

E650C – Technical Datasheet

1. Chemical & Mechanical Properties

A. Chemical Composition

| Element | % Composition |
|----------------|---------------|
| Carbon (C) | ≤ 0.26% |
| Manganese (Mn) | ≤ 1.75% |
| Phosphorus (P) | ≤ 0.045% |
| Sulphur (S) | ≤ 0.040% |
| Silicon (Si) | ≤ 0.55% |
| Copper (Cu) | 0.20 – 0.40% |

B. Mechanical Properties

| Property | Value |
|-----------------------|-----------------------------------|
| Yield Strength (YS) | ≥ 650 MPa |
| Tensile Strength (TS) | 720 – 870 MPa |
| Elongation | ≥ 13% |
| 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 | E650C | ≤ 0.26 | ≤ 1.75 | ≤ 0.045 | ≤ 0.040 | ≤ 0.55 | 0.20 – 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 | E650C | ≥ 650 | 720 – 870 | ≥ 13% / 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

- Weather resistant steel
- Bridges
- Marine structures
- Heavy machinery
- Industrial fabrication

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; C: Copper added for corrosion resistance

5. Disclaimer

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