SAE 1018 vs SAE 1010 Steel: Key Differences in Composition, Properties, and Applications

Description

Introduction

SAE 1018 and SAE 1010 are widely used low-carbon steels, but their subtle differences in composition lead to distinct performance characteristics. This comparison covers:

- Chemical composition
- Mechanical properties
- Machinability and weldability
- Typical applications

Steelmet Industries stocks both grades in **round bars, flat bars, and sheets** â?? available in standard and custom sizes.

Chemical Composition Comparison

Element (%)	SAE 1018	SAE 1010
Carbon (C)	0.15 â?? 0.20	0.08 â?? 0.13
Manganese (Mn)	0.60 â?? 0.90	0.30 â?? 0.60
Phosphorus (P)	â?¤ 0.04	â?¤ 0.04
Sulfur (S)	â?¤ 0.05	â?¤ 0.05

ð??¹ **Key Difference:** SAE 1018 has **higher carbon and manganese** content, giving it better strength.

Mechanical Properties

Property	SAE 1018	SAE 1010
Tensile Strength	440 â?? 640 MPa	365 â?? 460 MPa
Yield Strength	370 MPa	305 MPa
Elongation (%)	15%	20%
Hardness (BHN)	126	95

â? **SAE 1018** offers **20-30% higher strength** but slightly less ductility than 1010.

Key Differences & Applications

1. Machinability & Weldability

- **SAE 1010**: Excellent for **deep drawing** and **cold forming** due to higher ductility
- **SAE 1018**: Better machinability in **cold drawn** condition (higher Mn content improves chip breaking)

2. Strength vs. Formability

- Choose **SAE 1010** for:
  - Automotive panels
  - Wire products
  - Applications requiring extensive forming
- Choose **SAE 1018** for:
  - Shafts and pins

- Machinery parts
- Fasteners requiring more strength

3. Cost & Availability

Both grades are economical, with **SAE 1010** being slightly cheaper due to lower alloy content.

Equivalents & Alternatives

- **SAE 1018** â?? EN 1.0401 (Europe), C15E (ISO)
- **SAE 1010** â?? EN 1.0301 (Europe), DC01 (ISO)
- For better machinability: **SAE 12L14 (leaded steel)**

Which Grade Should You Choose?

- **Maximum formability** â?? SAE 1010
- **Balanced strength and machinability** â?? SAE 1018

Steelmet Industries provides:
ð??¹ **1018/1010 cold drawn bars / wires** (precision tolerances)
ð??¹ **Rounds, Wire Rods, Sheets & Plates**
ð??¹ **Custom cutting and processing**

ð??? **Contact us** for technical specifications or volume pricing.

Conclusion

While similar as low-carbon steels, **SAE 1018â??s higher carbon/manganese** makes it stronger, while **SAE 1010** excels in formability. Understanding these differences ensures optimal material selection.

Steelmet Industries supplies both grades in **ready-to-ship and custom-processed forms** â?? inquire today for your project needs.

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