

JIS G3141 COLD REDUCED CARBON STEEL SHEETS AND STRIP (1996)

1. Classification and Chemical Composition

Class	Symbol	Quality	Chemical Composition %				
			C	Si	Mn	P	S
Class 1	SPCC	General Use	0.12 Max.	-	0.50 Max.	0.040 Max.	0.045 Max.
Class 2	SPCD	Drawing Quality Use	0.10 Max.	-	0.45 Max.	0.035 Max.	0.035 Max.
Class 3	SPCE	Deep Drawing Quality Use	0.08 Max.	-	0.40 Max.	0.030 Max.	0.030 Max.

- Remarks:
- Where the value obtained by the tensile test are guaranteed by the order of purchaser for class 1 sheet or strip normally refined or as it is annealed, its symbol for classification shall be SPCCT, which has a suffix T at the end.
 - Where the non-aging is guaranteed by the order of purchaser for class 3 sheet or strip normally refined or as it is annealed, its symbol for classification shall be SPCEN, which has a suffix N at the end.

2. Mechanical Properties

(1) Tensile Strength, Elongation and Non-aging Property.

Tensile Test	Tensile Strength N/mm ²	Elongation %						Tensile Test Piece
		0.25 or over to 0.40, excl.	0.40 or over to 0.60, excl.	0.60 or over to 1.0, excl.	1.0 or over to 1.6, excl.	1.6 or over to 2.5, excl.	2.5 or over	
Division by nominal thickness mm	0.25 and over	0.25 or over to 0.40, excl.	0.40 or over to 0.60, excl.	0.60 or over to 1.0, excl.	1.0 or over to 1.6, excl.	1.6 or over to 2.5, excl.	2.5 or over	No. 5 in the direction of rolling
Symbol of class								
SPCC	(270 Min.)	(32 Min.)	(34 Min.)	(36 Min.)	(37 Min.)	(38 Min.)	(39 Min.)	
SPCD	270 Min.	34 Min.	36 Min.	38 Min.	39 Min.	40 Min.	41 Min.	
SPCE	270 Min.	36 Min.	38 Min.	40 Min.	41 Min.	42 Min.	43 Min.	

- Remarks:
- The tensile test value does not usually apply to SPCC. When required by the purchaser, however, the value in parentheses shall be adopted.
 - For those less than 0.60 mm in thickness, the tensile test shall generally be omitted.
 - This table applies to those of 30 mm or more in width.
 - When the non-aging is designated for the normally refined steel sheet and strip of SPCE, it shall be guaranteed for 6 months after delivery from the manufacturing factory. The term "non-aging" means the property to produce stretcher strain during the time of being worked.

(2) Hardness and Bendability

Distinction of Thermal Refining	Symbol of Refining	Hardness		Bend Test		
		Rockwell Scale "B" HRB	Vicker HV	Bend Angle	Inside Radius	Test Piece
As annealed	A	*57 Max	*105 Max	180°	Close contact	No. 3 in the direction of rolling
Normal refining	S	*65 Max	*115 Max	180°	Close contact	
1/8 hardness	8	50 to 71	95 to 130	180°	Close contact	
1/4 hardness	4	65 to 80	115 to 150	180°	0.5 x thickness	
1/2 hardness	2	74 to 89	135 to 185	180°	1.0 x thickness	
Full hardness	1	85 Min	170 Min	-	-	

(* Only for reference)

3. Permissible Variations in Dimensions and Shapes

(1) Tolerances A on Thickness

(Unit: mm)

Division by nominal thickness	Division by nominal width	
	630 or over to 1,000, excl.	1,000 or over to 1,250, excl.
0.25 to 0.40, excl.	±0.04	±0.04
0.40 to 0.60, excl.	±0.05	±0.05
0.60 to 0.80, excl.	±0.06	±0.06
0.80 to 1.00, excl.	±0.06	±0.07
1.00 to 1.25, excl.	±0.07	±0.08
1.25 to 1.60, excl.	±0.09	±0.10
1.60 to 2.00, excl.	±0.11	±0.12
2.00 to 2.50, excl.	±0.13	±0.14
2.50 to 3.15, excl.	±0.15	±0.16

- (2) Width Tolerances, the width tolerances shall be as follows:
- (i) The width tolerances shall be applied to the nominal width.
 - (ii) The width tolerances shall be classified into class A and B.

Width Tolerances, Class A (Unit: mm)

Discrimination according to nominal width	
Under 1,250	1,250 or over
+7	+10
0	0

Width Tolerances, Class B (Unit: mm)

Discrimination according to nominal width	
Under 1,250	1,250 or over
+3	+4
0	0

Remarks: The plus side tolerance shall not be applied to the stretched-levelled steel sheet.

(Unit: mm)

- (3) Tolerances A on Flatness

Division by nominal width	Classification of warpage		
	Bow wave	Edge wave	Centre Buckle
Under 1,000	12 Max.	8 Max.	6 Max.
1,000 to 1,250, excl.	15 Max.	9 Max.	8 Max.

(Unit: mm)

- (4) Camber Tolerances

Division by nominal width	Classification of Steel Sheet and Strip		
	Steel Sheet		Steel Strip
	Under 2,000 in length	2,000 and over in length	
30 to 60, excl.	8 Max.	Max. 8 per any length of 2,000	
60 to 630, excl.	4 Max.	Max. 4 per any length of 2,000	
630 and over	2 Max.	Max. 2 per any length of 2,000	

Product Range

Specification : JIS G3141

Symbol of Quality	Grades	Surface Finish	Symbol	Application / User	Remarks
SPCC	As-Annealed		SPCC-A	General Use	Commercial Quality
	Standard Temper Grade	Dull Finish	SPCC-SD	General Use, Furniture, Tubes, Cabinet, Drum, Automotive Parts, Electrical Parts	Commercial Quality
	1/8 Hard	Dull Finish	SPCC-8D	Electrical Parts Electronic Parts Computer Parts Automotive Parts	Special Hardness Quality
		Bright Finish	SPCC-8B		
	1/4 Hard	Dull Finish	SPCC-4D	Electrical Parts Electronic Parts Computer Parts Automotive Parts	Special Hardness Quality
		Bright Finish	SPCC-4B		
	1/2 Hard	Dull Finish	SPCC-2D	Electrical Parts Electronic Parts Computer Parts Automotive Parts	Special Hardness Quality
		Bright Finish	SPCC-2B		
	Full Hard	Bright Finish	SPCC-1B	Strapping / Bailing Hoop, Motorcycle & Bicycle Parts G.I. & Other Coated Sheet	Special Hardness / Tensile Quality
	SPCD	Standard Temper Grade	Dull Finish	SPCD-SD	Electrical Parts Electronic Parts Automotive Parts
SPCE	Standard Temper Grade	Dull Finish	SPCE-SD	Electrical Parts Electronic Parts Automotive Parts	Deep Drawing Quality
	Standard Temper Grade (Non-aging Property)	Dull Finish	SPCEN-SD	Electrical Parts Electronic Parts Automotive Parts	Deep Drawing Quality

Specification : JIS G3135

SPFC	SPFC 340	Dull Finish		Automotive Parts, Tubes	Drawing Use
	SPFC 370	Dull Finish		Automotive Parts, Tubes	Drawing Use
	SPFC 390	Dull Finish		Automotive Parts, Tubes	Forming Use