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# H62

## Description

H62 brass is the most widely used ordinary brass. It is not heat-treatable, and its properties are adjusted through cold working (hard temper) or annealing (soft temper). Its greatest advantage lies in its excellent combination of properties (a balance of strength, plasticity, and corrosion resistance), superb hot and cold formability, and economy, making it suitable for various stressed components manufactured by deep drawing and bending. Compared to H59, H62 has a higher copper content, offering better corrosion resistance and plasticity. Compared to H65/H68, H62 provides higher strength and a lower price, though its deep drawing performance is slightly inferior. Widely used in hardware, electronics, construction, and decoration, it is considered the brass grade with the "best cost-performance ratio."

## H62 Brass Material Data Sheet

### 1. Chemical Composition (%)

| **Elements** | Cu | Zn | Fe | Pb | Sb | Bi | P | Total impurities |
|---|---|---|---|---|---|---|---|---|
| **Content** | 60.5~63.5 | Balance | ≤0.15 | ≤0.08 | ≤0.005 | ≤0.002 | ≤0.01 | ≤0.5 |

Feature: A binary copper-zinc alloy, commonly known as "60/40 brass", with an α+β duplex structure. It is not heat-treatable.

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## 2. Physical Properties

| Performance parameters | Value | Unit | Note |
|---|---|---|---|
| Density | 8.43~8.50 | g/cm³ | Standard values |
| Melting range | 905~940 | °C | Solidus–Liquidus range |
| Elastic modulus | 90~122 | GPa | Tensile state |
| Poisson's ratio | 0.33 | — | Typical Value |
| Coefficient of Thermal Expansion | 18~20.6 | $\times 10^{-6}$ /°C | 20~300°C |
| Thermal conductivity | 109~150 | W/(m·K) | 20°C |
| Electrical conductivity | 22~35 | % IACS | Approximately 28–35% that of pure copper |
| Resistivity | 0.07~0.09 | μΩ·m | 20°C |
| Specific heat capacity | 0.377~0.393 | kJ/(kg·K) | |
| Gloss | Golden yellow | — | Aesthetic appearance with good decorative properties |

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### 3. Mechanical Properties (by Temper)

| State | Tensile strength Rm (MPa) | Yield strength Rp0.2 (MPa) | Elongation A (%) | Hardness HV | Feature description |
|---|---|---|---|---|---|
| O (annealing) | 330~400 | 140~250 | ≥40~52 | 80~100 | Fully softened with extremely high plasticity |
| 1/2H | 400~500 | 250~350 | 20~30 | 100~140 | Half-hard, balanced strength and formability |
| H (hard temper) | ≥400~600 | 300~400 | ≥10~15 | 120~180 | Standard hard temper, high strength |
| EH (extra hard) | ≥600 | ≥400 | 5~10 | 160~200 | For elastic components |

Temperature effects: At room temperature (20°C), the tensile strength is approximately 400 MPa, which decreases to around 340 MPa at 200°C, but increases significantly after cold working.

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## 4. Process Performance

| Items | Performance classification | Description |
|---|---|---|
| Cold working | ★★★★★ Excellent | Suitable for deep drawing, bending, and stamping; limiting drawing ratio (LDR) of 0.55 |
| Hot workability | ★★★★★ Excellent | superior hot plasticity above 600°C, with an optimal hot rolling temperature range of 700–850°C |
| Machinability | ★★★☆☆ Moderate | Better than stainless steel, but inferior to free-cutting brass C3604 |
| Weldability | ★★★★☆ Good | Suitable for gas welding, arc welding, brazing, resistance welding |
| Corrosion resistance | ★★★★☆ Good | Excellent in atmospheric and freshwater environments; susceptible to corrosion in seawater and ammonia environments |
| Electroplatability | ★★★★★ Excellent | Excellent performance for nickel plating, chrome plating, and gold plating |
| Heat treatment | — | Not heat-treatable, strengthened only by cold working / softened by annealing |

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## 5. Characteristics and Applications

| Core characteristics | Typical applications |
|---|---|
| Excellent combination of properties and high cost-effectiveness | Hardware parts, general machinery components, architectural hardware |
| Excellent hot and cold formability | Deep-drawn containers, radiator housings, cartridge cases, lighting fixtures |
| Attractive golden-yellow color | Decorative items, medals, sanitary hardware, furniture fittings |
| Moderate electrical and thermal conductivity | Electronic connectors, relay springs, conductive terminals |
| Good weldability | Welded structural components, pipe fittings, valve parts |
| Moderate strength and good wear resistance | Pins, rivets, washers, nuts, guide tubes |

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## 6. Codes and Standards

| Standard system | Designation | Standard No. |
|---|---|---|
| Chinese standard | H62 | GB/T 5231-2012, GB/T 4423-2007 |
| U.S. standard | C27400 | ASTM B36, ASTM B135 |
| Japanese standard | C2801 | JIS H3250 |
| European standard | CuZn37 / CW508L | EN 1652 |
| German standard | CuZn37 | DIN 17660 |