

E650CCu – Technical Datasheet

1. Chemical & Mechanical Properties

A. Chemical Composition

| Element | % Composition |
|----------------|---------------|
| Carbon (C) | ≤ 0.22% |
| Manganese (Mn) | ≤ 1.65% |
| Phosphorus (P) | ≤ 0.045% |
| Sulphur (S) | ≤ 0.040% |
| Silicon (Si) | ≤ 0.45% |
| Copper (Cu) | 0.25 – 0.40% |

B. Mechanical Properties

| Property | Value |
|-----------------------|-----------------------------------|
| Yield Strength (YS) | ≥ 650 MPa |
| Tensile Strength (TS) | 720 – 870 MPa |
| Elongation | ≥ 14% |
| Hardness | 230 – 260 HB |
| Impact Test | 27J min at -20°C (Charpy V-Notch) |

2. Equivalent / Alternative Grades

A. Chemical Composition Comparison

| Standard | Grade | C (%) | Mn (%) | P (%) | S (%) | Si (%) | Cu (%) |
|------------|-----------|--------|--------|---------|---------|--------|-------------|
| IS 2062 | E650CCu | ≤ 0.22 | ≤ 1.65 | ≤ 0.045 | ≤ 0.040 | ≤ 0.45 | 0.25 – 0.40 |
| EN 10025-2 | S550J2+Cu | ≤ 0.22 | ≤ 1.60 | ≤ 0.035 | ≤ 0.035 | ≤ 0.55 | ≥ 0.20 |
| ASTM A572 | Gr 80+Cu | ≤ 0.23 | ≤ 1.35 | ≤ 0.040 | ≤ 0.050 | ≤ 0.40 | ≥ 0.20 |

B. Mechanical Properties Comparison

| Standard | Grade | Yield Strength (MPa) | Tensile Strength (MPa) | Elongation / Impact |
|------------|-----------|----------------------|------------------------|----------------------|
| IS 2062 | E650CCu | ≥ 650 | 720 – 870 | ≥ 14% / 27J @ - 20°C |
| EN 10025-2 | S550J2+Cu | ≥ 550 | 590 – 720 | ≥ 19% / 27J @ - 20°C |
| ASTM A572 | Gr 80+Cu | ≥ 570 | 720 – 870 | ≥ 14% / 20J @ RT |

3. Common Applications

- Bridges
- Marine structures
- Heavy machinery
- Industrial fabrication
- Railway wagons

4. Standard Conformance

IS 2062:2011 – Indian Standard for Hot Rolled Medium and High Tensile Structural Steel.

Grade Code Meaning:

E: Killed steel; 650: Minimum yield strength in MPa; CCu: Copper added with impact testing

5. Disclaimer

All chemical compositions, mechanical properties, dimensions and other technical data presented on this page are provided by Raunaq Steels Trading Pvt. Ltd. for **general reference only**. While we endeavour to ensure that the information is as accurate and up-to-date as possible, **no warranty, express or implied, is given** as to its completeness, correctness or fitness for any particular purpose. Raunaq Steels Trading Pvt. Ltd. **accepts no liability** for any loss or damage arising directly or indirectly from the use of, or reliance upon, the information contained herein. For **authoritative** and **legally binding** specifications, users must refer to the **official publications** of the relevant standards—such as the BIS, ASTM, EN or JIS standards—available through their respective websites or published documents