

About This Glossary: Complete reference covering fastener types, threads, materials, coatings, testing, standards, joint design, failure modes, and installation. Essential terminology for engineers, procurement, and maintenance professionals.

A

A2 Stainless

European designation for 304/18-8 stainless steel fasteners. Equivalent to ASTM F593 Group 1.

A4 Stainless

European designation for 316 stainless steel fasteners. Superior marine/chemical corrosion resistance. Equivalent to ASTM F593 Group 2.

A286

Iron-based superalloy with excellent high-temperature strength to 1300°F. Used in aerospace and gas turbine fasteners.

A307

ASTM specification for low-carbon steel bolts (Grade A) and studs (Grade B). 60 ksi tensile minimum.

A325

ASTM specification for structural bolts. 120/105 ksi min tensile. Now incorporated into F3125.

A490

ASTM specification for high-strength structural bolts. 150 ksi min tensile. Now incorporated into F3125.

Acme Thread

Trapezoidal thread with 29° included angle for power transmission. Stronger than square threads. Used in lead screws, vises, jacks.

Acorn Nut

Domed cap nut that covers exposed bolt threads for safety and appearance. Also called cap nut or dome nut.

Across Corners

Maximum dimension of hex head measured corner to corner. Equals 1.155 × across flats.

Across Flats

Width of hex head measured flat to flat. Determines wrench/socket size required.

Alloy Steel

Steel with added elements (Cr, Mo, Ni, V) for enhanced properties. Used in Grade 5, 8, and socket head cap screws.

AN (Air Force-Navy)

Military standard for aerospace fasteners. AN3-AN20 bolts, AN315-AN320 nuts, AN960 washers.

Anchor

Fastening device for concrete, masonry, or hollow walls. Types: mechanical expansion, undercut, adhesive, screw, toggle, hollow wall.

Anchor Bolt

Bolt cast or grouted into concrete to attach structural members. Types: L-bolt, J-bolt, headed, threaded rod.

Angle of Thread

Included angle between thread flanks. 60° for unified/metric; 55° for Whitworth; 29° for Acme.

Annealing

Heat treatment softening metal by heating and slow cooling. Relieves stress, improves machinability, restores ductility.

Anodizing

Electrochemical process creating oxide layer on aluminum. Increases corrosion and wear resistance. Types I, II (decorative), III (hard).

ANSI

American National Standards Institute. Coordinates US standards including fastener dimensions and threads (ANSI/ASME B1.1, B18 series).

Anti-Seize

Lubricant preventing galling, seizing, and corrosion on threads. Types: copper, nickel, aluminum, molybdenum based. Affects torque-tension.

ASME

American Society of Mechanical Engineers. Publishes fastener standards (B1.1 threads, B18 dimensions, PCC-1 bolting).

ASTM

American Society for Testing and Materials. Publishes material specifications (A193, A320, A325, A490, F593, F594, F3125).

Austenitic Stainless

Non-magnetic 300 series stainless (304, 316). High Cr and Ni content. Excellent corrosion resistance, cannot be hardened by heat treatment.

B

B7 (ASTM A193)

Chromium-molybdenum alloy steel stud specification for high-temperature/pressure service. 125 ksi min tensile.

Bake Out

Heat treatment (375°F, 4+ hours) after plating to expel hydrogen and prevent hydrogen embrittlement in high-strength fasteners.

Ball Detent

Spring-loaded ball providing locating or locking function. Used in quick-release pins and positioning devices.

Barrel Nut

Cylindrical internally threaded insert used in cross-dowel furniture joints. Also called cross dowel or connector bolt nut.

Bearing Surface

Contact area between fastener head/nut and joint surface that distributes clamping load.

Bearing Type Connection

Structural joint where loads transfer through bolt shear and hole bearing rather than friction.

Belleville Washer

Conical disc spring washer providing high force in small space. Maintains tension, compensates for thermal expansion/relaxation.

Binding Head

Wide, low profile head with slight undercut. Common in electrical terminals and binding posts.

Black Oxide

Chemical conversion coating (magnetite Fe3O4) providing black finish, mild corrosion resistance, and light absorption. Often oiled.

Blind Fastener

Fastener installed from one side only. Includes blind rivets (pop rivets), blind nuts (rivet nuts), blind bolts.

Blind Hole

Hole that doesn't pass completely through material. Requires bottoming tap for full thread depth.

Block Shear

Failure mode where block of material tears out along shear and tension planes. Controls connection design.

Body

Main cylindrical portion of fastener. May include threaded and unthreaded (shank) sections.

Bolt

Externally threaded fastener designed for insertion through holes and mating with nut. Tightened or released by torquing nut.

Bolt Circle

Diameter of circle passing through centers of bolt holes in circular pattern (flanges, wheels, hubs).

Bolt Stretch

Elastic elongation of bolt under tension. Creates spring effect that maintains clamp load. Can be measured for tension verification.

Bonding

Electrical connection between metallic components for safety grounding or static dissipation.

Boss

Raised cylindrical feature on casting or molded part for fastener attachment. Provides material for threads.

Bottoming Tap

Tap with minimal chamfer (1-2 threads) for threading to bottom of blind holes.

Brass

Copper-zinc alloy. Good corrosion resistance, electrical conductivity, non-sparking. Common: C36000 (free-cutting).

Breakaway Torque

Torque required to start loosening a tightened fastener. Higher than running torque due to static friction.

Breaking Strength

Maximum load fastener withstands before fracture. Same as Ultimate Tensile Strength (UTS).

Brinell Hardness (HB)

Hardness test using steel/carbide ball indenter. Used for softer metals and rough surfaces.

Broaching

Machining process using toothed tool to cut shapes. Used for internal hex sockets and splines.

Bronze

Copper-tin alloy family. Types: silicon bronze (marine), phosphor bronze (springs), aluminum bronze (high strength).

BSP

British Standard Pipe thread. BSPP (parallel/straight) for fittings; BSPT (tapered) for sealing.

Bugle Head

Countersunk head with concave bearing surface, reducing surface damage. Common on drywall screws.

Burnishing

Surface finishing by rubbing/rolling that smooths and work-hardens. Improves fatigue resistance.

Bushing

Cylindrical liner reducing hole size, providing wear surface, or insulating. Threaded bushing adapts thread sizes.

Buttress Thread

Asymmetrical thread (7°/45° flanks) for high axial loads in one direction. Used in vises, jacks, breech locks.

Button Head

Low-profile domed head with hex socket drive. Decorative appearance, lower torque capacity than socket cap.

C

Cadmium Plating

Electroplated coating with excellent corrosion resistance and lubricity. Toxic; restricted by RoHS. Being replaced by zinc-nickel.

Cage Nut

Captive nut in spring steel cage that clips into square hole. Common in rack-mount equipment and panels.

Cam-Out

Driver slipping out of head recess during driving. Causes damage. Phillips prone; Torx/hex socket resistant.

Cap Nut

See Acorn Nut.

Cap Screw

Finished fastener intended for use in tapped hole without nut. Types: hex, socket head, button head.

Captive Fastener

Fastener retained in panel when loosened, preventing loss. Types: captive screws, quarter-turn, spring-loaded.

Carburizing

Case hardening process adding carbon to steel surface at high temperature. Creates hard case with tough core.

Carriage Bolt

Round head bolt with square neck that pulls into wood to prevent rotation. No wrench needed on head.

Case Hardening

Surface hardening creating hard outer layer with tough core. Processes: carburizing, carbonitriding, nitriding.

Castle Nut

Slotted hex nut for use with cotter pin through bolt. Positive locking for safety-critical applications.

Chamfer

Beveled edge on hole or fastener end easing assembly. Thread chamfer aids starting engagement.

Charpy Test

Impact test measuring energy to fracture notched specimen. Indicates toughness, especially at low temperatures.

Chemical Anchor

Anchor system using adhesive (epoxy, polyester, vinylester) to bond threaded rod to concrete. High strength, no expansion stress.

Chicago Screw

See Sex Bolt.

Chromate Conversion

Chemical treatment on zinc plating adding corrosion resistance. Types: clear, yellow (gold), olive drab, black. Hex-chrome restricted.

Chrome Plating

Decorative (thin, over nickel) or hard chrome (thick, for wear). Decorative for appearance; hard for industrial wear surfaces.

Clamp Load

Compressive force applied to joint by tightened fastener. Also called preload, bolt tension, clamping force.

Class (Metric)

Metric strength grade (4.6, 8.8, 10.9, 12.9). First digit × 100 = tensile MPa; product of digits × 10 = yield MPa.

Class of Fit

Thread tolerance class. Unified: 1A/1B (loose), 2A/2B (standard), 3A/3B (tight). A=external, B=internal.

Clearance Hole

Hole larger than fastener allowing free passage. Sizes: close fit, normal fit, loose fit per standards.

Clevis

U-shaped fitting with pin hole for pivoting connections. Clevis pin secures with cotter pin or other retainer.

Clevis Pin

Headed pin with hole for cotter pin, used in clevises and linkages. Allows pivoting motion.

Clinch Fastener

See Self-Clinching.

Close Fit

Tightest clearance hole providing best alignment. Hole diameter = nominal + 1/64" (inch) or + 0.4mm (metric).

Coarse Thread

Standard thread pitch with larger spacing. UNC for inch; standard pitch for metric. Better for soft materials, faster assembly.

Coefficient of Friction

Ratio of friction force to normal force. Affects torque-tension relationship. Ranges 0.10-0.20 lubricated; 0.15-0.25 dry.

Cold Forming

Shaping metal at room temperature using dies. Produces stronger parts than machining due to grain flow.

Cold Heading

Cold forming process creating fastener heads by upsetting wire in dies. Most economical high-volume method.

Combination Drive

Head recess accepting multiple driver types. Common: Phillips/slotted combo, Pozisquare (Pozidriv/square).

Cone Point

Set screw point ground to cone shape. Provides permanent location when seated in matching depression.

Constant Section Ring

Retaining ring of uniform cross-section installed in groove. Spiral or stamped types. Also called spiral ring.

Corrosion

Degradation of metal by chemical/electrochemical reaction. Types: uniform, pitting, crevice, galvanic, stress cracking, intergranular.

Cotter Pin

Split pin inserted through hole and bent to retain. Used with castle nuts, clevis pins. Also called split pin.

Counterbore

Cylindrical enlargement of hole allowing bolt head or socket cap screw to sit below surface.

Countersink

Conical enlargement of hole for flat or oval head screws. Standard angles: 82° (US), 90° (metric), 100° (aerospace).

Coupling Nut

Extended hex nut for joining two threaded rods end-to-end. Also called rod coupling or extension nut.

Creep

Slow continuous deformation under constant stress over time. Important at elevated temperatures and with polymers.

Crest

Top surface of thread connecting flanks. Major diameter measured at crest of external threads.

Crevice Corrosion

Localized attack in confined spaces (under heads, in lap joints) where oxygen depletes and pH drops.

Cup Point

Set screw point with chamfered edge creating cup shape. Digs into shaft for maximum holding without permanent mark.

Cut Thread

Threads machined by removing material. Lower strength than rolled threads due to interrupted grain flow.

Cyclic Loading

Repeated loading/unloading or load reversal causing fatigue. Can fail at stresses below yield.

D

Dacromet®

Zinc-aluminum flake coating with excellent corrosion resistance. No hydrogen embrittlement risk. Now Geomet®.

Decarburization

Carbon loss from steel surface during heat treatment, creating soft surface layer reducing fatigue strength.

Degree of Engagement

Percentage of full thread depth in contact. Standard taps produce 60-75% engagement, sufficient for most applications.

Die

Tool for cutting external threads or forming parts. Hex dies for hand threading; roll dies for production.

DIN

Deutsches Institut für Normung. German standards widely used internationally (DIN 931, 933, 934, 912, 7991).

Direct Tension Indicator (DTI)

Washer with protrusions that flatten under load, indicating bolt tension by gap measurement. Per ASTM F959.

Dog Point

Set screw point with cylindrical extension (pilot). Locates in hole or slot for alignment.

Double-End Stud

Stud with threads both ends and unthreaded middle. One end permanent; nut applied to other.

Dowel Pin

Precision cylindrical pin for accurate alignment of mating parts. Press or slip fit depending on tolerance.

Drive Style

Head recess design accepting driving tool. Types: slotted, Phillips, Pozidriv, hex socket, Torx, square, tri-wing, spanner, one-way.

Drop-In Anchor

Female concrete anchor set by driving expansion cone down. Provides flush internal thread for machine screws.

Drywall Screw

Self-tapping screw with bugle head and deep Phillips drive for drywall installation. Fine thread for metal studs; coarse for wood.

DTI

See Direct Tension Indicator.

Ductility

Ability to deform plastically without fracture. Measured by elongation and reduction of area. Ductile fasteners stretch before breaking.

Duplex Stainless

Mixed austenitic/ferritic stainless (2205, 2507). Higher strength than austenitic with good corrosion resistance.

Dye Penetrant Test

Non-destructive inspection using colored dye to reveal surface cracks. For non-porous materials.

E

E-Clip

External retaining ring installed from side onto grooved shaft. E-shape with prongs gripping groove.

Edge Distance

Distance from bolt centerline to material edge. Minimum required to prevent tear-out failure.

Effective Thread Length

Fully formed threads providing load-bearing engagement. Excludes runout and chamfered threads.

Elastic Limit

Maximum stress returning to original dimensions when unloaded. Below yield strength.

Electroless Nickel

Chemical (not electrolytic) nickel plating providing uniform coating thickness and hardness. Excellent corrosion and wear resistance.

Electroplating

Depositing metal coating using electrical current. Common: zinc, nickel, chrome, cadmium, tin, copper.

Elongation

Increase in length under tension, expressed as percentage. Indicates ductility. Measured at fracture in tensile test.

Embedment Depth

Depth anchor is inserted into base material. Critical parameter for anchor strength calculations.

Endurance Limit

Stress below which infinite fatigue life expected. Steel has defined limit; aluminum/copper don't.

Expansion Anchor

Concrete anchor using mechanical expansion to grip hole walls. Types: wedge, sleeve, drop-in, single/double expansion.

External Thread

Thread on outside of fastener (bolt, screw, stud). Mates with internal thread.

Eye Bolt

Bolt with circular loop head for lifting or cable attachment. Types: plain (angular load), shoulder (rated lifting).

F

F593

ASTM specification for stainless steel bolts, hex cap screws, and studs. Groups 1-4 for different alloys.

F594

ASTM specification for stainless steel nuts. Companion to F593 bolts.

F3125

ASTM specification consolidating structural bolt grades (A325, A490, F1852, F2280) into single document.

Fatigue

Progressive damage from cyclic loading causing crack initiation and propagation. Leading cause of fastener failure.

Fatigue Life

Number of load cycles to failure at given stress level. Displayed on S-N curve.

Faying Surface

Contact surfaces between clamped members. Surface condition critical for slip-critical joints.

Ferritic Stainless

Magnetic 400 series stainless (430). Moderate corrosion resistance, lower cost than austenitic.

Ferrule

Ring or cap reinforcing or securing. Wire rope ferrule, cable end ferrule, tube fitting ferrule.

Fillet

Curved transition between head and shank. Larger radius improves fatigue strength.

Fine Thread

Smaller thread pitch. UNF for inch. Greater tensile stress area, better in thin walls, more susceptible to stripping.

Finish

Surface treatment or coating for corrosion protection, appearance, or lubricity. See specific coatings.

Flange

Integral washer-like projection on head or nut providing larger bearing surface.

Flange Bolt

Hex bolt with integral flange eliminating need for washer. Flange may be serrated for locking.

Flange Nut

Hex nut with integral flange. Serrated flange provides locking action.

Flank

Thread surface connecting crest and root. Load-bearing contact surface between mating threads.

Flat Head

Countersunk head sitting flush with surface. Angles: 82° (US), 90° (metric), 100° (aerospace).

Flat Point

Set screw with flat end. Minimum surface damage, permits adjustment. Lowest holding power.

Flat Washer

Plain circular washer for load distribution, surface protection, spanning oversized holes.

Forging

Shaping metal by compressive force. Hot or cold. Produces superior grain structure vs. machining.

Friction Grip

See Slip-Critical Joint.

Full Thread

Bolt threaded from under head to tip, no unthreaded shank. Also called fully threaded or tap bolt.

G

Galling

Severe adhesive wear causing material transfer and seizing. Common with stainless steel. Prevented by lubrication, dissimilar materials.

Galvanic Corrosion

Corrosion from contact between dissimilar metals in electrolyte. More active (anodic) metal corrodes preferentially.

Galvanic Series

Metals ranked by electrochemical potential. Greater separation = more severe galvanic corrosion when coupled.

Galvanizing

Zinc coating by hot-dipping (thick, 2-5 mils) or electroplating (thin, 0.2-0.5 mils). Sacrificial corrosion protection.

Gasket

Compressible material between joint surfaces for sealing. Requires controlled bolt load for proper compression.

Geomet®

Zinc-aluminum flake coating. Successor to Dacromet®. Excellent corrosion resistance without hydrogen embrittlement.

Go/No-Go Gauge

Thread gauge checking acceptability. Go gauge must thread freely; No-Go must not thread more than 3 turns.

Grade

Inch-series strength classification (Grade 2, 5, 8). Higher = stronger. See also Class for metric.

Grade Marking

Symbols on bolt head indicating grade. Grade 5: 3 radial lines. Grade 8: 6 lines. Metric: numbers (8.8, 10.9, 12.9).

Grain Flow

Directional structure of metal from processing. Unbroken grain flow in rolled threads increases strength.

Grip Length

Total thickness of materials being clamped. Determines required bolt length.

Grommet

Ring inserted in hole to protect edges, provide insulation, or act as bushing. Rubber, plastic, or metal.

Grounding

Electrical connection to earth for safety. Fasteners may provide grounding path requiring conductivity.

H

Half-Dog Point

Set screw point with shortened dog for shallow holes or slots. Provides alignment.

Hanger Bolt

Bolt with wood screw thread one end, machine thread other. For attaching hardware to wood.

Hardness

Resistance to indentation. Scales: Rockwell (HRC, HRB), Brinell (HB), Vickers (HV). Correlates with strength.

Hastelloy®

Nickel-based superalloys for extreme corrosion resistance. Types: C-276 (general), B-2 (reducing acids), C-22 (oxidizing).

Head

Enlarged portion providing bearing surface and/or drive engagement. Many styles for different applications.

Heat Treatment

Controlled heating/cooling to modify properties. Processes: quenching, tempering, annealing, normalizing, case hardening.

Heavy Hex

Structural bolt/nut with larger across-flats than standard hex. Per ASTM A325, A490, F3125.

Helicoil®

Brand of helical wire thread insert. Repairs damaged threads; provides wear-resistant threads in soft materials.

Helix Angle

Angle of thread helix from perpendicular to axis. Affects friction and self-locking characteristics.

Hex Socket

Six-sided recess in head accepting hex key (Allen wrench). High torque capacity, compact head.

Hi-Lo Thread

Self-tapping thread with alternating high/low profile for plastics. Reduces boss stress.

High-Strength Bolt

Generally ≥120 ksi tensile. Grade 5/8 inch; Class 8.8/10.9/12.9 metric; A325/A490/F3125 structural.

Hitch Pin

Pin with formed head and spring clip or cotter pin hole for quick assembly of linkages.

Hot-Dip Galvanizing

Immersion in molten zinc (850°F). Thick coating (2-5 mils), metallurgically bonded. Excellent outdoor protection.

Hydrogen Embrittlement

Loss of ductility from hydrogen absorption during plating/cleaning. Affects steel ≥HRC 32. Mitigated by baking.

I

IFI

Industrial Fasteners Institute. Trade association publishing IFI standards and technical information.

Impact Strength

Energy absorbed before fracture under sudden loading. Charpy/Izod tests. Critical for low-temperature applications.

Inconel®

Nickel-chromium superalloy for high temperature and corrosion. Types: 600, 625, 718. Aerospace and chemical processing.

Insert

Device providing threads in hole. Types: helical wire (Helicoil), key-locking (Keensert), press-in, self-tapping, molded-in.

Interference Fit

Assembly where pin/shaft is larger than hole, requiring press. Creates secure retention by friction.

Internal Thread

Thread on inside surface (nut, tapped hole). Mates with external thread.

ISO

International Organization for Standardization. Publishes global fastener standards (ISO 898, 3506, 4014, 4762, etc.).

J

J-Bolt

Anchor bolt bent into J-shape. Cast or grouted into concrete with hook providing pull-out resistance.

Jam Nut

Thin nut used with full nut, locked against each other to prevent loosening.

JIS

Japanese Industrial Standards. Japan's standards with some differences from ISO despite broad compatibility.

Joint

Assembly of components held by fasteners. Includes clamped materials, fasteners, washers, all contact surfaces.

Joint Diagram

Graph showing bolt tension and joint compression vs. applied external load. Used for joint design analysis.

Joint Relaxation

Clamp load loss from embedding, gasket creep, thermal effects. Most occurs within first hours/days.

Joint Stiffness

Resistance to compression under load. Stiff joints maintain clamp load better than soft (gasketed) joints.

K

K-Factor

Nut factor in torque-tension relationship: $T = K \times D \times F$. Varies with lubrication (0.10-0.25 typical).

Keensert®

Key-locking thread insert with external keys engaging parent material for high torque-out resistance.

Keps Nut

Hex nut with captive external tooth lock washer. Also called K-nut or washer nut.

Killed Steel

Fully deoxidized steel (aluminum or silicon killed) with uniform properties and minimal porosity.

Knuckle Thread

Rounded thread form for applications requiring debris tolerance. Used on light bulbs, bottle caps.

Knurled

Textured surface pattern (straight or diamond) for grip. Applied by rolling. Common on thumb screws, press-fit pins.

L

L-Bolt

Anchor bolt bent 90° into L-shape. Cast or grouted with bend providing pull-out resistance.

Lag Screw (Lag Bolt)

Heavy wood screw with hex/square head and gimlet point. For heavy wood-to-wood or hardware-to-wood connections.

Lead

Axial advance per revolution. Equals pitch for single-start; pitch × starts for multi-start threads.

Left-Hand Thread

Thread advancing counterclockwise. Used where rotation would loosen RH thread. Marked "LH."

Length

Bolt: under head to end. Countersunk: top of head to end. Studs: end to end.

Lever Nut

Electrical connector with lever-actuated spring clamp for quick, tool-free wire connection.

Load Indicating Washer

See Direct Tension Indicator (DTI).

Lock Nut

Nut resisting loosening. Types: nylon insert (Nylock), all-metal distorted, serrated flange, castle with cotter pin.

Lock Washer

Washer resisting loosening. Types: split (helical), internal/external tooth, conical (Belleville). Effectiveness debated.

Locking Feature

Design preventing loosening. Categories: prevailing torque (friction), free-spinning (mechanical), chemical (adhesive).

Loctite®

Brand of anaerobic thread locking adhesives. Strengths: purple (low), blue (medium), red (high), green (wicking).

Lot

Production quantity from same material, heat, and process. Enables traceability and quality control.

Lubrication

Substance reducing friction. Critical for consistent torque-tension. Must be specified and controlled.

Lynch Pin

Quick-release pin with integral spring loop retainer. For clevis and hitch applications.

M

Machine Screw

Small fastener with machine threads for use with nut or tapped hole. Various head styles. #0 to 1/2" typical.

Magni®

Zinc-flake coating system providing excellent corrosion resistance without hydrogen embrittlement.

Magnetic Particle Inspection

NDT method using magnetic field and iron particles to reveal surface/near-surface cracks in ferromagnetic materials.

Major Diameter

Largest thread diameter. Crest of external; root of internal thread. Nominal size approximates major diameter.

Maraging Steel

Ultra-high-strength steel (250-350 ksi) hardened by aging. Excellent toughness. Aerospace fasteners.

Martensitic Stainless

Hardenable 400 series stainless (410, 416, 420, 440). Heat treatable to high strength. Moderate corrosion resistance.

Mechanical Properties

Response to forces: tensile strength, yield strength, hardness, elongation, reduction of area, impact strength.

Mechanical Zinc

Zinc coating applied by tumbling with zinc dust and glass beads. No hydrogen embrittlement risk.

Metric Thread

ISO thread system with 60° angle, dimensions in millimeters. M × pitch designation (M8 × 1.25).

MIL-SPEC

US Military specification. MIL-S-1222 for screws; MIL-N-25027 for nuts. Being replaced by commercial specs.

Mill Test Report (MTR)

Document certifying material chemical composition and mechanical properties. Required for critical applications.

Minor Diameter

Smallest thread diameter. Root of external; crest of internal thread.

Modulus of Elasticity

Stress/strain ratio in elastic range. Material stiffness. Steel: ~30 Msi; aluminum: ~10 Msi; titanium: ~16 Msi.

Molly Bolt

Hollow wall anchor with sleeve that expands behind drywall when screw tightened. Permanent installation.

Monel®

Nickel-copper alloy (400 series) with excellent seawater corrosion resistance. Marine fasteners.

MP35N®

Nickel-cobalt-chromium-molybdenum alloy. Extreme strength (260 ksi) and corrosion resistance. Aerospace and medical.

MS (Military Standard)

Military fastener specifications. MS16995 nuts; MS20995 safety wire; MS21250 bolts.

Multi-Start Thread

Two or more independent thread helixes for faster linear motion. Lead = pitch × number of starts.

N

NAS (National Aerospace Standard)

Aerospace fastener specifications. NAS1351 socket head; NAS1801 hex bolts; NAS679 self-locking nuts.

NDT

Non-Destructive Testing. Methods: magnetic particle, dye penetrant, ultrasonic, radiographic, eddy current.

Nickel Plating

Electroplated or electroless nickel for corrosion resistance and appearance. Often base for chrome.

Nitriding

Surface hardening diffusing nitrogen into steel. Creates hard, wear-resistant case without quenching distortion.

Nominal Size

Designated size (1/4"-20, M8-1.25). Actual dimensions vary within tolerances.

Nord-Lock®

Wedge-locking washer system using pairs of washers with cam surfaces that resist loosening.

Normalizing

Heat treatment: heating above transformation range, air cooling. Refines grain, improves uniformity.

NPT

National Pipe Tapered thread. Tapered thread sealing by interference. Requires sealant for pressure applications.

NPTF

National Pipe Tapered Fuel/Dryseal. Designed for metal-to-metal seal without sealant.

Nut

Internally threaded fastener mating with bolt/screw/stud. Many styles: hex, square, wing, cap, castle, lock, flange.

Nut Factor

See K-Factor.

Nylok®

Nylon pellet or patch on threads providing prevailing torque locking. Reusable several cycles.

Nylon Insert Nut

Nut with nylon collar that deforms around threads creating friction lock. One-way (requires tools to remove).

O

One-Way Screw

Security screw that can be driven in but not removed with standard tools. Slotted with ramp permits forward only.

Oval Head

Countersunk head with decorative domed top. Also called raised countersunk.

Oval Point

Set screw point with rounded end. Slight holding power without marking shaft. For frequent adjustment.

Oversized Hole

Clearance hole larger than standard for fit-up adjustment. Requires larger washers. Permitted in structural bolting per specifications.

P

Pal Nut

Thin sheet metal nut providing secondary locking. Pushes against primary nut.

Pan Head

Low-profile rounded head with flat bearing. Most versatile machine screw head style.

Parkerizing

Manganese or zinc phosphate coating (military gray-green). Excellent rust prevention and paint adhesion.

Passivation

Chemical treatment enhancing stainless steel's protective oxide layer. Removes free iron contamination.

PEM®

Brand of self-clinching fasteners. Studs, nuts, standoffs for permanent installation in sheet metal.

Phosphate Coating

Conversion coating (zinc or manganese phosphate) for corrosion resistance, oil retention, paint adhesion.

Pin

Cylindrical fastener for alignment, pivoting, or retention. Types: dowel, taper, roll, cotter, clevis, groove, spring.

Pitch

Distance crest to crest measured parallel to axis. Metric: mm. Inch: TPI = 1/pitch.

Pitch Diameter

Theoretical diameter where thread width equals space. Used for strength and tolerance calculations.

Pitting Corrosion

Localized attack creating small holes. Common in stainless steel exposed to chlorides.

Plain Finish

No coating. Steel will rust. May be oiled. Also called "self-color" or "black."

Plating Thickness

Coating thickness in mils (0.001") or microns (µm). Affects fit, corrosion protection, appearance.

Plug Tap

Standard tap with 3-5 thread chamfer. General purpose for through holes.

Point

End of fastener opposite head. Types: chamfer, cone, cup, flat, oval, dog, half-dog, gimlet, pilot.

Pop Rivet

Blind rivet installed with special tool. Mandrel pulls head, expanding body, then breaks off.

Pozidriv

Improved cross recess (Phillips alternative) with additional ribs for better engagement, less cam-out.

Precipitation Hardening

Heat treatment hardening certain alloys (17-4 PH stainless, A286) through controlled aging.

Preload

Tension induced in fastener when tightened. Creates clamping force. See Clamp Load.

Press Fit

See Interference Fit.

Prevailing Torque

Torque required to turn locking fastener regardless of clamp load. Provided by deformed threads or nylon insert.

Proof Load

Maximum load without permanent deformation. Typically 85-93% of yield. Test load per specifications.

Proof Stress

Proof load divided by stress area. Stress at which material would just begin to yield.

Prying Action

Additional bolt load from joint geometry acting as lever. Can significantly increase actual bolt stress.

PSI

Pounds per Square Inch. US stress/strength unit. 1 MPa ≈ 145 PSI; 1 ksi = 1000 PSI.

PTFE (Teflon®)

Fluoropolymer coating providing lubricity and chemical resistance. Used on fasteners for anti-galling and corrosion protection.

Pull-Out Strength

Force to pull threaded fastener from material. Function of thread engagement, material strength.

Push Nut

One-piece stamped fastener pushed onto shaft. Internal prongs grip shaft. Permanent installation.

Q

Quarter-Turn Fastener

Quick-release fastener engaging/disengaging with 90° turn. Used on access panels, cowlings.

Quench

Rapid cooling from high temperature to harden steel. Media: water, oil, polymer, air. Followed by tempering.

Quench and Temper (Q&T)

Heat treatment: austenitize, quench, temper. Used for Grade 5, 8 and high-strength fasteners.

R

RCSC

Research Council on Structural Connections. Publishes specification for structural steel bolted joints.

Reduction of Area

Decrease in cross-section at fracture in tensile test. Measure of ductility. Expressed as percentage.

Relaxation

Stress decrease at constant strain over time. Causes preload loss. More significant at elevated temperatures.

Retaining Ring

Snap ring holding components on shafts (external) or in bores (internal). Types: E-clip, C-clip, spiral, bowed.

Rivet

Permanent fastener installed by deforming. Types: solid, blind (pop), tubular, semi-tubular, drive, flush.

Rivet Nut

Blind internally threaded insert. Installed by collapsing body against back side. Also called nutsert.

Robertson

Square drive recess. Excellent torque transfer, virtually no cam-out. Popular in Canada.

Rockwell Hardness

Hardness scale measuring indentation depth. HRC (diamond cone) for hardened steel; HRB (ball) for softer materials.

RoHS

Restriction of Hazardous Substances. EU directive limiting lead, cadmium, hex-chrome, mercury in products.

Roll Pin

Hollow spring pin with slot allowing compression for press fit. Also called spring pin.

Rolled Thread

Threads formed by displacement between dies. Stronger than cut threads due to unbroken grain flow and work hardening.

Root

Bottom of thread groove. Minor diameter measured at root of external threads.

Round Head

Full dome head (not countersunk). Traditional style largely replaced by pan head.

Runout

Incomplete threads at end where form tapers off. Not counted as effective thread length.

S

SAE

SAE International (Society of Automotive Engineers). Standards for automotive/aerospace (SAE J429 bolt grades).

Safety Wire

Wire securing fasteners against loosening. Threaded through holes, twisted, routed so loosening tightens wire.

Salt Spray Test

Accelerated corrosion test per ASTM B117. Hours to white (zinc) or red (base metal) rust indicates relative protection.

Screw

Externally threaded fastener that engages internal threads or creates own threads. Tightened by rotating head.

Seating Torque

Torque to draw joint surfaces together before clamping begins. Overcome before useful preload develops.

Self-Clinching

Installation method where fastener displaces parent metal to lock permanently in sheet metal when pressed.

Self-Drilling

Screw with drill point creating its own hole. Also called TEK® screw. Eliminates pre-drilling.

Self-Tapping

Screw creating mating threads in pre-drilled hole. Thread-forming displaces material; thread-cutting removes chips.

Serrated Flange

Flange with radial teeth providing free-spinning locking action by biting into surface.

Set Screw

Headless screw threaded full length. Secures components to shafts. Various point styles: cup, cone, flat, dog, oval.

Sex Bolt

Two-piece fastener: internally threaded barrel with mating screw. Also called Chicago screw or binding post.

Shank

Unthreaded portion of bolt body. Provides shear strength without thread stress concentration.

Shear Strength

Load capacity perpendicular to axis. Typically 60% of tensile strength for steel.

Sheet Metal Screw

Self-tapping screw with sharp threads for thin sheet metal. Types: A (pointed), AB (pointed), B (blunt).

Sherardizing

Diffusion zinc coating applied by tumbling parts in zinc dust at elevated temperature. Uniform coating.

Shoulder Bolt

Bolt with precision unthreaded shoulder for pivot, guide, or spacer. Also called shoulder screw or stripper bolt.

Silicon Bronze

Copper-silicon alloy with excellent marine corrosion resistance. Common for boat building fasteners.

Single-Start Thread

Standard thread with one helix. Lead equals pitch. Most fasteners are single-start.

Slip-Critical Joint

Structural connection transferring load by friction between faying surfaces, not bolt shear.

Slotted Hole

Elongated hole for adjustment. Standard or oversized slots per structural specifications.

S-N Curve

Graph plotting stress (S) vs. cycles to failure (N). Used for fatigue life prediction.

Snug Tight

All surfaces in firm contact. Few impacts with impact wrench or full effort with spud wrench.

Socket Cap Screw

Fastener with cylindrical head and hex socket drive. High strength, compact profile for tight spaces.

Spanner Drive

Security drive with two holes for special two-pin tool. Also called pig-nose or snake-eye.

Spiral Ring

See Constant Section Ring.

Split Washer

Helical spring lock washer. Effectiveness debated; proper preload more important for locking.

Spring Pin

See Roll Pin.

Spring Rate

Force per unit deflection (lb/in, N/mm). Determines joint stiffness and load sharing.

Square Neck

Square section under head that seats in square hole to prevent rotation. Carriage bolts, elevator bolts.

Square Thread

Thread form with square profile (0° flank angle). Maximum efficiency but difficult to manufacture.

Stainless Steel

Steel with ≥10.5% Cr for corrosion resistance. Types: austenitic (300), ferritic (400), martensitic (400), duplex, PH.

Standoff

Spacer with internal and/or external threads to maintain precise distance between components.

Stress Area

Effective cross-sectional area for tensile calculations. Less than nominal due to threads.

Stress Corrosion Cracking

Cracking from tensile stress plus corrosive environment in susceptible material. Sudden failure without warning.

Structural Bolt

High-strength bolt for steel structures. A325, A490, F3125 grades. Heavy hex pattern.

Stud

Headless fastener threaded both ends or full length. One end installed; nut applied to other.

Stub Acme

Shallower version of Acme thread for applications with clearance or strength issues.

Surface Roughness

Measure of surface texture. Ra (average) or Rz (peak-to-valley). Affects friction, sealing, fatigue.

T

T-Nut

Pronged nut that hammers into wood/composite, providing machine threads on back side. Also called tee nut.

Tap

Tool cutting internal threads. Types: taper (starting), plug (through), bottoming (blind). Also form taps.

Tap Bolt

Fully threaded hex head fastener. Also called full thread hex bolt.

Tap Drill

Drill size for hole before tapping. Selected for desired thread engagement (typically 65-75%).

Taper Pin

Precision pin with slight taper (1:48 standard) for alignment and retention in reamed holes.

Taper Tap

Starting tap with 8-10 thread chamfer. Easiest starting but doesn't thread to bottom.

TC Bolt

See Tension Control Bolt.

TEK® Screw

Brand name for self-drilling screws. Generic term for any self-drilling fastener.

Temper

Heat treatment after quenching reducing brittleness while maintaining strength. Higher temp = softer.

Tensile Strength

Maximum stress before fracture. Ultimate Tensile Strength (UTS). Key fastener specification.

Tension Control Bolt

Structural bolt with splined end shearing off at specified tension, indicating proper installation.

Thread

Helical ridge on fastener for engagement and advancement. External (bolt) or internal (nut).

Thread Angle

Included angle between flanks. 60° unified/metric; 55° Whitworth/BSP; 29° Acme; 7°/45° buttress.

Thread Class

Tolerance specification. Unified: 1A/B (loose), 2A/B (standard), 3A/B (tight). Metric: 6g/6H (standard).

Thread Engagement

Length of mating thread contact. Minimum typically equals nominal diameter for full strength.

Thread Form

Thread profile shape. Types: Unified (UN), Metric (M), Acme, Buttress, Square, Whitworth, NPT.

Thread Gauge

Inspection tool verifying thread dimensions. Types: ring (external), plug (internal), go/no-go.

Thread Insert

Device providing threads in hole. See Insert.

Thread Locker

Anaerobic adhesive applied to threads preventing loosening. Strengths: low, medium, high, wicking.

Thread Pitch Gauge

Tool with multiple blades for identifying thread pitch by matching blade teeth to threads.

Thread Rolling

Cold forming threads by displacement between dies. Creates stronger threads than cutting.

Thread Stripping

Failure by shearing threads due to excessive load or insufficient engagement.

Through Hole

Hole passing completely through material. Opposite of blind hole.

Thumb Screw

Fastener with flattened or knurled head for hand tightening without tools.

Titanium

Lightweight, high-strength, corrosion-resistant metal. Ti-6Al-4V (Grade 5) common for aerospace fasteners.

Toggle Bolt

Hollow wall anchor with spring wings that open behind panel. For heavy loads in drywall.

Tolerance

Permitted variation from nominal dimension. Specifies acceptable manufacturing range.

Tooth Lock Washer

Lock washer with teeth (internal, external, or combination) that bite into surface.

Torque

Rotational force measured in ft-lb, in-lb, or N-m. Applied to tighten fasteners.

Torque-Tension

Relationship between applied torque and resulting bolt tension. Affected by friction, lubrication, conditions.

Torque Wrench

Tool indicating or limiting applied torque. Types: beam, click (micrometer), dial, electronic.

Torx®

Six-lobe star drive providing excellent torque transfer without cam-out. Sizes: T1-T100.

Toughness

Energy absorption before fracture. Combines strength and ductility. Measured by impact test.

TPI

Threads Per Inch. Inch thread pitch designation. TPI = 1/pitch.

Truss Head

Extra-wide, low-profile head preventing pull-through in thin or soft materials.

Turn-of-Nut

Tightening method: snug tight, then rotate specified amount (1/3 to 1 turn). Reliable for structural bolts.

Turnbuckle

Device with opposite-hand threads at each end for adjusting tension in cables, rods, or tie rods.

U

U-Bolt

Bolt bent into U-shape with threads on both legs. For attaching pipes, tubes, or round objects.

Ultimate Strength

Maximum stress before failure. Same as Tensile Strength.

Ultrasonic Testing

NDT using sound waves to detect internal flaws and measure bolt stretch/tension.

UNC

Unified National Coarse. Standard coarse thread series for inch fasteners.

Undercut

Relief groove at thread/shank transition or countersink recess allowing mating parts to seat fully.

Undercut Anchor

Concrete anchor where mechanical interlock is formed by special drill creating undercut cavity.

UNEF

Unified National Extra Fine. Finer pitch than UNF for thin walls and fine adjustment.

UNF

Unified National Fine. Standard fine thread series for inch fasteners.

Unified Thread

Thread system used in US, Canada, UK. 60° angle. Series: UNC, UNF, UNEF, UNS.

UNS

Unified National Special. Non-standard pitch combinations for special applications.

V

Vibration Loosening

Loss of preload from cyclic transverse motion causing incremental back-off rotation.

Vickers Hardness (HV)

Hardness scale using diamond pyramid. Consistent across all hardness ranges.

W

Washer

Disk under head/nut for load distribution, surface protection, spanning holes, or locking.

Weathering Steel

Alloy (A588, Cor-Ten®) forming protective rust layer. For exposed structures.

Wedge Anchor

Expansion anchor with wedge clip that expands against hole wall when nut tightened.

Wedge Locking

Locking system using mated wedge-faced washers (Nord-Lock®) resisting loosening.

Weld Nut

Nut designed for welding to base metal. Projection weld or full weld types.

Weld Stud

Stud designed for capacitor discharge or arc stud welding to base metal.

Whitworth Thread

British thread system with 55° angle, rounded roots/crests. BSW (coarse), BSF (fine). Largely obsolete.

Wing Nut

Nut with wings for hand tightening without tools.

Wire Rope Clip

U-bolt clamp for securing wire rope loops. Also called cable clamp or wire rope clamp.

Work Hardening

Strength increase from plastic deformation. Occurs during cold forming and thread rolling.

Wrench Size

Across-flats dimension determining socket/wrench size. May differ from nominal fastener size.

X

X-Ray Inspection

Radiographic NDT revealing internal defects, voids, and inclusions in fasteners.

Xylan®

Fluoropolymer coating providing lubricity, corrosion resistance, and chemical resistance.

Y

Yellow Zinc

Zinc plating with yellow/gold chromate conversion. Better corrosion resistance than clear. Being phased out (hex chrome).

Yield Point

Stress where plastic deformation begins without load increase. Distinct in mild steel.

Yield Strength

Stress at onset of permanent deformation. 0.2% offset method for materials without distinct yield point.

Z

Zinc Flake

Coating of zinc/aluminum flakes in binder. Dacromet®, Geomet®, Magni®. No hydrogen embrittlement.

Zinc-Iron

Zinc alloy plating with iron for enhanced corrosion resistance and high-temperature stability.

Zinc-Nickel

Alloy plating (12-15% Ni) with superior corrosion resistance. Replacing cadmium in many applications.

Zinc Plating

Electroplated zinc providing sacrificial corrosion protection. Chromate conversion: clear, yellow, black.

⚠ **Disclaimer:** This glossary provides general reference information. Definitions may vary by standards organization (ANSI, ASTM, ISO, SAE, DIN) and industry. Always consult applicable standards and specifications for engineering decisions. Albany County Fasteners assumes no liability for decisions based on this information.

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