CR Applications)

C .39/.42 Mn .75/1.00 Si .15/.30 S .012 Max Cr .80/1.10 Mo .15/.25

ASTM A606 / A588 Weathering Steels (CR Applications – Internal Grade V588)

C .05/.07 Mn .90/1.10 Si .35/.45 S .020 Max Cr .40/.65 P .006/.040 Cu .35/.40 V .05/.07

10B38 Steels (HR Cutting Blade Applications)

C .37/.39 Mn .75/.90 Si .15/.25 S .010 Max P .006/.040 Ti .03/.07 N .010 Max B .0015/.0030

NOTE: Melt Shop practice is to add Ti at LMF first to scavenge N prior to B addition. Ti:N ratio is maintained.



Hot Rolled Sheet Product Offering

Hot Rolled Specialty Product Offerings

Clean Steel Grades

S .005% Max

AR200 Abrasion Resistant Steels

High Mn, Medium C, Cu-Bearing Steel

Manganese-Bearing Steels (15B23 heat treatable, 1526 & 1527)

Boron-Treated LC Steels (Counteract Effect of Higher Residuals)

Low-Si 1050 Steel (1S50 internal Grade)

Silicon-Killed Chemistries

Al .010 max

MIL-A-12560H Armor Plate (Military Vehicle Body Panel Ballistic Inserts)