

IS 2062 Steel (E250 & E350): Complete Guide to Grades (A, BR, B0, C), Composition & Properties

Steelmet Industries - Bright Bars, Alloy Steels, Free Cutting Steels, Stainless Steels

Description

IS 2062 is the Indian Standard specification for **hot-rolled medium and high tensile structural steel**, published by the Bureau of Indian Standards (BIS). Covering structural plates, strips, shapes, sections, and hot-rolled bars, IS 2062 serves as the primary material specification for pre-engineered buildings (PEBs), heavy machinery frames, bridges, crane girders, and general structural fabrication across India.

While buyers frequently ask simply for â??mild steelâ?• or â??IS 2062,â?• the standard actually covers nine strength designations (from E250 up to E650) and multiple sub-qualities based on impact toughness and deoxidation practice. Specifying the wrong sub-grade can lead to brittle fracture in low-temperature service or cracking during heavy welding.

At **Steelmet Industries**, we supply IS 2062 hot-rolled plain mild steel rounds, squares, flats, and structural sections, as well as cold-drawn bright steel bars produced from tested mild steel feedstock to tight dimensional tolerances. Below is a practical engineering breakdown of IS 2062:2011.

Understanding IS 2062 Designations: Strength Grades & Sub-Qualities

Under the revised **IS 2062:2011** standard, grades are designated by their minimum yield strength in MPa (for thickness under 20 mm), followed by a suffix indicating impact test temperature and deoxidation (killing) practice:

- **E250 (Minimum Yield Strength: 250 MPa):** The standard structural mild steel grade, replacing the older IS 2062 Fe 410W designations. Used for general fabrication, anchor bolts, base plates, and structural sections.
- **E350 (Minimum Yield Strength: 350 MPa):** High-tensile structural steel used where higher load-bearing capacity and section weight reduction are required, such as crane booms, transmission

towers, heavy chassis, and earthmoving equipment.
- **Other Strength Grades:** The standard also includes **E275, E300, E410, E450, E550, E600, and E650** for specialized heavy structural and weight-critical applications.

What Do Sub-Grades A, BR, B0, and C Mean?

The suffix after E250 or E350 defines the steelâ??s toughness at low temperatures and how it was deoxidized during steelmaking:

- **Quality A:** Supplied in semi-killed or killed condition. Charpy V-notch impact testing is not required. Suitable for standard indoor or ambient-temperature structures without severe dynamic shock.
- **Quality BR:** Semi-killed or killed steel. Charpy V-notch impact testing at room temperature (27 Joules minimum) is optional and carried out only if agreed between purchaser and manufacturer.
- **Quality B0:** Fully killed steel with mandatory Charpy V-notch impact testing at **0Â°C** (27 Joules minimum). Recommended for outdoor structures and welded joints exposed to winter temperatures.
- **Quality C:** Fully killed, fine-grained steel (often normalized or controlled-rolled) with stricter limits on sulfur and phosphorus (0.040% max). Mandatory impact testing at **-20Â°C** (27 Joules minimum) for critical dynamic loads and sub-zero service.

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Chemical Composition of IS 2062 E250 and E350 (Ladle Analysis, Max %)

Controlling carbon and Carbon Equivalent Value (CEV) is essential for weldability. A lower CEV prevents hydrogen-induced cold cracking in the heat-affected zone (HAZ) during multi-pass structural welding.

Grade & Quality	Carbon (C) % Max	Manganese (Mn) % Max	Silicon (Si) % Max	Sulfur (S) % Max	Phosphorus (P) % Max	Carbon Equivalent (CEV) Max
E250 A	0.23	1.50	0.40	0.045	0.045	0.42
E250 BR	0.22	1.50	0.40	0.045	0.045	0.41
E250 B0	0.22	1.50	0.40	0.045	0.045	0.41
E250 C	0.20	1.50	0.40	0.040	0.040	0.39
E350 A	0.20	1.55	0.45	0.045	0.045	0.47
E350 BR / B0	0.20	1.55	0.45	0.045	0.045	0.45
E350 C	0.20	1.55	0.45	0.040	0.040	0.44

Note: Micro-alloying elements such as Niobium (Nb), Vanadium (V), and Titanium (Ti) may be added individually or in combination up to 0.25% total to achieve higher yield strength in E350 grades without raising carbon content.

Mechanical Properties of IS 2062 Steel

As section thickness increases, cooling rates during hot rolling slow down, resulting in a slightly coarser grain structure and lower minimum yield strength. Structural designers must account for this thickness step-down:

Grade	Ultimate Tensile Strength (UTS) Min	Yield Stress (< 20 mm) Min	Yield Stress (20 â?? 40 mm) Min	Yield Stress (> 40 mm) Min	Elongation % Min (Gauge 5.65â??So)	Charpy V-Notch Impact (Min 27 J)
E250 A	410 MPa	250 MPa	240 MPa	230 MPa	23%	Not Required
E250 BR	410 MPa	250 MPa	240 MPa	230 MPa	23%	Room Temp (Optional)
E250 B0	410 MPa	250 MPa	240 MPa	230 MPa	23%	0Â°C
E250 C	410 MPa	250 MPa	240 MPa	230 MPa	23%	-20Â°C
E350 A	490 MPa	350 MPa	330 MPa	320 MPa	22%	Not Required
E350 BR	490 MPa	350 MPa	330 MPa	320 MPa	22%	Room Temp (Optional)
E350 B0	490 MPa	350 MPa	330 MPa	320 MPa	22%	0Â°C
E350 C	490 MPa	350 MPa	330 MPa	320 MPa	22%	-20Â°C

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International Equivalent Grades for IS 2062

When working on export projects or cross-referencing international engineering drawings, IS 2062 aligns closely with EN 10025-2, ASTM, and JIS structural standards:

Indian Standard (IS 2062)	European (EN 10025-2)	American (ASTM)	German (DIN 17100)	Japanese (JIS G3101 / G3106)	British (BS 4360)
E250 A / BR	S235JR / S275JR	ASTM A36 / A283 Gr. D	St37-2 / St44-2	SS400	40A / 43A
E250 B0	S235J0 / S275J0	ASTM A573 Gr. 58	St37-3U / St44-3U	SM400B	40C / 43C
E250 C	S235J2 / S275J2	ASTM A573 Gr. 65	St37-3N / St44-3N	SM400C	40D / 43D

Indian Standard (IS 2062)	European (EN 10025-2)	American (ASTM)	German (DIN 17100)	Japanese (JIS G3101 / G3106)	British (BS 4360)
E350 A / BR	S355JR	ASTM A572 Gr. 50	St52-3	SM490A	50B
E350 B0	S355J0	ASTM A572 Gr. 50	St52-3U	SM490B	50C
E350 C	S355J2	ASTM A992 / A572 Gr. 50	St52-3N	SM490C	50D

Disclaimer: Equivalent grades share close chemical and mechanical profiles, but exact tolerances and impact test temperatures vary by standard. Always confirm compliance against project drawings before substitution. You can explore standard cross-references on our Steel Grade Cross-Reference page.

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Hot-Rolled IS 2062 Stock vs. Cold-Drawn Bright Bars (IS 9550)

Because **IS 2062** applies strictly to hot-rolled structural products, hot-rolled bars and sections carry a dark mill-scale surface and standard rolling tolerances. When a component requires tight dimensional accuracy, a smooth scale-free finish, or higher yield strength for precision machining, engineers specify **cold-drawn bright steel bars** (governed in India by **IS 9550**) produced from low-carbon mild steel feedstock of matching chemical composition:

- **Tight Dimensional Tolerances:** Cold drawing pickled hot-rolled bars through tungsten carbide dies achieves ISO **h9, h10, or h11** tolerances, eliminating preliminary rough turning on CNC lathes and automatic screw machines.
- **Work-Hardened Strength Increase:** Cold plastic deformation raises the yield strength and tensile strength of mild steel bright bars compared to as-rolled stock.
- **Scale-Free Surface Finish:** Pickling and cold drawing remove abrasive mill scale completely, extending cutting tool life and providing a clean surface for threading, welding, or electroplating.
- **Improved Straightness:** Precision roller straightening makes cold-drawn bars suitable for long tie rods, conveyor shafts, and structural pins.

Explore our Hot Rolled Plain Mild Steel Bars and Cold Drawn Bright Steel Bars product ranges on our main website.

Key Industrial Applications of IS 2062 Steel

- **Pre-Engineered Buildings (PEBs) & Structural Sheds:** Anchor bolts, sag rods, tie bars, gusset plates, and built-up columns.
- **Heavy Engineering & Material Handling:** EOT crane girders, hoist frames, conveyor structures, and machine base frames.
- **Automotive & Earthmoving Equipment:** Chassis cross-members, trailer frames, hydraulic cylinder mounts, and structural brackets (primarily E350).

- **Power Transmission & Railways:** Transmission line towers, substation structures, wagon components, and railway track fittings.
- **General Fabrication & Machining:** Base plates, pins, spacers, keys, and welded sub-assemblies.

Frequently Asked Questions on IS 2062 Steel

1. What is the difference between IS 2062 E250 A and E250 BR?

Both grades share a minimum yield strength of 250 MPa and minimum tensile strength of 410 MPa. However, E250 BR has slightly tighter carbon limits (0.22% max vs. 0.23% max) and allows optional Charpy impact testing at room temperature, making it preferable for critical welded structures.

2. Is IS 2062 E250 the same as mild steel (MS)?

Yes. In Indian industrial practice, structural mild steel rounds, flats, angles, channels, and plates are manufactured to IS 2062 E250 specifications. Ordering by the exact IS 2062 grade rather than generic â??MSâ?• ensures certified chemistry and mechanical properties.

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3. Does IS 2062 cover cold-drawn bright bars?

No. IS 2062 covers hot-rolled structural steel products. Cold-drawn bright steel bars in India are specified under **IS 9550** (or international equivalents like EN 10277 and ASTM A108), often drawn from hot-rolled mild steel feedstock matching IS 2062 chemistry.

4. How is IS 2062 different from EN8 (080M40)?

IS 2062 E250 is a low-carbon structural steel (0.23% C max) designed for weldability and general fabrication. EN8 is a medium-carbon engineering steel (0.36% to 0.44% C) offering higher tensile strength (550 to 700+ MPa) and induction-hardening capability for shafts and gears, though it requires preheating for welding.

Source Certified IS 2062 Structural Steel & Bright Bars from Steelmet Industries

Steelmet Industries supplies IS 2062 E250 and E350 hot-rolled mild steel rounds, squares, flats, and structural sections alongside precision cold-drawn bright bars. Every dispatch is backed by batch traceability and mill test certificates. Review our Uses & Applications to see how our steel grades support diverse engineering sectors.

Request a Quote or Technical Consultation:
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