

# Product Specification

## 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. | 0.40 Max. | 0.45 Max. |
| Class 2 | SPCD   | Drawing Quality Use      | 0.10 Max.              | -  | 0.45 Max. | 0.35 Max. | 0.35 Max. |
| Class 3 | SPCE   | Deep Drawing Quality Use | 0.08 Max.              | -  | 0.40 Max. | 0.30 Max. | 0.30 Max. |

- Remarks:
- Where the value obtained by the tension 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 SPCC, which as 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 SPCCN, which as a suffix N at the end.

### 2. Mechanical Properties

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

| Tension test                     | Tensile Strength N/mm <sup>2</sup> | Elongation %                |                             |                            |                           |                           |             | Tension 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                      |                             |                             |                            |                           |                           |             |                                   |
| Symbol of class                  |                                    |                             |                             |                            |                           |                           |             |                                   |
| SPCC                             | (270 Min.)                         | (32 Min.)                   | (34 Min.)                   | (36 Min.)                  | (37 Min.)                 | (38 Min.)                 | (39 Min.)   | No. 5 in the direction of rolling |
| SPCD                             | 270 Min.                           | 34 Min.                     | 36 Min.                     | 38 Min.                    | 39 Min.                   | 40 Min.                   | 41 Min.     |                                   |

- Remarks:
- The tension 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 tension 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 SPCCN, 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) 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             |

**(3) Tolerances A on Flatness**

**(Unit: mm)**

| 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.        |

**(4) Chamber Tolerances**

**(Unit: mm)**

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