



[Product Manual]

HOT-DIP ZINC- COATED STEEL COILS



CHINA STEEL AND NIPPON STEEL
VIETNAM JOINT STOCK COMPANY

Our Quality, Your Better Life

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1. FOREWORD



China Steel and Nippon Steel Vietnam Joint Stock Company, a delicate steel-manufacturing company, we commit to continually improve our Quality Management System and provide good products and will endeavor to pursue both internal and external satisfactions.

China Steel and Nippon Steel Vietnam Joint Stock Company (abbreviated as CSVC) is a joint stock company of Taiwanese and Japanese companies. The main investors are China Steel Corporation (Taiwan, R.O. China) and Nippon Steel Corporation (Japan). CSVC started its construction in September 2011 and start commercial running in November 2013.

CSVC can provide P/O (Pickled & Oiled) CR (Cold Rolled), ASCR (As Cold Rolled), Galvanized (GI & GA) and ES (Electrical Steel) product with high quality. The total annual production capacity is 1.2 million metric tons.

CSVC implemented its quality management system based on ISO 9001 requirement, we especially stress on meeting customer requirement and continually improving products quality. That's why it makes CSVC to be a reliable and trustworthy supplier of steel products. Besides, in order to commit our responsibility to the environment, CSVC also put much effort in reducing or even eliminating of any hazardous substance to make our products eco-friendly.

2.PRODUCT CERTIFICATES

CSVC achieve many certificates such as:

ISO 9001:2015, IATF16949:2016, SIRIM Mark, SNI Mark, QUATEST Mark, TISI Mark, ...

ISO 9001:2015



IATF16949:2016



Quatest3 Mark



SIRIM Mark



ISO 17025:2005



JAPAN Mark



SNI Mark



3. FEATURES OF HOT-DIP GALVANIZED STEEL COILS

Hot-dip Galvanized steel sheets are widely used in modern society, such as automobile parts, computer case, architecture material, household appliance and so on. To meet the multiple requirements, the specification of hot-dip Galvanized steel became more and more diversified. Brief introductions of products are as below:

✚ JIS G3302 SGCC/SGCD1/2/3/4, JFS A3011 JAC270C/D/E/F

JIS/JFS standard of hot-dip galvanized products, grade from commercial quality to deep drawing quality, which can be used in various applications, mainly focus on their deforming properties.

✚ JIS G3302 SGC340~570, JFS A3011 JAC340~440W

JIS/JFS standard of high strength hot-dip galvanized steel, tensile strength (TS) from 340 to 570 N/mm², which are widely used in automobile structures or other high strength-required parts.

✚ ASTM A653 CS/FS/DDS/EDDS

ASTM standard of hot-dip galvanized products, grade from commercial quality to deep drawing quality, which can be used in various applications, mainly focus on their deforming properties.

✚ EN 10346 DX51/52/53/54/56/57D

EN standard of hot-dip galvanized products, grade from commercial quality to deep drawing quality, which can be widely used in various applications, mainly focus on their deforming properties.

✚ EN 10346 HX260YD, HX300YD, JAC340~390P

EN standard of hot-dip galvanized steel coils possessing high strength, excellent press-formability, which are widely used in automobile structure parts

✚ EN 10346 HX380LAD, HX420LAD, JAC440~590R

EN standard of hot-dip galvanized micro alloyed steel coils with high strength and low carbon equivalent (to promote weld-ability), excellent formability, which are widely used in automobile structural reinforce members to reduce vehicle weight.

✚ AS 1397 G350, G450, G500, G550

AS 1397 of continuous hot-dip metallic coated steel sheet and strip-coatings of zinc and zinc with aluminum and magnesium, excellent formability, mainly focus on their deforming properties.

4. MANUFACTURING PROCESS

Hot-dip galvanized steel coils are produced by using as-cold-rolled steel coil as its base material; the typical manufacturing processes are described as Fig1.

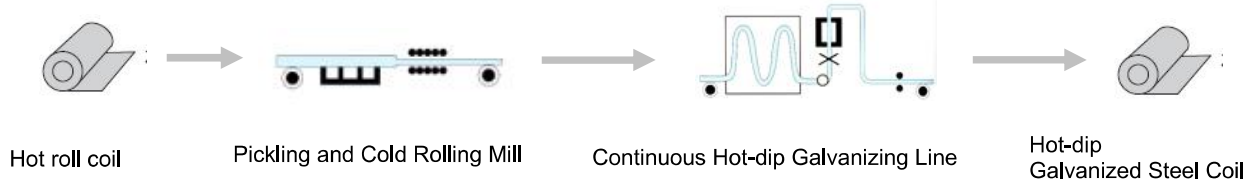
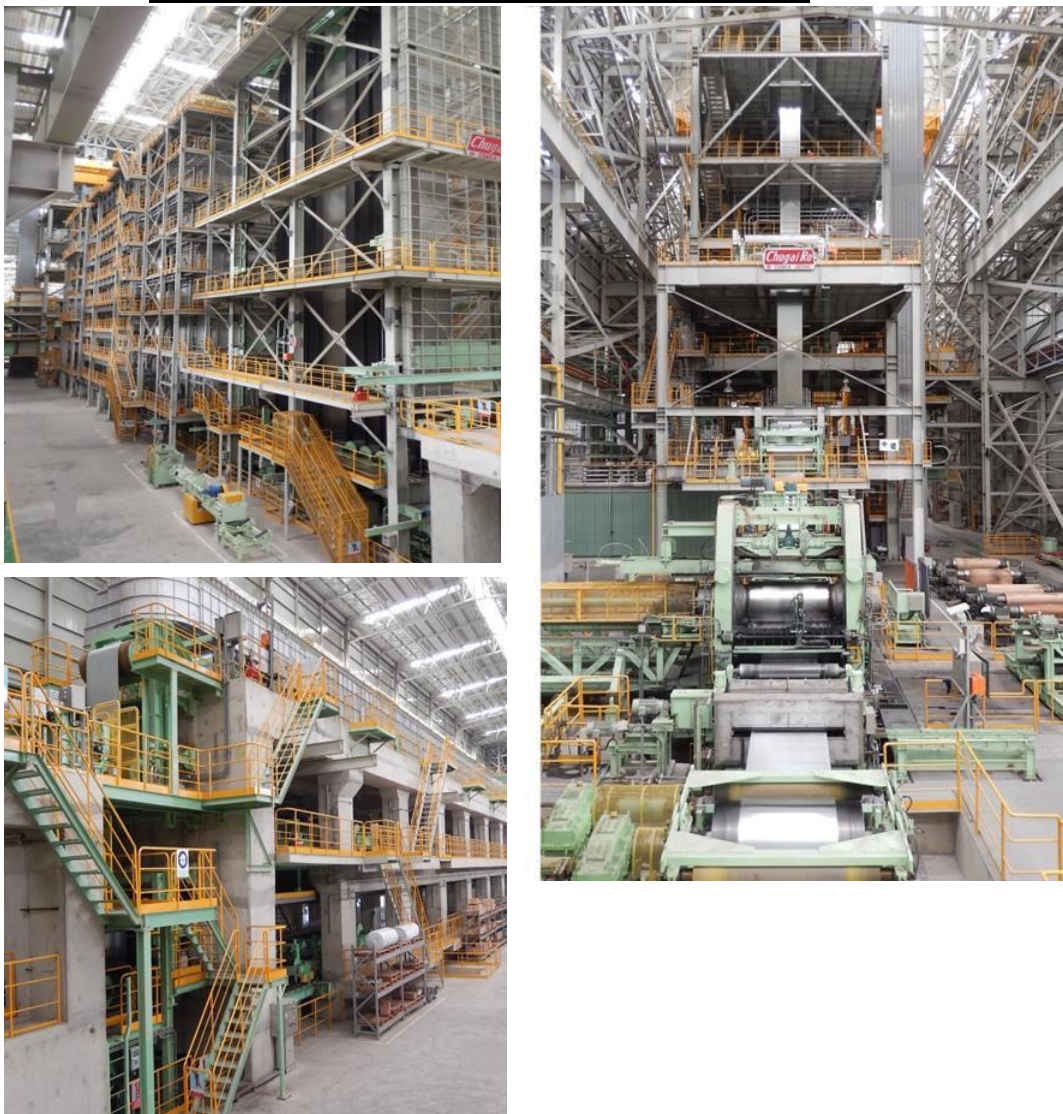


Fig.1: Manufacturing process flow of galvanized products

CSVC produce its cold rolled products by the combination line of PLTCM (abbreviated from Pickling and Tandem Cold-rolling Mill), and CGL (abbreviated from Continuous Hot-dip Galvanizing Line) respectively.

Some pictures of Continuous Hot-dip Galvanizing Line



5. SPECIFICATIONS

While much effort has been made to ensure the accuracy of the information contained within this publication, the use of the information is at the user's risk and no warranty is implied or expressed by CSVC with respect to the use of information contained herein. The information in this publication is subject to change without notice. Please contact CSVC office for the latest information.

5.1 Chemical Compositions and Mechanical Properties

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

Table 1 – 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.	2.50 max.	0.20 max.	0.05 max.

Table 2 – 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.	No.5 in rolling direction or perpendicular to the rolling direction
SGC340	245 min.	340 min.	20 min.	20 min.	20 min.	20 min.	20 min.	
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.	—	—	—	—	—	

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

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

5.1.2. JFS A3011 Hot-dip galvaneal steel for automobile use

Table 3 – Mechanical Properties follow JFS A3011

Table 3.1

Designation		JAC270C	JAC270D	JAC270E	JAC270F
Tensile strength (N/mm ²)		270 min.	270 min.	270 min.	270 min.
Yield strength (N/ mm ²)	0.4≤t<0.8	185 - 305	135 - 225	130 - 205	120 - 185
	0.8≤t<1.0	175 - 295	125 - 215	120 - 195	110 - 175
	1.0≤t≤2.4	165 - 285	115 - 205	110 - 185	100 - 165
Elongation (%)	0.4≤t<0.6	35 - 44	40 - 49	42 - 50	44 - 52
	0.6≤t<0.8	36 - 45	41 - 50	43 - 51	45 - 53
	0.8≤t<1.0	37 - 46	42 - 51	44 - 52	46 - 54
	1.0≤t<1.2	38 - 47	43 - 52	45 - 53	47 - 55
	1.2≤t<1.6	39 - 48	44 - 53	46 - 54	48 - 56
	1.6≤t<2.0	40 - 51	45 - 55	47 - 56	49 - 58
	2.0≤t≤2.4	41 - 53	46 - 57	48 - 58	50 - 60
Mean plastic strain ratio r value	0.5≤t≤1.0	-	1.2 min	1.4 min	1.5 min
	1.0≤t≤1.6	-	1.1 min	1.3 min	1.4 min

Table 3.2

Designation		JAC340W	JAC390W	JAC440W	JAC340P	JAC390P	JAC440R	JAC590R	JAC590Y
Tensile strength (N/mm ²)		340 min.	390 min.	440 min.	340 min.	390 min.	440 min.	590 min.	590 min.
Yield strength (N/ mm ²)	0.4≤t<0.8	215 - 315	255 - 365	295 - 400	175 - 265	215 - 315	365 - 470	440 - 590	340 - 460
	0.8≤t<1.0	205 - 305	245 - 355	285 - 390	165 - 255	205 - 305	355 - 460	430 - 580	330 - 450
	1.0≤t≤ 2.4	195 - 295	235 - 345	275 - 380	155 - 245	195 - 295	345 - 450	420 - 570	320 - 440
Elongation (%)	0.4≤t<0.6	32 - 42	28 - 39	25 - 37	34 - 44	30 - 41	22 - 34	-	-
	0.6≤t<0.8	33 - 43	29 - 40	26 - 38	35 - 45	31 - 42	23 - 35	14 - 29	16 - 31
	0.8≤t<1.0	34 - 44	30 - 41	27 - 39	36 - 46	32 - 43	24 - 36	15 - 30	17 - 32
	1.0≤t<1.2	35 - 45	31 - 42	28 - 40	37 - 47	33 - 44	25 - 37	16 - 31	18 - 33
	1.2≤t<1.6	36 - 46	32 - 43	29 - 41	38 - 48	34 - 45	26 - 38	17 - 32	19 - 34
	1.6≤t≤2.4	37 min	33 min	30 min	39 min	35 min	27 min	17 min	20 min
Mean plastic strain ratio r value	0.5≤t≤1.0	-	-	-	1.3 min	1.3 min	-	-	-
	1.0≤t≤1.6	-	-	-	1.2 min	1.2 min	-	-	-

5.1.3. ASTM A653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanneal) by the Hot-Dip Process.

Table 4 – Chemical Composition follow ASTM A653 (Mild Steel)

Unit:%

Grade	CS Type A ^{b,c,d}	CS Type B ^{b,e}	CS Type C ^{b,c,d}	FS Type A ^{b,f}	FS Type B ^{b,e}	DDS Type A ^{c,d}	DDS Type C ^g	EDDS ^g
C	0.1 max.	0.02~0.15	0.08 max.	0.10 max.	0.02~0.10	0.06 max.	0.02 max.	0.02 max.
Mn	0.60 max.	0.60 max.	0.60 max.	0.50 max.	0.50 max.	0.50 max.	0.50 max.	0.40 max.
P	0.030 max.	0.030 max.	0.100 max.	0.020 max.	0.020 max.	0.020 max.	0.020~0.1	0.020 max.
S	0.035 max.	0.035 max.	0.035 max.	0.035 max.	0.030 max.	0.025 max.	0.025 max.	0.020 max.
Al	-	-	-	-	-	0.01 max.	0.01 max.	0.01 max.
Cu	0.25 max.	0.25 max.	0.25 max.	0.25 max.	0.25 max.	0.25 max.	0.25 max.	0.25 max.
Ni	0.20 max.	0.20 max.	0.20 max.	0.20 max.	0.20 max.	0.20 max.	0.20 max.	0.20 max.
Cr	0.15 max.	0.15 max.	0.15 max.	0.15 max.	0.15 max.	0.15 max.	0.15 max.	0.15 max.
Mo	0.06 max.	0.06 max.	0.06 max.	0.06 max.	0.06 max.	0.06 max.	0.06 max.	0.06 max.
V	0.008 max.	0.008 max.	0.008 max.	0.008 max.	0.008 max.	0.008 max.	0.10 max.	0.10 max.
Cb	0.008 max.	0.008 max.	0.008 max.	0.008 max.	0.008 max.	0.008 max.	0.10 max.	0.10 max.
Tia	0.025 max.	0.025 max.	0.025 max.	0.025 max.	0.025 max.	0.025 max.	0.15 max.	0.15 max.

Note:

- For steels containing 0.02% carbon or more, titanium is permitted at the producer's option, to the lesser of 3.4N+1.5S or 0.0025%.
- When deoxidized steel is required for the application, the purchaser has the option to order CS and FS to a min. of 0.01% total aluminum.
- Steel is permitted to be finished as vacuum degassed or chemically stabilized steel or both, at the producer's option.
- For carbon levels less than or equal to 0.02%, vanadium, columbium or combinations thereof are permitted to be used as stabilizing elements at the producer's option. In such case, the applicable limit for vanadium and columbium shall be 0.10% max and the limit for titanium shall be 0.15% max.
- For CS and FS, specify Type B to avoid carbon levels below 0.02%.
- Shall not be furnished as stabilized steel.
- Shall be furnished as stabilized steel

Table 5 – Mechanical Properties follow ASTM A653 (Mild Steel)

Grade	YS (MPa)	EL in 50mm (%)	r _m value	n value
CS Type A	170-380	20 min.	-	-
CS Type B	205-380	20 min.	-	-
CS Type C	170-410	15 min.	-	-
FS Type A and B	170-310	26 min.	1.0 - 1.4	0.17 - 0.21
DDS Type A	140-240	32 min.	1.4 - 1.8	0.19 - 0.24
DDS Type C	170-280	32 min.	1.2 - 1.8	0.17 - 0.24
EDDS	105-170	40 min.	1.6 - 2.1	0.22 - 0.27

Table 6 – 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	...

Notes:

^A Where an ellipsis (...) appears in this table there is no requirement, but the analysis shall be reported.

^B 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.

^C Titanium is permitted for SS steel at the producer's option, to the lesser of 3.4N + 1.5S or 0.025%

^D For steels containing more than 0.02% carbon, titanium is permitted to the lesser of 3.4N + 1.5S or 0.025%

^E Shall be furnished as the stabilized steel.

Table 7 – Mechanical Properties follow ASTM A653 (Structure Steel and High Tensile 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

Grade	YS min (MPa)	TS min (MPa) ^A	EL in 50mm, min, (%) ^A
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

Note:

^A Where an ellipsis (...) appears in this table there is no requirement

^B For sheet thickness of 0.71mm or thinner, the elongation requirement is reduced two percentage points for SS 60(410) and 70(480).

^C For sheet thickness of 0.71mm or thinner, no tension test is required if the hardness result in Rockwell B85 or higher.

^D 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.

^E SS 80(550) class 2 may exhibit different forming characteristics than Class 1, due to difference in chemistry.

^F 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.

^G If a higher tensile strength is required, the user should consult the producer.

5.1.4. EN 10346 Continuously hot-dip coated steel flat products

Table 8 – 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)	EL. ^a min. (%)	Plastic strain ratio min	Strain hardening exponent min
	max.(%)										
DX51D (Z,ZF)	0.18		1.20	0.12			-	270~ 500	22	-	
DX52D (Z,ZF)	0.12	0.50	0.60	0.10	0.045	0.30	140~300	270~ 420	26	-	-
DX53D (Z,ZF)							140~260	270~ 380	30	-	-
DX54D (Z)							120~220	260~ 350	36	1.6b	0.18
DX54D (ZF)									34	1.4b	0.18
DX56D (Z)							120~180		39	1.9b	0.21
DX56D (ZF)									37	1.7b,c	0.20c
DX57D (Z)							120~170	41	2.1b	0.22	
DX57D (ZF)								39	1.9b,c	0.21c	

Note:

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 apples.

c) For $t > 1.5\text{mm}$, the min. r90-value reduced by 0.2 apples and the min. n90-value reduced by 0.01 apply.

Table 9 – Chemical Composition follow EN 10346 (High Tensile Strength Steel)

Unit: %

Steel grade	C	Si	Mn	P	S	Ti	Nb	T.Al
HX180YD	0.01	0.30	0.70	0.060	0.025	0.12	0.09	≥ 0.010
HX220YD	0.01	0.30	0.90	0.080		0.12	0.09	≥ 0.010
HX300YD	0.015	0.30	1.60	0.100		0.12	0.09	≥ 0.010
HX220BD	0.08	0.50	0.70	0.085		0.12	0.09	≥ 0.015
HX260LAD	0.11	0.50	1.00	0.030		0.15	0.09	≥ 0.015
HX300LAD	0.12	0.50	1.40	0.030		0.15	0.09	≥ 0.015
HX340LAD	0.12	0.50	1.40	0.030		0.15	0.10	≥ 0.015
HX380LAD	0.12	0.50	1.50	0.030		0.15	0.10	≥ 0.015
HX420LAD	0.12	0.50	1.60	0.030		0.15	0.10	≥ 0.015

Table 10 – 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)	Elongation _{a,c} - 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	-	-	-

Note:

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).

For $t > 1.5\text{mm}$, the min. r₉₀-value reduced by 0.2 applies.

For ZF - coatings (GA), the minimum Elongation value reduced by 2 units and the minimum r₉₀-value reduced by 0,2 apply.

Table 11- Chemical composition (cast analysis) of steels for construction**Unit:** %

Steel Grade		Symbols for the types of available coatings	C	Si	Mn	P	S
Steel name	Steel number						
S220GD	1.0241	+Z, +ZF	0.20	0.60	1.70	0.10	0.045
S250GD	1.0242	+Z, +ZF					
S280GD	1.0244	+Z, +ZF					
S320GD	1.025	+Z, +ZF					
S350GD	1.0529	+Z, +ZF					
S390GD	1.0238	+Z, +ZF					
S420GD	1.0239	+Z, +ZF					
S450GD	1.0233	+Z, +ZF					

By agreement at the time of enquiry and order, if other chemical elements are added, they shall be mentioned on the inspection document which may need a change of classification.

Table 12 – Mechanical properties (longitudinal direction) of steel for construction

Steel Grade		Symbols for the types of available coatings	Proof strength RP _{0.2 a} MPa d min.	Tensile strength R _{m b} MPa d min.	Elongation A _{80 c} % min.
Steel name	Steel number				
S220GD	1.0241	+Z, +ZF	220	300	20
S250GD	1.0242	+Z, +ZF	250	330	19
S280GD	1.0244	+Z, +ZF	280	360	18
S320GD	1.0250	+Z, +ZF	320	390	17

Steel Grade		Symbols for the types of available coatings	Proof strength RP0.2 a MPa d min.	Tensile strength Rm b MPa d min.	Elongation A80 c % min.
Steel name	Steel number				
S350GD	1.0529	+Z, +ZF	350	420	16
S390GD	1.0238	+Z, +ZF	390	460	16
S420GD	1.0239	+Z, +ZF	420	480	15
S450GD	1.0233	+Z, +ZF	450	510	14

a If the yield point is pronounced, the values apply to the upper yield point R_{eH} .

b For all grades a range of 140 MPa can be expected for tensile strength.

c Decreased minimum elongation values apply for product thickness:

0.50mm $t \le 0.70\text{mm}$ (minus 2 units)

0.35mm $t \le 0.50\text{mm}$ (minus 4 units)

And $t \le 0.35\text{mm}$ (minus 7 units)

d 1MPa = N/mm²

5.1.5. AS 1397 Steel sheet and strip_ Hot-dip zinc coated.

Table 13 – Requirements for chemical composition

Steel grade	Chemical composition, % max			
	Carbon	Manganese	Phosphorus	Sulfur
G250	0.12	0.5	0.04	0.035
G300 & G350	0.30	1.60	0.100	0.035
G450 & G500 & G550	0.20	1.20	0.040	0.030

Table 14 – Mechanical property requirements for structural grades (High tensile steel for construction)

Steel grade designation	Longitudinal tensile test				Transverse bend test	
	Min yield strength (Note 1) (MPa)	Min tensile strength (MPa)	Min. elongation, % (Note 2)		Angle of bend (degree)	Diameter of mandrel in terms of test piece thickness
			Lo=50mm	Lo=80mm		
G250	250	320	25	22	180	0
G300	300	340	20	18	180	t
G350	350	420	15	14	180	2t
G450 (Note 3)	450	480	10	9	90	4t
G500 (Note 4)	500	520	8	7	90	6t
G550 (Note 5)	550	550	2	2	-	-

Note:

1. The yield strength is the lower yield stress. If well-defined yielding is not obvious, the 0,2% proof stress should be determined.
2. Applies to test pieces equal to or greater than 0.6 mm thick. Lo = original gauge length
3. Applies to hard-rolled material equal to or greater than 1.50 mm thick.

5.2. Coating mass, Chemical treatment, Spangle and Oiling

5.2.1. JIS G3302 Hot-dip zinc-coated steel

Table 15 – Coating mass for GI

Unit: g/m²

Symbol	Z06	Z08	Z10	Z12	Z14	Z18	Z20	Z22	Z25	Z27	Z35
Minimum Coating mass at triple spots (g/m ²)	60	80	100	120	140	180	200	220	250	275	350
Minimum Coating mass at single spot (g/m ²)	51	68	85	102	119	153	170	187	213	234	298

Equivalent coating thickness (mm)	0.013	0.017	0.021	0.026	0.029	0.034	0.04	0.043	0.049	0.054	0.064
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Table 16 – Coating mass for GAUnit: g/m²

Symbol	F06	F08	F10	F12
Coating mass (g/m ²)	60	80	100	120
Equivalent coating thickness (mm)	0.008	0.013	0.017	0.026

Table 17 – Post Treatment

Type of chemical treatment	Symbol
Untreated	M
Chromate treatment	C
Chromate-free treatment	NC
Anti-finger print treatment	B

Table 18 – Oiling type

Type of oiling	Symbol
Oiled	O
Uncoiled	X

Remark: The type and the symbol of the sheets, corrugated sheets and coils shall be given in the table below. Unless otherwise specified, the non-alloyed coating shall be un-oiled and the alloyed coating shall be oiled.

Table 19 – Surface Finish

Type of coating surface finish	Symbol	Remark
Minimized spangle	Z	A coating having the spangles obtained by restricting normal spangle formation to a minimum.

5.2.2. JFS A3011 Hot-dip Galvanneal steel for automobile use

Table 20 – Coating mass

Coating mass designation		30	35	40	45	50	55
Coating mass (g/m ²)	Minimum	30	35	40	45	50	55
	Maximum	50	55	60	65	70	75

Table 21 – Post Treatment

Type of chemical treatment	Symbol
No treatment	M
Lubricant treatment	U

Table 22 – Oiling type

Type of oiling	Symbol
Normal rust preventive oil	O
Uncoiled	X

5.2.3. ASTM A653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy - Coated (Galvanneal) by the Hot-Dip Process

Table 23.1 – Coating mass

Inch-Pound Units		SI Units	
Coating mass symbol	Coating mass (oz/ft ²) min.	Coating mass symbol	Coating mass (g/m ²)
G01	-	Z001	-
G30	0.30	Z90	90
G40	0.40	Z120	120
G60	0.60	Z180	180
G90	0.90	Z275	275
G100	1.00	Z305	305
G115	1.15	Z350	350
A01	-	ZF001	-
A25	0.25	ZF75	75
A40	0.40	ZF120	120

Table 23.2 – Coating mass (for supplementary requirement)

The order shall specify a coating mass designation from table 23.2 for each surface.
The format for specifying the coating for each surface on the order shall be, for instance, 60G60G.

Type	Coating Designation	SI Units (g/m ²)		Inch-Pound Units (oz/ft ²)	
		Min.	Max	Min.	Max.
Zinc	20G	20	70	0.07	0.23
	30G	30	80	0.10	0.26
	40G	40	90	0.12	0.29
	45G	45	95	0.15	0.31
	50G	50	100	0.16	0.33
	55G	55	105	0.18	0.34
	60G	60	110	0.20	0.36
	70G	70	120	0.23	0.40
	90G	90	160	0.30	0.62
Zinc-Iron Alloy	100GD	100	200	0.32	0.65
	40A	10	70	0.13	0.23
	45A	45	75	0.15	0.25
	50A	50	80	0.16	0.26

Table 24 – Post Treatment

Type of chemical treatment	Symbol
Untreated	M
Chromate treatment	C
Chromate-free treatment	NC
Anti-finger print treatment	B

Table 25 – Oiling type

Type of oiling	Symbol
Oiled	O
Uncoiled	X

Remark: The type and the symbol of the sheets, corrugated sheets and coils shall be given in the table below. Unless otherwise specified, the non-alloyed coating shall be uncoiled and the alloyed coating shall be oiled.

Table 26 – Surface Finish

Type of coating surface finish	Symbol	Remark
Minimized spangle	Z	A coating having the spangles obtained by restricting normal spangle formation to a minimum.

5.2.4. EN 10346 Continuously hot-dip coated steel flat products

Table 27 – Coating mass

Symbol	Z100	Z140	Z200	Z225	Z275	ZF100	ZF120
Coating mass (g/m ²)	100	140	200	225	275	100	120

The available coating masses are given in table 27. Deviating coating masses and/or different coating masses on each surface may be supplied if agreed at the time of inquiry and order.

Table 28 – Post Treatment

Type of chemical treatment	Symbol
Untreated	U
Anti-finger print treatment	B

Table 29 – Oiling type

Type of oiling	Symbol
Oiled	O
Uncoiled	X

Remark: The type and the symbol of the sheets, corrugated sheets and coils shall be given in the table below. Unless otherwise specified, the non-alloyed coating shall be uncoiled and the alloyed coating shall be oiled.

Table 30 – Surface Finish

Type of coating surface finish	Symbol	Remark
Minimized spangle	M	A coating having the spangles obtained by restricting normal spangle formation to a minimum.

Table 31 – Surface Qualities

Type of surface qualities	Symbol
As coated surface	A
Improved surface	B
Best quality surface	C

5.2.5. AS 1397 Continuously hot-dip coated steel flat products

Table 32 – Coating mass

Symbol		Z100	Z200	Z275	Z350	
Minimum Coating mass (g/m ²)	Total both surface	Triple spot	100	200	270	350
		Single spot	90	180	250	315
	One surface	Single spot	40	80	110	140

5.3. Tolerances

5.3.1. JIS G3302 Hot-dip zinc-coated steel sheet and strip

Table 33 – Thickness Tolerances

Unit: mm

Thickness (t)	Thickness Tolerance			
	630 ≤ w < 1000	1000 ≤ w < 1250	1250 ≤ w < 1600	1600 ≤ w
0.25 ≤ t < 0.40	±0.05	±0.05	±0.06	—
0.40 ≤ t < 0.60	±0.06	±0.06	±0.07	±0.08
0.60 ≤ t < 0.80	±0.07	±0.07	±0.07	±0.08
0.80 ≤ t < 1.00	±0.07	±0.08	±0.09	±0.10
1.00 ≤ t < 1.25	±0.08	±0.09	±0.10	±0.12
1.25 ≤ t < 1.60	±0.10	±0.11	±0.12	±0.14
1.60 ≤ t < 2.00	±0.12	±0.13	±0.14	±0.16
2.00 ≤ t < 2.50	±0.14	±0.15	±0.16	±0.18

Note: The product thickness shall be measured at any point 25mm or over from the side edge.

Table 34 – Width Tolerances

Unit: mm

Width (w)	Tolerance on product width
w ≤ 1500	-0/+7
1500 < w	-0/+10

Table 35 – Flatness Tolerances

Unit: mm

Type of strain width(w)	Flatness tolerance (max.)		
	Bow, wave	Edge wave	Center buckle
w < 1000	12	8	6
1000 ≤ w < 1250	15	9	8
1250 ≤ w < 1600	15	11	8
1600 ≤ w	20	13	9

Table 36 – Camber Tolerances

Unit: mm

Width (w)	Maximum value of Camber
630 ≤ w	2 in any 2000 length

5.3.2. JFS A3011 Hot-dip galvaneal steel for automobile use

Table 37 – Thickness Tolerances

Unit: mm

Specified minimum tensile strength	Width (w)				
	Thickness(t)	w < 1000	1000 ≤ w < 1250	1250 ≤ w < 1600	1600 ≤ w
TS ≤ 270	0.30 ≤ t < 0.40	±0.04	±0.04	-	-
	0.40 ≤ t < 0.60	±0.05	±0.05	±0.06	±0.07
	0.60 ≤ t < 0.80	±0.06	±0.06	±0.06	±0.07
	0.80 ≤ t < 1.00	±0.06	±0.07	±0.08	±0.09
	1.00 ≤ t < 1.25	±0.07	±0.08	±0.09	±0.11

	$1.25 \leq t < 1.60$	± 0.09	± 0.10	± 0.11	± 0.13
	$1.60 \leq t < 2.00$	± 0.11	± 0.12	± 0.13	± 0.15
	$2.00 \leq t < 2.40$	± 0.13	± 0.14	± 0.15	± 0.17
270 < TS < 780	$0.40 \leq t < 0.60$	± 0.05	± 0.05	± 0.07	± 0.08
	$0.60 \leq t < 0.80$	± 0.06	± 0.06	± 0.07	± 0.08
	$0.80 \leq t < 1.00$	± 0.07	± 0.08	± 0.09	± 0.10
	$1.00 \leq t < 1.25$	± 0.08	± 0.09	± 0.10	± 0.12
	$1.25 \leq t < 1.60$	± 0.10	± 0.11	± 0.12	± 0.14
	$1.60 \leq t < 2.00$	± 0.11	± 0.12	± 0.14	± 0.16
	$2.00 \leq t < 2.40$	± 0.13	± 0.14	± 0.16	± 0.18
780 \leq TS	$0.60 \leq t < 0.80$	± 0.08		± 0.09	-
	$0.80 \leq t < 1.00$	± 0.09		± 0.10	-
	$1.00 \leq t < 1.25$	± 0.11		± 0.12	-
	$1.25 \leq t < 1.60$	± 0.12		± 0.14	-
	$1.60 \leq t < 2.00$	± 0.14		± 0.16	-
	$2.00 \leq t < 2.40$	± 0.16		± 0.18	

Table 38 – Width Tolerances

Unit: mm

Width (w)	Tolerances	
	Class A	Class B
$w < 1250$	+7/0	+3/0
$w \geq 1250$	+10/0	+4/0

Table 39 – Flatness Tolerances

Unit: mm

Width (w) \ TS	TS \leq 440	440 < TS
$w < 1000$	≤ 8	≤ 8
$1000 \leq w < 1250$	≤ 9	≤ 10
$1250 \leq w < 1600$	≤ 11	≤ 12
$1600 \leq w$	≤ 13	≤ 14

Table 40– Camber Tolerances

Unit: mm

Width (w)	Tolerances, maximum value
$w \geq 630$	for any 2000 length

5.3.3. ASTM A924M Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process

Table 41 – Thickness Tolerances for Hot-Dip Metallic-Coated Sheet-[25mm] Minimum Edge Distance

Note 1: The coated sheet thickness includes the base metal and coating and is measured at any point across the width of the coated sheet not less than 25mm from side edge.

Note 2: Micrometers used for measurement of thickness shall be constructed with anvils and spindles having minimum diameters of 4.80mm. The tip of the anvil shall be flat or rounded with minimum radius of curvature of 2.25mm and the tip of the spindle shall be flat. Micrometers with conical tips shall not be used for thickness measurements of sheet steels.

Unit: mm

Thickness(t) Width (w)	t ≤ 0.40	0.40 < t ≤ 1.00	1.00 < t ≤ 1.50	1.50 < t ≤ 2.00	2.00 < t ≤ 2.40
w ≤ 1500	0.08	0.10	0.13	0.15	0.30
w > 1500	0.08	0.10	0.13	0.15	0.34

Remark: The tolerances provide in the table are based on minimum thickness (tolerance over, no tolerance under). For nominal thickness, the tolerance is divided over and under (tolerance over, tolerance under)

Table 42 – Width tolerances for Hot-Dip Metallic-Coated Sheet, Coils, and Cut Lengths, not resquared

Width (w)	Tolerance Over Specified Width, No Tolerance Under
w < 1200	5
1200 ≤ w < 1500	6
1500 ≤ w < 1800	8

Table 43 – Flatness Tolerances for Hot-Dip Metallic-Coated Sheet, Cut Lengths

Unit: mm

Thickness (t) Width (w)	Flatness tolerance (max.)	
	t ≤ 1.0	1.0 < t
w ≤ 900	10	8
900 < w ≤ 1500	15	10
1500 < w ≤ 1600	20	15

Remark: This table applies to all designations except SS, HSLAS.

5.3.4. EN 10143 Continuously hot-dip coated steel sheet and strip - Tolerances on dimensions and shape.

Note: The thickness may be measured at any point located more than 40mm from the edges.

Table 44 – Thickness Tolerances for steel grades with specified minimum proof strength R_{p0.2} < 260MPa

Unit: mm

Thickness (t) Width (w)	w ≤ 1200	1200 < w ≤ 1500	1500 < w
0.30 < t ≤ 0.40	±0.04	±0.05	±0.06
0.40 < t ≤ 0.60	±0.04	±0.05	±0.06
0.60 < t ≤ 0.80	±0.05	±0.06	±0.07
0.80 < t ≤ 1.00	±0.06	±0.07	±0.08
1.00 < t ≤ 1.20	±0.07	±0.08	±0.09
1.20 < t ≤ 1.60	±0.10	±0.11	±0.12
1.60 < t ≤ 2.00	±0.12	±0.13	±0.14
2.00 < t ≤ 2.40	±0.14	±0.15	±0.16

Table 45– Thickness Tolerances for steel grades with specified minimum proof strength

260MPa ≤ R_{p0.2} < 360MPa and for grade DX51D

Unit: mm

Thickness (t) Width (w)	w ≤ 1200	1200 < w ≤ 1500	1500 < w
0.30 < t ≤ 0.40	±0.05	±0.06	±0.07
0.40 < t ≤ 0.60	±0.05	±0.06	±0.07
0.60 < t ≤ 0.80	±0.06	±0.07	±0.08
0.80 < t ≤ 1.00	±0.07	±0.08	±0.09

Thickness (t)	Width (w)		
	w ≤ 1200	1200 < w ≤ 1500	1500 < w
1.00 < t ≤ 1.20	±0.08	±0.09	±0.11
1.20 < t ≤ 1.60	±0.11	±0.13	±0.14
1.60 < t ≤ 2.00	±0.14	±0.15	±0.16
2.00 < t ≤ 2.40	±0.16	±0.17	±0.18

Table 46 – Thickness Tolerances for steel grades with specified minimum proof strength

$$360\text{MPa} \leq R_{p0.2} < 420\text{MPa}$$

Unit: mm

Thickness (t)	Width (w)		
	w ≤ 1200	1200 < w ≤ 1500	1500 < w
0.30 < t ≤ 0.40	±0.05	±0.06	±0.07
0.40 < t ≤ 0.60	±0.06	±0.07	±0.08
0.60 < t ≤ 0.80	±0.07	±0.08	±0.09
0.80 < t ≤ 1.00	±0.08	±0.09	±0.11
1.00 < t ≤ 1.20	±0.10	±0.11	±0.12
1.20 < t ≤ 1.60	±0.13	±0.14	±0.16
1.60 < t ≤ 2.00	±0.16	±0.17	±0.19
2.00 < t ≤ 2.40	±0.18	±0.20	±0.21

Table 47 – Thickness Tolerances for steel grades with specified minimum proof strength

$$420\text{MPa} \leq R_{p0.2} < 900\text{MPa}$$

Unit: mm

Thickness (t)	Width (w)		
	w ≤ 1200	1200 < w ≤ 1500	1500 < w
0.30 < t ≤ 0.40	±0.06	±0.07	±0.08
0.40 < t ≤ 0.60	±0.06	±0.08	±0.09
0.60 < t ≤ 0.80	±0.07	±0.09	±0.11
0.80 < t ≤ 1.00	±0.09	±0.11	±0.12
1.00 < t ≤ 1.20	±0.11	±0.13	±0.14
1.20 < t ≤ 1.60	±0.15	±0.16	±0.18
1.60 < t ≤ 2.00	±0.18	±0.19	±0.21
2.00 < t ≤ 2.40	±0.21	±0.22	±0.24

Table 48 – Width Tolerances

Width (w)	Width tolerances	
	Upper limit	Lower limit
w ≤ 1200	5	0
1200 < w ≤ 1500	6	0
1500 < w ≤ 1800	7	0

Table 49– Flatness Tolerances for steel grades with specified minimum proof strength

$$R_{p0.2} < 260\text{MPa}$$

Unit: mm

Width (w)	Thickness (t)	Flatness tolerances (max.)			
		Rp0.2 < 260MPa		260MPa < Rp0.2 < 360MPa	
		t < 0.70	t < 0.70	0.70 ≤ t < 3.0	0.70 ≤ t < 3.0
w < 1200		10	10	13	10
1200 ≤ w < 1500		12	12	15	13
1500 ≤ w		17	17	20	19

Table 50 – Camber Tolerances**Unit:** mm

Length	Camber tolerances (max.)
2000 < L	5 mm

5.3.5. AS 1365 Cold Rolled and Metallic Coated Sheet & Strip**Table 51- Thickness Tolerance**

Thickness (t)	Width (w)	w ≤ 1200	1200 < w ≤ 1500	1500 < w
0.30 < t ≤ 0.50		±0.03	±0.04	-
0.50 < t ≤ 0.80		±0.04	±0.05	±0.06
0.80 < t ≤ 1.20		±0.05	±0.06	±0.07
1.20 < t ≤ 1.60		±0.06	±0.07	±0.08
1.60 < t ≤ 2.00		±0.07	±0.08	±0.09
2.00 < t ≤ 2.50		±0.08	±0.09	±0.10

Table 52– Width Tolerances

Width (w)	Width tolerances	
	Mill Edge	Cut Edge
750 ≤ w ≤ 1000	-0/+25	-0/+4
1000.1 ≤ w ≤ 1250	-0/+30	-0/+5
1250.1 ≤ w ≤ 1500	-0/+35	-0/+5
1500.1 ≤ w ≤ 1650	-0/+40	-0/+5

Table 53 – Flatness Tolerances

Width (w)	Thickness (t)	Flatness Tolerance	
		Class A	Class B10
750 < w < 1000		10	5
1000 < w ≤ 1500		15	8
1500 < w		20	10

Table 50 – Camber Tolerances**Unit:** mm

Length	Camber tolerances (max.)
2000 < L	0.2%

5.4. Classification of Quality

Classification	Quality	Common Specification	Typical Application
For Forming Fabrication	Commercial Quality (CQ)	JIS G3302 SGCC JFS A3011 JAC270C ASTM A653/A653M CS,FS EN 10346 DX51D, DX52D	Computer case & parts, Pre-painted GI, Construction material, OA Furniture and Closet
	Drawing & Deep Drawing & Extreme Drawing Quality (DQ,DDQ,EDDQ)	JIS G3302 SGCD1~3 JFS A3011 JAC270D/E/F ASTM A653/A653M DS,DDS EN 10346 DX53D~DX57D EN 10346 HX180~300YD	Household electrical appliances, Inner or outer panel of automobile, Air condition or washing machine case & frame, Computer case & parts, Automobile parts
For Structural Uses	Structural Quality (SQ)	JIS G3302 SGC340~570 JFS A3011 JAC340~440W, 340~390P, 440~590R, 590Y ASTM SS 33(230)~80(550) EN HX260~420LAD	Slide rail, Deck, Auto-vending machines case & parts, Steel door, Construction material, Automobile used steel

6. PRODUCT AVAILABILITY

6.1 Unit mass

Product Type	Maximum Unit mass
Hot-dip Galvanized Coil	20MT/Coil

6.2 Available Sizes

Product Type	Thickness	Width	Coil Inner Diameter
Hot-dip Galvanized Coil	0.300 ~ 0.349	700 ~ 1100	508/610
	0.350 ~ 0.409	700 ~ 1219	
	0.410 ~ 0.509	700 ~ 1250	
	0.510 ~ 0.599	700 ~ 1350	
	0.600 ~ 0.699	700 ~ 1500	
	0.700 ~ 1.799	700 ~ 1600	
	1.800 ~ 2.400	700 ~ 1600	

Remark: The above data is reference only. Actual available sizes range shall be confirmed with CSVC sales department.

7. MARKING AND PACKING

7.1. Marking for Hot-Dip Galvanized Steel

CÔNG TY CỔ PHẦN CHINA STEEL & NIPPON STEEL VIỆT NAM
CHINA STEEL AND NIPPON STEEL VIETNAM JOINT STOCK COMPANY
 Địa chỉ: Khu công nghiệp Mỹ Xuân A2, Phường Mỹ Xuân, Thị xã Phú Mỹ, Tỉnh Bà Rịa Vũng Tàu, Việt Nam.
 Address: My Xuan A2 Industrial Zone, My Xuan Ward, Phu My Town, Ba Ria-Vung Tau Province, Vietnam.

Tên Sản Phẩm Product Name	HDG - GI COIL		 QUATEST3 <small>ASTM A653/A653M-15</small>		
Khách Hàng Customer	MISI				
Tiêu Chuẩn Specification	ASTM A653				
Mức Thép Steel Grade	CS TYPE B, G60				
Kích Thước Size	0.0210" x60.000" × COIL				
Mã Cuộn Coil ID	3219611				
Khối Lượng Tịnh Net mass	7,580	kg	<table border="1" style="margin: 0 auto;"> <tr> <td>Mã Nhiệt Heat No</td> <td>4J414</td> </tr> </table>	Mã Nhiệt Heat No	4J414
Mã Nhiệt Heat No	4J414				
Khối Lượng Tổng Gross mass	7,660	kg	<table border="1" style="margin: 0 auto;"> <tr> <td>Ngày Sản Xuất Product Date</td> <td>17.05.2019</td> </tr> </table>	Ngày Sản Xuất Product Date	17.05.2019
Ngày Sản Xuất Product Date	17.05.2019				

Sản Xuất Tại Việt Nam
Made in Viet Nam

3219611

7,580

(The label is a sample and just for reference)

7.2 . Packing for Hot-Dip Galvanized Steel



Case 1: Film/paper wrapping/VCI paper + Paper edge protector+ Metal edge protector + Hard board paper + Circumferential strapping + Eye strapping



Case 2: Film/Paper/VCI paper wrapping+ Paper edge protector + Metal edge protector+ Hard board paper+ Metal protector+ Circumferential strapping + Eye strapping

8. APPLICATIONS EXAMPLES



Automobiles



Air conditioner



Computer case



Slide rail

9. CONVERSION TABLES

Length	ft	in	mm	m
	1	12	304.8	0.3048
	0.08333	1	25.4	0.0254
	0.003281	0.03937	1	0.001

Weight	1kg = 2.20462 lbs
--------	-------------------

Force	1kgf = 9.80665 N
-------	------------------

Stress	ksi (=1000psi)	psi	kgf/mm ²	N/mm ² (MPa)
	1	1000	0.703070	6.89476
	0.001	1	0.703070×10 ⁻⁴	6.89476×10 ⁻³
	1.42233	1422.33	1	9.80665
0.145038	145.038	1.101972	1	

bsorbed Energy	lbf-ft	kgf-m	N-m (=Joule)	
	1	0.138255	1.35582	
	7.23301	1	9.80665	
	0.737562	0.101972	1	

10. ORDER INFORMATION

For promptly and properly processing of your orders, please clearly specify the items as shown in the table below. If you need to confirm any information about CSVC's products or services, please feel free to contact with CSVC's sales or QC/QA department.

Required Ordering Data		Example	
1	Specification (Name, Number, Grade)		
	Coating Type	ZZ(GI), ZF(GA)	
	Coating Mass	Z10, Z12, F08, F10...etc.	
	Chemical Treatment	M, C, P, NC	
	Surface Quality	Unexposed (UE)	
		General (GP)	
		Exposed (GE)	
	Severe Exposed (SE)		
2	Mill Edge, Cut Edge, Mill option	Mill Option	
3	Oiling	Uncoiled	
4	Dimensions (Thickness × Width × coil)	1.0mm×1219mm×Coil	
5	Tolerance	JIS Standard	
6	Inner Diameter	ID 610	
7	Mass	Max. Mass	10 ton max.
		Order Mass	45 ton
8	Application and Fabrication Methods	Welded Pipe	
9	Special Requirements (if any)	HRB 55max.	

Notes:

- (1) The contents of this catalog are for reference only. Customers are recommended to consult the specifications published by the corresponding associations.
- (2) Information of the available steel grades, sizes, marking and packing as shown herein may be updated without notice to comply with actual production situations.
- (3) Customers are recommended to confirm with CSVC, should you have any questions concerning steel specifications or ordering requirements.

11. NOTIFICATION

➤ Rust Prevention

If antirust treatment is not properly performed for the Zn-coated steel products, it will be easy to rust the steel surface. Therefore, the coils have to be spread with proper rust preventive oil or chemical treatment according to the orders to protect zinc layer surface, and the coils are packed completely to protect them before shipping. However, the steel sheets and coils are easy to rust owing to the environmental factors during their storage and use. Especially the condensation problems are easy to occur when the coil storage is in an environment of high humidity and high/low temperature with rapid changes. Therefore, it should particularly pay attention to the prevention of condensation and drain water in advance. Besides, since the dust or acidic substance in the atmosphere are also easy to rust the surface of steel coils or sheets, such problems in the storage or processing must be eliminated for keeping good surface quality.

➤ Stretcher strain and Aging

There are solid solution Carbon and Nitrogen in the low carbon steels. If they are not treated properly, the stretcher strain marks will be occurred in the process. Therefore, the temper rolling process will be carried out appropriately on these products to eliminate the extension of yield point. However, the extension of yield point may appear again with the longer period of storage as we called the aging problem. Aging is mainly related to solid solution Carbon, storing temperature and time. The “first in, first out (FIFO)” management to use these grades of steel is recommended as soon as possible in order to avoid the aging problems.

➤ Storage and Loading/Unloading

1. Water leakage during loading/unloading and storage constitutes a cause of corrosion. Strictly avoid loading/unloading during rain and prevent exposure to seawater and dew condensation. Also, avoid storage in atmospheres of high humidity or sulfur-dioxide. Indoor storage under dry, clean conditions is recommended.
2. Broken or torn packaging paper must be repaired.
3. When coils and cut-length sheets are stored in piles for an extended time, the coated surfaces may become blackened. Because of this, early application is recommended.

➤ Welding

1. In resistance welding, because the electrodes are soiled by picking up of zinc, they should be properly maintained and replaced at regular intervals.
2. In welding, fumes consisting mainly of zinc oxides are generated. Although the effect of these fumes will differ depending on the working environment, it is recommended that welding be conducted in a well-ventilated place.

- The information in this catalog is intended for reference only and may be subject to change without notice. For more information regarding either sales or techniques., please contact to C1, C2 - Sale Department or P5-Quality Control and Quality Assurance department.