

Phosphor bronze (C5191)

Cu-Sn-P ALLOY

1、Characteristic：

- Sn : 5.5~7.0%
- Having good workability, fatigue resistance and corrosion resistance.
- C5191 is applicable to spring. However, when required specially high quality of spring, phosphor bronze for spring is recommendable.

2、Chemical Composition (%)

| Alloy | Chemical Composition % | | |
|-------|------------------------|---------|-----------|
| | Cu | Sn | P |
| C5191 | Rem. | 5.5~7.0 | 0.03~0.35 |

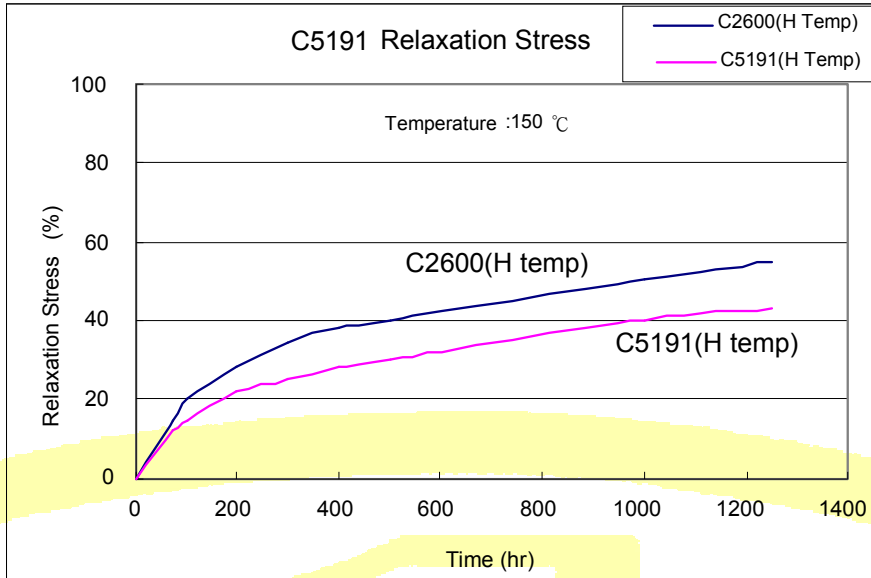
3、Physical Properties：

| Characteristic | C5191 |
|---|-------|
| Melting Point (°C) | 1045 |
| Solidifying Point (°C) | 900 |
| Density (g/cm ³) | 8.83 |
| Coefficient of Thermal Expansion×10 ⁻⁶ /°C | 18.0 |
| Thermal Conductivity(cal/cm ² /cm/sec/°C) | 0.16 |
| Electrical Conductivity (IACS%) | 13 |
| Modulus of Elasticity (kgf/mm ²) | 11200 |

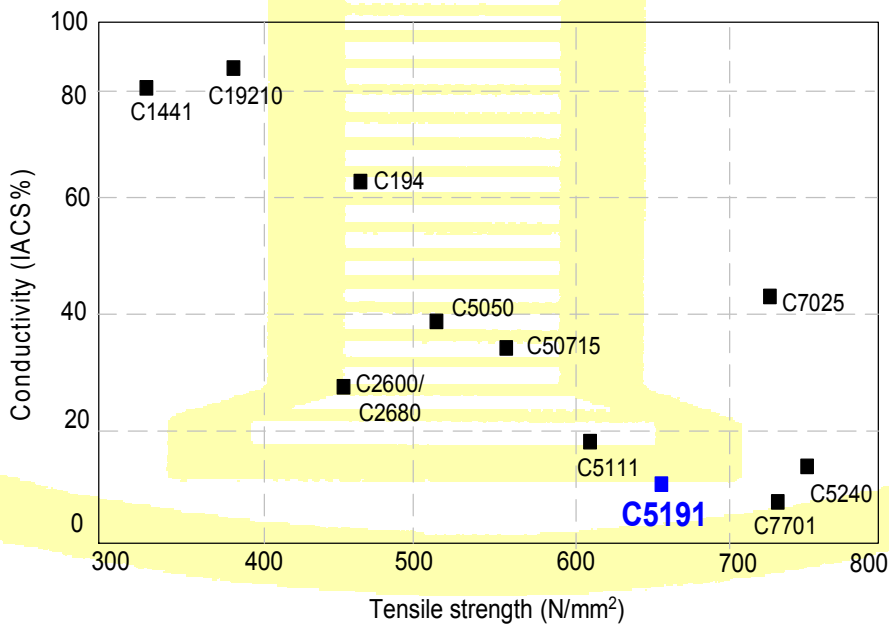
4、Mechanical Properties：

| Alloy | Temper | Mechanical Properties | | |
|-------|--------|-------------------------|-------|----------|
| | | TS (N/mm ²) | EL(%) | Hv(500g) |
| C5191 | O | ≥ 315 | ≥ 42 | 90~110 |
| | 1/4H | 390~510 | ≥ 35 | 110~140 |
| | 1/2H | 490~610 | ≥ 20 | 140~180 |
| | H | 590~685 | ≥ 8 | 180~210 |
| | EH | ≥ 635 | ≥ 5 | ≥ 200 |

5、Stress relaxation characteristics：



6、Characteristic location：



7、Bending Properties：

180° bending test：

Test method：JIS Z 2248

| Alloy | thickness (mm) | Direction | R/t | | | | | R/t (min) |
|-------|----------------|-----------|-----|-----|-----|-----|-----|------------|
| | | | 0 | 0.5 | 1.0 | 1.5 | 2.0 | |
| H | ≤ 0.4 | Good way | ▲ | ○ | ◎ | ◎ | ◎ | 0.5 |
| | | Bad way | ▲ | ▲ | ○ | ◎ | ◎ | 1.0 |
| | 0.4~0.8 | Good way | ▲ | ▲ | ○ | ◎ | ◎ | 1.0 |
| | | Bad way | ▲ | ▲ | ▲ | ○ | ◎ | 1.5 |

Determination：▲：Crack(Failed)、△：Big wrinkles(Qualified)、○：Small wrinkles(Qualified)、◎：Good (Qualified)