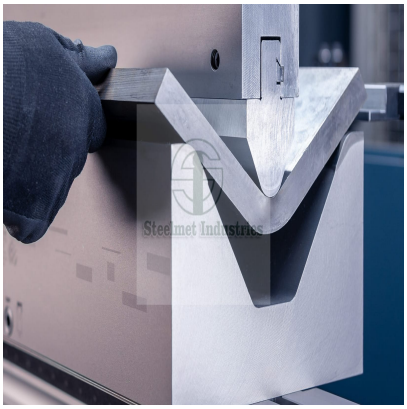

Bending Performance of MS, SAE 1010, SAE 1015, SAE 1018, and IS 2062 E250 – A Practical Comparison

Description

When it comes to bending operations in fabrication, forming, and machining industries, **selecting the right steel grade** can make a noticeable difference in output quality, rejection rates, tool life, and operator effort.

This article compares the **bending behavior** of five commonly used **low-carbon steels**:

- Mild Steel (MS)
- SAE 1010
- SAE 1015
- SAE 1018
- IS 2062 E250

? Steel Grades Compared: Bending Properties

Property / Grade	MS (Generic)	SAE 1010	SAE 1015	SAE 1018	IS 2062 E250 (Fe410W)
Carbon Content (%)	~0.15 max	~0.08–0.13	~0.13–0.18	~0.15–0.20	~0.20 max
Ductility	High	Very High	High	Moderate	Moderate

Property / Grade	MS (Generic)	SAE 1010	SAE 1015	SAE 1018	IS 2062 E250 (Fe410W)
Tensile Strength (MPa)	~350–410 (approx)	~330–420	~380–450	~440–500	?410
Yield Strength (MPa)	~250 max	~170–250	~200–280	~250–320	?250
Cold Bending Suitability	Very Good	Excellent	Very Good	Good	Moderate (lot-dependent)
Springback After Bend	Low	Very Low	Low	Moderate	Moderate to High
Crack Risk at Tight Radius	Low	Very Low	Low	Medium	Medium to High
Surface Finish After Bend	Depends on source	Good	Good	Good	Moderate (scaly finish)
Availability in Bright Form	Limited	Available	Available	Widely Available	Mostly hot rolled
Typical Uses	General bending, brackets	Automotive parts, deep draw	Tubes, mild bend parts	Shafts, CNC precision parts	Structural fabrication

? What the Data Means for Bending Applications

? 1. Best for Tight Radius Bending: SAE 1010

- Lowest carbon content ? high ductility
- Minimal springback
- Highly suited for sharp, deep, and small-radius bends

? 2. General Purpose Bending: MS and SAE 1015

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Mild Steel (MS) is easy to source, economical, and ductile

- **SAE 1015** has slightly higher strength but retains good bendability

Use these when:

- You’re forming medium-radius parts
- Cost is a constraint
- Bright finish is not critical

?? 3. Use with Caution: SAE 1018

- Cold drawn 1018 may be harder and exhibit springback
- May crack under tight radius unless annealed
- Great dimensional control, but not ideal for sharp bends unless softened

Best used for:

- **Precision forming**, CNC bending, or applications requiring higher strength after bending

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?? 4. Least Preferred for Critical Bends: IS 2062 E250

- Designed as a structural steel—not optimized for forming
- Surface is rougher and ductility is variable across heats
- More prone to **cracking or wrinkling** at tight bend radii

Use this for:

- Gradual bends
- Heavy fabrication where tolerances are relaxed

? Cold Drawn vs Hot Rolled Impact on Bending

- **Bright Bars (cold drawn)**: Higher strength ? more springback ? risk of surface cracks in tight bends
- **Black Bars (hot rolled)**: Softer, easier to bend, but lower dimensional accuracy and poorer finish

? For tight bends using bright bars like 1018: **annealing before bending** is strongly recommended.

? Conclusion

Choosing the right steel grade for bending is about **understanding the trade-off** between:

- **Strength vs Ductility**
- **Surface finish vs Formability**
- **Cost vs Performance**

Application Type	Best Grades
Sharp bends, deep draw	SAE 1010, SAE 1015
Manual bending	Mild Steel (MS), SAE 1010
CNC / Precision press brake	SAE 1018 (annealed)
Structural bending	IS 2062 E250

? When in doubt, always validate with a **trial bend** and check the **heat-specific test certificate (TC)**.

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