Fastener Industry Standards Guide

Quick reference for common standards, strength grades, thread series and organizations used in the fastener industry.

Why Fastener Standards Matter

Fastener standards define dimensions, strength levels, materials and testing so parts from different manufacturers work together safely. Understanding the most common standards helps you select the right bolt, screw or nut and interpret drawings, certifications and packaging correctly.

What Standards Control

- Dimensions and tolerances (head size, thread pitch, length).
- Mechanical properties (tensile strength, proof load, hardness).
- Materials and coatings (steel grades, stainless, plating).
- Test methods and quality and inspection requirements.

Common Fastener Standards Organizations

Acronym	Full Name	Typical Role
ANSI	American National Standards Institute	Approves U.S. standards for threads & dimensions.
ASME	American Society of Mechanical Engineers	Dimensional standards (B18 series) for bolts, screws & nuts.
SAE	Society of Automotive Engineers	Mechanical grades such as J429 Grade 2, 5, 8.
ASTM	ASTM International	Material and performance specs (A307, A193, A194, F3125, etc.).
ISO	International Organization for Standardization	Global metric standards (ISO 898-1, 4014, 4017, 4762).
DIN	Deutsches Institut für Normung	German metric designs (DIN 933, 912 and others).
IFI	Industrial Fasteners Institute	Industry guidance and fastener standards.

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Inch & Metric Thread Series

Series	Abbrev.	Description	Typical Use
Unified Coarse	UNC	Fewer, deeper threads per inch for strength in softer materials.	General-purpose bolts and screws.
Unified Fine	UNF	More threads per inch for better adjustment and tensile area.	Automotive, machinery, vibration-prone joints.
Unified Extra Fine	UNEF	Very fine pitch where only short engagement is available.	Instrumentation, aerospace and specialty hardware.

Type	Example	Description	Use
Coarse	M10 × 1.5	Standard pitch for most metric bolts.	General structural and machinery joints.
Fine	M10 × 1.25	Smaller pitch for better adjustment and clamp load control.	Automotive, thin materials, vibration service.
Extra Fine	M10 × 1.0	Very fine pitch where space is limited.	Precision equipment and specialty designs.

Inch Bolt Grades (SAE / ASTM)

Grade	Common Standard	Characteristics	Typical Use
Grade 2	SAE J429 / ASTM A307	Low carbon steel, lower strength.	Light-duty, non-critical joints.
Grade 5	SAE J429	Medium carbon, heat-treated.	Automotive, machinery, general structural.
Grade 8	SAE J429	Alloy steel, high strength.	Heavy equipment, high clamp-load joints.
Structural	ASTM F3125 (A325/A490)	Controlled strength and ductility.	Structural steel connections and bridges.

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Metric Property Classes (ISO 898-1)

Class	Approx. Inch Grade	Notes
4.6	~ Grade 2	Lower-strength carbon steel for light-duty joints.
8.8	~ Grade 5	Medium carbon, heat-treated; common structural class.
10.9	Between Grade 8 & structural	High-strength metric bolts for demanding service.
12.9	High-strength socket products	Very high strength, typically socket cap screws and tooling.

Typical Head Markings

Fastener	Marking	Meaning
Inch Hex Bolt	No radial lines	Typically Grade 2 carbon steel.
Inch Hex Bolt	Three radial lines	Grade 5 medium carbon, heat-treated.
Inch Hex Bolt	Six radial lines	Grade 8 alloy steel.
Metric Bolt	8.8, 10.9, 12.9	Metric property class per ISO 898-1.
All Types	Manufacturer symbol	Identifies producer for traceability.

Materials & Finishes (Examples)

Area	Examples	Notes
Carbon Steel	ASTM A307, SAE J429	General-purpose inch bolts and studs.
Alloy / Structural	ASTM F3125 (A325/A490)	High-strength structural bolts.
Stainless Steel	Common grades such as 304 & 316	Improved corrosion resistance; verify grade and standard.
Coatings	Zinc, mechanical zinc, hot-dip galvanized	Corrosion protection; thickness and type affect torque.

Important Disclaimer

This guide is for general reference only. Always follow manufacturer specifications, project documents and applicable standards for your specific application. Fastener performance depends on correct selection for material, load, installation method and environment. When in doubt, consult a qualified engineer.