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Acme thread: An American screw thread having a section that is a mean between the V threads and square threads.



Acorn Nut: A nut (so-called because of its shape) that has a domed top so that it prevents contact with the external thread.

Actual Fit: The actual fit between two mating parts is the relation existing between them with respect to the amount of clearance or interference which is present when they are assembled.

Actual Size: An actual size is a measured size.

Allowance: An intentional clearance between internal or external thread and the design form of the thread when the thread form is on it's maximum metal condition. Not all classes of fit have an allowance. For metric threads the allowance is called the fundamental deviation.

Alloy Steel: Alloy steels made by combining carbon steel with one or several alloying elements, such as manganese, silicon, nickel, titanium, copper, chromium and aluminum. These metals are added to produce specific properties that are not found in regular carbon steel.

Anaerobic Adhesive: An adhesive which hardens in the absence of air, such



adhesives are often used as a thread locking medium.

Anti-Friction Coating: AF coatings are dry lubricants consisting of suspensions of solid lubricants.

Anti-Seize Compound: An anti-seize compound is used on the threads of fasteners in some applications to prevent friction or corrosion of the threads.

Angularity: Angularity is the angle between the axes of two surfaces of a fastener.

Angle Controlled Tightening: A tightening procedure in which a fastener is first tightened by a pre-selected torque (called the snug torque) so that the clamped surfaces are pulled together, and then is further tightened by giving the nut an additional measured rotation.

Annealed: A fastener is considered in the annealed state when it has been heated and cooled to make it soft-that is, free of hardness caused by working or previous heat treatment.

Anodizing: Anodizing is the formation of an oxide film on the surface by means of an anodic treatment. This is commonly used on aluminum.

ASME: The designation of a society of writing specifications. American Society of Mechanical Engineers United Engineering

ANSI: The designation of a society of writing specifications. American National Standards Institute

ASTM: The designation of a society for writing specifications American Society for Testing and Materials



B

Basic Size: The basic size is that size from which the limits of size are derived by the application of allowances and tolerances.

Basic Thread Profile: This is the theoretical profile of external and internal threads with no manufacturing tolerance applied.

Bearing Surface: The bearing surface is the supporting or locating surface of a fastener with respect to the part which it fastens (mates). The loading of a fastener is usually through the bearing surface.

Bearing Stress: The surface pressure acting on a joint face directly as a result of the force applied by a fastener.

Bi-hexagon Head: A bolt or screw whose cross section of its head is in the shape of a 12 pointed star.

Blank: A blank is a fastener in some intermediate stage of manufacture.

Body: The body of a threaded fastener is the unthreaded portion of the shank.

Bound Body (Body-Bound or Fitted): A bound body is a body which has a definite interference or extremely small clearance with its mating hole.

Body Diameter: The body diameter is the diameter of the body of a threaded fastener.

Bolt: A bolt is a headed and externally threaded mechanical device designed for insertion through an oversized hole and mated with a nut or tapped hole.



Breakaway Torque: Breakaway torque is the rotating force required to “break” the head loose, going in the same direction as applied-tightening

Break loose Torque: The torque required to effect reverse rotation when a pre-stressed threaded assembly is loosened.

British Standard Brass: A specialist thread form based upon the Whitworth thread and consisting of 26 threads per inch whatever the thread diameter.

Broaching: Broaching is the process of removing metal by pushing or pulling a cutting tool, called a broach, along the surface.

Burr: A burr is a small amount of material extending out from the edge of a hole, shoulder, etc. as the result of a machining operation.

C

Cadmium Electroplating: Coating of threaded fasteners with cadmium can provide the parts with excellent corrosion resistance.

Carbon Steel: Carbon steel is a steel which does not contain any substantial amounts of alloying materials other than carbon.

Case Hardened: A case hardened fastener is a fastener of ferrous material having a surface which has been made harder than the core.



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Chamfer Angle: The chamfer angle is the angle of the chamfer measured from the normal to the axis of the fastener and is generally specified in conjunction with either a length or a diameter.

Chip: A chip is a small fragment of metal removed from a surface by cutting with a tool.

Clamping Force: The compressive force which a fastener exerts on the joint.

Class of Fit: The Class of Fit is a measure of the degree of fit between mating internal and external threads. Three main Classes of Fit are Fine (Close), Medium (Standard) and Coarse (Loose):

	Unified		Metric	
Class	External Thread	Internal Thread	External Thread	Internal Thread
Loose	1A	1B	8g	7h
Standard	2A	2B	6g	6h
Close	3A	3B	4g	5h

Coating: Coating is the application of some material such as metal, organic compound, etc. to the surface of a fastener.

Collar: A collar is a raised ring or flange of material on the head or shank of a fastener.

Commercial Fastener: A commercial fastener is a fastener manufactured to published standards and stocked by manufacturers or distributors.



Comparator: A device for inspecting screw threads and outlines by comparing them with a greatly enlarged standard chart.

Compression Fastener: A compression fastener is a fastener the primary function of which is to resist forces which tend to compress it.

Conflict minerals: Is a list of minerals that which are extracted from the Eastern Congo, and passed through a variety of intermediaries.

Concentric, Concentricity: Two surfaces of a fastener are concentric when they have a common center of axis. Concentricity is the term used to describe this condition.

Cone Proof Load: This is an axial applied force applied to a nut when it is seated on a cone shaped washer which has an included angle of 120 degrees.

Counter boring: Is the process of enlarging for part of its depth a hole previously formed and to provide a shoulder at the bottom of the enlarged hole..

Countersink: A countersink is an internal chamfer.

Countersinking: Countersinking is the process of beveling or flaring the end of a hole.

Cracks: Fractures passing through or across grain boundaries without the inclusion of foreign elements.

Creep Strength: At elevated temperatures metal under stress elongates. This elongation increased with time and temperature. To prevent failure it is often necessary to change to heat resistant materials.



Crest: That surface of the thread which joins the flanks of the thread and is farthest from the cylinder or cone from which the thread projects.

Crest Clearance: As in a thread assembly, the distance, measured perpendicular to the axis, between the crest of a thread and the root of its mating thread.

Cross Drilled: A cross drilled fastener is a fastener having one or more holes in the head or shank at right angles to, and normally intersecting, the axis of the fastener.

Cut Thread: A cut thread is a thread produced by removing material from the surface with a form cutting tool.

D

Decarburized: A fastener has a decarburized surface when the carbon content of the surface is lower than the carbon content of the core.

Design Size: The design size is that size from which the limits of size are derived by the application of tolerances. When there is no allowance the design size is the same as the basic size.

Die: (1) One of a pair of hardened metal blocks for forming, impressing, or cutting out a desired shape. (2) (thread). A tool for cutting external threads. Opposite of tap.

Die Chaser: The separate cutting tools used in die heads, which actually cut the screw threads.



Die Fin: A die fin is a slight amount of excess material or flash which may be visible on the bearing surface and/or body of fasteners made by open die heading.

DIN: DIN stands for "**Deutsches Institut für Normung**", meaning "German institute for standardization"

DIN is rapidly being replaced by European standards **EN**. DIN standards are still valid for products having no ISO or EN standards.

Drilling: Drilling is the process of forming holes by means of specialized cutting tools called drills.

Dynamic Friction: Resistance to relative movement of two bodies that are already in motion.

E

Eccentric, Eccentricity: Two surfaces of a fastener are eccentric when they do not have the same center or axis. The amount by which the centers or axes are displaced from each other is called eccentricity.

Effective Diameter: This is the diameter of an imaginary cylinder coaxial with the thread, which has equal metal and space widths. It is often referred to as pitch diameter.

from the virtual effective diameter.

Effective Nut Diameter: Twice the effective nut radius.

Effective Nut Radius: The radius from the center of the nut to the point where the contact forces, generated when the nut is turned, can be considered to act.



Electro-Galvanizing: Electro-galvanizing is the process of coating metal with zinc by electroplating.

Elongation: Longitudinal stretching of a fastener caused by a tensile load due either to tightening or to the external load.

Electroless Nickel: A relatively thin, hard coating that can be applied to threads and deposited uniformly. Bright metallic in appearance this coating has excellent resistance to wear and corrosion.

Embedment: Localized plastic deformation which occurs in the vicinity of clamped fasteners or in the fastener threads.

EN standards: The purpose of European standards (EN) is the harmonization of technical regulations and laws within the single market of the European Union (EU/EWG) that was jointly created on 1st January 1993.

Endurance Limit: The endurance limit is the maximum stress that a fastener can withstand without failure for a specified number of stress cycles. (Also called Fatigue Limit.)

Environmentally Assisted Cracking (EAC): A process that can occur with the use of high strength steel fasteners in which crack initiation and growth occurs in the fastener at a comparatively low stress level as a result of interactions that occur with the environment. Hydrogen is suspected of causing EAC in high



External Force or Load: Forces exerted on a fastener as a result of an applied loading to the joint.

External Thread: A screw thread which is formed on an external cylinder, such as on bolts, screws, studs etc.

Extruding: Extruding is the process of reducing the size of some feature or diameter by forcing it through a die.

E

Facing: Facing is a machining operation on the end, flat face or shoulder of a fastener.

Fatigue Strength: Under variations in applied stress a fastener feels internal stretching that can cause rupture after a specific number of cycles. The number of cycles to failure for a specific load is the fatigue life of the screw.

Ferrous: Relating to or containing iron.

Fillet: A fillet is the concave junction at two intersecting surfaces of a fastener.

Under head Fillet: An under head fillet is the fillet at the junction of the head and shank of a headed fastener.

Fin: A fin is a form of key under the head of a fastener which serves to keep the fastener from turning during assembly and use.

Finish: The term finish is commonly applied to the condition of the surface of a fastener as a result of chemical or organic treatment subsequent to fabrication.



Finish Fastener: A finished fastener is a fastener made to close tolerances and having surfaces other than the threads and bearing surface finished to provide a general high grade appearance.

Fit: Fit is the general term used to signify the range of tightness which may result from the application of a specific combination of allowances and tolerances in the design of mating parts.

Flash: Flash is the thin fin of metal along the sides around the edges of a forged or upset section. It is caused when metal flows out between the edges of the forging dies.

Flash Plating: Flash plating is a very thin deposit of metal, usually on the order of 0.00005 to 0.0001 5 inch in thickness.

Floating Type Flange Joint: A conventional flanged joint in which a gasket is compressed by bolts - the gasket is not rigidly located.

Fluoro-Carbon Thread Coating: A low friction coating applied to threads. This type of coating is frequently used to prevent thread fouling when an assembly containing threaded fasteners is painted.

Following Flank: The flank of a thread opposite to the leading flank.

Forging: Forging is the process of forming a product by hammering or pressing.

Friction: Mechanical resistance to the relative movement of two surfaces.



Friction Stabilizers: Coating materials used on fasteners with the intention of reducing the scatter in the thread and bearing surface friction coefficients.

Full or Nominal Diameter Body: The diameter of which is generally within the dimensional limits of the major diameter of the thread. Sometimes referred to as “full size body.”

Fundamental Deviation: An intentional clearance between internal or external thread and the design form of the thread when the thread form is on it's maximum metal condition.

G

Gage: An instrument used in the measuring of the important measurements of fasteners.

Thread gage: A thread pitch gauge, also known as a screw pitch gauge or pitch gauge, is used to measure the pitch or lead of a screw thread.

Plug gage: a gauge in the form of a plug, used for measuring the diameter of a hole.

Ball gage: ball gauges used for measuring OD of a tapered shaft (micrometer won't sit flat).

Galling: A severe form of adhesive wear which occurs during sliding contact of one surface relative to another.

Galvanizing: Galvanizing is the process of coating metal with zinc by hot dipping, mechanical deposition, or electrolysis.



Gauge: The thickness of sheet metal or the diameter of a wire.

Grains: Grains are the individual crystals of the material.

Grinding: Grinding is the process of removing material from the surface by the cutting action of a bonded abrasive wheel.

Grip: In general, the grip of a fastener is the thickness of material or parts which the fastener is designed to secure when assembled.

Grip Length: Total distance between the underside of the nut to the bearing face of the bolt head; includes washer, gasket thickness etc.

Ground Thread: A ground thread is a thread finished on the flanks by a grinding operation.

H

Hardenability: In a ferrous alloy, the property that determines the depth and distribution of hardness induced by quenching.

Hard Joint: A joint in which the plates and material between the nut and bolt bearing surfaces have a high stiffness when subjected to compression by the bolt load.

Head: The head of a fastener is the enlarged shape performed on one end of a headed fastener to provide a bearing surface:



Binding Head: The binding head has a rounded top surface, slightly tapered side surface and a flat bearing surface, a portion of which is sometimes undercut adjacent to the shank.

Button Head: A button head as applied to threaded fasteners has a low rounded top surface with a large flat bearing surface.

Fillister Head: The fillister head has a rounded top surface, cylindrical side surface and a flat bearing surface.

Flat Fillister Head: The flat fillister head has a flat top surface, cylindrical side surface and a flat bearing surface.

Head Angle: The head angle is the included angle of the bearing surface of the head.

Head Diameter: The head diameter is the diameter at the largest periphery of the head.

Head Eccentricity: Head eccentricity is the amount that the head of a fastener is eccentric with the fastener body or shank.

Head Height: For a flat bearing surface head, the head height is the overall distance, measured parallel to the fastener axis, from the extreme top to the bearing surface.

Head Length: For rectangular or irregular shaped heads, the head length is the distance along the longest axis of the head, measured in a plane perpendicular to the axis of the fastener.



Head Taper: Head taper is the angle formed by the side or sides of the head and the axis of the fastener. This is not applicable to conventional countersunk heads and should not be confused with head angle.

Head Width: The head width is the distance across opposite flats of hexagon, square, or twelve-point heads measured in a plane perpendicular to the fastener axis.

Headed Fastener: A headed fastener is a fastener having one end enlarged or pre-formed.

Headless: A headless threaded fastener is a fastener normally having a slot, recess, or socket in one end.

Heat Tightening: Heat tightening utilizes the thermal expansion characteristics of the bolt by heating the bolt so it expands.

Hexagon Head: The hexagon head has a flat or indented top surface, six flat sides, and a flat bearing surface.

Hexagon Washer Head: The hexagon washer head is a washer head upon which a hexagon head is formed.

Header: A header is a specialized form of press.

Heading: Heading is a manufacturing process involving the use of a header. This process may or may not involve upsetting or extruding.

Headless Fastener: A headless fastener is a fastener, either threaded or unthreaded which does not have either end enlarged.



High Strength Fastener: A high strength fastener is a fastener having high tensile and shear strengths attained through combinations of materials, work hardening, and heat treatment.

High Strength Friction Grip Bolts: Sometimes abbreviated to HSFG bolts. Bolts which are of high tensile strength used in conjunction with high strength nuts and hardened steel washers in structural steelwork.

Hot Dip Galvanizing: Hot dip galvanizing is the process of immersing the parts to be coated in a bath of molten zinc.

Hydraulic Tensioner: A hydraulic tool used to tighten a fastener by stretching it rather than applying a large torque to the nut. After the fastener has been stretched, the nut is run down the thread to snug up with the joint, the hydraulically applied load is then removed resulting in tension being induced into the fastener.



Immunize: To remove small particles of iron or grit from the surface of stainless steel by pickling in an acid solution.

Impact Test: A test to determine the energy absorbed in fracturing a test bar at high velocity.

Impact Wrench: A wrench, usually powered by electricity or air, in which repeated blows from little hammers are used to generate torque to tighten fasteners.



Inclusions: Inclusions are particles of non-metallic impurities contained in material.

Integral Fastener: A term used to describe types of fasteners which are highly resistant to vibration loosening and/or removal. Some types have special thread forms.

Internally Relieved Body: An internally relieved body is a body which has an axial hole drilled through a portion of the body.

Internal Thread: A screw thread which is formed in holes, such as in nuts.

ISO: The International Organization for Standardization (**ISO**) is an international **standard**-setting body composed of representatives from various national **standards** organizations.

J

Jam Nut: A **jam nut** is a low profile type of **nut**, typically half as tall as a standard **nut**. It is commonly used as a type of locknut, where it is "jammed" up against a standard **nut** to lock the two in place.

K

K Factor: The factor in the torque tightening equation: $T=KDF$ where T is the fastener tightening torque in Newton metres, D is the fastener diameter in metres, F is the fasteners preload in Newtons and K is a factor whose value is often taken



Keps: A pre-assembled nut and washer assembly (the washer is attached to the nut so that it won't fall off)

Knurling: Knurling is the process of producing a roughened surface by means of a specialized forming tool called a knurl

L

Left-hand Thread: A screw thread that is screwed in by rotating counterclockwise.

Length: The length of a headed fastener is the distance from the intersection of the largest diameter of the head with the bearing surface to the extreme point, measured in a line parallel to the axis of the fastener.

Length of Engagement: The axial distance over which an external thread is in contact with an internal thread.

Lock Nut: There are two common usages for the term:

1) A nut which provides extra resistance to vibration loosening by either providing some form of prevailing torque, or, in free spinning nuts, by deforming and/or biting into mating parts when fully tightened.

2) The term is sometimes used for when thin nuts, such as Panel and Jam nuts are used to lock a thicker nuts. When used in this way the thin nut should be adjacent to the joint surface and tightened against the thick nut.

M

Machining: Machining is the process of forming the surface by cutting away material.



Major Diameter: This is the diameter of an imaginary cylinder parallel with the crests of the thread; in other words it is the distance from crest to crest for an external thread, or root to root for an internal thread.

Maximum Material Condition: The maximum material condition of a feature of a fastener means the maximum amount of material permitted by the tolerance shown for that feature (abbreviated MMC).

Meanshift: The difference in tightening torque values produced by the same tightening tool on hard and soft joints.

Mechanical Galvanizing: Mechanical galvanizing is a process in which powdered zinc is applied to a base metal using the principles of cold welding and barrel finishing techniques.

Mechanical Properties: Mechanical properties are those properties which involve a relationship between strain and stress. Hardness, proof load, yield strength and ultimate tensile strength are examples of mechanical properties.

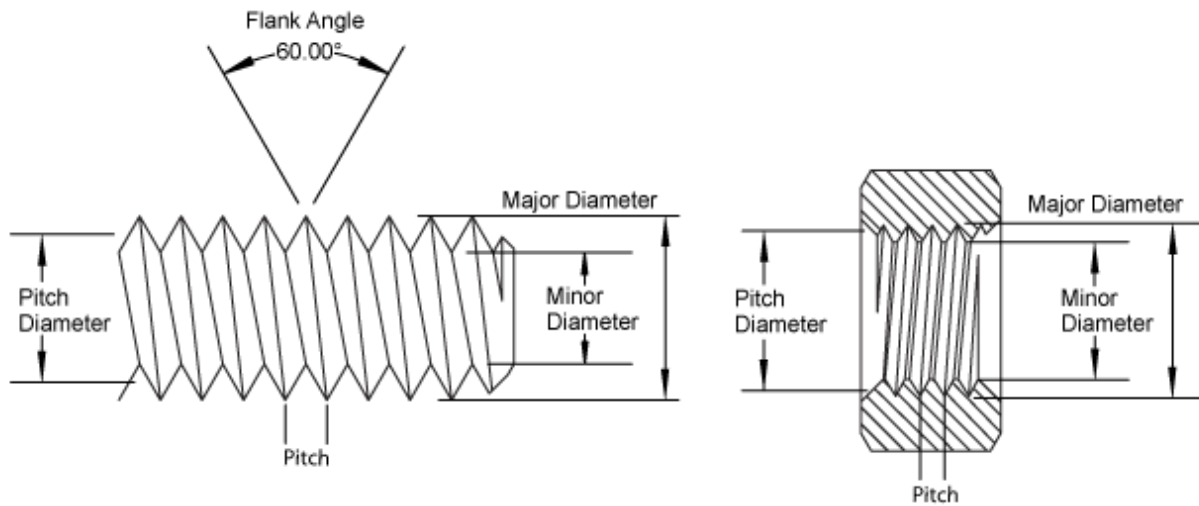
Metal to Metal Contact Flange Joint: A flanged joint in which a gasket is compressed by bolts - the gasket being located in a recess within the joint so that it is compressed by the bolt loads until metal to metal contact occurs.

Milled From Bar: Milled from bar fasteners are fasteners machined from bar stock on a lathe, screw machine, etc.

Minor Diameter: This is the diameter of an imaginary cylinder which just touches the roots of an external thread, or the crests of an internal thread.



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Molybdenum Disulphide: A solid lubricant that acts as a high pressure resistant film. Can be used by itself as a dry lubricant as well as in with other solid lubricants and in oils and greases.

N

Neck: Neck is used to define:

- (1) a specialized form of a portion of the body of fasteners near the head to perform a definite function.
- (2) a reduced diameter of a portion of the shank of a fastener which is required for design or manufacturing reasons.

Nicked Threads: Nicks or indentations in threads can occur during the manufacturing process and during fastener transportation. In general, nicked thread problems tend to increase as the thread diameter increases and for fine pitches.

Nitriding: A surface hardening process used on ferrous metals by heating the metal in contact with ammonia gas or other nitrogenous material.



Nominal Diameter: The diameter equal to the external diameter of the threads.

Nominal Size: the nominal size is the designation used for the purpose of general identification.

Nonstandard Fastener: A nonstandard fastener is a fastener which differs in size, length, material, or finish from established and published standards.

Normalize: To remove internal stresses by heating a metal piece to its critical temperature and allowing it to cool very slowly.

Nut Dilation: Under load, the wedging action of the threads causes dilation of the nut resulting in an increase in the minor diameter of the nut, and reducing the effective shear areas of both the external and internal threads.

that the applied torque is independent of joint stiffness.

Nut Thickness: Nut thickness is the overall distance from the top of the nut to the bearing surface, measured parallel to the axis of the nut.

Nut Width and Length: the nut width is the distance across opposite flats of hexagon, square or twelve-point nuts.

Nyloc Nut: A torque prevailing nut that uses a nylon patented insert to provide a locking feature. The nylon insert, it is claimed, helps to seal the bolt thread against seepage of water, oil, petrol, paraffin and other liquids.



O

Octagon Head: A bolt or screw whose head cross section is a regular polygon with 8 sides.

Oiled: Oiled is the term denoting the application of a suitable corrosion retarding oil to a fastener.

Overtapping: Tapping of a thread following a plating operation so that the thread tolerances comply within specification allowing the internal and external threads to assemble. It is normal practice to over tap the internal rather than the external thread.

P

Passivating: Passivating is the process of dissolving ferrous particles and surface impurities from stainless steel by chemical means (normally a nitric acid dip) and to produce a passive film on the surface. The purpose is to improve the corrosion resistance of the surface.

Physical Properties: Physical properties are the properties defining the basic characteristics of the material or fastener, They are inherent in the raw material and remain basically unchanged in the fastener following its manufacture and include: density, coefficient of thermal expansion, electrical conductivity, thermal conductivity and magnetic properties.

Performance Properties: Functional design features manufactured into the fastener to satisfy various requirements of the service application such as locking ability, prevailing torque, etc.



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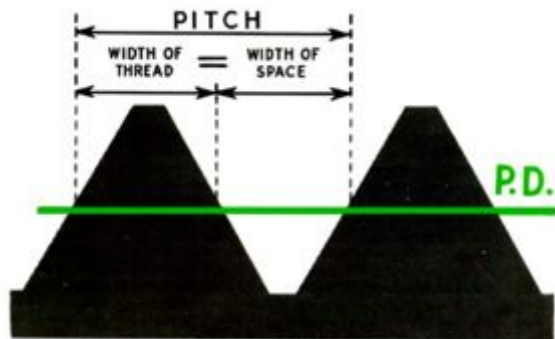
Pickling: Pickling is the process of removing surface oxides or impurities by chemical or electrochemical means.

Piles: Term used in structural engineering for the joint plates.

Pin: A pin is a straight cylindrical or tapered fastener, with or without a head, designed to perform a attaching or locating function.

Pitch: The distance; measured parallel to fastener axis, between corresponding points on adjacent thread forms in the same axial plane and on the same side of the axis.

Pitch Diameter: The class of fit defines the tolerance range of thread dimensions including major, minor, and **pitch diameters** of internally or externally threaded parts.



Pits: Pits are sharp depressions on the surface of a raw material or fastener.

Plain: Plain as applied to finish of fasteners is used to indicate that the fastener has had no supplementary surface treatment, such as plating, coating, etc., other than being oiled.

Plating: Plating is the application of a metallic deposit on



the surface of the fastener by electrolysis, impact, or other suitable means.

Plating Build Up: Plating build up is the term used to describe the disposition of more plating on edges or corners than on the other surfaces of the fasteners.

Ply: A single thickness of steel forming part of a structural joint.

Point: The point of a fastener is the configuration of the end of the shank of a headed fastener or of each end of a headless fastener. Points of fasteners fall into general categories.

Chamfer Point: A chamfer point is a truncated cone point, the end of which is approximately flat and perpendicular to the fastener axis. This point is intended to facilitate entry of fasteners into holes at assembly.

Cone Point: A cone point is a sharp conical point designed to perform perforating or aligning functions at assembly.

Gimlet point: A gimlet point is a threaded cone point usually have a point angle of 45 to 50 degrees. Examples include tapping screws, wood screws, lag bolts, etc.

Oval Point: An oval point is a radius point, sometimes referred to as a 'Crowned End' or "Round Point."

Point Diameter: The point diameter is the diameter of the point measured at the extreme end of the fastener. It may sometimes be designated as

Point Length: the point length is the length of the pointed portion of the fastener, measured parallel to the axis of the fastener from the extreme end.



Point Radius: The point radius is the spherical radius on an oval or spherical point.

Plain Point: The term plain point is applied to the end of a fastener cut

approximately flat and perpendicular to the fastener axis. These points on threaded fasteners may be slightly concave especially when threads are rolled.

Spherical Point: A spherical point is an oval point in which the point radius is equal to half the shank diameter.

Pointing: Pointing is a secondary machining operation consisting of cutting points on fastener blanks which were not pointed during the heading operation.

Polishing: Polishing is the process of producing a smooth surface by rubbing with fine abrasive wheels, belts, or compounds.

Pooching: Pooching is a term sometimes used to describe the effect of the area immediately surrounding a tapped hole being raised up as a result of the tension from the stud. Tapped holes are often bored out for the first couple of threads to eliminate this problem.

Position tolerance: The axis of the feature shall fall within or pass through the zone bounded by a circle about the true position or reference axis whose diameter is the position tolerance.

Precision: Precision is the result of being manufactured to close tolerances.

Preload: The tension created in a fastener when first tightened. Reduces after a period of time due to embedding and other factors.



Prevailing Torque: The torque required to run a nut down a thread on certain types of nuts designed to resist vibration loosening. The resistance can be provided by a plastic insert or a noncircular head.

Proof Load: A proof load is a specified test load which a fastener must withstand without any indication of failure.

Proof Test: A proof test is any specified test required for a fastener to indicate that it is suitable for the purpose intended.

Property Class: A designation system which defines the strength of a bolt or nut. For metric fasteners, property classes are designated by numbers where increasing numbers generally represent increasing tensile strengths.

Punching: Punching is the process of trimming or removing material with dies in a press.

Prying: The amplification of an external force acting on a bolt by a lever action which can occur when that force is an eccentric tensile load.

Q

Quench Hardening: Hardening a ferrous alloy by heating and then cooling rapidly.

Quenching: Rapid cooling. When applicable, the following more specific terms should be used; direct quenching, fog quenching, hot quenching, interrupted quenching, selective quenching, spray quenching.



R

Ream: To finish a drilled or punched hole very accurately with a rotating fluted tool of the required diameter.

REACH: Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH). It addresses the production and use of chemical substances in the manufacturing process and their potential impacts on both human health and the environment.

Reamer: Tool used for enlarging holes previously formed by drilling or boring.

Recess Depth: The the distance measured parallel to the fastener axis from the intersection of the head surface with the maximum diameter of the recess to the bottom of the recess.

Recess Diameter: The recess diameter is the diameter measured in a plane perpendicular to the axis of the fastener over the intersection of the outermost extremities of the recess with the head surface.

Recess Eccentricity: Recess eccentricity is the amount that a recess in a recessed head is eccentric with the shank of the fastener.

Recess Width: The recess width is the distance measured in a plane perpendicular to the axis of the fastener across the intersection of the sides or wings of the recess with the head surface.

Recessed Head: A recessed head is a head having a specially formed indentation or recess centered in its top surface.



Reduced Diameter Body: A reduced diameter body is a body the diameter of which may range from the rolled thread blank size to the minimum major diameter of the thread and is common on screws having rolled threads.

Reduced Shank Bolt: A bolt whose shank diameter is smaller than the nominal diameter of the bolt.

Reference Dimension: A reference dimension on a fastener is a dimension without tolerance used for information purposes only.

Relaxation: The loss of clamping force in a bolt which commonly occurs as a result of temperature expansion or vibration loosening.

Relief: The amount one plane surface of a piece is set below or above another plane, usually for clearance or for economy in machining.

Rib: Ribs are small ridges of material usually formed longitudinally around the shank.

Righthand Thread: A screw thread that is screwed in by rotating clockwise.

Rivet: A rivet is a headed metal fastener of malleable material used to join parts of structures and machines by inserting the shanks through the aligned hole in each piece and forming a head on the headless end by upsetting.

Rockwell Hardness Test: A measure of material hardness.



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R.O.H.S: RoHS is the acronym for **Restriction of Hazardous Substances**. **RoHS**, originated in the European Union, and is now accepted world wide, restricts the use of specific hazardous materials found in electrical and electronic products. Ex Lead (Pb), Cadmium (Cd), Mercury (Hg), Hexavalent chromium (Hex-Cr), etc.

Rolled Thread: A thread formed by plastically deforming a blank rather than by cutting. The majority of standard fasteners have their threads formed by rolling.

Most threads are rolled before any heat treatment operation. Significant improvements in fatigue life can be achieved by rolling the thread after heat treatment, this improvement is due to compressive stresses being induced in the roots of the thread.



Root Diameter: Identical to [MINOR DIAMETER](#)

**S
I
T**

Taper: Taper is to diminish or reduce in thickness toward one end.



Temper: Temper is the state of a metal or alloy involving its structure and mechanical properties. Temper varies from the annealed temper (soft) to spring temper.

Tensile Strength: Force or stress required to break a fastener when pulled in straight tension.

Tension Washers: A general name given to spring washers, curved washers, Belleville washers and disc springs.

Thread: A thread is a ridge of uniform section in the form of a helix on the external or internal surface of a cylinder. This is known as a straight or parallel thread to distinguish it from a taper thread which is formed on a cone.

Complete Thread: The length of complete thread is the length of that cross section of a threaded length having full form at both crest and root.

Effective Thread: the effective (or useful) thread includes the complete thread and that portion of the incomplete thread having fully formed roots but having crests not fully formed.

Incomplete Thread: this is also known as the vanish or washout thread. On straight threads, the incomplete thread is that portion at the end having roots not fully formed by the lead or chamfer on threading tools.

Left-Hand Thread: A thread is a left-hand thread if, when viewed axially, it winds in a counterclockwise and receding direction, All left-hand threads are designated LH.



Right-Hand Thread: A thread is a right-hand thread if, when viewed axially, it winds in a clockwise and receding direction. All threads are right-hand threads unless otherwise designated.

Total Thread: The total thread includes the complete or effective thread and the incomplete thread.

Threaded Fastener: A threaded fastener is a fastener a portion of which has some form of screw thread.

Thread Crest: The top part of the thread. For external threads, the crest is the region of the thread which is on it's outer surface, for internal threads it is the region which forms the inner diameter.

Thread Flank: The thread flanks join the thread roots to the crest.

Thread Height: This is the distance between the minor and major diameters of the thread measured radially.

Thread Length: Length the portion of the fastener with threads.

Thread locker: Can be a term used for a number of vibration resistant products but is now usually reserved for thread locking adhesives.

Thread Root: The thread root is the bottom of the thread, on external threads the roots are usually rounded so that fatigue performance is improved.

Thread Runout: The portion at the end of a threaded shank which is not cut or rolled to full depth, but which provides a transition between full depth threads and the fastener shank or head.



Tolerance: a tolerance is the total permissible variation of a size: The tolerance is the difference between the limits of size.

Tolerance Class: A combination of tolerance grade and a fundamental deviation which is given to an internal or external thread. A tolerance class for an internal thread when combined with the tolerance class for an external thread gives the class of fit for the mating threads.

Tolerance Grade: The difference between maximum and minimum metal conditions for a tolerance applied to a screw thread.

Torque Wrench: A manual wrench which incorporates a gauge or other method to indicate the amount of torque transferred to the nut or bolt.

Torsion: Twisting force applied to a fastener during tightening.

Toughness: Toughness is the ability of a material to absorb considerable energy without fracturing.

Trimming: Trimming is the term applied to the process of shaping or sizing by forcing a part through a die of desired size and shape.

Tumbling: Tumbling is the process of cleaning or abrading parts in a rotating container, either with or without cleaning or abrasive materials.

U

U Bolt: A U shaped fastener threaded at both ends used primarily in suspension and related areas of vehicles.



UNC: The designation describing Unified National Coarse threads.

UNF: The designation describing Unified National Fine threads.

Upsetting: Upsetting is the process of increasing the cross sectional area by displacement of material longitudinally and radially.

V

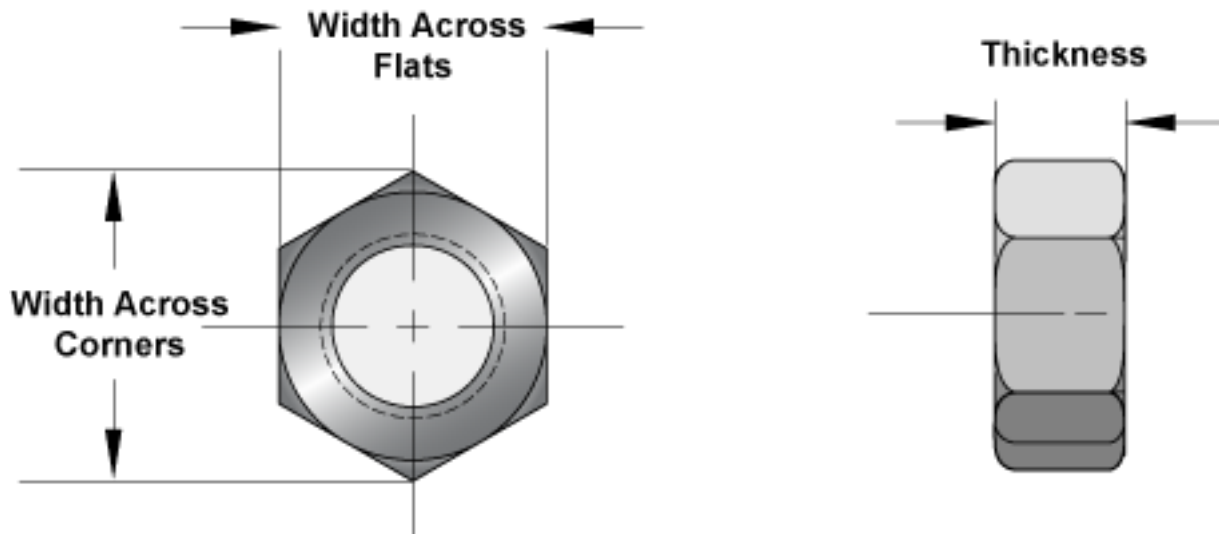
W

Washer: A washer is a part usually thin, having a centrally located hole or partial slot.

Washer Face: A washer face is a circular boss on the bearing surface of a bolt or nut.

Width Across Corners: The width across corners of hexagon, square, or rectangular shaped fasteners is the distance measured perpendicular to the axis of the fastener from the intersection of two sides to the intersection of the two opposite sides.

Width Across Flats: The width across flats of hexagon or square heads of fasteners is the distance measured perpendicular to the fastener axis across opposite sides of the fastener.



Work Hardening: Work hardening, also known as strain hardening or cold working, is the strengthening of a metal by plastic deformation. This strengthening occurs because of dislocation movements and dislocation generation within the crystal structure of the material.

X

Y

Yield Controlled Tightening: A fastener tightening method which allows a fastener to be tightened to yield.

Yield Point: The stress necessary to produce an elongation under load of 0.50 percent of the specimen's original length. Expressed as psi.

Yield Strength: This is the measure of the resistance of a material to plastic (permanent) deformation. It is usually at a point of 0.2% permanent strain.



Z

Zinc Chromate Plating: Is a type of conversion coating used to passivate steel, aluminum, **zinc**, cadmium, copper, silver, magnesium, and tin alloys. It is primarily used as a corrosion inhibitor, primer, decorative finish, or to retain electrical conductivity.

Zinc Die Casting: Pressure die casting is a metal **casting** process that is characterized by forcing molten metal under high **pressure** into a mold cavity. The mold cavity is created using two hardened tool steel dies which have been machined into shape and work similarly to an injection mold during the process.