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IRON ORE
STEEL BILLETS
HOT ROLLED STEEL COILS
COLD ROLLED STEEL COILS (CR, PO, GS, ES)
CONSTRUCTION STEELS (WIRE RODS, DEFORMED BARS, SECTION STEELS)





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COMPANY INTRODUCTION

STAVIAN INDUSTRIAL METAL JOINT STOCK COMPANY

Stavian Industrial Metal Joint Stock Company was established on June 18, 2021, with new directions and the desire to conquer new peaks, to build a vibrant – transparent industrial metal materials market, towards the goal of sustainable development.

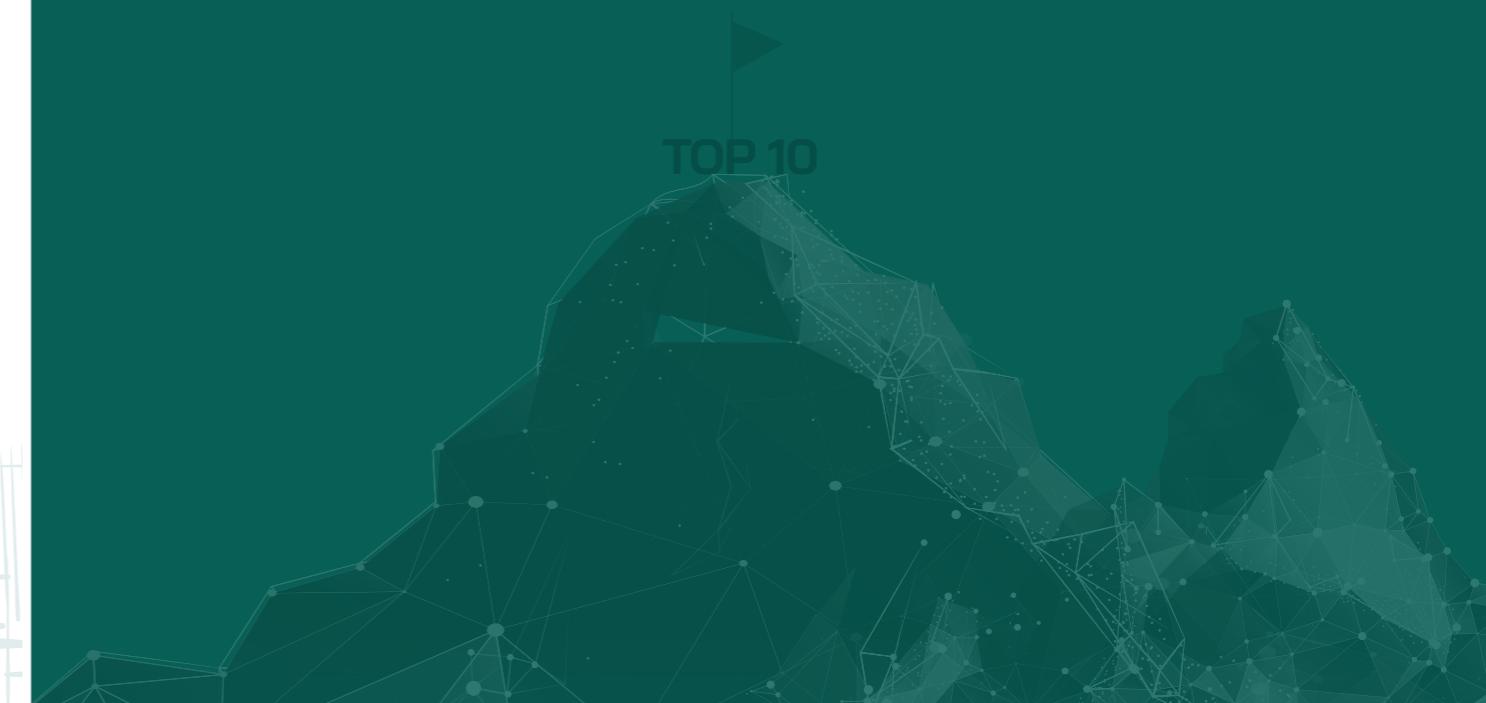


The strong capability, strong financial foundation and professional sales solutions customized specifically for each customer have created a distinct advantage and solid foundation for Stavian Industrial Metal to make a breakthrough in the commercial market of industrial metal materials.

The system of offices and warehouses in Hanoi, Hai Phong, and Ho Chi Minh City along with a strong domestic distribution network, reputable partners in more than 100 countries and 30 branches around the world help Stavian Industrial Metal become a leading trading company, with the ability to quickly provide all products to domestic customers and promote exports to international markets.

Therefore, Stavian Industrial Metal is increasingly receiving the trust of major partners in the industry, gradually affirming its position as a large-scale industrial metal materials trading company, not only serving the ecosystem of the group, but also has full capacity to supply materials for large-scale projects inside and outside the country, bringing Vietnam's building material products to the world.

Stavian Industrial Metal sets the goal by 2028 to become one of the Top 10 largest industrial metal materials trading companies in Southeast Asia.



IRON ORE



1 | IRON ORE

Stavian Industrial Metal.,JSC is a large-scale trading company, offers a wide range of iron ore originating from Southeast Asia. Our natural ore is rich with Fe content from 60.0% up to 68.0%, and very low impurities. All of the tests are done and certified by SGS.

In addition to great quality, our company is also committed to abundant reserves; with a minimum supplying capacity of 200,000MTs monthly, both lumps & fines sizes. We also focus on improving the infrastructure by making new roads, building our own wharves.

Standard substances	Percentage
Fe	60.0 – 68.0%
SiO ₂	~ 0.87%
Al ₂ O ₃	~ 0.59%
P	~ 0.011%
S	~ 0.12%
CaO	~ 0.055%
MgO	~ 0.88%
FeO	~ 11.18%
Zn	~ 0.017%
Pb	~ 0.002%
LOI	~ 0.077%
Moisture	~ 0.33%
Physical Sizes	Normal Lump & Fine sizes
REMARK:	
Sustainability is one of the key factors we are concentrating on every business decision. We are environment responsible and also pay attention to local communities.	
* The above numbers are based on Lump tests.	

STEEL BILLETS



2 | STEEL BILLETS

2.1 | PRODUCT FEATURES

Steel billets distributed by Stavian Industrial Metal,JSC are manufactured in large-scale factories, invested in building a closed and synchronous production complex to create a continuous chain in the production of billets and finished steel.

Category	Value
Size	Nominal section area: 120×120mm, 130×130mm, 150×150mm Length: 6/12m
Grade	3SP, 5SP, SD295(A)...
Standard	JIS, ASTM, BS, TCVN...

2.2 | SPECIFICATIONS

Chemical Compositions									
No.	Grades	%C	%Si	%Mn	%P	%S	%Cu	%Cr	%Ni
1	3SP	0.12-0.25	0.15-0.35	0.37-0.7	0.05 max	0.05 max	0.3 max	0.3 max	0.3 max
2	SD295A	0.2-0.32	0.15-0.35	0.50-0.80	0.05 max	0.05 max	0.3 max	0.3 max	0.3 max
3	5SP	0.23-0.37	0.15-0.35	0.50-0.80	0.05 max	0.05 max	0.3 max	0.3 max	0.3 max

- We are able to provide the steel billets with the chemical properties and dimension upon the customers' request and accordance with the international standards.



HOT ROLLED STEEL COILS



3 | HOT ROLLED STEEL COILS

3.1 | PRODUCT FEATURES

Stavian Industrial Metal.,JSC provides a full range of hot rolled steel products in coils, plates, a full range of common steel grades.

The products provided by Stavian Industrial Metal.,JSC are manufactured from prestigious global factories such as Hoa Phat, Formosa, TATA Steel, Nippon Steel, Hyundai Steel, Baotou, Shangchen Steel...

Category	Value
Coil	03 - 16mm in thickness
Plate	03 - 40mm in thickness and cut-to-order
Grade	SS400, Q235B, Q355B, A572, 1004...
Standard	JIS, ASTM, SAE, TIS, EN, MS, GB...

3.2 | SPECIFICATIONS

Chemical Composition & Mechanical Properties

1 SAE J403 Carbon Steel

Chemical Compostion (wL%)				
Grade	C	Mn	P	S
1004	0.02-0.08	0.35 max	0.030 max	0.035 max
1006	0.08 max	0.45 max	0.030 max	0.035 max
1008	0.10 max	0.50 max	0.030 max	0.035 max
1010	0.08-0.13	0.30-0.60	0.030 max	0.035 max
1012	0.10~0.15	0.30-0.60	0.030 max	0.035 max
1017	0.15~0.20	0.30-0.60	0.030 max	0.035 max

REMARK:

Residueal element Cu, Ni, Cr, Mo.

2 JIS G 3101 Rolled Steels for General Structure

Grade	Chemical Compositions (wt.%)					Tensile Test					Bendability ⁽²⁾				
						Yield Strength N/mm ²		Tensile Strength N/mm ²	Thickness (t) mm	Test piece	Elongation %	Angle of Bending	Inside Radius	Test Piece	
						Thickness (t) mm									
C	Si	Mn	P	S	t≤16	16 ≤ t ≤ 40									
SS400	—	—	—	—	0.050 max	0.050 max	245 min	235 min	400~510	t≤5	No.5	21 min	180	1.5×t	No.1
										5< t ≤ 16	No.1A	17 min			
										16< t ≤ 50	No.1A	21 min			
SS490	—	—	—	—	0.050 max	0.050 max	285 min	275 min	490~610	t≤5	No.5	19 min	180	2.0×t	No.1
										5< t ≤ 16	No.1A	15 min			
										16< t ≤ 50	No.1A	19 min			

REMARK:

- Alloy elements other than those shown in the above table may be added as necessary.
- Bending test may be omitted, based on the bending performance specification requirements can be achieved by the manufacturer.

3 JIS G 3131 Hot-Rolled Mild Steel Plate, Sheet and Strip

Grade	Chemical Compositions (wt.%)					Tensile Test ⁽¹⁾					Bendability ⁽²⁾						
						Tensile Strength N/mm ²	Elongation %				Test Piece ⁽³⁾	Angle of Bending	Inside Radius	Test Piece ⁽³⁾			
							Thickness (t) mm										
C	Si	Mn	P	S		1.2≤ t <1.6	1.6≤ t <2.0	2.0≤ t <2.5	2.5≤ t <3.2	3.2≤ t <4.0	4.0≤ t						
SPHC	0.12 max	—	0.60 max	0.045 max	0.035 max	270 min	27 min	27 min	29 min	29 min	31 min	31 min	No.5	180	Flat on itself	0.5×t	No.3

REMARK:

- The values specified shall not apply to the irregular portions at both ends of steel strip.
- Bending test may be omitted, based on the bending performance specification requirements can be achieved by the manufacturer.
- The length of the Test Piece is parallel to the rolling direction



4 JIS G 3132 Hot-Rolled Carbon Strip for Pipes and Tubes

Grade	Chemical Compositions (wt.%)					Tensile Test ⁽¹⁾					Bendability ⁽²⁾					
						Tensile Strength N/mm ²	Elongation %				Test Piece ⁽³⁾	Angle of Bending	Inside Radius	Thickness (t) mm		
							1.2≤ t <1.6	1.6≤ t <3.0	3.0≤ t <6.0	6.0≤ t <13						
C	Si	Mn	P	S												
SPHT1	0.10 max	0.35 max	0.50 max	0.040 max	0.040 max	270 min	30 min	32 min	35 min	37 min				Flat on itself	0.5×t	
SPHT2	0.18 max	0.35 max	0.60 max	0.040 max	0.040 max	340 min	25 min	27 min	30 min	32 min	No.5	180		1.0×t	1.5×t	No.3
SPHT3	0.25 max	0.35 max	0.30 ~0.90	0.040 max	0.040 max	410 min	(20) ⁽⁴⁾ min	22 min	25 min	27 min				1.5×t	2.0×t	

REMARK:

- The values specified shall not apply to the irregular portions at both ends of steel strip.
- Bending test may be omitted, based on the bending performance specification requirements can be achieved by the manufacturer.
- Test Piece will be in rolling direction.
- The values in parentheses are the referential values and may be applied under the agreement between the manufacturer and the purchaser.

5 ASTM A1011 Carbon steel, structural steel, high-strength low-alloy steel

Grade	Chemical Compositions (wt.%)														
	C	Mn	P	S	Al	Si	Cu(1)	Ni	Cr(2)	Mo	V	Nb	Ti(3)	N	B
CS Type B	0.02 ~0.15 max	0.60 max	0.030 max	0.035 max	-	-	0.20 max	0.20 max	0.15 max	0.06 max	0.008 max	0.008 max	0.025 max	-	-
SS Grade 33	0.25 max	0.90 max	0.035 max	0.04 max	-	-	0.20 max	0.20 max	0.15 max	0.06 max	0.008 max	0.008 max	0.025 max	-	-
SS Grade 36 Type1	0.25 max	0.90 max	0.035 max	0.04 max	-	-	0.20 max	0.20 max	0.15 max	0.06 max	0.008 max	0.008 max	0.025 max	-	-
SS Grade 36 Type2	0.25 max	1.35 max	0.35 max	0.04 max	-	-	0.20 max	0.20 max	0.15 max	0.06 max	0.008 max	0.008 max	0.025 max	-	-

REMARK:

- When copper-containing steel is required, the minimum value is 0.20%. When copper-containing steel is not required, the specified value is the maximum value.
- When the carbon content is ≤ 0.05%, the manufacturer may allow the maximum content of Cr to be 0.25%.
- When the carbon content is 0.02%, the manufacturer can add Ti but it shall be less than or equal to 0.025% or less than (3.4N + 1.5S).

Grade	Tensile Test							Bendability					
	Yield Strength N/mm ²	Elongation %			Test Piece	Inside radius		Thickness (t) mm	Thickness (t) mm	Thickness (t) mm			
		Gauge length 2in. (50mm)				Thickness (t) mm							
		0.65≤ t <1.6	0.65≤ t <1.6	2.5≤ t <6.0		0.65≤ t <1.6	0.65≤ t <1.6	2.5≤ t <6.0					
CS Type B	205~340	-		25 min	25 min	25 min							

Grade	Chemical Compositions (wt.%)							
	C	Si	Mn	P	S	N	Cu	CEV
S235JR	0.17 max	0.17 max	1.40 max	0.035 max	0.035 max	0.012 max	0.55 max	0.35 max
S235J0	0.17 max	0.17 max	1.40 max	0.030 max	0.030 max	0.012 max	0.55 max	0.35 max
S275JR	0.21 max	0.21 max	1.50 max	0.035 max	0.035 max	0.012 max	0.55 max	0.40 max
S355JR	0.24 max	0.24 max	1.60 max	0.035 max	0.035 max	0.012 max	0.55 max	0.45 max
S355J0	0.20 max	0.20 max	1.60 max	0.030 max	0.030 max	0.012 max	0.55 max	0.45 max
S355J2	0.20 max	0.20 max	1.60 max	0.025 max	0.025 max	-	0.55 max	0.45 max

Grade	Tensile test (Perpendicular to rolling direction)								Impact Test			
	Yield strength N/mm ²		Tensile strength N/mm ²		Elongation %			Gauge length = 80mm	Gauge length = 5.65 $\sqrt{S_0}$	Test temper- ature °C	Absor- bed energy J	Test Piece
					Thickness (t) mm							
	t < 16	16 < t < 25	t < 3	3 < t < 25	1 < t < 1.5	1.5 < t < 2	2 < t < 2.5	2.5 < t < 3	3 < t < 25			
	235 min	225 min	360~510	360~510	16 min	17 min	18 min	19 min	24 min	20	27 min	
S235JR	235 min	225 min	360~510	360~510	16 min	17 min	18 min	19 min	24 min	20	27 min	Parallel to rolling direction
S235J0	235 min	225 min	360~510	360~510	16 min	17 min	18 min	19 min	24 min	0	27 min	
S275JR	275 min	265 min	430~580	310~560	14 min	15 min	16 min	17 min	21 min	20	27 min	
S355JRt	355 min	345 min	510~680	470~630	13 min	14 min	15 min	16 min	20 min	20	27 min	
S355J0	355 min	345 min	360~510	470~630	13 min	14 min	15 min	16 min	20 min	0	27 min	
S355J2	355 min	345 min	360~510	470~630	13 min	14 min	15 min	16 min	20 min	20	27 min	

REMARK:1. S₀ represents the cross-sectional area of the test piece.

2. Impact test is applicable to products with a thickness of 6mm or more.

**3.2.3 | MARKING AND PACKING****3.2.3.1 | MARKING**

Products distributed by Stavian Industrial Metal.,JSC are labeled with the genuine manufacturer's mark.

Label of Hot-Rolled steel products is attached to the inner round of the coil.

The parameters shown on the label including:

1	Manufacturer Information
2	Product Name
3	Specification
4	Steel Grade
5	Size
6	Coil ID
7	Net Weight
8	Gross Weight
9	Production Date
10	Surface Quality
11	Heat Number
12	Product Barcode
13	End User
14	Product Certification Mark

3.2.3.2 | PACKING

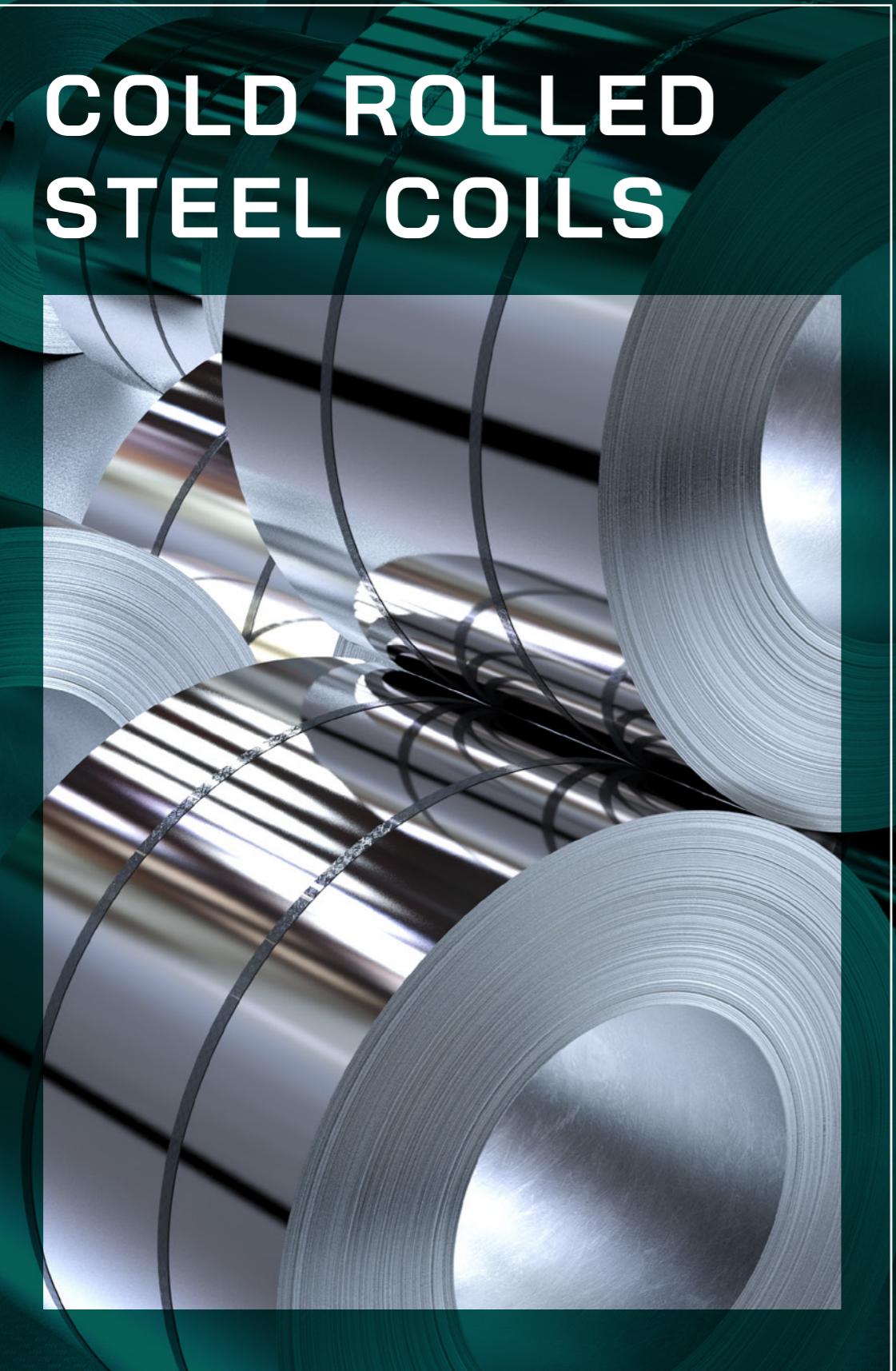
Packing catalog		
Thickness (T) ≤ 3.0 mm	Thickness (T) > 3.0 mm ⁽¹⁾	
The angle of the steel strap in the direction of the eye of the steel coil is 90°	The angle of the steel strap in the direction of the eye of the steel coil is 180°	

REMARK:

1. According to thickness and width of different orders, increase the number of Eye banding strap and Circle banding strap on the corresponding thickness and width.

2. Marking instructions: 1: Eye banding strap, 2: Circle banding strap, 3: Seal.

3. The above packaging is based on FHS packaging policy.



COLD ROLLED STEEL COILS

4 | COLD ROLLED STEEL COILS

4.1 | PRODUCT FEATURES

Stavian Industrial Metal.,JSC provides a full range of cold rolled steel products from coils, sheets in many common grade SPHC, SPCC,...to coated products Galvanized, Galvalume, Pre-painted,...

Besides, we also supply sheet & coil products in primary and secondary type from big factories in the world such as Hyundai Steel, Nippon Steel...

Category	Value
Coil	0.2 - 6 mm in thickness
Plate	Cut-to-order
Type	Cold rolled coil (CR), galvanized coil (CG), electromagnetic coil (ES), pickled and Oiled Coil (PO) secondary steel coils and sheets
Standard	JIS, ASTM, EN, SAE, JFS, ISO, AS...

4.2 | SPECIFICATIONS

4.2.1 | COLD ROLLED STEEL COILS

1 JIS G3141 Cold Reduced Carbon Steel Sheet and Strip

Specification		JIS G3141					
Symbol of Class		SPCC	SPCT ^b	SPCD	SPCE	SPCF ^d	SPCG ^d
Chemical Composition ^a %	C max	0.15		0.10	0.08	0.06	0.02
	Si max	-		-	-	-	-
	Mn max	0.60		0.50	0.45	0.45	0.25
	P max	0.10		0.040	0.030	0.030	0.020
	S max	0.035		0.035	0.030	0.030	0.020
Tensile Test ^c Thickness (t)mm	Tensile Strength ^a N/mm ² (min)	0.30≤t	-	270	270	270	270
	Yield Point N/mm ² (max)	0.30≤t	-	-	(240)	(220)	(210)
	Elongation % (min)	0.30≤t<0.40	-	31	33	35	-
		0.40≤t<0.60	-	34	36	38	40
		0.60≤t<1.00	-	36	38	40	42
		1.00≤t<1.60	-	37	39	41	43
		1.60≤t<2.50	-	38	40	42	44
	The average ratio of plastic strain r ^e	0.50≤t≤1.00	-	-	-	-	1.5 min
		1.00<t≤1.60	-	-	-	-	1.5 min
Bend Test ^f	Bend Angle		(180 ^o)				
	Radius of Inside Surface		Flat on Itself				

REMARK:

- Alloying elements other than those specified in the above table can be added as necessary.
- The tensile test value is guaranteed for those SPCC.
- For those under 0.60mm in thickness, the tensile test shall generally be omitted.
- SPCF and SPCG shall be guaranteed for non-ageing property for six months after shipment from the manufacturer's factory.
- The upper limit of yield point or proof stress in parenthesis is informative and can be applied when agreed upon between the purchaser and the supplier.
- The test for bendability may be omitted. However, when designated by the purchaser, the test shall be performed.

2 ASTM A1008 Cold Rolled Low Carbon and High-Strength Steel-Alloy with Improved Formability, Solution Hardened and Bake Hardenable Steel Sheet

Classification	CS TYPE			DS TYPE		DDS ^{f,g}	EDDS ^j
Symbol	A ^{d,e,f,g}	B ^d	C ^{d,e,f,g}	A ^{e,j}	B		
Chemical Composition %	C	0.10 max	0.02~0.15	0.08 max	0.08 max	0.06 max	0.02 max
	Mn max	0.6		0.5		0.5	0.4
	P max	0.025		0.1		0.02	0.02
	S max	0.035		0.02		0.025	0.02
	Al min	a		0.01	0.02	0.01	0.01
	Si	a					
	Cu max	0.20 ^h		0.2		0.2	0.1
	Ni max	0.2		0.2		0.2	0.1
	Cr max b	0.15		0.15		0.15	0.15
	Mo max	0.06		0.06		0.06	0.03
	V max	0.008		0.008		0.008	0.1
	Nb max	0.008		0.008		0.008	0.1
	Ti max c	0.025		0.025		0.025	0.15
	N	a					

REMARK

- Where an ellipsis (...) appears in the table, though no specified, the analysis result shall be reported.
- Chromium is permitted, at the purchaser's option, to 0.25% maximum when the carbon content is less than or equal to 0.05%.
- For steels containing 0.02% or more carbon, titanium is permitted at the producer's option, to the lesser of 3.4N+1.5S or 0.025%.
- When an aluminum deoxidized steel is required for the application, it is permissible to order commercial steel (CS) to a minimum of 0.01% total aluminum.
- Specify Type B to avoid carbon level below 0.02%.
- It is permissible to furnish as a vacuum degassed or chemically stabilized steel, or both, at the purchaser's option.
- For carbon levels less than or equal to 0.02%, it is permissible to use vanadium, columbium or titanium, or a combination thereof as stabilizing elements at the purchaser's option. In such cases, the applicable limit for vanadium or columbium shall be 0.10% max. and limit for titanium shall be 0.15% max.
- When copper steel is specified, the copper limit is a minimum requirement. When copper steel is not specified, the copper limit is a maximum requirement.
- If produced utilizing a continuous anneal process, stabilized steel is permissible at the producer's option, and Footnotes f and g apply.
- Shall be furnished as vacuum degassed and stabilized steel.

3 SAE J403 Carbon Steel

Grade	Chemical Composition %				
	C	Si	Mn	P	S
1002(1)	0.02~0.04		0.35 max		
1003(1)	0.02~0.06		0.35 max		
1004(1)	0.02~0.08		0.35 max		
1005(1)	0.06 max		0.35 max		
1006(1)	0.08 max		0.25~0.40		
1007(1)	0.02~0.10		0.50 max		
1008(1)	0.10 max		0.30~0.50		
1009(1)	0.15 max		0.60 max		
1010	0.08~0.13		0.30~0.60		
1012	0.10~0.15		0.30~0.60		
1013	0.11~0.16		0.30~0.60		
1015	0.13~0.18		0.30~0.60		
1016	0.13~0.18		0.60~0.90		
1017	0.15~0.20		0.30~0.60		
1018	0.15~0.20		0.60~0.90		
1019	0.15~0.20		0.70~1.00		
1020	0.18~0.23		0.30~0.60		
1021	0.18~0.23		0.60~0.90		
1022	0.18~0.23		0.70~1.00		

REMARK:

- Ultra low carbon, interstitial free stabilized and non-stabilized steel shall not be supplied for these grades.
- Ultra low carbon, interstitial free stabilized and non-stabilized steel may be supplied for these grades. Manganese limits for Structural Shapes, Plates, Strip, Sheets and Welded Tubing shall be as follows: SAE1006 requires Mn 0.45% maximum and SAE1008 requires Mn 0.50% maximum.



4 EN 10130 Cold Rolled Sheet for Drawing and Forming

Steel name		DC01	DC03	DC04	DC05	DC06	DC07
Chemical Composition %	C max	0.12	0.10	0.08	0.06	0.02	0.01
	Mn max	0.60	0.45	0.40	0.35	0.25	0.20
	P max	0.045	0.035	0.030	0.025	0.020	0.020
	S max	0.045	0.035	0.030	0.025	0.020	0.020
	Ti max	-	-	-	-	0.3	0.2
Tensile Test	Tensile Strength MPa	270~410	270~370	270~350	270~330	270~330	250~310
	Yield Proof Stress MP (max)	280	240	210	180	170	150
	Elongation % (min)	28	34	38	40	41	44
	Ratio of plastic strain r90 (min)	-	1.3	1.6	1.9	2.1	2.5
	Tensile strain hardening exponent n90 (min)	-	-	0.180	0.200	0.220	0.230

REMARK:

1. 1MPa=1 N/mm²
2. Titanium may be replaced by niobium. Carbon and nitrogen shall be completely stabilized.
3. When the thickness is greater than 0.5 mm and less than (incl.) 0.7 mm the minimum value for elongation is reduced by 2 units. For a thickness less than (incl.) 0.5 mm, the minimum value is reduced by 4 units.
4. The values of r90 and n90 only apply to products with a thickness equal to or greater than 0.5 mm.
5. When the thickness is over 2 mm, the value for r90 is reduced by 0.2.
6. For design purposes the lower limit of Yield Proof Stress for grades DC01, DC03, DC04 and DC05 may be assumed to be 140 MPa.
7. (*) is developed by manufacturer



4.2.2 | HOT-DIP VALGANIZED STEEL COILS

1 JIS G3302 Hot-dip zinc-coated steel sheet and strip

■ Chemical Composition follow JIS G3302

Unit: %

Symbol of grade	C	Mn	P	S
SGCC	0.15 max	0.80 max	0.05 max	0.05 max
SGCH	0.18 max	1.20 max	0.08 max	0.05 max
SGCD1	0.12 max	0.60 max	0.04 max	0.04 max
SGCD2	0.10 max	0.45 max	0.03 max	0.03 max
SGCD3	0.08 max	0.45 max	0.03 max	0.03 max
SGCD4	0.06 max	0.45 max	0.03 max	0.03 max
SGC340	0.25 max	1.70 max	0.20 max	0.05 max
SGC400	0.25 max	1.70 max	0.20 max	0.05 max
SGC440	0.25 max	2.00 max	0.20 max	0.05 max
SGC490	0.30 max	2.00 max	0.20 max	0.05 max
SGC570	0.30 max	2.00 max	0.20 max	0.05 max

■ Mechanical Properties follow JIS G3302

Symbol of grade	Yield point or proof stress (N/mm ²)	Tensile strength (N/mm ²)	Elongation (%)					Test piece and direction of tensile test	
			Nominal thickness (t) mm						
			0.25≤t<0.40	0.40≤t<0.60	0.60≤t<1.0	1.0≤t<1.6	1.6≤t<2.5		
SGCC	(205 min) b	(270 min) b	-	-	-	-	-	No.5 in rolling direction	
SGCHC	-	-	-	-	-	-	-		
SGCD1	-	270 min	32 min	34 min	36 min	37 min	38 min		
SGCD2	-	270 min	-	36 min	38 min	39 min	40 min		
SGCD3	-	270 min	-	38 min	40 min	41 min	42 min		
SGCD4a	-	270 min	-	-	42 min	43 min	44 min		
SGC340	245 min	340 min	20 min	20 min	20 min	20 min	20 min	No.5 in rolling direction or perpendicular to the rolling direction	
SGC400	295 min	400 min	18 min	18 min	18 min	18 min	18 min		
SGC440	335 min	440 min	18 min	18 min	18 min	18 min	18 min		
SGC490	365 min	490 min	16 min	16 min	16 min	16 min	16 min		
SGC570	560 min	570 min	-	-	-	-	-		

REMARK:

Test piece: the test piece shall be No.5 test piece of JIS Z 2201.

1. For the sheet and coil of SGCD4, the stretcher strain shall not be generated when working is performed during 6 months after manufacturing.
2. Yield and tensile strength are for reference.
3. SGCH is not annealing material.

2 ASTM A653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron

Alloy-Coated (Galvanneal) by the Hot-Dip Process.

■ Chemical Composition follow ASTM A653 (Structure Steel and High Tensile Steel)

Grade	C	Mn	P	S	Si	Al	Cu	Ni	Cr	Mo	V ^b	Cb ^b	Ti ^{b,c,d}	N
SS 33(230)	0.20	1.35	0.10	0.04	-	-	0.25	0.20	0.15	0.06	0.008	0.008	0.025	A
SS 37(255)	0.20	1.35	0.10	0.04	-	-	0.25	0.20	0.15	0.06	0.008	0.008	0.025	...
SS 40(275)	0.25	1.35	0.10	0.04	-	-	0.25	0.20	0.15	0.06	0.008	0.008	0.025	...
SS 50(340) Class 1,2 & 4	0.25	1.35	0.20	0.04	-	-	0.25	0.20	0.15	0.06	0.008	0.008	0.025	...
SS 50(340) Class 3	0.25	1.35	0.04	0.04	-	-	0.25	0.20	0.15	0.06	0.008	0.008	0.025	...
SS 55(380)	0.25	1.35	0.04	0.04	-	-	0.25	0.20	0.15	0.06	0.008	0.008	0.025	...
SS 60(410)	0.25	1.35	0.04	0.04	-	-	0.25	0.20	0.15	0.06	0.008	0.008	0.025	...
SS 70(480)	0.25	1.35	0.04	0.04	-	-	0.25	0.20	0.15	0.06	0.008	0.008	0.025	...
SS 80(550) Class 1	0.20	1.35	0.04	0.04	-	-	0.25	0.20	0.15	0.06	0.008	0.015	0.025	...
SS 80(550) Class 2 ^e	0.02	1.35	0.05	0.02	-	-	0.25	0.20	0.15	0.06	0.10	0.10	0.15	...
SS 80(550) Class 3	0.20	1.35	0.04	0.04	-	-	0.25	0.20	0.15	0.06	0.008	0.015	0.025	...
HSLAS 40(275)	0.15	1.20	...	0.035	-	-	...	0.20	0.15	0.16	0.01 min	0.005 min	0.01 min	...
HSLAS 50(340)	0.15	1.20	...	0.035	-	-	0.20	0.20	0.15	0.16	0.01 min	0.005 min	0.01 min	...
HSLAS 55(380) Class 1	0.20	1.35	...	0.035	-	-	0.20	0.20	0.15	0.16	0.01 min	0.005 min	0.01 min	...
HSLAS 55(380) Class 2	0.15	1.20	...	0.035	-	-	0.20	0.20	0.15	0.16	0.01 min	0.005 min	0.01 min	...
HSLAS 60(410)	0.15	1.20	...	0.035	-	-	0.20	0.20	0.15	0.16	0.01 min	0.005 min	0.01 min	...
HSLAS 70(480)	0.15	1.65	...	0.035	-	-	0.20	0.20	0.15	0.16	0.01 min	0.005 min	0.01 min	...
HSLAS 80(550)	0.15	1.65	...	0.035	-	-	0.20	0.20	0.15	0.16	0.01 min	0.005 min	0.01 min	...

REMARK:

- Where an ellipsis (...) appears in this table there is no requirement, but the analysis shall be reported.
- For carbon levels less than or equal to 0.02%, vanadium, columbium, or titanium, or combinations thereof, are permitted to be used as stabilizing element at the producer's option.
- In such cases, the applicable limit for vanadium and columbium shall be 0.10% max, and the limit for titanium shall be 0.15% max
- Titanium is permitted for SS steel at the producer's option, to the lesser of $3.4N + 1.5S$ or 0.025%
- For steels containing more than 0.02% carbon, titanium is permitted to the lesser of $3.4N + 1.5S$ or 0.025%
- Shall be furnished as the stabilized steel.



Grade	YS min (MPa)	TS min (MPa)A	EL in 50mm, min, (%)A
SS 33(230)	230	310	20
SS 37(255)	255	360	18
SS 40(275)	275	380	16
SS 50(340) Class 1	340	450	12
SS 50(340) Class 2	340	...	12
SS 50(340) Class 3	340	480	12
SS 50(340) Class 4	340	410	12
SS 55(380)	380	480	11
SS 60(410)	410	480	10B
SS 70(480)	480	550	9B
SS 80(550) Class 1C	550D	570	...
SS 80(550) Class 2C, E	550D	570	...
SS 80(550) Class 3	550D	570	3F
HSLAS 40(275)	275	340G	22
HSLAS 50(340)	340	410G	20
HSLAS 55(380) Class 1	380	480G	16
HSLAS 55(380) Class 2	380	450G	18
HSLAS 60(410)	410	480G	16
HSLAS 70(480)	480	550G	12
HSLAS 80(550)	550	620G	10

REMARK:

- Where an ellipsis (...) appears in this table there is no requirement
- For sheet thickness of 0.71mm or thinner, the elongation requirement is reduced two percentage points for SS 60(410) and 70(480).
- For sheet thickness of 0.71mm or thinner, no tension test is required if the hardness result in Rockwell B85 or higher.
- As there is no discontinuous yield curve, the yield strength should be taken as the stress at 0.5% elongation under load or 0.2% offset.
- SS 80(550) class 2 may exhibit different forming characteristics than Class 1, due to difference in chemistry.
- The purchaser should consult with the producer when ordering SS 80(550) Class 3 material in sheet thicknesses 0.71mm or thinner regarding elongation and tension test requirements.
- If a higher tensile strength is required, the user should consult the producer.
- c. EN 10346 Continuously hot-dip coated steel flat products

3 EN 10346 Continuously hot-dip coated steel flat products

■ Chemical Composition and Mechanical Properties of low carbon steels for cold forming

Steel grade	C	Si	Mn	P	S	Ti	YS (N/mm ²)	TS (N/mm ²)	ELa min (%)	Plastic strain ratio min	Strain hardening exponent min
	max(%)										
DX51D (Z,ZF)	0.18 0.12 0.50 0.60 0.10 0.045 0.30	1.20 140~300 140~260 120~220 120~180 120~180 120~170	1.20	0.12			-	270~500	22	-	
DX52D (Z,ZF)			270~420				140~300	26	-	-	
DX53D (Z,ZF)			270~380				140~260	30	-	-	
DX54D (Z)			36		1.6b	0.18	120~220				
DX54D (ZF)			34		1.4b	0.18					
DX56D (Z)			39		1.9b	0.21	120~180				
DX56D (ZF)			37		1.7b,c	0.20c					
DX57D (Z)			41		2.1b	0.22					
DX57D (ZF)			39		1.9b,c	0.21c	120~170				

REMARK:

- a. Decrease minimum elongation values apply for product thickness $t \leq 0.50\text{mm}$ (minus 4 units) and for $0.5\text{mm} < t \leq 0.7\text{mm}$ (minus 2 units).
- b. For $t > 1.5\text{mm}$, the min r90-value reduced by 0.2 applies.
- c. For $t > 1.5\text{mm}$, the min r90-value reduced by 0.2 applies and the min n90-value reduced by 0.01 apply.

Mechanical Properties (transverse direction) of steels with high proof strength for cold forming

Steel grade	Yield stress (N/mm ²)	Tensile stress N/mm ²)	Elongationa, - min(%)	Baked hardening Index-min (MPa)	Plastic strain ratio b,c-min	Strain hardening Exponent-min
HX180YD	180~240	330~390	34	-	1.7	0.18
HX220YD	220~280	340~420	32	-	1.5	0.17
HX300YD	300~360	390~470	27	-	1.3	0.15
HX220BD	220~280	320~400	32	30	1.2	0.15
HX260LAD	260~330	350~430	26	-	-	-
HX300LAD	300~380	380~480	23	-	-	-
HX340LAD	340~420	410~510	21	-	-	-
HX380LAD	380~480	440~560	19	-	-	-
HX420LAD	420~520	470~590	17	-	-	-

REMARK:

- 1. Decrease minimum elongation values apply for product thickness $t \leq 0.50\text{mm}$ (minus 4 units) and for $0.5\text{mm} < t \leq 0.7\text{mm}$ (minus 2 units).
- 2. For $t > 1.5\text{mm}$, the min r90-value reduced by 0.2 applies.
- 3. For ZF-coatings (GA), the minimum Elongation value reduced by 2 units and the minimum r90-value reduced by 0.2 apply.

4.2.3 | ELECTRICAL STEEL COILS

Magnetic Properties

■ Iron Loss and Magnetic Flux Density for Non-Oriented Electrical Steel Coils

Symbol of class	JIS C2552 Classified Symbol	Thickness (mm)	Density kg/dm ³	Iron loss W/kg (max)	Magnetic flux density T(min)
				W _{15/50}	B ₅₀
35CSV550	-	0.35	7.75	5.50	1.64
35CSV440	35A440		7.70	4.40	1.64
50CSV1300	50A1300		7.85	13.00	1.69
50CSV1000	50A1000		7.85	10.00	1.69
50CSV800	50A800	0.50	7.80	8.00	1.68
50CSV700	50A700		7.80	7.00	1.68
50CSV600	50A600		7.75	6.00	1.65
50CSV470	50A470		7.70	4.70	1.62
65CSV1300	65A1300	0.65	7.85	13.00	1.69
65CSV1000	65A1000		7.80	10.00	1.68
65CSV600	65A600		7.75	6.00	1.66
65CSV800	65A800		7.80	8.00	1.70

REMARK:

- 1. The density is used for calculation of cross sectional area of test piece.
- 2. Iron loss W_{15/50} means the iron loss when the frequency is 50 Hz and the maximum magnetic flux density is 1.5T.
- 3. Magnetic flux density B₅₀ means the magnetic flux density at a magnetic field strength of 5000 A/m.

4.2.4 | Pickled & Oiled Steel Coils

1 JIS G3131 Hot-Rolled Mild Steel Plate, Sheets and Strip

Grade			SPHC	SPHD	SPHE	SPHF
Chemical Composition %	C		0.12 max	0.10 max	0.08 max	0.08 max
	Mn		0.60 max	0.45 max	0.40 max	0.35 max
	P		0.045 max	0.035 max	0.030 max	0.025 max
	S		0.035 max	0.035 max	0.030 max	0.025 max
Tensile Test	Tensile Strength M/mm ²			270 min		
	Elongation %	Thickness (t) mm	t<1.6	27 min	30 min	32 min
			1.6≤t<2.0	29 min	32 min	34 min
			2.0≤t≤2.5	29 min	33 min	35 min
			2.5≤t<3.2	29 min	35 min	37 min
			3.2≤t<4.0	31 min	37 min	39 min
	Test piece			No.5, in rolling		
Bendability	Angle of Bending			180		
	Inside radius	Thickness (t) mm	t<3.2	Flat on itself		
			t≥3.2	0.5 t		
	Test piece			No.3, in rolling direction		

REMARK:

- 1. Grade SPHF is manufactured by a special process, such as made of killed steel to improve drawability
- 2. The values specified shall not apply to the irregular portions both ends of steel strip.
- 3. The bend test may be omitted by the manufacturer's decision, but the bendability shall satisfy the specification. However, when the purchaser designates, the test shall be performed

2 JIS G3101 Hot-Rolled Steel for General Structure

Grade	Chemical Composition %					Tensile Test				Bendability		
	C	Mn	P	S	Yield Strength N/mm²	Tensile Strength N/mm²	Elongation %		Angle of Blending	Inside radius	Test piece	
							No.5 Test piece	No.1A Test Piece				
							Thickness(t) mm	Thickness(t) mm				
							t≤5	t≥5				
SS300	-	-	0.05 max	0.05 max	205 min	330 - 430	26 min	21 min	180°	0.5 t	No.1	
SS400	-	-	0.05 max	0.05 max	245 min	400 - 510	21 min	17 min		1.5 t		
SS490	-	-	0.05 max	0.05 max	285 min	490 - 610	19 min	15 min		2.0 t		
SS540	0.3 max	1.6 max	0.04 max	0.04 max	400 min	540 min	16 min	13 min		2.0 t		

REMARK:

1. Alloy elements other than those shown in the above table may be added if necessary.
2. The bend test may be omitted by the manufacturer's decision, but the bendability shall satisfy the specification. However, when the purchaser designates, the test shall be performed

3 JIS G3132 Hot-Rolled Carbon Steel Strip for Pipes and Tubes

Grade	Chemical Composition					Tensile Test				Test Piece	Bendability		
	C	Si	Mn	P	S	Tensile Strength N/mm²	Elongation %		Angle of Bending	Inside radius	Test Piece		
							Thickness (t)mm						
							t<1.6	1.6≤t<3.0	3.0≤t<6.0	t=6.0			
SPHT1	0.10 max	-	0.50 max	-	-	270 min	30 min	32 min	35 min	37 min	No.5 in rolling direction	Flat on itself	0.5 t
SPHT2	0.18 max	0.35 max	0.60 max	0.040 max	0.040 max	340 min	25 min	27 min	30 min	32 min		1.0 t	1.5 t
SPHT3	0.25 max	-	0.30 - 0.90	-	-	410 min	20 min	22 min	25 min	27 min		1.5 t	2.0 t
SPHT4	0.30 max	-	0.30 - 1.00	-	-	490 min	15 min	18 min	20 min	22 min		1.5 t	2.0 t

REMARK:

1. The Si content of SPHT1 can be modified to 0.04% max, upon agreement between the purchaser & manufacturer
2. Values in parentheses mean reference values
3. The values specified shall not apply to the irregular portions at both ends of steel strip
4. The bend test may be omitted by the manufacturer's decision, but the bendability shall satisfy the specification. However, when the purchaser designates, the test shall be performed

4 ASTM A1011 Carbon, structural, High-Strength Low-Alloy Steel and High-Strength Low-Alloy with Improved Formability

Grade	Chemical Composition											
	C	Mn	P	S	Al	Cu	Ni	Cr	Mo	V	Nb	Ti
CS Type B	0.02-0.15	0.60	0.030	0.035	-							
DS Type B	0.02-0.08	0.50	0.020	0.030	0.01							
SS Grade 33	0.25	0.90	0.035	0.04	-							
SS Gr. 36 Type 1	0.25	0.90	0.35	0.04	-							
SS Gr. 36 Type 2	0.25	1.35	0.035	0.040	-							
HSLAS Gr.45 Class 1	0.22	1.35	0.040	0.040	-							
HSLAS-F Gr.50												
HSLAS-F Gr.60	0.15	1.65	0.020	0.025	-							
HSLAS-F Gr.70	0.15	1.65	0.020	0.025	-							
HSLAS-F Gr.80												

5 EN 10111 Continuously hot rolled low carbon steel sheet and strip for cold forming

Grade	Chemical Composition				
	C	Mn	P	S	
DD11	0.12	0.6	0.045	0.045	
DD12	0.1	0.45	0.035	0.035	
DD13	0.08	0.4	0.3	0.3	
DD14	0.08	0.35	0.025	0.025	

Grade	Yield Strength N/mm²		Tensile Strength N/mm²	Elongation		
	1.0≤t<2	2≤t≤11		L0=80mm	L0=5.65/S0	T≥3
DD11	170-360	170-340	440	22	23	24
DD12	170-340	170-320	420	24	25	26
DD13	170-330	170-310	400	27	28	29
DD14	170-310	170-290	380	30	31	32

REMARK:

As long as the width of the product permits, the test pieces for the tensile test shall be taken transverse to the direction of roll.

6 SAE J403 Carbon Steel

Grade	Chemical Composition %				
	C	Si	Mn	P	S
1002(1)	0.02~0.04		0.35max		
1003(1)	0.02~0.06		0.35max		
1004(1)	0.02~0.08		0.35max		
1005(2)	0.06max		0.35max		
1006(2)	0.08max		0.25~0.40		
1007(1)	0.02~0.10		0.50max		
1008(2)	0.10max		0.30~0.50		
1009(2)	0.15max		0.60max		
1010	0.08~0.13	-	0.30~0.60	0.030 max	0.030 max
1012	0.10~0.15		0.30~0.60		
1013	0.11~0.16		0.30~0.60		
1015	0.13~0.18		0.30~0.60		
1016	0.13~0.18		0.60~0.90		
1017	0.15~0.20		0.30~0.60		
1018	0.15~0.20		0.60~0.90		
1019	0.15~0.20		0.70~1.00		
1020	0.18~0.23		0.30~0.60		
1021	0.18~0.23		0.60~0.90		
1022	0.18~0.23		0.70~1.00		



4.2.5 | MARKING & PACKING

4.2.5.1 | Marking

1	Manufacture Information
2	Product Name
3	Specification
4	Steel Grade
5	Size
6	Coil ID
7	Net Weight
8	Gross Weight
9	Production Date
10	Surface Quality
11	Heat Number
12	Production Barcode
13	End User
14	Product Certification Mark

4.2.5.2 | Packing



Case 1

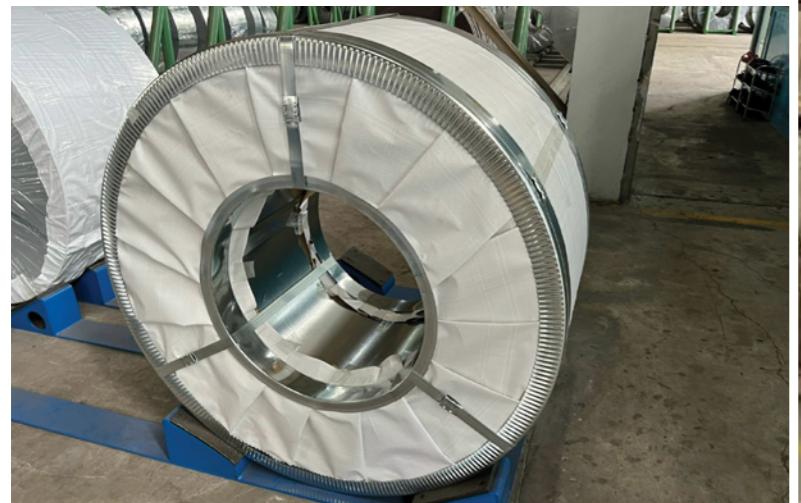
Film/Paper/VCI paper wrapping + Paper edge protector + Metal edge protector + Hard board paper + Metal protector + Circumferential strapping + Eye strapping



Case 2

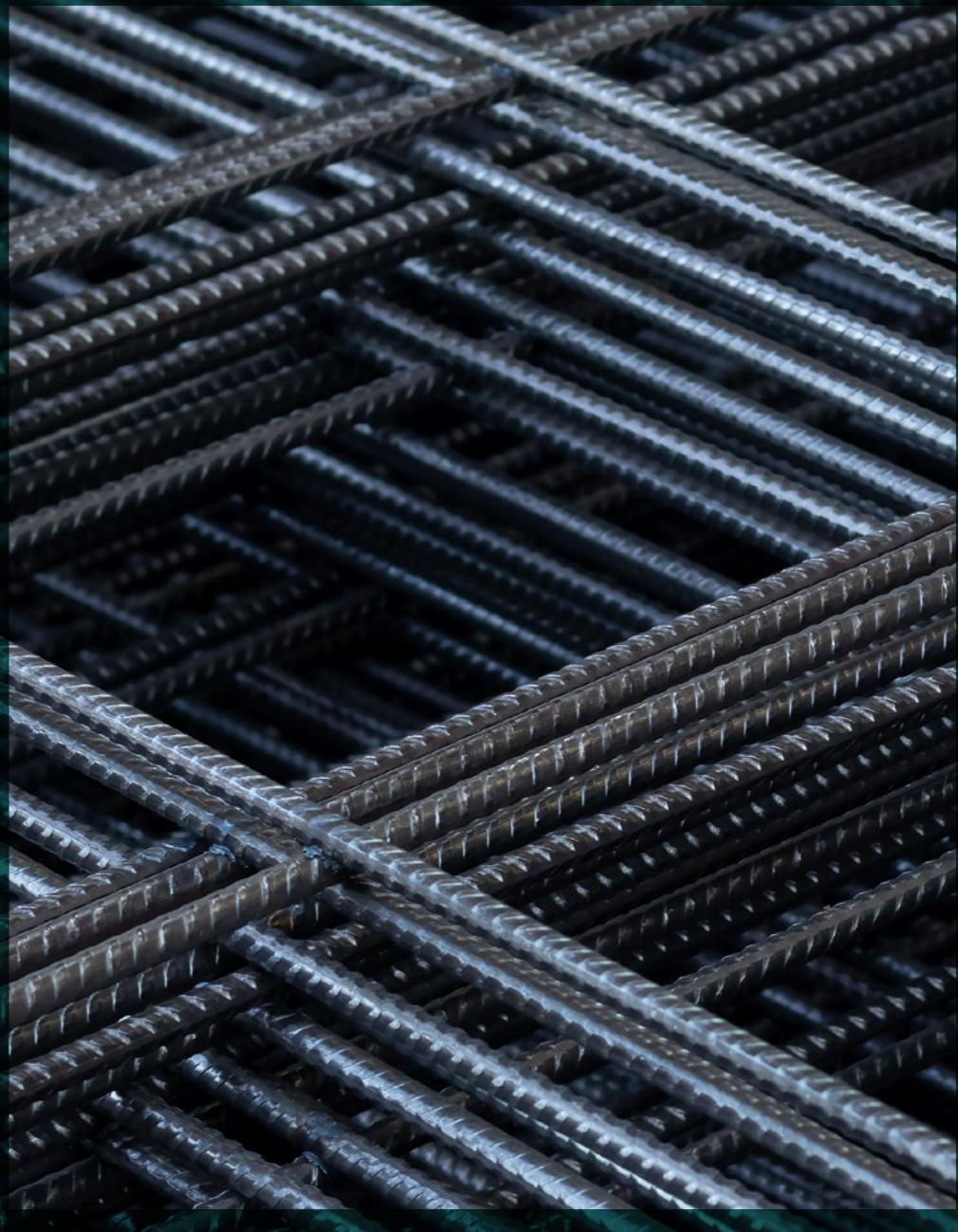
Film/Paper/VCI paper wrapping +Paper edge Protector + Hard Board paper + Circumferential strapping + Eye Strapping

Other packing



REMARK:
Customised packing is available upon request.

CONSTRUCTION STEELS DEFORMED BARS



5 | CONSTRUCTION STEELS

5.1 | DEFORMED BARS

5.1.1 | PRODUCT FEATURES

Deformed Bar (Or rebar) is one of the most commonly used steel materials in construction industry. It has surface irregularities as transverse ridges.

With the characteristics of high tensile property, high thermal resistance, high yield strength & toughness..., this product is used for reinforced concrete constructions, buildings, offices, hydroelectric projects, bridges & roads...



Category	Details
Grade	SD295, SD390, SD490, CB300-V, CB400-V, CB500-V, Grade 460..
Diameter	D06 - D50mm
Application	In the construction of concrete, reinforced concrete, civil houses, industrial buildings, office buildings, bridges and roads, hydroelectric projects...
Standard	BS, ASTM, JIS...

5.1.2 | SPECIFICATIONS

Standard	Grade	Chemical composition (%)					
		C	Mn	Si	P	S	Carbon equivalent
JIS G3112-2004	SD 295A (SR 30A)	•	•	•	0.050max	0.050 max	•
	SD 295A (SR 30B)	0.27max	1.50max	0.55 max	0.040max	0.040max	•
	SD 345 (SR 35)"	0.27max	1.60max	0.55 max	0.040max	0.040max	0.50 max
	SD 390 (SR 40)	0.29max	180max	055max	0.040max	0.040max	0.55max
	SD490 (SR 50)	0.32max	1.80max	0.55 max	0.040max	0.040max	0.60 max
TCVN 1651-2-2008	CB 300-V	•	•	•	0.050 max	0.050 max	•
	CB 400-V	0.29max	1.80max	0.55 max	0.040max	0.040max	0.56 max
	CB 500 -V	0.32max	1.80max	0.55 max	0.040max	0.040max	0.61 max
TCVN 6285-1997	RB 300	•	•	•	•	•	•
	RB 400	•	•	•	0.060max	0.060max	•
	RB 500	•	•	•	0.060max	0.060max	•
	RB 400W	0.22ma	1.60max	0.60max	0.50max	0.50max	0.50 max
	RB SOOW	0.22max	1.60max	0.60max	0.50max	0.50max	0.50 max
TCVN 1651-1985	CII	•	•	•	•	•	•
	CIII	•	•	•	•	•	•
	CIV	•	•	•	•	•	•
BS 4449:1997	Gr 250	0.25max	•	•	0.060max	0.060max	0.42max
	Gr 460A	0.25max	•	•	0.050max	0.050max	0.51max
	Gr 460B	0.25max	•	•	0.050max	0.050max	0.51max
ASTM A615/A615M-01a	GR 40	•	•	•	0.060max	•	•
	GR 60	•	•	•	0.060max	•	•

Standard	Mechanical properties			Bending properties		Application
	Yield Point (Re) N/mm ²	Tensile Strength (Rm) M/mm ²	Elongation (%)	Angle of bending (o)	Radius of bending (mm)	
JIS G3112-2004	295 min	440~600	16 min with D<25 18 min with D≥25	180°	1.5D with D≤16 2D with D>16	Deformed bar
	295~390	440 min	16 min with D<25 18 min with D≥25	180°		
	345~440	490 min	18 min with D<25 20 min with D≥25	180°		
	390~510	560 min	16 min with D<25 18 min with D≥25	180°	2.5D	
	490~625	620 min	12 min with D<25 14 min with D≥25	90°	1.5D with D≤16 2D with D>16	
TCVN 1651-2-2008	300 min	450 min	19 min	160°-180°	In accordance with Table 7 of TCVN 1651-2-2008 (applicable to each steel size and grade)	Deformed bar
	400 min	570 min	14 min	160°-180°		
	500 min	650 min	14 min	160°-180°		
TCVN 6285-1997	300 min	330 min	16 min	160°-180°	In accordance with Table 5 of TCVN 6285-1997 (applicable to each steel size and grade)	Deformed bar
	400 min	440 min	14 min	160°-180°		
	500 min	550 min	14 min	160°-180°		
	400 min	440 min	14 min	160°-180°		
	500 min	550 min	14 min	160°-180°		
TCVN 1651-1985	300 min	500 min	19 min	180°	1.5D	Deformed bar
	400 min	600 min	14 min	90°	1.5D	
	600 min	900 min	6 min	45°	1.5D	
BS 4449:1997	250 min	(Rm/Re) min = 1.15	22 min	45°	1D	Deformed bar
	460 min	(Rm/Re) min = 1.08	14 min	45°	2.5D with D≤16 3.5D with D>16	
ASTM A615/A615M-01a	300 min	420 min	D10: 11min D13,16,19: 12 min	180°	D10, 13, 16: 1.75D' D19: 2.5D	Deformed bar: D10 ~ D19
	420 min	620 min	D10, 13, 16, 19: 9 min D22, 25: 8 min D29, 32, 36: 7 min	180°	D10, 13, 16: 3.5D D19, 22, 25: 5D D29, 32, 36: 7D	Deformed bar: D10 ~ D36

CONSTRUCTION STEELS WIRE RODS



5 | CONSTRUCTION STEELS

5.2 | WIRE RODS

5.2.1 | PRODUCT FEATURES

Wire Rod is made from billets which are heated by the heating furnace, and then passed through the rough rolling mill, intermediate rolling mill, finishing mill and reducing and sizing Mill, and then coiled and formed by the coiler.

Category	Description
Diameter of rod	ø6 – ø20
Diameter of steel bundle	D = 1.2 m
Weight of steel bundle	W = 2000 kg
Surface	Glossy, no cracks
Color	Typical blue
Section	Round section, the small oval
Grade	SAE 1006, SAE 1008, CB 240, CB 300...
Standard	JIS, ASTM, EN, JFS, AS...

Customized Steel Grades can be developed according to customer's demand, please contact Sales Department for more details.

5.2.2 | SPECIFICATIONS

Chemical Compositions

JIS G3131 Carbon Steel

SAE symbol	Chemical compositions (wt.%)			
	C	Mn	P	S
1006	0.08 max.	0.25-0.40		
1008	0.10 max.	0.30-0.50		
1010	0.08-0.13	0.30-0.60		
1012	0.10-0.15	0.30-0.60		
1015	0.13-0.18	0.30-0.60		
1017	0.15-0.20	0.30-0.60		
1018	0.15-0.20	0.60-0.90		
1021	0.18-0.23	0.60-0.90		
1022	0.18-0.23	0.70-1.00		
1030	0.28-0.34	0.60-0.90		
1033	0.30-0.36	0.70-1.00		

REMARK:

Standard killed carbon steels, which are fine grain, 0.0005 - 0.0030% of Boron can be added to improve hardenability. At this time, the letter B needs to be marked in the middle of the Grade Number, such as 10B21,10B33.

5.2.3 | MARKING AND PACKING

4.2.3.1 | Marking

1	Manufacturer Information
2	Product Name
3	Specification
4	Steel Grade
5	Heat Number
6	Diameter
7	Net Weight
8	Coil ID
9	Surface Quality
10	Product Barcode
11	Production Date
12	Heat Seq. No.
13	Product Certification Mark

5.2.3.2 | Packing

Figure				
Packing type	1. General packing	2. Duplicate packing	3. Special packing 1	4. Special packing 2
Caption	Eye strap number: 4	Eye strap number: 8	Both sides of steel coil are added corner protective pad.	The whole coil is covered with PP coating
1. Circle strap number depends on height of coil. 2. Symbol 1 :Protection pad 2 :PP Laminating cover 3. Special packing 2 is not applicable to Wire Rod				

CONSTRUCTION STEELS

SECTION STEEL



5 | CONSTRUCTION STEELS

5.3 | SECTION STEEL

5.3.1 | PRODUCT FEATURES

Stavian Industrial Metal provides a full range of section steel including H beam, Equal-leg Angles from famous factories like POSCO YAMATO, TISCO, An Khanh Steel,... The products are produced on modern lines according to international standards such as JIS G3192:2014, KS D3502:2021, ASTM A6-11, BS 4-1:2005, EN 10365:2017,...

Category	Value
Type	H, U, I, W beam, EA...
Standard	JIS, ASTM, KS, BS, EU...
Grade	TSS400, SS490, A36, A572...

5.3.2 | Specification

1 JIS STANDARD

Chemical Compositions

Standard	Steel Grade	C	Si	Mn	P	S	Ceq	Pcm
JIS G3101:2015	SS400	-	-	-	≤0.050	≤0.050	-	-
	SS490	-	-	-	≤0.050	≤0.050	-	-
	SS540	≤0.30	-	≤1.60	≤0.040	≤0.040	-	-

Mechanical Properties

Standard	Steel Grade	Tensile Test							Bendability	
		Yield Point (N/mm ²) min.		Tensile Strength (N/mm ²)	Elongation (%) min.			Charpy Impact Test (t > 12mm)	Bend Angle (*)	Inside Radius (mm)
JIS G3101:2015	t ≤ 16	16 < t ≤ 40		t ≤ 5	5 < t ≤ 16	16 < t ≤ 50	Temp (°C)	Absorption energy (min.) (J)	1.5 x t	1.5 x t
	≥ 245	≥ 235	400~510	≥ 21	≥ 17	≥ 21	-	-		
	≥ 285	≥ 275	490~610	≥ 19	≥ 15	≥ 19	-	-	180°	2.0 x t
	≥ 400	≥ 390	≥ 540	≥ 16	≥ 13	≥ 17	-	-	x t	x t

2 ASTM STANDARD

Chemical Compositions

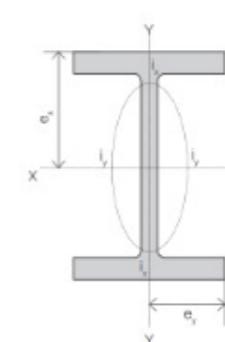
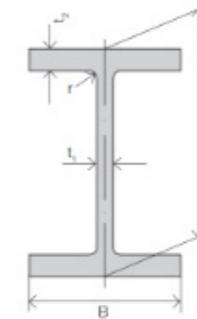
Standard	Steel Grade	C max	Si max	Mn max	P max	S max	Ceq max	Pcm max
ASTM A36/A36M:2014	A36	0	0.40	-	0.040	0.050	-	-
ASTM A572/A572M:2018	Gr42	0	0.40	1	0.040	0.050	-	-
	Gr50	0	0.40	1	0.040	0.050	-	-
	Gr55	0	0.40	1	0.040	0.050	-	-
	Gr60	0	0.40	1	0.040	0.050	-	-

Mechanical Properties

Standard		Steel Grade	Tensile Test							
			Yield Point (min.) (N/mm ²)		Tensile Strength (N/mm ²)		Elongation (min.) (%)			
			t ≤ 50		t ≤ 50		t ≤ 50			
ASTM A36/A36M:2014	A36		250		400 ~ 550		21			
ASTM A572/A572M:2018	Gr42		290		415 min.		24			
	Gr50		345		450 min.		21			
	Gr55		380		485 min.		20			
	Gr60		415		520 min.		18			

5.3.3 | Dimension & Sectional Properties

a H beam: JIS G3192:2014



Standard Size (H x B)	Unit Mass	Sectional Dimension					Sectional Area	Standard Size	Unit Mass	Sectional Dimension					Sectional Area
		H	B	T1	T2	R				H	B	T1	T2	R	
kg/m	mm					cm ²	kg/m	mm					cm ²	cm ²	cm ²
100x100	17	100	100	6	8	8	22	350x175	49	350	175	7	11	63	
125x125	24	125	125	7	9	8	30.00	350x250	78	340	250	9	14	13	100
150x100	21	148	100	6	9	8	26	400x200	56	396	199	7	11	13	71
150x150	31	150	150	7	10	8	40		65	400	200	8	13	13	83
150x75	14	150	75	5	7	8	18	400x300	105	390	300	10	16	13	133
175x90	18	175	90	5	8	8	22.90	450x200	65	446	199	8	12	13	83
200x150	30	194	150	6	9	8	38		75	450	200	9	14	13	95
200x100	18	198	99	5	7	8	23	450x300	121	440	300	11	18	13	154
	21	200	100	6	8	8	27	500x200	78	496	199	9	14	13	99
200x200	50	200	200	8	12	13	64		88	500	200	10	16	13	112
250x175	44	244	175	7	11	13	55	500x300	111	482	300	11	15	13	141
250x125	25	248	124	5	8	8	32		125	488	300	11	18	13	159
	29	250	125	6	9	8	37	600x200	93	596	199	10	15	13	118
250x250	72	250	250	9	14	13	91		103	600	200	11	17	13	132
300x150	32	298	149	6	8	13	40.80	600x300	133	582	300	12	17	13	169
	37	300	150	7	9	13	47		147	588	300	12	20	13	187
300x200	56	294	200	8	12	13	71		170	594	302	14	23	13	217
300x300	93	300	300	10	15	13	118	700x300	163	692	300	13	20	18	208
350x175	41	346	174	6	9	13	52		182	700	300	13	24	18	232

b W Beam: ASTM A6-19

Standard Size	Unit Mass		Sectional Dimension									
			H		B		T1		T2		R	
	kg/m	lb/ft	mm	in	mm	in	mm	in	mm	in	mm	in
W4 x 4	19	13	106	4.160	103	4.060	7	0.280	9	0	8	0
W5 x 5	24	16	127	5.010	127	5.000	6	0.240	9	0.360	8	0
	28	19	131	5.150	128	5.030	7	0.270	11	0.430	8	0
W6x4	13	9	148	5.830	100	3.940	4	0.170	5	0	8	0
	14	9	150	5.900	100	3.940	4	0.170	6	0	8	0
	18	12	153	6.030	102	4.000	6	0.230	7	0.280	8	0
	24	16	160	6.280	102	4.030	7	0.260	10	0	8	0
W6 x 6	23	15	152	5.990	152	5.990	6	0.230	7	0.260	8	0
	30	20	157	6.200	153	6.020	7	0.260	9	0	8	0
	37	25	162	6.380	154	6.080	8	0.320	12	0	8	0
W8 x 4	15	10	200	7.890	100	3.940	4	0.170	5	0	8	0
	19	13	203	7.990	102	4.000	6	0.230	7	0	8	0
	23	15	206	8.110	102	4	6	0	8.0	0	8	0
W8 x 5½	27	18	207	8.140	133	5.250	6	0.230	8	0.330	8	0
	31	21	210	8.280	134	5.270	6	0.250	10	0.400	8	0
W8 x 6½	36	24	201	7.930	165	6	6	0	10	0.400	10	0
	42	28	205	8.060	166	7	7	0	12	0	10	0
W8 x 8	46	31	203	8.000	203	8	7	0	11.0	0	10	0
	52	35	206	8.120	204	8.020	8	0.310	13	0	10	0
	59	40	210	8.250	205	8.070	9	0.360	14	0.560	10	0
	71	48	216	8.500	206	8.110	10	0.400	17	1	10	0
	86	58	222	8.750	209	8.220	13.0	0.510	21	0.810	10	0
	100	67	229	9.000	210	8.280	15	0.570	24	1	10	0

c H Pile: ASTM A6-19

Standard Size (H x B)	Unit Mass		Sectional Dimension									
			H		B		T1		T2		R	
kg/m	lb/ft	mm	in	mm	in	mm	in	mm	in	mm	in	mm
HP8 (8X8)	53	36	204	8.020	207	8	11	0	11	0	10	0
HP10 (10X10)	62	42	246	9.700	256	10	11	0	11	0.420	13	1
	85	57	254	9.990	260	10	14	1	14	1	13	1
HP12 (12X12)	79	53	299	11.780	306	12	11.0	0	11.0	0	15	1
	93	63	303	11.940	308	12	13	1	13	1	15	1
	110	74	308	12.130	310	12	15	1	16	0.610	15	1
	125	84	312	12.280	312	12	17	1	17	1	15	1

d Sheet Pile: JIS A5528:2012

Nominal Size (H x B)	Unit Mass			Sectional Dimension				Sectional Area		
	Per pile	Per wall width	We	Wo	He	Ho	T	Per pile		
			kg/m	kg/m ²	Mm			cm ²		
SP-IV	76		190		440	443	170	194	15.5	96.99

e EA (Equal – Leg Angles): JIS G3192:2014

Nominal Size (A x B)	Unit Mass	Sectional Dimension							Sectional Area	
		kg/m	Mm							cm ²
200x200	45	200	200	15	17	12			57.75	
200x200	60	200	200	20	17	12			76.00	

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