

## GLOSSARY OF TERMS

### A

**alloy steel** An alloy steel is a steel containing elements, other than carbon, which have been added to obtain definite mechanical or physical properties, such as higher strength at elevated temperatures, toughness, etc.

**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.

### B

**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.

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

**blind rivet** A rivet designed for use where only one side of the work is accessible.

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

**bolt** A bolt is an externally threaded fastener.

**bolt blank** A headed rod or bar intended for a subsequent threading operation.

**bolt end** A bolt end is a headless rod threaded at one end and assembled with a square nut; it is designed to be welded or otherwise fastened to a part or structure.

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

**burnishing** Burnishing is the process of producing a smooth surface by rubbing or rolling a tool against the surface.

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

### C

**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 harder than the core.

**chamfer** (v) To bevel a sharp external edge. (n) A beveled edge.

**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.

**chamfer point** A chamfer point is a truncated cone point, the end of which is approximately flat and perpendicular to the fastener axis. Three points on threaded fasteners generally have point included angles of 45 to 90 degrees and a point diameter equal to or slightly less than the minor diameter of the thread. This point is intended to facilitate entry of fasteners into holes at assembly.

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

**class of thread** Classes of threads are distinguished from each other by the amount of tolerance or tolerance and allowance specified. Classes 1A, 2A, and 3A apply to external threads, and Classes 1B, 2B, and 3B apply to internal threads. Classes 2 and 3 apply to both external and internal threads.

**cold heading** Forcing metal to flow cold into dies to form thicker sections and more or less intricate shapes. The operation is performed in specialized machines where the metal, in the form of a wire or bar stock, may be upset or headed in certain sections to a larger size and, if desired, may be extruded in other sections to a smaller diameter than the stock wire.

**cold heading stock** Cold heading stock is material produced under closely controlled manufacturing and inspection methods so as to be suitable for heading and to be free from those defects causing fractures during heading.

**commercial fastener** A commercial fastener is a fastener manufactured to published standards and stocked by manufacturers or distributors. The material, dimensions and finish of commercial fasteners conform to the quality level generally recognized by manufacturers and users as commercial quality.

**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.

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

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

**copper steel** When any minimum copper content is specified, the steel is classed as copper steel. The copper is added to enhance corrosion resistance of the steel.

**corrosion** Gradual chemical or electrochemical attack on metal by atmosphere, moisture or other agents.

**counterbore** (v) To enlarge a hole to a given depth. (n) 1. The cylindrical enlargement of the end of a drilled or bored hole. 2. A cutting tool for counterboring, having a piloted end of the size of the drilled hole.

**counterboring** Counterboring 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. Special tools called counterbores are generally used for this operation.

**countersink** A countersink is an internal chamfer.

**countersinking** Countersinking is the process of beveling or flaring the end of a hole. Holes in which countersunk head type fasteners are to be used must be countersunk to provide a mating bearing surface.

**countersunk head** A head, the underside of which is beveled to fit a flaring hole. The bearing surface of other types of heads is generally perpendicular to the body axis.

**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.

**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.

**cup point** A point in the form of a cone, commonly having an included angle of 90E, with a conical depression in the end commonly having an included angle of 118E. The contact area is a circular ridge which has considerable holding power with slight penetration; applied to set screws generally.

**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.

**diameter** The length of a line passing through the center of any object from one side to the other.

**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.

**dog point** A cylindrical extension, or pilot, of diameter smaller than the minor diameter of the thread, commonly equal to about D/2 in length, with a conical section between it and the thread; usually used as a pilot in assembling or as the end of a set screw projecting into a fairly deep hole or slot.

**driver head** A head, on a bolt or screw, designed for driving the fastener by means of a tool other than a wrench, such as a screwdriver.

**drill** (v) To sink a hole with a drill, usually a twist drill. (n) A pointed cutting tool rotated under pressure.

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

**drive** The means for tightening a fastener.

## 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. This is not to be confused with Total Indicator Reading (TIR). (See Runout).

**effective thread** The effective (or useful) thread includes the complete thread and that portion of the incomplete thread having crests not fully formed.

**electro-galvanizing** Electro-galvanizing is the process of coating metal with zinc by electroplating.

**embossing** Embossing is the process of raising a boss or protuberance on the surface.

**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).

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

**eyelet** An eyelet is a flanged tubular fastener designed for securing by curling or playing the tubular end.

## F

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

**fastener** A fastener is a mechanical device for holding two or more bodies in definite positions with respect to each other.

**fatigue strength** The stress to which a metal can be subjected for a specified number of cyclic changes of stress.

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

**fillister head** Rounded top surface, cylindrical sides, and a flat bearing surface.

**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.

**fin neck** A fin neck is a style of neck consisting of two or more fins under and integral with the head.

**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. The term finish is also applied to some types of fasteners to indicate the condition of the surface as a result of mechanical operations and the degree of precision. See: Finished, Semi-Finished, and Unfinished Fasteners.

**finished 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. ( See: Semi-Finished Fastener, Unfinished Fastener).

**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.

**flange** The projecting annular rim around a cylinder used for fastening, strengthening or positioning.

**flash** Flash is the thin fin of metal along the sides or 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 0.00015 in. in thickness.

**flat head** Flat top surface and a conical bearing surface.

**flush/countersunk** A head, the underside of which is beveled to fit a flaring hole. The bearing surface of other types of heads is generally perpendicular to the body axis.

**forging** Forging is the process of forming a product by hammering or pressing. When the material is forged below the recrystallization temperature it is said to be cold forged. When worked above the recrystallization temperature it is said to be hot forged.

**form of thread** The profile of a thread in an axial plane for a length of one pitch.

**full annealing** Annealing a ferrous alloy by austenitizing and then cooling slowly through the transformation range.

**full or nominal diameter body** A full or nominal diameter body is a 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."

## G

**galvanize** To treat with a bath of lead and zinc to prevent rusting.

**galvanizing** Galvanizing is the process of coating metal with zinc by hot dipping.

**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.

**grommet** A grommet is a large eyelet type fastener designed for securing by curling the tubular end over a formed washer to provide strength in holes through resilient materials.

## H

**half dog point** The same as a dog point but half as long; used on short screws for the same purposes as the dog point, but in shallower hole or slot.

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

**hardening** A method of heat treating metals by heating to a temperature within, or above, the critical range, holding at that temperature for a given time, and then cooling rapidly, usually by quenching in oil or water.

**hardness** Resistance to plastic deformation by indentation, penetration, scratching or bending.

**head** The head of a fastener is the enlarged shape preformed on one end of a headed fastener to provide a 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. For a conical bearing surface head the head height is the overall distance, measured in a line parallel to the fastener axis from the extreme top to the intersection of the bearing surface with the extended thread major diameter cylinder on a threaded fastener or with the shank on an unthreaded fastener. For flat and oval undercut heads, it is this distance measured to the intersection of the bearing surface with the undercut. For oval heads and undercut oval heads, the overall distance is referred to as total head height.

**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 the head angle.

**head mark** Used in bolt manufacturing to identify the fastener. It frequently includes such details as: manufacturer's symbol, basic part number of the fastener, its grip length and diameter, as well as a letter code for material and self-locking device, as appropriate.

**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. For rectangular or irregular shaped heads the head width is the distance along the narrowest axis of the head measured in a like manner.

**headed fastener** A headed fastener is a fastener having one end enlarged or preformed.

**headed and threaded rod** A headed and threaded rod is a fastener similar to a machine screw except that it has a very much greater length. It has a round truss, or flat head and an end threaded for a nut.

**header** A header is a specialized for of horizontal press.

**header point** A header point is a chamfered point normally produced during the heading operation. The screw blank is chamfered before threads are rolled. It is applied to machine screws in certain sizes and lengths.

**heading** Heading is a manufacturing process involving the use of a header. this process may or may not involve upsetting or extruding. A part made from wire below the recrystallization temperature is said to be cold headed whereas parts made from wire above the recrystallization temperature are said to be hot headed.

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

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

**heat treating** An operation involving the heating and cooling of a metal to obtain desirable conditions or properties.

**height of thread** The distance, measured perpendicular to the axis, between the major and minor cylinders or cones, respectively.

**hexagon head** Flat top surface with hexagonal sides and with a flat bearing surface.

**hex socket** A hexagonal recess in the head of a cap or a set screw in which the sides of the recess are parallel to the body axis, into which a wrench fits.

**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.

**hot forming** Working operations such as bending and drawing sheet and plate, forging, pressing, and heading, performed on metal heated to temperatures above room temperature.

## I

**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. The test may be in tension or in bending, or it may properly be a notch test if a notch is present, creating multiaxial stresses.

**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. On the taper threads, the crest at the end may also be not fully formed due to the intersection of the major cone of an external thread or the minor cone of an internal thread with the cylindrical surface of the work.

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

**interference fit** A thread fit having limits of size so prescribed that an interference always results when mating parts are assembled.

**internal thread** A thread on the internal surface of a hollow cylinder or cone.

## J

**jam nut** (1) A second nut forced or jammed against the main nut to prevent loosening. (2) A thin nut.

## K

**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 thread is a left-handed thread, if, when viewed axially, it winds in a counterclockwise and receding direction. All left-hand threads are designated LH.

**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. Exceptions: The length of shoulder screw and ta socket head shoulder screw is the length of the shoulder. The length of a flat top countersunk head tubular rivet (with chamfered top) is measured from the intersection of the bearing surface with the shank diameter to the extreme point. The length of a headless fastener is the distance from one extreme point to the other, measured in a line parallel to the axis of the fastener.

**length of thread engagement** The length of thread engagement of two mating threads is the distance between the extreme points of contact on the pitch cylinders or cones, measured parallel to the axis.

**lock nut** There are two basically different types of lock nuts; (1) a prevailing torque type which resists relative bolt-nut movement with or without an axially applied load to the bolt-nut combination, and (2) a free-running type which exhibits a locking ability when there is an axial load applied to the base of the nut. The "locking" or stopping action of the nut is accomplished by thread deformation, or clamping, or by the addition of non-metallic inserts. The free-running type usually has a design feature which adds to the elastic elongation of the bolt-nut combination.

## M

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

**major diameter** On a straight thread, the diameter of the coaxial cylinder which would pass through the crests of an external thread or the roots of an internal thread.

**mechanical properties** Mechanical properties are those properties which involve a relationship between strain and stress.

**milled from the bar** Milled from the bar fastener machined from bar stock on a lathe, screw machine, etc.

**miniature screw** A miniature screw is a screw less than 0.06 in. in diameter, having a slotted head, and threaded for assembly with a preformed internal thread.

**minor diameter** On a straight thread, the minor diameter is the diameter of the coaxial cylinder which would pass through the roots of an external thread.

## N

**nail point** A nail point is a sharp pyramidal point generally having a point angle of 30 to 45 degrees, and is produced by a pinching operation. It is designed for piercing wood or other resilient materials.

**neck** Neck is used to define: (1) a specialized for of a portion of the body of fasteners near the head to perform a definite function, such as preventing rotation, etc.; and (2) a reduced diameter of a portion of the shank of a fastener which is required for design or manufacturing reasons.

**needle point** A needle point is a cone point of long length intended to perform a piercing function.

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

**non-ferrous metal** Metals or alloys without an appreciable amount of iron. Examples are aluminum, brass, copper, etc.

**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** A nut is block or sleeve having an internal thread designed to assemble with the external thread on a bolt, screw, or other threaded part. It may serve as a fastening means, an adjusting means, a means for transmitting motion, or a means for transmitting power with a large mechanical advantage and non-reversible motion.

**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.

## O

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

## P

**pan head** Flat top surface rounded into cylindrical sides, and a flat bearing surface. The recessed pan head has a rounded top surface blending into cylindrical sides and flat bearing surface.

**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.

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

**pilot point** A pilot point is a cylindrical point having a diameter. It is designed to facilitate the alignment and starting of such fasteners as drive screws and groove pins into holes at assembly.

**pin** A pin is a straight cylindrical or tapered fastener, with or without a head, designed to perform a semi-permanent attaching or locating function.

**pinch point** A pinch point is a short sharp cone point, usually having a point angle of 45 degrees, formed by a pinching operation. This point is normally limited to diameters of ¼ inch or smaller and is applied to metal drive screws, and Type BP tapping screws.

**pipe screw thread** American Standard pipe threads are tapered 1 inch in 16, or three-quarters inch per foot. They are 60 degree threads, of National form with flat or rounded top and bottom.

**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** On a straight thread, the diameter of the coaxial cylinder, the surface of which would pass through the thread profiles at such points as to make the width of the groove equal to one-half of the basic pitch. On a perfect thread this occurs at the point where the widths of the thread and groove are equal.

**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 fastener.

**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.

**point angle** The point angle is the included angle of the 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 "Chamfer Diameter" or "Pilot Diameter" on respective point types.

**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. It may sometimes be designated as "Chamfer Length" or "Pilot Length" on respective point types.

**pointing** Pointing is a secondary machine 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.

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

## Q

**quality** Quality denotes the suitability of a fastener for the purpose for which it is intended. Quality should not be confused with precision or workmanship as it is possible that precision parts of good workmanship and finish can be of poor quality if they fail to perform the function for which they are intended. Also for countless applications good quality parts do not require precision or fine finish to serve satisfactorily.

**quench hardening** Hardening a ferrous alloy by austenitizing and then cooling rapidly enough so that some or all of the austenite transforms to martensite.

**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, and time quenching.

## R

**radius** An arc at the junction of two intersecting plane surfaces. May be internal, as in head-to-shank fillet radius, or external, as at the head surface of a brazier-head fastener.

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

**reamer** Tool used for enlarging holes previously formed by drilling or boring.

**recess** A manufactured groove, slot, depression or other geometric form, usually in the heads of countersunk screws, through which torque is applied by the use of a mating driver.

**recessed head** A recessed head is a head having a specially formed indentation or recess centered on its top surface. Two common forms of recess heads are the "Cross Recess" and "Clutch Recess."

**reduced diameter body** A reduced diameter body is a body the diameter of which may range from the minimum pitch diameter to the minimum major diameter of the thread and is common on screws having rolled heads. Sometimes referred to as "undersize body," which term is not recommended.

**reference dimension** A reference dimension on a fastener is a dimension without tolerance used for information purposes only.

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

**ribbed neck** A ribbed neck is a style of neck consisting of longitudinal ribs around the shank adjacent of the underside of the head.

**ribs** Ribs are small ridges of material usually formed longitudinally around the shank.

**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.

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

**riveting burr** A riveting burr is a small plain washer which is assembled with a small rivet before peening the end to provide a large area of contact on the part.

**rockwell hardness test** A measure of hardness by determining the depth of penetration of a penetrator into the specimen under certain fixed conditions of test. The penetrator may be either a steel ball or a diamond sphero-conical penetrator. The hardness number is related to the depth of indentation and the higher the number the harder the material.

**roll threading** Applying a thread to a bolt or screw by rolling the piece between two grooved die plates, one of which is in motion, or between rotating grooved circular rolls.

**rolled point** The point frequently produced by the cupping of the last 1 to 1½ threads by the thread rolling pressure. This type of point is not produced intentionally but is considered as an alternative form of the plain sheared point.

**rolled thread** A rolled thread is a thread produced by the action of a form tool which when pressed into the surface of a blank displaces material radially.

**root** That surface of the thread which joins the flanks of adjacent thread forms and is identical with or immediately adjacent to the cylinder or cone from which the thread projects.

**round head** Semi-elliptical top surface and flat bearing surface.

## S

**SAE specifications** Standards developed by the Society of Automotive Engineers, Inc.

**SAE standard screw threads** The SAE Screw Thread Standard, as revised in 1954, conforms with the Unified and American Standard (ASA B1.1-1949).

**scale** Scale is an oxide of iron sometimes formed on the surfaces of hot headed or forged fasteners.

**screw stock** Screw stock is metal in the form of wire or rod which is used for making screw machine parts. Usually it is of a free machining type of material.

**screw thread chasers** Cutting tools having teeth spaced to match the pitch of the threads to be cut.

**screws** A screw is an externally threaded fastener.

**semi-finished fastener** A semi-finished fastener is a fastener made to the same basic dimensions as a finished fastener but having greater tolerances on most dimensions and only the bearing surface and threads finished. (See Finished Fastener, Unfinished Fastener).

**sems** This is a preassembled screw and washer unit in which the washer is retained free to rotate under the screw head by the rolled thread. These units expedite assembly operations and assure the presence of a washer in each assembly. They are generally available in various combinations of head styles and washer types.

**serrations** Ridges underneath the head of a fastener that help as a locking element.

**shank** the shank is that portion of a headed fastener which lies between the head and the extreme point.

**shaving** Shaving is a cutting operation in which thin layers of material are removed from the outer surfaces of the product.

**shear fastener** A shear fastener is a fastener whose primary function is to resist forces which tend to shear it.

**shear strength** The stress required to produce fracture when impressed vertically upon the cross-section of a material. Expressed in psi.

**shoulder** A shoulder is an enlarged portion of the body of a threaded fastener or shank of an unthreaded fastener.

**single thread** A single-start thread having lead equal to the pitch.

**sliver** A sliver is an irregular shaped piece of metal clinging loosely to the finished fastener.

**slot depth** The slot depth on a headed fastener is the distance measured parallel to the axis of the fastener from the highest part of the head to the intersection of the bottom of the slot with the head or bearing surface. The slot depth on a nut or headless fastener is the distance measured parallel to the fastener axis from the top surface to the extreme bottom of the slot.

**slot eccentricity** Slot eccentricity is the amount that a slot in a slotted head is eccentric with the body of the fastener.

**slot width** The slot width is the distance measured in a plane perpendicular to the axis of the fastener over the intersection of the sides of the slot with the head surface of a headed fastener or top surface of a nut.

**slotted head** A slotted head is a head having a slot centered across its top surface.

**slotted nut** A hexagon nut having opposed slots at the end opposite to the bearing face which are perpendicular to the axis, designed for insertion of a cotter to secure the nut in place when used with a drilled fastener.

**slotting** Slotting is the process of forming or cutting the slot on the head of a fastener during either the primary or secondary operation.

## T

**taper** The angle between one side and the axis of the fastener. May refer to head, shank or some other feature of a fastener.

**temper** 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** In tensile testing, the ratio of maximum load of a material coupon or component at failure to its original cross-sectional area.

**tension fastener** A fastener whose primary function is to resist forces that tend to elongate it.

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

**threaded fastener** A fastener a portion of which has some form of screw thread.

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

**torsion** Twisting force applied to a fastener during tightening.

**toughness** The ability of a material to absorb considerable energy without fracturing.

**trimming** The process of shaping or sizing by forcing a part through a die of desired size and shape.

**truncate** To cut off at the apex.

**truncation** The axial or centerline length by which the apex is cut off.

**tumbling** The process of cleaning or abrading parts in a rotating container, either with or without cleaning or abrasive materials.

## U

**undercut head** For short lengths of flat and oval head machine screws, the heads are undercut to 70 percent of normal side height to afford greater length of thread on the screws.

**under-size body** The reduced body of a bolt or screw, the diameter of which may range from below the pitch diameter to the minimum major diameter of the thread. Such a body diameter is found on some bolts or screws having roller threads.

**unfinished fastener** An unfinished fastener is a fastener made to the same basic dimensions as a finished fastener but having relatively wider tolerances than a finished fastener and having all surfaces in their formed condition. (See Finished Fastener, Semi-Finished Fastener).

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

## V

**voids** Voids are internal fissures in ferrous materials. They are sometimes called "chrome checks," "fish eyes," "shatter cracks" and "snow flakes."

## W

**washer** A washer is a part usually thin, having a centrally located hole or partial slot. The washer performs various functions when assembled between the bearing surface of a fastener and the part being attached. Insulation, lubrication, spanning of large clearance holes, and improved stress distribution are a few design uses.

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

**width across the corner** The width across corners of a hex, square or rectangular shaped fastener is the distance measured perpendicular to the axis of the fastener from the intersection at two sides of the intersection of the two opposite sides.

**width across the flat** The width across flats of hex or square heads of fasteners is the distance measured perpendicular to the fastener axis across opposite sides of the fastener.

**work hardness** Hardness developed in metal as a result of cold working.

**wrenching** The transmission of torque to a fastener by means of a tool.

## Y

**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** The stress at which a material exhibits a specified limiting set, commonly taken by the offset method as 0.20 percent of the specimen's original length. Expressed as psi.