EN8 vs EN8A vs EN8B vs EN8C vs EN8D vs EN8M vs EN8DM: Complete Steel Grade Comparison

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Introduction

The EN8 series represents a family of versatile medium-carbon steels with subtle variations that impact machinability, strength, and heat treatment response. This guide compares:

- Chemical composition differences
- Mechanical properties
- Optimal heat treatment
- Recommended applications

Steelmet Industries supplies all EN8 variants as:
ð??¹ Round bars (Ã? 10mm â?? 300mm)
ð??¹ Flat bars and forged blanks
ð??¹ Turned or ground precision stock

Chemical Composition Comparison

Grade	C%	Si%	Mn%	P%	S%	Other
EN8	0.36-0.44	0.10-0.40	0.60-1.00	â?¤0.05	â?¤0.05	â??
EN8A	0.36-0.44	0.10-0.40	0.60-1.00	â?¤0.05	â?¤0.05	Improved purity

Grade	C%	Si%	Mn%	P%	S%	Other
EN8B	0.36-0.44	0.10-0.40	0.60-1.00	â?¤0.05	â?¤0.05	Lead added
EN8C	0.36-0.44	0.10-0.40	0.60-1.00	â?¤0.05	â?¤0.05	Sulfur increased
EN8D	0.36-0.44	0.10-0.40	0.60-1.00	â?¤0.05	â?¤0.05	Controlled Mn
EN8M	0.36-0.44	0.10-0.40	0.90-1.50	â?¤0.05	â?¤0.05	Higher Mn
EN8DM	0.36-0.44	0.10-0.40	0.90-1.50	â?¤0.05	â?¤0.05	Higher Mn + controlled chemistry

ð??¹ **Key Variations**:

- **EN8B**: Contains lead (Pb) for improved machinability
- **EN8C**: Higher sulfur for better chip formation
- **EN8M/EN8DM**: Increased manganese for better hardenability

Mechanical Properties (Normalized Condition)

Grade	Tensile (MPa)	Yield (MPa)	Elongation (%)	Hardness (BHN)
EN8	700-850	460	14	201-255
EN8A	700-850	460	14	201-255
EN8B	700-850	460	14	201-255
EN8C	700-850	460	14	201-255
EN8D	700-850	460	14	201-255
EN8M	800-950	550	12	248-302
EN8DM	800-950	550	12	248-302

â? **EN8M/EN8DM** offer **15-20% higher strength** due to increased manganese

Key Differences & Applications

1. Machinability Comparison

- **Best Machinability**: EN8B (lead added) > EN8C (sulfur added) > Standard EN8
- **EN8M/EN8DM**: Require more power but maintain good tool life

2. Heat Treatment Response

- **EN8M/EN8DM**: Achieve deeper hardening (ideal for large sections)
- **Standard EN8**: Suitable for smaller components

3. Recommended Uses

- **EN8/EN8A**: General engineering components, shafts, bolts
- **EN8B/EN8C**: High-volume machined parts (gears, fittings)
- **EN8M/EN8DM**: Heavy-duty gears, high-stress components

Equivalents & Alternatives

Grade	AISI	DIN	ISO
EN8	1040	1.0511	C40
EN8M	1045	1.1191	C45

For better machinability: **EN1A (free-cutting steel)**

Selection Guide

- **General purpose**: EN8/EN8A
- **Mass machining**: EN8B/EN8C
- **Heavy sections/strength**: EN8M/EN8DM

Steelmet Industries provides:
ð??¹ All EN8 variants in stock
ð??¹ Custom heat treatment (quenching & tempering)
ð??¹ Precision ground bars (h9 tolerance)

ð??? **Contact our technical team** for grade recommendations.

Conclusion

While all EN8 grades share similar base composition, subtle variations significantly impact their performance in machining, heat treatment, and final applications.

Steelmet Industries maintains ready stock of all EN8 variants â?? from standard EN8 to specialty EN8DM. Request a quote for your specific requirements.

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1. BS970 1955 EN8 Steel and variants

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1. EN8A
2. EN8B
3. EN8C
4. EN8D
5. EN8DM
6. EN8M
7. engineering steel
8. medium carbon steel
9. steel grade comparison
10. Steelmet Industries

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