

## Applicable Standards

The following list contains specification references for products we can offer. **Applicable Standards** describe specification requirements our suppliers can meet. **Other Reference Standards** are included for your reference.

	Applicable Standards	Other Reference Standards
Quality designations	ASTM A591 JIS G3313	
Chemical composition	ASTM A591	
Mechanical properties	ASTM A591 JIS G3313	DIN17163
Coating weights & thickness	ASTM A591 JIS G3313	DIN17163
Thickness tolerances	ASTM A591 JIS G3313	
Width tolerances	JIS G3313	
Length tolerances	JIS G3313	

### ASTM A 591

(Steel Sheet, Electrolytic Zinc-Coated, for Light Coating Mass Applications)

- **Quality Designations**

- Commercial Quality (CQ) sheet: steel sheet intended for applications where material is subjected to bending or moderate forming.
- Drawing Quality (DQ) sheet: steel sheet intended for fabricating identified parts where drawing or severe forming may be involved.
- Drawing Quality Special Killed(DQSK) sheet: steel manufactured from specially produced or selected killed steels (normally aluminum killed) specially processed to have good uniform drawing properties for use in fabricating an identified part having extremely severe deformations and to be essentially free from aging.
- Structural (Physical) Quality (SQ) sheet: steel sheet intended for applications where mechanical properties are specified or required. Such properties or values include those indicated by tension, hardness, or other commonly accepted mechanical tests. (Care should be taken to ensure that the grade

designation us compatible with the application.)

- High-strength, low-alloy (HSLA) quality sheet: steel sheet of high strength steels which have better formability when compared to structural quality sheet.

▪ **Coating Class**

Coating Class	Coating Weight Minimum Check Limit			
	Total, Both Sides			
	Triple Spot		Single Spot	
	oz/ft <sup>2</sup>	g/m <sup>2</sup>	oz/ft <sup>2</sup>	g/m <sup>2</sup>
A	No minimum required	No minimum required	No minimum required	No minimum required
B	0.08	24	0.07	22
C	0.16	48	0.15	45

▪ **Chemical Requirements**

Element	Composition (%), max.	
	Commercial Quality	Drawing Quality (Special Killed)
Carbon	0.15	0.10
Manganese	0.60	0.50
Phosphorus	0.035	0.025
Sulfur	0.04	0.035

▪ **Thickness Tolerances**

Specified	Specified Minimum Thickness, in.
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Width, in.	From 0.14 to 0.019 incl.	Over 0.019 to 0.039 incl.	Over 0.039 to 0.057 incl.	Over 0.057 to 0.098 incl.
Up to 60	0.004	0.006	0.008	0.010
Specified Width, in.	Specified Minimum Thickness, in.			
	From 0.4 to 0.5 incl.	Over 0.5 to 1.0 incl.	Over 1.0 to 1.5 incl.	Over 1.5 to 2.5 incl.
Up to 1500	0.10	0.15	0.20	0.25

## DIN 17163

- Grades and Mechanical Properties

Steel Grade	Type of Deoxidation and Chemical Composition as in	Yield Strength (N/mm <sup>2</sup> )	Tensile Strength (N/mm <sup>2</sup> )	Minimum Elongation after Fracture (%)	Minimum Cupping	Maximum Hardness	Bend Test
St 12	DIN 1623 Part 1	max.280	270 to 410	28	As in DIN 1623 Part 1.	As in DIN 1623 Part 1.	
RR St 13			max.240	34			
St 14			max.210	38			
			270 to 350				
St 37-3G	DIN 1623 Part 2	min.215	360 to 510	20	-	-	As in DIN 1623 Part 2
Z StE 260	SEW 093	260 to 340	350 to 450	24	-	-	As in SEW 093.
Z StE 300		300 to 380	380 to 480	22	-	-	
Z StE		340 to 410	410 to	20	-	-	

- **Thickness and Mass of Coating**

Type of Zinc Coating	Designation	Nominal Coating Thickness, S, per Surface, (μm)	Nominal Coating Mass per Unit Area, GA, per Surface, (g/m <sup>2</sup> )	Minimum Coating Mass per Unit Area, per Surface, (g/m <sup>2</sup> )
ZE 10/10	Thin coating	1/1	7/7	4/4
ZE 25/25	Normal coating	2.5/2.5	18/18	12/12
ZE 50/50	Thick coating	5/5	36/36	28/28
ZE 75/75		7.5/7.5	54/54	47/47
ZE 25/0	One-sided coating	2.5/0	18/0	12/0
ZE 50/0		5/0	36/0	28/0
ZE 75/0		7.5/0	54/0	47/0
ZE 100/0		10/0	72/0	65/0
ZE 50.25	Differential coating	5/2.5	36/18	28/12
ZE 75/25		7.5/2.5	54/18	47/12
ZE 75/50		7.5/5	54/36	47/28

### JIS G3313

- **Grades**

Symbol	Thickness (mm)	Base Metal	Quality
SECC	0.4~3.2	SPCC	Commercial
SECD		SPCD	Drawing
SECE		SPCE	Deep Drawing

SEFC340	0.6~2.3	SPFC340	High Strength Steel for Deep Drawing
SEFC370		SPFC370	
SEFC390		SPFC390	High Strength Steel for Drawing
SEFC440		SPFC440	
SEFC490		SPFC490	
SEFC540		SPFC540	
SEFC590		SPFC590	
SEFC490Y	0.6~1.6	SPFC490Y	Low Yield Ratio Type
SEFC540Y		SPFC540Y	
SEFC590Y		SPFC590Y	
SEFC780Y	0.8~1.4	SPFC780Y	
SEFC980Y		SPFC980Y	
SEFC340H	0.6~1.6	SPFC340H	Bake Hardening Type

- Coating Weights

Symbol	Minimum Coating Weight of Zinc(One-sided) g/m <sup>2</sup>		Standard Coating Weight of Zinc(One-sided) g/m <sup>2</sup>
	In Case of Equal Thickness Coating	In Case of Differential Coating	
EB	2.5	-	3
E8	8.5	8	10
E16	17	16	20
E24	25.5	24	30
E32	34	32	40
E40	42.5	40	50

- Mechanical Properties

Symbol	Yield Strength (N/mm <sup>2</sup> ) min.	Tensile Strength (N/mm <sup>2</sup> ) min.	Elongation (%)						Test Piece
			Thickness (mm)						
			0.40 to 0.60excl	0.60 to 1.0excl	1.0 to 1.6excl	1.6 to 2.3excl	2.3 to 2.5excl	2.5 and over	
SECC	-	(270)	(34)	(36)	(37)	(38)	(38)	(39)	No.5 Rolling Direction
SECD	-	270	36	38	39	40	40	41	
SECE	-	270	38	40	41	42	42	43	
SEFC 340	175	340	-	34	35	35	-	-	No.5 Perpendicular Rolling Direction
SEFC 370	205	370	-	32	33	33	-	-	
SEFC 390	235	390	-	30	31	31	-	-	
SEFC 440	265	440	-	26	27	27	-	-	
SEFC 490	295	490	-	23	24	24	-	-	
SEFC 540	325	540	-	20	21	21	-	-	
SEFC 590	355	590	-	17	18	18	-	-	
SEFC 490Y	225	490	-	24	25	25	-	-	
SEFC 540Y	245	540	-	21	22	22	-	-	
SEFC 590Y	265	590	-	18	19	19	-	-	
SEFC 780Y	365	780	-	13	14	14	-	-	
SEFC 980Y	490	980	-	6	7	7	-	-	
SEFC	185	340	-	34	35	35	-	-	

- **Thickness Tolerances**

(Base metal: Cold-rolled sheet)

Thickness	Width				
	Under 630	630 and over to 1000, excl.	1000 and over to 1250, excl.	1250 and over to 1600, excl.	1600 and over
0.40 and over to 0.60,excl.	±0.05	±0.05	±0.05	±0.06	-
0.60 and over to 0.80,excl.	±0.06	±0.06	±0.06	±0.06	±0.07
0.80 and over to 1.00,excl.	±0.06	±0.06	±0.07	±0.08	±0.09
1.00 and over to 1.25,excl.	±0.07	±0.07	±0.08	±0.09	±0.11
1.25 and over to 1.60,excl.	±0.08	±0.09	±0.10	±0.11	±0.13
1.60 and over to 2.00,excl.	±0.10	±0.11	±0.12	±0.13	±0.15
2.00 and over to 2.50,excl.	±0.12	±0.13	±0.14	±0.15	±0.17
2.50 and over to 3.15,excl.	±0.14	±0.15	±0.16	±0.17	±0.20
3.15 and over	±0.16	±0.17	±0.19	±0.20	-

- **Width Tolerances**

Width	Base Metal	Cold-rolled Sheet used as Base Metal
Under 1250		+7 0
1250 and over		+10 0

- **Length Tolerances**

Length	Base Metal	Cold-rolled Sheet used as Base Metal
Under 2000		+10 0
2000 and over to 4000,excl.		+15 0
4000 and over to 6000,excl.		+20 0

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