

- ALLOY:** A composition of two or more commercially pure metals.
- ALPHA BRASS:** Any brass containing more than approximately 64% copper which normally shows only Alpha crystals under the microscope.
- ALTERNATING STRESS:** The cyclical change from tension to compression and back again in the metal. Example: reversal of spring deflections.
- ALUMINUM BRASS:** A metal containing copper, zinc and aluminum as its chief constituents.
- ALUMINUM SILICON BRONZE:** Alloy consisting chiefly of copper with aluminum and silicon added to give it additional qualities of strength and hardness.
- AMORPHOUS:** Refers to absence of crystalline structure.
- ANNEAL:** Process of softening metals by subjection to moderate or high temperatures followed usually by slow cooling. The hardness or temper of annealed metals will vary with the degree of anneal.
- ARCHITECTURAL BRONZE:** Actually a special brass whose composition and properties render it suitable for extrusion into complicated shapes for architectural and industrial uses.
- ASME:** American Society of Mechanical Engineers--a nationally recognized professional group of engineers whose fundamental purpose is to exchange engineering information among its membership.
- ASTM:** American Society for Testing and Materials--this is the foremost body of specification writers in the world. It is commonly referred to as ASTM. As a group, they study properties, also the methods of studying those properties about any materials.
- BERYLLIUM COPPER:** A copper base alloy whose chief addition is beryllium. The principal properties of the alloy are great hardness, resistance to fatigue failure and an ability to be tempered. Its chief use is in the manufacture of springs.
- BETA BRASS:** Any brass having a copper content of approximately 51% to 55% which shows only the Beta crystal under the microscope. Beta brasses are very hard and strong, but they are also very brittle and of practically no commercial value.
- BRASS:** Any alloy of copper with zinc as the principal alloying agent, with or without small quantities of some other metals.
- BRAZING ROD:** Rod which is manufactured to special requirements as to chemical composition and surface cleanliness for use in joining metals by brazing.
- BRINNELL:** A test used for measuring the hardness of a specimen wherein a steel ball of standard diameter is pressed into the test sample under a given load.
- "B" SCALE (Rockwell):** A specific scale of numbers used in the Rockwell testing of specimens whenever a 1/16" ball with 100 Kg load is applied.
- B. & S. GAUGE:** The Brown and Sharpe or American wire gauge--the diameters of wires having successive numbers in this gauge are in the ratio of 1.123 to 1.
- CARTRIDGE BRASS:** An alloy composed of 70% copper, 30% zinc providing combined strength ductility and resistance to corrosion and which is well-suited to the manufacture of munitions.
- CATALYSIS:** Acceleration of a chemical reaction by a substance (catalytic agent) which itself appears to remain unchanged.
- CATHODE:** The negative electrode of a cell.
- CHEMICAL MEDIA:** Chemical substances.
- COLD DRAWN:** A term used to define the process of pulling a material through a set of dies designed to reduce the cross-sectional area of the metal at a temperature below the softening point, e.g., tube and rod.
- COLD ROLLED:** The reduction in gauge of metal by rolling at metal temperatures below the softening point.
- COLD WORKING:** A general term used to describe the variety of processes used to change the form of metals below the softening temperature.
- COMMERCIAL BRONZE:** An alloy containing 90% copper, 10% zinc so called because of its bronze color.
- COMMERCIAL TOLERANCES:** The "plus" and/or "minus" allowances that are acceptable on a specified dimension.
- CONCENTRATION CELL:** An electrolytic cell caused by concentration differences in the electrolyte.
- CONDENSER TUBE:** Tube manufactured to special requirements as to straightness tolerances, finish, temper and freedom from physical defects.
- CORRODING MEDIUM:** The chemical substance that corrodes.

- CRYSTAL:** A solid assembly of atoms, regularly arranged in three-dimensional space.
- CUPRO-NICKEL:** An alloy whose chief constituents are copper and nickel with the copper showing 50% or more of the composition.
- DEALUMINIFICATION:** Applies only to aluminum bronzes and is analogous to "dezincification".
- DEOXIDIZED:** A term applied to any metal or alloy to indicate its having been treated to remove oxygen. It is specially applied to copper and refers to removal of oxygen by means of phosphorus or other strong deoxidizing agents.
- DEZINCIFICATION:** A form of corrosion of brass characterized by solution followed by deposition of the copper back on the brass.
- DISSOCIATION:** Breaking up of molecules into ions.
- DRAWING:** A process used to pull rod, tube or wire through a set of dies for the purpose of reducing the cross-sectional area or hardening the metal, or changing its shape.
- DUCTILITY:** The inherent property of a metal denoting its ability to be drawn through a set of dies for reduction purposes without fracturing or otherwise cold or hot worked.
- ELASTIC LIMIT:** The maximum unit stress to which metal can be put without permanent deformation.
- ELECTROLYSIS:** The decomposition of metals by means of an electric current.
- ELECTROLYTIC COPPER:** Copper that has been refined by electrolytic deposition. Used for manufacture of tough pitch copper and copper alloys.
- ELECTROMOTIVE SERIES:** A series in which the metals are arranged according to their normal electrode potentials.
- ELONGATION:** The stretch of metal under a tensile stress. The percentage elongation is a measure of the ductility of metals.
- EROSION-CORROSION:** Dual action taking place upon metal with "erosion" describing the "wearing out" of the metal by impinging abrasives and "corrosion" describing the deterioration of the metal by electrochemical processes.
- EXTRUSION:** The pushing of metal, usually at high temperature, through a die to form various shapes.
- FATIGUE:** The failure of metals by repeated or alternate stresses.
- FORGING ROD:** Metal fabricated to rod shape which will be later cut up, preheated and shaped while hot by the blow of a hammer.
- FREE-MACHINING:** Ability to be cut easily by a cutting tool. Leaded brasses and tellurium copper exhibit this quality.
- "F" SCALE:** A specific scale of numbers adapted in The Rockwell test for measuring the surface hardness of a metal by use of a 1/16" steel ball with a 60 Kg load.
- FULL HARD:** The temper of a metal cold rolled 4 B. & S. numbers.
- GALVANIC ACTION:** A type of corrosion wherein decomposition of a metal takes place by means of an electric current that is set up whenever two dissimilar metals are in contact with each other in a conducting solution.
- GAUGE:** (1) A measure of the thickness of the metal; (2) An instrument used to measure the thickness or diameter of metal.
- GILDING METAL:** A copper-zinc alloy containing 95% copper, 5% zinc. It is used chiefly on the basis of its color.
- GRAIN BOUNDARIES.** The boundaries between individual crystals or grains in metals.
- GRAIN GROWTH:** An increase in the grain size of metal.
- GRAIN SIZE:** The size of grains or crystals in metal, usually referred to in terms of average or mean diameter and expressed in millimeters.
- HARDNESS:** Same as Temper.
- HEAT-TREATED;** Metal that has been subjected to moderate or high temperatures in order to gain for it certain desired properties such as acquired by annealing processes.
- HERCULOY:** A name applied to Revere silicon bronze. Its outstanding characteristics are high strength and resistance to corrosion and abrasion.
- HOT ROLLING:** A process of fabrication used to reduce the cross-sectional area of metal at a temperature above the softening point.
- HOT WORKED:** A term describing a metal that has been processed at a temperature above the softening point.
- INTERNAL STRESS:** The load per unit area developed inside a body by cold working or deformation.
- ION:** An electrically charged atom or radicle whose migration effects the transportation of electricity through Electrolytes and occasionally through gases. Positively charged Ions are known as Cations and negatively charged Ions are known as Anions.

- IONIZATION:** The production of Ions from molecules such as Salts, etc.
- LEADED BRASSES:** A special group of copper-zinc alloys that contain small amounts of lead which imparts free-machining properties to the metal.
- MALLEABILITY:** The plastic quality possessed by a metal being rolled into sheet without tearing or breaking or otherwise deformed.
- MANGANESE BRONZE WELDING ROD:** Copper-zinc alloys containing small amounts of iron and manganese and which are used as welding rod principally for building up wear-resistant overlays.
- MERCUROUS NITRATE TEST:** An accelerated corrosion test whereby the use of mercury salts determines the presence of applied or residual stresses or their combination, which might bring about the failure of the metal in service or storage through sea-son cracking.
- MIXTURE:** A term used to denote an alloy or composition.
- MOLECULE:** A combination of two or more atoms.
- MONEL METAL:** A high nickel copper alloy.
- MUNTZ METAL:** A copper-zinc alloy having 60 copper content.
- NAVAL BRASS:** A copper-zinc alloy also containing a small quantity of tin.
- NICKEL SILVER:** A name given to a group of copper-zinc nickel alloys which produce a metal of usually white color.
- NONFERROUS:** A term applied to metallic alloys not composed mainly of iron.
- NONOXIDIZING:** A term used to describe resistance to oxidation.
- OHFC:** A combination of letters meaning "Oxygen free high conductivity" and used to describe a particular type of copper.
- ORANGE PEEL:** A rough surface defect obtained on cold working brass that resembles orange peel.
- PHOSPHOR BRONZE:** Copper-tin alloys deoxidized by phosphorus, highly useful as material for springs.
- PHOSPHOR DEOXIDIZED COPPER:** Copper that has been deoxidized with phosphorus.
- PIERCING:** An initial mill operation used in making seamless tubes by means of rolling a preheated billet against a pointed mandrel.
- PRECIPITATION HARDENING:** This term is often referred to as "accelerated age hardening," and it is a process usually involving two heat treatment operations. The metal is heated to a high enough temperature to put elements into solution in more or less equilibrium. It is then quenched, trapping these elements in this state. A further heating to moderate temperatures will allow hard particles to precipitate from the solution throughout the crystalline structure. These particles interfere with the movement within the crystal and so impart hardness and strength. This is best illustrated, perhaps, by the heat treating of duralumin.
- PREFERRED ORIENTATION:** A term describing a condition within the metal whereby the crystals are not arranged irregularly or "at random" but have a preferred or "directional orientation".
- READY-FINISH ANNEAL:** A mill term referring to the anneal before the final cold working process.
- RECRYSTALLIZATION:** The transformation taking place in grain structure of cold worked metals during the process of annealing.
- RED BRASS:** A copper-zinc alloy having an 85% copper content.
- RESISTANCE TO CORROSION:** A term describing the ability of a metal to withstand deterioration or "failure" by attacking chemical media.
- ROCKWELL:** A term used to describe a hardness test reading on metal that was made by testing equipment called the Rockwell hardness tester."
- ROLLING:** A general term applied to various processes which work the metal by means of rolling.
- ROMAN BRONZE:** A copper-zinc alloy having a small quantity of tin.
- S.A.E.:** Society of Automotive Engineers.
- SCELERSCOPE:** A device used for testing hardness of metals wherein a small hammer is dropped onto the sample from a fixed height and the hardness determined by the height of the rebound of the hammer.
- SEASON CRACKING:** A term describing the failure taking place on metal possessing excessive internal or external stresses when in contact with a certain corroding atmosphere. This failure which is seen as cracks may take place after a few days, weeks or even longer.
- SINGLE PHASE ALLOYS:** Alloys containing only one phase, e.g., cartridge brass.
- SLIP-PLANES:** Planes in the metal of relatively easy slip or deformation.
- SPECTROSCOPE:** An instrument used for analyzing the spectra of rays emitted by luminous bodies.

**STAMPING:** A process used to shape various articles by means of a die and a punch used in a drop hammer.

**STATIC-STRESS:** A steady force exerted in distinction to cyclic stresses.

**STRAIGHTENING MACHINES:** Processing equipment used for taking out the bends and kinks in tube, rod and wire.

**STRESS CORROSION:** Same as season cracking.

**TELLURIDE:** A compound of tellurium which is a rare, brittle, lustrous element resembling sulphur and selenium.

**TELLURIUM COPPER:** Copper containing a small amount of tellurium for purpose of improving machinability.

**TEMPER:** The condition of a metal or alloy determining its physical properties as produced by the mechanical and thermal treatments it has received.

**TENSILE STRENGTH:** The maximum breaking load per unit of original cross-section areas when tested in tension.

**VALENCE:** The number of ions that will combine with a given ion to form a molecule.

**YIELD STRENGTH:** As applied to nonferrous alloys, yield strength is an empirical value determined by the stress which will produce an elongation of 0.50% in two inches under load. It is known as "yield strength (0.50% extension)."

- ARC BLOW: Magnetic disturbance of the arc which causes it to waver from its intended path. (S.E.L.&P.B.)
- ARC LENGTH: The distance from the end of the electrode to the point where the arc makes contact with the working surface. (S.E.L. & P.B.)
- ARC VOLTAGE: The voltage across the welding arc. (S.E.L. & P.B.)
- AS-WELDED: The condition of weld metal, welded joints and weldments after welding prior to any subsequent thermal or mechanical treatment. (S.E.L. & P.B.)
- BASE METAL: The metal to be welded or cut. (S.E.L. & P.B.)
- BUTT WELD: Weld made in the joint between two pieces of metal lying approximately in the same plane. (S.E.L. & P.B.)
- FACE OF WELD: The exposed surface of a weld on the side from which the welding is done. (S.E.L. & P.B.)
- FILLET WELD: A weld of approximately triangular cross-section joining two surfaces approximately at right angles to each other in a lap joint, tee joint or corner joint. (S.E.L. & P.B.)
- GROOVE WELD: Made in the groove between two members to be joined. (S.E.L. & P.B.)
- LEG OF FILLET WELD: The distance from the roof of the joint to the toe of the fillet weld. (S.E.L. & P.B.)
- ROOT OF WELD: The points at which the bottom of the weld intersects the base metal surfaces. (S.E.L. & P.B.)
- TACK WELD: Made to hold parts of a weldment in proper alignment until the final welds are made. (S.E.L. & P.B.)
- THROAT OF FILLET WELD: Shortest distance from the root to the face. (S.E.L. & P.B.)
- TOE OF WELD: The junction between the face and the base metal. (S.E.L. & P.B.)
- WELD: A metallic bond between mating contacts. (S.E.L. & P.B.)
- WELDING: Joining the ends of members by fusing, using the application of heat or pressure, or both, by means of a flame torch, electric arc or electric current. (S.E.L. & P.B.)

- ALLOY:** A substance consisting of two or more metals mixed together, or nonmetallic bodies mixed with metals, in intimate solution or combination with one another, forming, when melted a homogeneous fluid. (AISC)
- ANGLE:** The amount of divergence between two intersecting straight lines. The term is also applied to an angle-iron section. (AISC)
- Bulb Angle:** An angle-iron section in which one leg has a bulb on one end.
- Clip Angle:** A short attaching angle that takes a portion of the stress of any member; also termed a "lug angle".
- Connection Angle:** An angle iron used for connecting two pieces.
- Lacing or Lattice Angle:** An angle used in latticing.
- Lug Angle:** See Clip Angle.
- Seat Angle:** A short angle riveted or welded together to a column to support temporarily a beam during erection.
- Shelf Angle:** See Seat Angle.
- Stiffening Angles:** Angles riveted or welded together to the web of a girder to stiffen it against buckling.
- ANGLE CLIP:** A clip angle. (AISC)
- ANGLE IRON:** A rolled piece of steel having a cross section shaped into a right angle. (AISC)
- ANGLE LUG:** A clip angle. (AISC)
- ANNEAL:** To reduce the brittleness and increase the ductility of metal by heating to a certain temperature, then cooling slowly in air or oil. (AISC)
- ARC:** A portion of a curve; an arch. (AISC)
- ARC WELDING:** A group of welding processes wherein coalescence is produced by heating within arc or arcs, with or without the use of filler metal. (AWS)
- ARCH:** Any bowlike curve, structure or object, usually having the convex side upward, generally spanning an opening and producing horizontal as well as vertical reactions. (AISC)
- AREA:** The amount of surface included between certain closed boundary lines; any particular extent or surface, region or tract. (AISC)
- Moment Area:** (Sometimes called "area moment.") The area enclosed by a moment curve.
- Sectional Area:** The area enclosed by the periphery of a section of a piece or member.
- ASSAY:** A test of the composition, purity, weight, etc., of metals or metallic substances such as ores or alloys. (AISC)
- AS-WELDED:** The condition of weld metal, welded joints and weldments after welding prior to any subsequent aging, thermal mechanical or chemical treatments. (AWS)
- AXIAL:** Pertaining to or of the nature of an axis. (AISC)
- AXIS:** A line about which a figure or a body is symmetrically arranged, or about which such a figure or body rotates; a principal line through the center of a figure or solid; a fixed line along which distances are measured or to which positions are referred. (AISC)
- AXIS OF A WELD:** A line through the length of a weld, perpendicular to the cross section at its center of gravity. (AWS)
- BACKING:** Material (metal, weld, asbestos, carbon, granular flux, gas, etc.) backing up the joint during welding. (AWS)
- BACKING PASS:** A pass made to deposit a backing weld. (AWS)
- BACKING STRIP:** Backing in the form of a strip. (AWS)
- BAR:** Any piece of wood, metal or solid material long in proportion, to its cross section. (AISC)
- Arbitration Test Bar:** A form of small test bar used for determining the quality of material going into a casting.
- Merchant's Bar:** Wrought-iron bars in their finished form ready for sale.
- Muck Bar:** The bar made by the first rolling of the bloom.
- Reinforcing Bar:** A bar or rod placed in concrete constructions to increase their resistance especially to bending and shear.
- Tension Bar:** Any bar subjected to tension.
- Z-Bar:** A rolled steel shape having a cross section resembling the letter Z and all angles right angles.
- BASE METAL:** The metal to be welded, soldered or cut. (AWS)
- BASE METAL TEST SPECIMEN:** A test specimen composed wholly of base metal. (AWS)
- BATTER:** To strike with repeated blows; an incline from the vertical (said of a wall having a face receding as it rises); to incline a face or line in masonry or any other construction. (AISC)

**BATTLEDECK FLOOR:** A steel floor system for bridges and buildings, devised and developed by the AISC, and consisting of steel plates and beams welded together so as to develop the whole as a T-beam section with continuity in all directions. (AISC)

**BAY:** The portion of a trestle between two columns; the English term for a panel of a truss. (AISC)

**BEAM:** A member the principal function of which is to carry a transverse load. (AISC)

**Box Beam:** A hollow beam, generally rectangular in section, having its sides made of plates.

**Built Beam:** A beam made up of structural shapes, such as plates and angles, riveted or welded together.

**Cantilever beam:** A beam supported at one end only.

**Collar Beam:** A horizontal member stretching from one to another of two rafters which meet at the top, and which are above the main beam.

**Continuous Beam:** A beam that rests on three or more supports.

**Cross Beam:** A beam which runs transversely to the centerline of a structure.

**Deck Beam:** A rolled shape having a T cross section but with a slight enlargement at the lower end of the stem or web.

**I-beam:** A rolled structural shape having a cross section resembling the letter I.

**Rolled Beam:** A metal beam made by a rolling process.

**Simple Beam:** A beam having its ends free and resting on two supports only.

**T-beam:** A reinforced concrete beam or a rolled structural shape having a cross section resembling the letter T.

**Tension Beam:** A beam subjected to tension as well as to cross-bending.

**Transverse Beam:** Any beam of a bridge that passes from one truss to an adjacent truss.

**Trussed Beam:** A beam braced by one or more vertical posts supported by inclined rods attached to the ends of the beam.

**BEARING:** The resistance to crushing as offered by a member; the pressure transferred from one member to another; the capacity to carry load; the support for a beam, pin bolt or rivet. (AISC)

**Allowable Bearing:** The maximum intensity of pressure on a support allowed by the specifications.

**Even Bearing:** A bearing in which the pressure is uniformly distributed.

**Expansion Bearing:** A support at the end of a span where provision is made for the expansion and contraction of the structure.

**Pin Bearing:** A type of end support for a girder or a truss in which a pin is used to transfer the load to the shoe.

**Roller Bearing:** A shoe or plate resting on rollers which in turn rest on a base casting at the expansion end of the span.

**Sliding Bearing:** A bearing constructed so that one part slides on another.

**Thrust Bearing:** A support for a shaft adapted to take up the end thrust therefrom.

**BEARING POINT:** The point of support for a load or a place where concentrated pressure is applied. (AISC)

**BENT:** (AISC)

**Column Bent:** A bent composed of columns and bracing in contradistinction to "Pile bent."

**Rocker Bent:** A bent, generally of steel, though sometimes of timber, hinged at either one or both ends so as to provide for the expansion and contraction of the span supported.

**Solitary Bent:** A single bent of a trestle that is not attached to either adjacent bent except by the girders of the deck.

**Trestle Bent:** In trestle construction, one of a series of bents carrying a deck.

**BEVEL:** The slope on the end of a piece; an instrument for drawing angles--used by mechanics; to slope or sharpen an edge. (AISC)

**BEVELED-EDGE:** An edge that is made thin by beveling. (AISC)

**BILL OF MATERIAL:** A list of the various portions of material for a construction, either proposed or completed, giving dimensions and weights or other quantitative measurements. (AISC)

**BILLET:** A small bloom; a short chunky bar of iron or steel. (AISC)

**BIT:** A tool for boring into wood or metal. (AISC)

**BLISTER:** To raise filmy vesicles on a surface by heat; a small raised portion of a metal surface with a void beneath. (AISC)

**BLOWHOLE:** A defect in iron or steel caused by the escape of gas or air while solidifying. (AISC)

**BLUE SHORTNESS:** A condition of brittleness in wrought iron caused by its having been worked at a blue heat. (AISC)

**BOLT:** A metallic pin or rod having a head at one end and a thread on the other for screwing up a nut used for holding members or parts of members together. (AISC)

**Anchor Bolt:** A round, steel bolt embedded in concrete or masonry to hold down machinery, castings, shoes, spans, engine beds, etc.

**Assembling Bolt:** A threaded bolt for holding together temporarily the several parts of a structure during riveting.

**Construction Bolt:** A bolt having its head beveled and flattened, so that when put into place the head will not project from the surface.

**Eye Bolt:** A bolt having a loop or eye at one end in place of the customary flat head.

**Fitting-up Bolt:** An ordinary bolt used to hold steel members together while they are being riveted.

**Grip of a Bolt:** The length of a threaded bolt measured from inside of the head to inside of the nut when the nut is screwed on far enough to provide full thread.

**Hook Bolt:** A bolt having one end in the form of a hook.

**Machine Bolt:** A threaded bolt having a straight shank and a square or hexagonal head.

**Tap Bolt:** A bolt that is screwed into the material that it holds instead of being screwed by a nut; also called a tap screw.

**Through Bolt:** A bolt that passes from side to side of the members that it fastens.

**Tie Bolt:** A round bolt with a square shank and lip for hooking ties to the flanges or stringers.

**Turner Bolt:** Machine bolt, ordinarily with hexagonal head, turned down so that when put in place it has a driving fit.

**U-Bolt:** A rod bent in the shape of the letter U with threads and nuts on the ends.

**BOOM:** A long beam or spar projecting from near the foot of a derrick, and sustaining the load that is raised from its outer end. (AISC)

**BRACE:** Generally a strut supporting or fixing in position another member; a tie used for such a purpose. (AISC)

**Batter Brace:** The inclined end post of a truss, sometimes called the "batter post".

**Tension Brace:** A brace that resists tension.

**Wind Bracing:** Bracing that takes up the stresses induced by the wind.

**BRACING FRAME:** A frame of steel or timber built in a manner to withstand distortion. (AISC)

**BRIDGE:** A structure that spans a body of water, a valley, or a road and affords passage for pedestrians, or vehicles of all kinds, or any combination thereof. (AISC)

**Arch Bridge:** A curved structure that produces reactions inclined to the vertical.

**Bascule Bridge:** A bridge having a span that opens by rotating in a vertical span.

**Cantilever Bridge:** A structure at least one portion of which acts as an anchorage for sustaining another portion that projects beyond the supporting pier.

**Chain Bridge:** A suspension bridge in which chains are employed instead of the usual cables.

**Deck Bridge:** A bridge in which the passing loads are carried directly to the upper chokes or to the upper portions of the posts.

**Drawbridge:** A bridge that may be drawn or turned to one side or lifted up, either bodily or in sections, so as to permit boats to pass under or through it.

**Fixed Bridge:** One that does not move except for expansion and contraction.

**I-beam Bridge:** A small bridge consisting of a floor supported on I-beams.

**Jackknife Bridge:** A bridge in which the lifting arms fold on themselves at midlength when in a raised position.

**Leaf Bridge:** A form of drawbridge in which the rising leaf, or leaves, swing vertically on hinges.

**Lift Bridge:** A type of movable bridge that travels in a vertical plane, sometimes called a hoist bridge.

**Pull-Back Drawbridge:** A movable span that retreats longitudinally to allow the passage of vessels.

**Revolving Drawbridge:** A drawbridge that turns in a horizontal plane.



- Rolling Lift Bridge:** A bascule bridge in which the moving arm rolls on a plane or upon friction rollers.
- Skew Bridge:** A bridge in which the horizontal lines joining corresponding end pins of the opposite trusses are oblique to the planes of the said trusses.
- Suspension Bridge:** A roadway suspended from chain or wire cables, usually hung between massive towers and securely attached to abutments.
- Swing Bridge or Swivel Bridge:** A span that rotates about a vertical axis so as to provide openings for the passage of vessels.
- Through Bridge:** A bridge with overhead bracing and carrying its floor near the elevation of the bottom chords.
- Trestle Bridge:** A bridge composed of bents or towers carrying the deck.
- BRIDGING:** A piece of steel placed between and attached to two beams, or other pieces, in order to prevent them from approaching each other; also the spanning of any opening. (AISC)
- BRAZE:** A weld wherein coalescence is produced by heating to suitable temperatures and by using a filler metal, having a liquidus above 800°F (427°C) and below the closely fitted surfaces of the joint by capillary attraction. (AWS)
- BUILDUP SEQUENCE:** The order in which the weld beads of a multiple-pass weld are deposited with respect to the cross section of the joint. (AWS)
- BUTT JOINT:** A joint between two members lying approximately in the same plane. (AWS)
- BUTT WELD:** A weld in a butt joint. (AWS)
- CAMBER:** The upward curvature of a member or truss above its nominal position. (AISC)
- CANTILEVER:** The projecting of a member from the supporting beam or wall.
- CARBON-ARC CUTTING (CAC):** An arc-cutting process wherein the severing of metals is effected by melting with the heat of an arc between a carbon electrode and the base metal. (AWS)
- CASE HARDENING:** Converting the outer surface of iron into steel by heating in contact with charcoal. (AISC)
- CAST:** To make a casting of molten metal. (AISC)
- CASTING:** The act or process of founding; that which has been cast by pouring molten metal into a mold. (AISC)
- CENTROID:** The center of mass or center of gravity; the point of application of the resultant of a system of stresses or forces. (AISC)
- CHAMFER:** To bevel or sharpen to a blunt edge. (AISC)
- CHANNEL:** A structural or rolled steel shape used in steel constructions. (AISC)
- CHORD:** That portion of a truss the main function of which is to resist bending on the span. (AISC)
- Bottom Chord:** The lower member of a truss, usually resisting tension.
- Broken Top Chord:** A top chord in which each successive segment deviates or deflects from the line of its contiguous segment, at the panel point.
- Camel-back Top Chord:** A top chord that is broken, or deflects at two or, at most, three points.
- Curved Top Chord:** A top chord that approximates to the form of a curve. Strictly speaking, such a chord is "polygonal", as curving chords between panel points is not permissible.
- Lower Chord:** Bottom chord.
- Parabolic Chord:** A chord of a truss in which the panel points lie on the arc of a parabola.
- Polygonal Top Chord:** A top chord composed of panel length segments which form a polygon.
- Top Chord:** The upper member of a truss, usually resisting compression, also called Upper Chord.
- CLEAR HEADWAY:** The vertical distance from the upper surface of a floor to the lowest part of the overhead bracing. (AISC)
- COEFFICIENT:** A constant factor in an algebraic expression.
- Differential Coefficient:** The measure of the rate of change in a function relative to its variable used in the calculus.
- Empirical Coefficient:** A coefficient established by experience or observation rather than by scientific deduction from fundamental principles.
- COLD SOLDERED JOINT:** A joint with incomplete bonding caused by insufficient application of heat to the base metal during soldering. (AWS)
- COLUMN:** A pillar or strut; a vertical member which resists compression. (AISC)

• Closed Column: A column that is boxed in, shutting out water and air, generally making the interior inaccessible for painting.

COMPLETE FUSION: Fusion which has occurred over the entire base-metal surfaces exposed for welding, and between all layers and passes. (AISC)

COMPONENT: A constituent part; one of the parts into which forces or stresses may be resolved or divided. (AISC)

Horizontal Component: A component of an oblique force taken in a horizontal line.

Longitudinal Component: A component in direction parallel to the plane of the trusses.

Transverse component: A component in a transverse direction, generally intended for a component perpendicular to the planes of the trusses.

COMPOSITE JOINT: A joint wherein welding is used in conjunction with a joining process other than welding. (AWS)

COMPRESSION: The state of being compressed; shortening by pressure. (AISC)

CONCAVE FILLET WELD: A fillet weld having a concave face. (AWS)

CONCAVE ROOT SURFACE: A root surface which is concave. (AWS)

CONCAVITY: The maximum distance from the face of a concave filled weld perpendicular to a line joining the toes. (AWS)

CONCENTRATION: A system of loading in which several loads are collected and applied at a point or over a very small area. (AISC)

CONTINUOUS WELD: A weld which extends continuously from one end of a joint to the other. Where the joint is essentially circular, it extends completely around the joint. (AWS)

CONTRACTION: The act of drawing together or shrinking; diminishing the length, area or volume of anything. (AISC)

CONVEX FILLET WELD: A fillet weld having a convex face. (AWS)

CONVEXITY: The maximum distance from the face of a convex fillet weld perpendicular to a line joining the toes. (AWS)

COPE: To dress; to notch steel beams, channels, etc. (AISC)

CORROSION: The disintegration of a substance by the action of chemical agents. (AISC)

CORRUGATED: Bent or drawn into parallel furrows or ridges; wrinkled; fluted. (AISC)

COUNTERSINK: To form by drilling or turning a conical cavity in metal, or other material, for the reception of the head of a bolt, rivet, or screw, so that the end thereof may lie flush with the surface of the said material. (AISC)

COUNTERWEIGHT: A weight that counterbalances some other weight; to weight against. (AISC)

COUPLE: Two equal and parallel forces acting in opposite direction and in different lines. (AISC)

CUTTING TORCH: A device used in oxygen cutting for controlling and directing the gases used for preheating and the oxygen used for cutting the metal. (AWS)

CYLINDER: A portable cylindrical container used for transportation and storage of a compressed gas. (AWS)

DECKING, FLOORING: The flooring of a bridge (AISC)

DEFLECTION: A lateral motion at right angles to the length of the piece; also the amount of such motion expressed in some lineal unit as inches. (AISC)

Dynamic Deflection: The additional deflection caused by the live load being in motion.

Static Deflection: Deflection due to a quiescent load.

DEFORMATION: Change of form; a change of shape in a member or combination of members without any breach of the continuity of its parts. (AISC)

Elastic Deformation: A change of shape without impairment of the elastic properties of the material; a deformation with resulting stress inside the elastic limit.

Residual Deformation: Deformation left in a member after the forces causing same have been removed; "permanent set".

Truss Deformation: An alteration in the lengths and positions of the members composing a truss.

DEPOSITED METAL: Filler metal that has been added during a welding operation. (AWS)

DEPTH: The downward distance from the surface or top. The term generally carries the idea of verticality but such is not always the case; for instance, the depth of any beam inclined to the horizontal is measured in a direction perpendicular to its length and, therefore, on a line inclined to the vertical (AISC)

**Arch Depth:** The depth of the arch ring at any point at right angles to the axis.

**Economic Depth:** That depth of truss or girder, which, when everything is considered, will give results that are satisfactory from all standpoints and involve the least expenditure of money for properly combined first cost, operation, maintenance and repairs.

**Effective Depth:** The perpendicular distance between the gravity lines of a truss or girder.

**Truss Depth:** The vertical distance between the centerlines of the upper and lower chords.

**DESIGN:** To proportion all the parts of a structure; a plan or plans, showing the various parts of a structure, their sizes and relations. (AISC)

**DETAIL:** One of the smaller parts into which any construction or design may be divided; to go into particulars; to draw the particular parts. (AISC)

**DETAILING:** The actual work of planning and drawing the different parts and the connections of any structure; the smaller parts of any construction, speaking of them as a class.

**DIAGONAL:** A member running obliquely across the panel of a truss. (AISC)

**Lateral Diagonal:** A diagonal member in a lateral system.

**Main Diagonal:** A web diagonal member joining the top and bottom chords of a truss, and taking its greatest stress when not less than one-half of the span is covered by the live load.

**Subdiagonal:** An intermediate web diagonal joining a chord with a main diagonal.

**DIAGRAM:** A sketch, outline or skeleton drawing; a record made by curves plotted on cross section paper. (AISC)

**Erection Diagram:** A skeleton drawing of a truss or span showing all pieces in their relative positions, properly lettered and numbered in order to facilitate the process of erection.

**Force Diagram:** A diagram in which the amounts and directions of forces are represented by lines for the purpose of finding their resultant.

**Frame Diagram:** A diagram of a frame in which the positions of the axes of the joints are shown by points, while the rigid connections are shown by lines between them.

**Load Diagram:** A diagram showing the amounts and arrangement of loads on a structure; the diagram taken off an engine by an indicator.

**Moment Diagram:** A curve showing the values of the bending moments in a beam or truss at various sections thereof.

**Shear Diagram:** A diagram showing the variations of the shear along a beam or truss.

**Skeleton Diagram:** A diagram which shows the general peripheral outline and the main members in a truss.

**Stress Diagram:** A skeleton drawing of a truss, upon which are written the stresses in the different members. Also called "diagram of stresses".

**DIAPHRAGM:** A structural shape or plate, fastened between members to act as a stiffener.

**DIE:** A steel former or device for shaping, impressing or cutting out something. (AISC)

**DRAWING:** The making of a plan on paper, etc.; also the plan itself. (AISC)

**Detail Drawing:** A drawing on a large scale showing all small parts, dimensions, details, etc.

**Erection Drawing:** An erection diagram. See Diagram.

**General Drawing:** A drawing showing the elevation, plan and cross section of the structure, also the borings for substructure and the main dimensions.

**Perspective Drawing.** A drawing showing in perspective any structure.

**Picture Drawing:** A general drawing attempting to show as a picture the actual way the structure would look.

**Shop Drawing:** A drawing of a structure or machine showing all parts and dimensions so that the shop can actually build what is indicated on the drawing without other information.

**Skeleton Drawing:** A skeleton diagram. See Diagram.

**Working Drawing:** Any drawing showing all the parts and dimensions with other information pertinent to construction, so that whatever is shown can be built without other drawings or instructions.

**DRAWING DOWN:** Reducing gradually the sectional area. (AISC)

**DRILL:** To bore a hole in a material with a tool revolved by a suitable mechanism; the tool itself; the apparatus holding and turning it. (AISC)

**ECCENTRIC:** Out of center. A disk mounted out of center on a driving shaft and surrounded by a collar or a strap connected with a rod. Its purpose is to convert rotary motion into reciprocating rectilinear motion. (AISC)

- EFFECTIVE LENGTH OF WELD:** The length of weld throughout which the correctly proportioned cross section exists. In a curved weld, it shall be measured along the centerline of the throat. (AWS)
- ELASTIC LIMIT:** The unit stress at which the deformation begins to increase in a faster ratio than the applied loads. (AISC)
- ELASTICITY:** That property which many bodies have of recovering their original form after the removal of the deforming cause. (AISC)
- Coefficient of Elasticity or Modulus of Elasticity:** The ratio of the direct stress per unit of area to the corresponding relative deformation, sometimes called "lineal modulus." The numerical value is equal to the stress per unit of area in tension that would be required to double the length of a piece; were the material of which it is composed perfectly elastic; also called "Young's modulus".
- Shearing Modulus of Elasticity:** The ratio of the unit shearing stress to the accompanying angular deformation. It generally equals two-fifths of the lineal modulus.
- Volumetric Modulus of Elasticity:** The ratio of the unit stress applied on the three principal axes, to the relative change in volume. It generally equals two-thirds of the lineal modulus.
- ELECTRODE:** (AISC)
- Arc Welding:** A component of the welding circuit through which current is conducted between the electrode holder and the arc.
- Resistance Welding:** The part of parts of a resistance-welding machine through which the welding current and, in most cases, pressure are applied directly to the work.
- ELEMENT:** That of which anything is in part compounded, which exists in it, and which is itself not decomposable into parts of different kinds. (AISC)
- Truss Element:** A component part of a truss.
- ELEVATION:** The projection of an object on a vertical plane, used in drafting. (AISC)
- ELLIPSE:** A curve such that the sum of the distances from two fixed points, called the foci, to any point on the curve is a constant. (AISC)
- ELLIPTICAL CURVE:** An ellipse, (AISC)
- ERECTION:** The assembling of the members in the field and making the necessary permanent connections. (AISC)
- ERECTION DRAWING:** An erection diagram. See Diagram. (AISC)
- EXTRADOS:** The convex curve of a masonry arch; the upper surface of the voussoirs when in position. (AISC)
- EYE:** The hold in the end of a member to permit the passage of a pin. (AISC)
- FABRICATION:** The act or process of framing and fitting rolled steel shapes for structures; the putting together of parts of a structural steel construction and riveting them. (AISC)
- FACE OF WELD:** The exposed surface of a weld on the side from which welding was done. (AWS)
- FILLER:** A plate, the sole function of which is to fill up space. (AISC)
- FILLER METAL:** The metal to be added in making a welded, brazed or soldered joint. See Electrode, Welding Rod, Backing Filler Metal, Brazing Filler Metal and Solder. (AWS)
- FILLET:** The rounding of a sharp corner. (AISC)
- FILLET WELD:** A weld of approximately triangular cross section joining two surfaces approximately at right angles to each other in a lap joint, tee joint or corner joint. (AWS)
- FLANGE:** One of the principal longitudinal members of a girder which resist tension or compression, also sometimes called the upper and lower chords of a beam; a projecting edge, rim or rib on anything. (AISC)
- FLASH WELDING (FW):** A resistance-welding process wherein coalescence is produced, simultaneously over the entire area of abutting surfaces, by the heat obtained from resistance to electric current between the two surfaces, and by the application of pressure after heating is substantially completed. Flashing and upsetting are accompanied by expulsion of metal from the joint. (AWS)
- FLAT-HEAD:** A rivet or bolt head that has been flattened. (AISC)
- FLEXURE:** Bending. (AISC)
- FLOOR OR FLOORING:** That part of a building which directly receives the travel or live load. (AISC)
- FLOOR BEAM:** A transverse beam or girder placed at the panel points of a span to support the stringers that carry the floor. (AISC)
- End Floor Beam:** The floor beam at the end of a span.
- Intermediate Floor Beam:** Any floor beam between the end floor beams

**FLUX:** Material used to prevent, dissolve or facilitate removal of oxides and other undesirable substances. (AWS)

**FOOTING:** The spreading course at the base of a foundation. (AISC)

**Column Footing:** A footing or spread base under a column.

**FORGE:** To work wrought iron into shape by first softening by heat and then hammering into required form; the apparatus or furnace in which the iron is heated before being worked. (AISC)

**FRACTURE:** To break or split; a partial or total separation of parts of a continuous solid body under the action of force. (AISC)

**FULL FILLET WELD:** A fillet weld whose size is equal to the thickness of the thinner member joined. (AWS)

**FUSION:** The melting together of filler metal and base metal, or of base metal only, which results in coalescence. (AWS)

**FUSION ZONE:** The area of base metal melted as determined on the cross section of a weld. (AWS)

**GAS METAL-ARC WELDING (GMAW):** An arc welding process wherein coalescence is produced by heating with an arc between a continuous filler metal (consumable) electrode and the work. Shielding is obtained entirely from an externally supplied gas, or gas mixture. Some methods of this process are called MIG or CO<sub>2</sub> welding. (AWS)

**GAS POCKET:** A cavity caused by entrapped gas. (AWS)

**GAS TUNGSTEN-ARC WELDING (GTAW):** An arc-welding process wherein coalescence is produced by heating with an arc between a single tungsten (nonconsumable) electrode and the work. Shielding is obtained from a gas or gas mixture. Pressure may or may not be used and filler metal may or may not be used. (This process has sometimes been called TIG welding). (AWS)

**GIRDER:** A beam or compound structure acting as a beam carrying principally transverse loads that develop normal reactions at the supports. (AISC)

**Box Girder:** A type of girder having two webs giving a section resembling a box made up of plates and angles riveted together and forming flanges and webs.

**GIRT:** Horizontal members from column to column to carry wall sheaths.

**GRILLAGE:** A network of rolled or built beams put in a pier to distribute the weight from the shoe, or at the bottom of a column to spread the weight over a greatly enlarged area. (AISC)

**GUSSET:** An angular piece of iron or steel, or a steel plate fastened to angles, channels, or

the members of a structure to give strength and stiffness to them, or to connect them to the construction. (AISC)

**GUY:** A line for bracing the top of a pole, derrick, or any similar apparatus. (AISC)

**GUY LINE:** A guy. (AISC)

**H-PILE:** Any steel H-section used as a bearing pile. (AISC)

**HEAT-AFFECTED ZONE:** That portion of the base metal which has not been melted, but whose mechanical properties or microstructure have been altered by the heat of welding, brazing, soldering or cutting. (AWS)

**HORIZONTAL POSITION:** (AWS)

**Fillet Weld:** The position of welding wherein welding is performed on the upper side of an approximately horizontal surface and against an approximately vertical surface.

**Groove Weld:** The position of welding wherein the axis of the weld lies in an approximately horizontal plane and the face of the weld lies in an approximately vertical plane.

**IMPACT:** The act of striking, the forcible momentary contact of a moving body with another either moving or at rest. (AISC)

**Coefficient of Impact:** In structural engineering, the ratio of the effect of a dynamically applied load to that of the same load applied statically, less unity. In other words, it is the factor, nearly always less than unity, by which a static load effect must be multiplied in order to find the increment of the dynamic effect of applying the said load in a manner other than statically.

**IMPACT-ALLOWANCE LOAD:** A percentage allowance for impact applied to the equivalent uniform live load. (AISC)

**IMPACT-LOAD STRESS:** Same as impact stress. See Stress. (AISC)

**INCOMPLETE FUSION:** Fusion which is less than complete. (AWS)

**INERT GAS:** A gas which does not normally combine chemically with the base metal or filler metal. (See also protective atmosphere). (AWS)

**INERTIA:** That property of matter by virtue of which it persists in a state of rest or of uniform motion in a straight line unless some force changes that state; the state or quality of being inert; indisposition to move or to act; inertness. (AISC)

- INFLECTION POINT:** The point where reversal of curvature occurs; point of contraflexure. (AISC)
- INTERMITTENT WELD:** A weld wherein the continuity of the weld is broken by recurring unwelded spaces. (AWS)
- INTERSECTION:** A place of crossing; cancellation; a point common to two lines or a line and a surface. (AISC)
- IRON:** A common but important and abundant metal having a specific gravity of about 8. The pure metal has a white, lustrous appearance, does not harden appreciably on quenching, and is strongly attracted by a magnet, although it cannot be made magnetic except when containing carbon, or while an electric current is passed around it. The term is often applied to a tool or utensil made of iron; also to various structural shapes. (AISC)
- Malleable Iron or Malleable Cast Iron:** Cast iron that has been rendered tough and malleable by long-continued high heating, while embedded in hematite; ferric oxide, etc., and then allowed to cool slowly.
- Wrought Iron:** In its perfect condition, wrought iron is simply pure iron, but, owing to impurities (to a certain degree) being present, it only approximates that condition.
- IRON OXIDE:** An intimate combination of oxygen and iron, such as rust. (AISC)
- IRON WORKER:** A person who works in the skilled trade of fabrication or erecting structural steel, ornamental ironwork, architectural metal, rigging machinery setting and the placing of reinforcing rods in concrete. One who has successfully completed a prescribed 3 years apprenticeship, approved by the US Department of Labor, and has achieved the status of Journeyman Iron Worker.
- JOINT:** The location where two or more members are to be joined. (AWS)
- JOINT DESIGN:** The joint geometry together with the required dimensions of the welded joining. (AWS)
- JOINT GEOMETRY:** The shape and dimensions of a joint in cross section prior to welding. (AWS)
- JOINT PENETRATION:** The minimum depth a groove or flange weld extends from its face into a joint, exclusive of reinforcement. (AWS)
- JOINT WELDING PROCEDURE:** The materials, detailed methods and practices employed in the welding of a particular joint. (AWS)
- JOIST:** One of the horizontal pieces usually laid in equidistant rows to which flooring is fastened. (AISC)
- JUNIOR BEAMS:** Lightweight steel beams. (AISC)
- KIP:** A stress unit equal to 1,000 lb. (AISC)
- KNEE or KNEE BRACE:** A short diagonal brace, used to connect a batter brace or a vertical post in a span to an overhead strut. (AISC)
- LASER BEAM CUTTING (LBC):** A cutting process wherein the severing of metals is effected by the heat obtained from the impingement upon the workpiece of a concentrated coherent light beam emitted from a laser, with or without an externally supplied gas. (AWS)
- LASER BEAM WELDING (LBW):** A welding process wherein coalescence is produced by the heat obtained from the application of a concentrated coherent light beam impinging upon the surfaces to be joined. (AWS)
- LATERAL:** One of the pieces in a lateral system. (AISC)
- Bottom Laterals or Lower Laterals:** Laterals in the plane of the bottom chords.
- Top Laterals or Upper Laterals:** Laterals in the plane of the upper chords.
- LATERAL SYSTEM:** A system of tension and compression members, forming the web of a horizontal truss, connecting the opposite chords of a span. Its purposes are to transmit wind pressure to the piers or abutments, to prevent undue vibration from passing trains or other loads, and to hold the chord members to place and line. (AISC)
- LAYOUT:** A plan or arrangement of the parts of a structure shown on a drawing. (AISC)
- Alternate or Alternative Layout:** One of two or more different layouts, or schemes, for the same project.
- General Layout:** A drawing showing an elevation, plan and cross section for a structure, and any other notes such as borings.
- LEAST WORK:** A method of determining stresses in the members of a redundant system. (AISC)
- Principle of Least Work:** The stresses in the members of a redundant system have such values that the internal energy of all stresses is a minimum.
- LEG OF A FILLET WELD:** The distance from the root of the joint of the toe of the fillet weld. (AWS)
- LENGTH:** Extension from end to end; distance measured along a line. (AISC)
- Effective Length:** That length of a member or structure used for the purpose of

designing it; in a girder or truss, the distance between the points of support.

Unsupported Length: The length of a compression member between the nearest points of lateral restraint.

LINE: A unit of length, as one-tenth or one-twelfth of an inch; a row of anything; a limit, division, or boundary; a length without a breadth, or the trace of a moving point; a string, cord or slender rope; a mark drawn by a pen or pencil. (AISC)

Base Line: A line adopted as a fundamental line in a survey from which other lines are run, used in triangulation work.

Influence Line: A line that represents the variation of moment, shear, stress, deflection, or similar function at a particular point in the structure, due to a load of unity moving across it.

Neat Line: The true face line of a building regardless of the projections of the stones; a line back or inside of incidental projections.

Rupture Line: The line along which rupture occurs or would occur if the piece were tested to destruction.

LINEAL: Relating to length only. (Often written "linear". (AISC)

LINEAL FOOT: A running foot. (AISC)

LINEAR: Lineal. (AISC)

LIQUATION: The separation of a low melting constituent of an alloy from the remaining constituents, usually apparent in alloys having a wide melting range. (AWS)

LIQUIDUS: The lowest temperature at which a metal or an alloy is completely liquid. (AWS)

LOAD: The weight carried by a beam, girder, truss, span, or structure of any sort, or any part of such structure, including its own weight. (AISC)

Apex Load: The load at a panel point of a truss.

Breaking Load: A load which when placed upon a structure or test piece would just be great enough to break it.

Concentrated Load: A load that is concentrated at a point or distributed over a very small area.

Crippling Load: A load that, if put on a member or a structure, will disable or weaken it.

Dead Load: The weight of all the parts of a bridge itself and anything that may remain upon it for any length of time, such as tracks, water mains, telephone and telegraph lines, snow, dirt, moisture, etc.

Eccentric Load: A load which is applied to one side of the axis of resistance, and which, consequently, produces a bending moment on the piece considered.

Indirect Wind Load: A transferred wind load.

Limit Load: The greatest load which a structure is permitted to carry as set forth in the specifications; a safety load.

Live Load: A moving load on a structure.

Moving Load: An advancing load on a structure.

Overload: A load which produces intensities of stress beyond the allowable unit stresses.

Panel Load: An "apex" load.

Permanent Load: A dead load.

Proof Load: The greatest load that can be applied to a member without producing permanent distortion.

Quiescent Load: A load that is not in motion.

Rolling Load: A moving load.

Safe Load: Any load that does not produce stresses, in the members, having higher intensities than those allowed in the specifications.

Static Load: A dead load.

Test Load: A live load applied to any finished construction as an ocular proof of its safety.

Transferred Load: A load that has been carried over from another part of the structure to the member in question.

Transverse Load: A load applied perpendicular to the plane of the longitudinal axis of the member of the structure, such as a wind load.

Uniform Load: A load that is uniformly distributed, or the same per lineal foot of span.

Wind Loads: A load on a structure due to the pressure of the wind.

Working Load: A safe load established by the specifications.

LOADING: A system of loads on a structure; the act of placing loads on vehicles. (AISC)

**LOCAL STRESS-RELIEF HEAT TREATMENT:** Stress-relief heat treatment of a specific portion of a structure. (AWS)

**LOCKED-UP STRESS:** See preferred term Residual Stress. (AWS)

**MALLEABLE:** Capable of being shaped by a beating or rolling process. (AISC)

**MASS:** The quantity of matter in a body. It is measured by the ratio of its weight to the acceleration due to gravity. (AISC)

**MATCH MARKING:** A system of marking the parts or members of a structure so that they always may be connected in exactly the same order and manner. (AISC)

**MELTING RANGE:** The temperature range between solidus and liquidus. (AWS)

**MELTING RATE:** The weight or length of electrode melted in a unit of time. (AWS)

**MEMBER:** A component part of a structure, complete in itself. (AISC)

**METAL:** As used in construction, this term means steel, unless specifically stated otherwise. (AISC)

**MIDSPAN:** The center of a span. (AISC)

**MIG WELDING:** See preferred term Gas Metal-Arc Welding. (AWS)

**MOMENT:** The tendency of a force to produce rotation of a stress or mass inertia to resist rotation. This tendency is measured by the product of the force into its lever arm. (AISC)

**Bending Moment:** The moment that produces or tends to produce bending in a beam or other member of a structure. It is measured by the algebraic sum of the products of all the forces by their respective lever arms.

**Resisting Moment:** The moment that opposes distortion, displacement or overturning; sometimes loosely used for moment of resistance.

**Twisting Moment:** Torque.

**MOLD:** A form or model pattern of a particular shape, used in fixing the shape of a plastic mass. (AISC)

**NEUTRAL FLAME:** A gas flame wherein the portion used is neither oxidizing nor reducing. (AWS)

**NUGGET:** The weld metal joining the parts in spot, seam or projection welds. (AWS)

**NUGGET SIZE:** The diameter or width of the nugget measured in the plane of the interface between the pieces joined. (AWS)

**NUT:** A short prism of metal having a central hole which is threaded to receive a bolt or a screw. (AISC)

**Check Nut:** An extra nut screwed on a bolt tight against the first nut to prevent the latter from working loose.

**Jam Nut:** A check nut.

**Lock Nut:** A nut having some special provision to prevent turning.

**OFFSET:** A short line run at right angles to a principal, or base, line; to move over from a base line called an offset line. (AISC)

**OUTRIGGER:** A beam or joist projecting from a structure, used to support a load at its end. (AISC)

**OVERHEAD POSITION:** The position of welding wherein welding is performed from the underside of the joint. (AWS)

**OVERHEAT:** To heat metal to a temperature near the melting point, causing it to become coarse grained and reducing the cohesion between the particles. (AISC)

**OXIDIZING FLAME:** A flame having an oxidizing effect (excess oxygen). (AWS)

**OXYACETYLENE CUTTING:** An oxygen-cutting method wherein the severing of metals is effected by means of chemical reaction of oxygen with the base metal at elevated temperatures, the necessary temperature being maintained by means of gas flames obtained from the combustion of acetylene with oxygen. (AWS)

**OXYACETYLENE WELDING (OAW):** A gas welding process wherein coalescence is produced by heating with a gas flame or flames obtained from the combustion of acetylene with oxygen, with or without the application of pressure and with or without the use of filler metal. (AWS)

**OXY-FUEL GAS CUTTING (OFGC):** An oxygen cutting process wherein the severing of metals is effected by means of gas flames obtained from the combustion of a specified fuel gas and oxygen. See Oxyacetylene Cutting, Oxyhydrogen Cutting, Oxy-Natural Gas Cutting, Oxypropane Cutting. (AWS)

**OXYHYDROGEN CUTTING:** An oxygen-cutting method wherein the severing of metals is effected by means of the chemical reaction of oxygen with the base metal at elevated temperatures, the necessary temperature being maintained by means of gas flames obtained from the combustion of hydrogen with oxygen. (AWS)

**OXYHYDROGEN WELDING (OHW):** A gas-welding process wherein coalescence is produced by heating with a gas flame or flames obtained from the combustion of hydrogen with oxygen, without the application of pressure and with or without the use of filler metal. (AWS)



- OXY-NATURAL GAS CUTTING:** An oxygen-cutting method wherein the severing of metals is effected by means of the chemical reaction of oxygen with the base metal at elevated temperatures, the necessary temperature being maintained by means of gas flames obtained from the combustion of natural gas with oxygen. (AWS)
- OXYPROPANE CUTTING:** An oxygen-cutting method wherein the severing of metals is effected by means of the chemical reaction of oxygen with the base metal at elevated temperatures, the necessary temperature being maintained by means of gas flames obtained from the combustion of propane with oxygen. (AWS)
- PANEL:** That portion of a truss between adjacent panel points lying in the same chord. (AISC)
- PARALLEL:** A condition of being everywhere equidistant, not intersecting; applied to lines and planes. (AISC)
- PARTIAL JOINT PENETRATION:** Joint penetration which is less than complete. (AWS)
- PASS:** A single longitudinal progression of a welding operation along a joint or weld deposit. The result of a pass is a weld bead. (AWS)
- PASS SEQUENCE:** The order of deposition of passes in a joint. (AWS)
- PEDESTAL:** A footing for a tower post. (AISC)
- PICKLING:** The treatment of iron or steel with dilute acids for the purpose of obtaining a clean surface by removing the scale (oxide). (AISC)
- PILLAR:** A post or column. (AISC)
- PITCH:** The slope of a roof; the distance from center to center of rivets; the degree of descent of declivity. (AISC)
- PLAN:** The general layout of a structure; the horizontal projection of an object or structure. (AISC)
- PLANISH:** To polish metals by rubbing with a hard smooth tool. (AISC)
- PLASMA-ARC WELDING (PAW):** An arc welding process wherein coalescence is produced by heating with a constricted arc between an electrode and the work piece (transferred arc) or the electrode and the constricting nozzle (nontransferred arc). Shielding is obtained from the hot, ionized gas issuing from the orifice which may be supplemented by an auxiliary source of shielding gas. Shielding gas may be an inert gas or a mixture of gases. Pressure may or may not be used, and filler metal may or may not be supplied. (AWS)
- PLATE:** A flat piece of metal. (AISC)
- Anchor Plate:** A square or rectangular plate, or washer, at the bottom of an anchor bolt.
- Base Plate:** The foundation plate of metal on which a heavy piece of machinery or a column rests. This plate is usually set on masonry or concrete.
- Diaphragm Plate:** A stiffening plate used in the interior of a column to give it additional strength and rigidity.
- Gusset Plate:** A large connecting plate used at panel points to join the chord and the web members.
- Reinforcing Plate:** An extra plate used to reinforce or strengthen a member.
- Shimming Plate:** A plate used as a shim for increasing the elevation of a bearing.
- Sole Plate:** A plate riveted to the bottom flange of a plate girder to bear on the masonry plate.
- Splice Plate:** A plate used in splicing or joining two parts of a member.
- Web Plate:** The plate forming the web of a girder.
- PLAY:** A looseness in a joint or in parts of a machine or structure permitting some freedom of motion. (AISC)
- POST:** A vertical, or nearly vertical, compression member. (AISC)
- POSTHEATING:** The application of heat to an assembly after a welding, bracing, soldering or cutting operation. (AWS)
- POUND-FOOT:** A unit of moment, equal to that produced by a force of 1 lb. acting with a lever arm of 1 ft. (AISC)
- PREHEATING:** The application of heat to the base metal immediately before welding, brazing, soldering or cutting. (AWS)
- PRESSURE:** The effect of pressing; the result of thrust. (AISC)
- Axis of Pressure:** A line passing through the centroids of pressure of different successive sections of a body.
- Bearing Pressure:** The pressure on a bearing.
- PROCEDURE:** The detailed elements (with prescribed values or ranges of values) of a process or method used to produce a specific result. (AWS)
- PROCEDURE QUALIFICATION:** The demonstration that welds made by a specific procedure can meet prescribed standards. (AWS)
- PROTECTIVE ATMOSPHERE:** A gas envelope surrounding the part to be brazed or

- welded where the gas composition is controlled with respect to chemical composition, dew point, pressure, flow rate, etc. Examples are inert gases, combusted fuel gases, hydrogen, vacuum. (AWS)
- PUNCH:** Forcing or shearing holes in metal; to make a hole with a punch. (AISC)
- PURLIN:** A member laid horizontally upon the principal rafters of a roof to support the covering. (AISC)
- QUENCH TIME:** The time from the end of weld time to the beginning of temper time in resistance welding. (AWS)
- QUIRK:** An acute angle or recess; a deep indentation. (AISC)
- RAFTER:** One of the members in a roof to which the roofing is fastened. (AISC)
- RAMP:** An inclined plane connecting two levels. (AISC)
- REACTION:** A passive force set up in opposition to an initial, active force, e.g., the upward pressure on the bottom of a beam resting on a support, equal in amount to the downward pressure from the beam. (AISC)
- REACTION STRESS:** The residual stress which could not otherwise exist if the members of parts being welded were isolated as free bodies without connection to other parts of the structure. (AWS)
- REAM:** To enlarge a hole by means of a cutting tool having fluted cutters on the side. (AISC)
- RESIDUAL STRESS:** Stress remaining in a structure or member as a result of thermal or mechanical treatment or both. (AWS)
- RESISTANCE:** The passive opposition or reaction to any action. (AISC)
- RESISTANCE WELDING:** A group of welding processes wherein coalescence is produced by the heat obtained from resistance of the work to electric current in a circuit of which the work is a part, and by the application of pressure. (AWS)
- RESISTUTION:** The ability of an elastic body to recover from deformation due to impact. (AISC)
- REVERSE POLARITY:** The arrangement of direct current arc-welding leads wherein the work is the negative pole and the electrode is the positive pole of the welding arc. (AWS)
- RIB:** Stiffening rib. (AISC)
- RIGIDITY:** The quality of being rigid or resistant to distortion. (AISC)
- ROOT CRACK:** A crack in the weld or heat-affected zone occurring at the root of a weld. (AWS)
- ROOT EDGE:** A root face of zero width. See Root Face. (AWS)
- ROOT FACE:** That portion of the groove face adjacent to the root of the joint. (AWS)
- ROOT OF JOINT:** That portion of a joint to be welded where the members approach closest to each other. In cross section, the root of the joint may be either a point, a line or an area. (AWS)
- ROOT OF WELD:** The points, as shown in cross section, at which the back of the weld intersects the base metal surfaces. (AWS)
- ROOT OPENING:** The separation between the members to be joined, at the root of the joint. (AWS)
- ROOT PENETRATION:** The depth a groove weld extends into the root of a joint measured on the centerline of the root cross section. (AWS)
- ROOT REINFORCEMENT:** Reinforcement of weld at the side other than that from which welding was done. (AWS)
- ROOT SURFACE:** The exposed surface of a weld on the side other than that from which welding was done. (AWS)
- RUPTURE:** To break apart; the act of breaking apart. (AISC)
- RUST:** An oxidization of a metal. (ASIC)
- SEAL WELD:** Any weld designed primarily to provide a specific degree of tightness against leakage. (AWS)
- SEAM:** A line of junction formed by two pieces of material along their joining margins. A similar line, ridge or groove made by fitting or joining.
- SEAM WELD:** A continuous weld made between or upon overlapping members, wherein coalescence may start and occur on the faying surfaces, or may consist of a single weld bead or a series of overlapping spot welds. (AWS)
- SECTION, CROSS SECTION:** A section made by a secant plane perpendicular to the axis of the member, structure or any construction. (AISC)
- SECTION MODULUS:** The moment of inertia of the area of a section of a member divided by the distance from the center of gravity to the outmost fiber. (AISC)
- SEMI BLIND JOINT:** A joint in which one extremity of the joint is not visible. (AWS)
- SET:** The permanent change or deformation which a material subjected to stress undergoes when its elastic limit is exceeded. (AISC)

- SHAPE:** Any rolled beam or bar used in a structure. (AISC)
- SHEAR:** To slide one part of a body upon an adjacent part; the stress set up in opposition to a shearing action. (AISC)
- SHEET PILE:** A specially rolled steel pile, designed so that each pile interlocks with those adjacent to it. (AISC)
- SHELF ANGLE:** A seat angle. See Angle. (AISC)
- SHIELDED METAL-ARC CUTTING:** A method of metal-arc cutting wherein the severing of metals is effected by melting with the heat of an arc between a covered metal electrode and the base metal. (AWS)
- SHIELDED METAL-ARC WELDING (SMAW):** An arc-welding process wherein coalescence is produced by heating with an arc between a covered metal electrode and the work. Shielding is obtained from decomposition of the electrode covering. Pressure is not used and filler metal is obtained from the electrode. (AWS)
- SIZE OF WELD:** (AWS)
- Groove Weld:** The joint penetration (depth of chamfering plus the root penetration when specified).
- Fillet Weld:** For equal fillet welds, the leg length of the largest isosceles right-triangle which can be inscribed within the fillet-weld cross section.
- For unequal leg fillet welds, the leg length of the largest right-triangle which can be inscribed within the fillet-weld cross section.
- Flange Weld:** The weld metal thickness measured at the root of the weld.
- SKELETON-CONSTRUCTION:** A framework of structural steel that sustains all the external loads or forces from the top of a building to the foundation. (AISC)
- SLAB:** A flat mass of metal. (AISC)
- SLAG INCLUSION:** Nonmetallic solid material entrapped in weld metal or between weld metal and base metal. (AWS)
- SLUGGING:** The act of adding a separate piece or pieces of material in a joint before or during welding resulting in a welded joint which does not comply with design, drawing or specification requirements. (AWS)
- SOLDER:** A filler metal used in soldering which has a liquidus not exceeding 800°F (427°C). (AWS)
- SOLDERABILITY:** The capacity of a metal to be soldered under the fabrication conditions imposed upon a specific suitably designed structure. (AWS)
- SOLDERING:** A group of joining processes wherein coalescence is produced by heating to a suitable temperature and by using a filler metal having a liquidus not exceeding 800°F (427°C) and below the solidus of the base metals. (AWS)
- SOLID STATE WELDING:** A group of welding processes wherein coalescence is produced essentially at temperatures below the melting point of the base metals being joined, without the addition of a brazing filler metal. Pressure may or may not be used. (AWS)
- SPACER STRIP:** A metal strip or bar inserted in the root of a joint prepared for a groove weld to serve as a backing and to maintain root opening during welding. (AWS)
- SPAN:** The distance between two supports holding up a structure; the structure itself that rests on the supports, as a span of a bridge; to reach from one support to another by means of a structure. (AISC)
- Anchor Span:** In a bridge consisting of a series of cantilevers, the span that separates two cantilever arms of other spans.
- Bascule Span:** The moving span of a bascule bridge.
- Beam Span:** A span built with beams.
- Cantilever Span:** That span of a cantilever bridge that contains a suspended span and either one or two cantilever arms. Sometimes the suspended span (most improperly) is omitted, making the cantilever span consist of two cantilever arms only.
- Channel Span:** The span that bridges the deepest part of a river or that part most accessible for navigation.
- Clear Span:** The distances between the two inside faces of the supports of a span.
- Continuous Span:** A span that is supported on more than two piers or on more than one abutment and one pier and that distributes the load to the various supports on which it rests, or a series of consecutive spans effectively connected together over the points of support.
- Deck Span:** One of the spans of a deck bridge.
- Draw Span:** A movable span in a bridge over a navigable stream, to permit the passage of vessels.
- Effective Span:** The distance from center to center of end pins in a bridge span, or that between centers of bearings in any structure.

**Fixed Span:** A span that is not movable as opposed to a draw span.

**Girder Span:** A span built of girders.

**Half-through Span:** A span in which the deck is placed between the upper and lower chords and where there is no overhead bracing.

**Intermediate Span:** Any one of the spans between the end spans of a bridge.

**Lift Span:** A span of a bridge that is raised for the passage of vessels.

**Movable Span:** Any span of a bridge that may be moved in any manner to allow passage for vessels through or under the bridge.

**Shore Span:** Either the first or the last span of a bridge.

**Simple Span:** A span that rests on two supports, one at each end, and that does not affect the stresses in the adjoining spans.

**Skew Span:** A span making an angle, other than a right angle, with the axes of the piers and abutments.

**Spread Span:** A span at the end of a bridge so spread out at the shore that diverging tracks may be run thereon.

**Suspended Span:** A span connecting two cantilever arms and supported wholly thereby.

**Swing Span:** A span that revolves on a center pier or swings from an end pier to allow a passage for vessels through the bridge.

**Through Span:** A span in which the traffic is carried between the trusses and which has lateral bracing in the plane of the upper chords.

**Tower Span:** A span directly over and supported by a tower in a trestle or viaduct.

**Truss Span:** A span supported by trusses.

**SPAN LENGTH:** The distance from center of supports. (AISC)

**SPANDREL BEAM:** A beam extending from column to column and carrying an exterior wall load. (AISC)

**SPATTER:** In arc and gas welding, the metal particles expelled during welding and which do not form a part of the weld. (AWS)

**SPLICE:** To unite two pieces firmly together; the parts used in making the union. (AISC)

**SPOT WELD:** A weld made between or upon overlapping members wherein coalescence may

start and occur on the faying surfaces or may have proceeded from the surface of one member. The weld cross section (plan view) is approximately circular. (AWS)

**STAGGER:** To arrange in a zigzag order. (AISC)

**STAGGERED INTERMITTENT FILLET WELDING:** Two lines of intermittent fillet welding on a joint wherein the fillet weld increments in one line are staggered with respect to those in the other line. (AISC)

**STANCHION:** An upright post supporting a roof. (AISC)

**STATIC:** Pertaining to or designating bodies at rest or forces in equilibrium. (AISC)

**STEEL:** A modified form of iron, not occurring in nature, made from pig iron by oxidizing most of the carbon. (AISC)

**Alloy Steel:** A steel carrying a certain portion of some other metal, such as nickel or vanadium.

**Carbon Steel:** Ordinary steel that contains no other alloying element than the usual amount of manganese. The term is generally employed in contradistinction to nickel steel or other alloy steel.

**Cast Steel:** Steel cast into shape directly from the furnace instead of being cast into ingots and rolled or melted.

**Chrome Steel:** Steel that usually contains 2% chromium and from 0.8% to 2% carbon. It is very hard and has a high elastic limit.

**Hard Steel:** Steel that has undergone the process of hardening; high steel.

**Hardening of Steel:** Bringing the metal to the condition in which it is best able to resist abrasion or scratching. This is accomplished by heating the steel to a high temperature and cooling quickly, or by mechanical working.

**High Steel:** Steel containing a comparatively large amount of carbon, from 0.5% to 1%.

**Low Steel:** A soft steel containing a small amount of carbon--less than 0.25%.

**Medium Steel:** Steel neither very hard nor very soft, containing from 0.25% or 0.5% of carbon.

**Mild Steel:** A soft steel; low steel.

**Nickel Steel:** Steel containing from 3 to 5% of nickel and from 0.2 to 0.5% of carbon. The addition of the nickel increases the strength and the elastic limit of the metal.

**Rolled Steel:** Steel that has been cast into ingots and then passed through a succession of rolls until the desired final shape is obtained.

- Tempered Steel:** Steel that has undergone the tempering process.
- Tool Steel:** Steel that, by special treatment or peculiar composition with alloying metals, is adapted to retain a cutting edge at comparatively high temperatures so as to permit high cutting speeds.
- Tungsten Steel:** Steel usually containing from 5 to 10% of tungsten (sometimes as much as 24%) and from 0.4 to 2% of carbon.
- Vanadium Steel:** An alloy steel containing a small percentage of vanadium which has the effect of raising the elastic limit and ultimate strength of the metal, mainly by purification.
- STIFFENER:** A secondary member, usually an angle, attached to a plate to prevent buckling. (AISC)
- STRAIGHT POLARITY:** The arrangement of direct current arc-welding leads wherein the work is the positive pole and the electrode is the negative pole of the welding arc. (AWS)
- STRAIN:** The deformation caused by an external force applied to any piece of material or to any bridge member; often loosely used for stress. (AISC)
- STRENGTH:** The capacity to resist distortion or disintegration. (AISC)
- STRESS:** An internal distributed force that resists the change in shape and size of a body subjected to external forces. (AISC)
- STRESS-CORROSION CRACKING:** Spontaneous failure of metals by cracking under combined action of corrosion and stress, residual or applied. In brazing, applied to cracking of stressed base metal by the presence of a liquid filler metal. (AWS)
- STRESS CRACKING:** Cracking of a weld or base metal containing residual stresses. (AWS)
- STRESS-RELIEF HEAT TREATMENT:** Uniform heating of a structure or portion thereof to a sufficient temperature, below the critical range, to relieve the major portion of the residual stresses, followed by uniform cooling. (Note: Terms Normalizing, Annealing, etc., are misnomers for this application). (AWS)
- STRUCTURE:** A general term for anything that is built or constructed, as a bridge or a building. (AISC)
- Substructure:** The part of any construction that supports the superstructure.
- Superstructure:** The part of a structure that receives the live load directly.
- STRUT:** A member carrying compression. (AISC)
- SUBMERGED ARC WELDING (SAW):** An arc-welding process wherein coalescence is produced by heating with an arc or arcs between a bare metal electrode or electrodes and the work. The arc is shielded by a blanket of granular, fusible material on the work. Pressure is not used and filler metal is obtained from the electrode and sometimes from a supplementary welding rod. (AWS)
- SURFACING:** The deposition of filler metal on a metal surface to obtain desired properties or dimensions. (AWS)
- SURFACING WELD:** A type of weld composed of one or more stringer or weave beads deposited on an unbroken surface to obtain desired properties or dimensions. (AWS)
- SWAY:** To brace laterally or longitudinally against horizontal movement. (AISC)
- SWEATING:** A method of fastening two metallic surfaces together by means of a very thin invisible layer of solder. (AISC)
- SWEAT SOLDERING:** A soldering method in which two or more parts which have been precoated with solder are reheated and assembled into a joint without the use of additional solder. (AWS)
- TACK WELD:** A weld made to hold parts of a weldment in proper alignment until the final welds are made. (AWS)
- TANGENT:** A straight line passing through two consecutive points of a curve. (AISC)
- TEE JOINT:** A joint between two members located approximately at right angles to each other in the form of a T. (AWS)
- TEMPER:** To bring a metal, such as steel, to a proper degree of hardness; the condition of steel relative to the degree of hardness. (AISC)
- TEMPERING:** The act of producing a temper in steel or other metal. (AISC)
- Oil Tempering:** A process of plumbing red-hot steel into oil to harden it; a term frequently used for oil hardening because the effect on the steel is similar to that of quenching in water and then drawing the temper by a subsequent application of a moderate heat.
- Water Tempering:** A process of heating hardened steel to draw the temper (lower the degree of hardness) and quenching in water when the desired condition (as indicated by the color) is attained.
- TEMPORARY WELD:** A weld made to attach a piece or pieces to a weldment for temporary use in handling, shipping or working on the weldment. (AWS)

- TEMPLET OR TEMPLATE:** A full-sized pattern, generally used to lay out work in fabricating shops. (AISC)
- TENSULE:** Pertaining to tension; the character of the force that tends to separate, in the most direct manner possible, the adjoining parts of the body. (AISC)
- TENSION:** The state or condition of being stretched. (AISC)
- TEST PIECE:** A piece, portion or specimen of any material used for testing or determining its qualities and properties.
- TESTING MACHINE:** A machine provided with the mechanism for exerting a force on a specimen of some material and thereby determining its properties. (AISC)
- THERMAL STRESSES:** Stresses set up within a metal or joint caused by differential heating or cooling. (AWS)
- THERMIT CRUCIBLE:** The vessel in which the thermit reaction takes place. (AWS)
- THERMIT MIXTURE:** A mixture of metal oxide and finely divided aluminum with the addition of alloying metals as required. (AWS)
- THERMIT MOLD:** A mold formed around the parts to be welded to receive the molten metal. (AWS)
- THERMIT REACTION:** The chemical reaction between metal oxide and aluminum which produces superheated molten metal and aluminum oxide slab. (AWS)
- THERMIT WELDING (TW):** A group of welding processes wherein coalescence is produced by heating with superheated liquid metal and slag resulting from a chemical reaction between a metal oxide and aluminum, with or without the application of pressure. Filler metal, when used, is obtained from the liquid metal. (AWS)
- THROAT OF A FILLET WELD:** (AWS)
- Theoretical:** The distance from the beginning of the root of the joint perpendicular to the hypotenuse of the largest right-triangle that can be inscribed within the fillet-weld cross section.
- Actual:** The shortest distance from the root of a fillet weld to its face.
- THRUST:** To push; the amount of push. (AISC)
- TIE:** A tension member of a truss. (AISC)
- TIG WELDING:** See preferred term Gas Tungsten-Arc Welding. (AWS)
- TOE CRACK:** A crack in the base metal occurring at the toe of a weld. (AWS)
- TOE OF WELD:** The junction between the face of a weld and the base metal. (AWS)
- TORQUE:** The moment of a force or a system of forces tending to produce rotation; the starting capacity of a rotative machine. (AISC)
- TORSION:** The twist or deformation of a body set up by a torque. (AISC)
- TRANSVERSE:** Extending across; crosswise direction. (AISC)
- TRESTLE:** A structure composed of bents or towers and supporting stringers or girders forming the floor system. (AISC)
- TRUSS:** A framed or jointed structure designed to act as a beam while each of its members is primarily subjected to longitudinal stress only. (AISC)
- Arch Truss:** A truss having an arched upper chord in compression and a straight bottom chord or tie rod with vertical hangers.
- Camelback Truss:** A truss having a broken outline for the upper chord taking the humped shape of a camel's back.
- TURNBUCKLE:** A device for tightening or drawing together two parts of a rod, consisting of a sleeve having an interior right-hand thread at one end and an interior left-hand thread at the other. This sleeve engages the threaded ends of the two pieces of rod so that a turning thereof in one direction screws up on the rods and in the reverse direction unscrews up on the rods and in the reverse direction unscrews on them. (AISC)
- ULTRASONIC COUPLER:** Elements through which ultrasonic vibration is transmitted from the transducer to the tip. (AWS)
- ULTRASONIC SOLDERING:** A soldering method in which high frequency vibratory energy is transmitted through molten solder to remove undesirable surface films and thereby promote wetting of the base metal. This operation is usually accomplished without a flux. (AWS)
- ULTRASONIC SONOTRODE:** The element of the ultrasonic machine through which the vibratory energy and pressure are applied directly to the work. (AWS)
- ULTRASONIC WELDILNG (USW):** A solid state welding process wherein coalescence is produced by the local application of high frequency vibratory energy as the work parts are held together under pressure. (AWS)
- UNDERBEAD CRACK:** A crack in the heat-affected zone generally not extending to the surface of the base metal. (AWS)
- UNDERCUT:** A groove melted into the base metal adjacent the toe or root of a weld and left unfilled by weld metal. (AWS)

- UNDERFILL:** A depression on the face of weld or root surface extending below the surface of the adjacent base metal. (AWS)
- VERTICAL:** An upright member in a truss. (AISC)
- VERTICAL POSITION:** The position of welding wherein the axis of the weld is approximately vertical. (AWS)
- WAX PATTERN:** Wax molded around the parts to be welded by a thermit welding process, to the form desired for the completed weld. (AWS)
- WEB:** The portion of a truss or girder between and connecting the flanges, its function being principally to resist shear. (AISC)
- WELD:** A localized coalescence of metal wherein coalescence is produced either by heating to suitable temperatures, with or without the application of pressure, or by the application of pressure alone, and with or without the use of filler metal. The filler metal either has a melting point approximately the same as the base metals or has a melting point below that of the base metals but above 800°F (427°C). (AWS)
- WELD BEAD:** A weld deposit resulting from a pass. (AWS)
- WELD CRACK:** A crack in weld metal. (AWS)
- WELD METAL:** That portion of a weld which has been melted during welding. (AWS)
- WELD METAL AREA:** The area of the weld metal as measured on the cross section of a weld. (AWS)
- WELD PENETRATION:** See preferred terms Joint Penetration and Root Penetration (AWS)
- WELDABILITY:** The capacity of a metal to be welded under the fabrication conditions imposed into a specific, suitably designed structure and to perform satisfactorily in the intended service. (AWS)
- WELDER:** One who is capable of performing a manual or semiautomatic welding operation. (Sometimes erroneously used to denote a welding machine). (AWS)
- WELDER CERTIFICATION:** Certification in writing that a welder has produced welds meeting prescribed standards. (AWS)
- WELDER QUALIFICATION:** The demonstration of a welder's ability to produce welds meeting prescribed standards. (AWS)
- WELDER REGISTRATION:** The act of registering a welder certification. (AWS)
- WELDING (NOUN):** The metal joining process used in making welds. (AWS)
- WELDING PROCEDURE:** The detailed methods and practices including all joint welding procedures involved in the production of a weldment. See Joint Welding Procedure. (AWS)
- WELDING PROCESS:** A metal-joining process wherein coalescence is produced by heating to suitable temperatures, with or without the application of pressure or by the application of pressure alone, and with or without the use of filler metal. (AWS)
- WELDING ROD:** A form of filler metal used for welding or brazing wherein the filler metal does not conduct the electrical current. (AWS)
- WELDING SEQUENCE:** The order of making the welds in a weldment. (AWS)
- WELDING TECHNIQUE:** The details of a welding operation which, within the limitations of the prescribed joint welding procedure, are controlled by the welder or welding operator. (AWS)
- WELDING TORCH:** A device used in gas welding or torch brazing for mixing and controlling the flow of gases. (AWS)
- WELDMENT:** An assembly whose component parts are joined by welding. (AWS)
- WORK ANGLE:** The angle that the electrode makes with a line perpendicular to the weld axis at the point of welding, taken in a transverse plane. (AWS)
- WORK OF RESILIENCE:** The work done by a deformed elastic body in recovering its normal condition. Theoretically, this is equal to the energy stored in the body during its deformation, provided that the elastic limit of the material has not been passed. (AISC)
- YIELD POINT:** That point, or intensity of stress, at which the rate of stretch begins to increase rapidly. (AISC)
- ZIGZAG:** Staggered. (AISC)

**ABRASIVE:** Hard granular material of varying fineness, used in grinding and/or polishing, or embedded in metal to provide a non-slip surface. (NAAMM)

**ALCLAD:** A term applied to an aluminum product having a thin, metallurgically bonded aluminum alloy covering which is anodic to the alloy it covers, protecting it both physically and electrolytically against corrosion. (NAAMM)

**ALUMILITE:** A trade name used by the Aluminum Company of America for its clear or color impregnated anodized finishes on aluminum. (NAAMM)

**ALUMINIZE:** To apply a surface coating of aluminum on another metal or other base material, usually by spraying or dipping in molten aluminum. "Aluminized Steel" is a trademark of Armco Steel Corporation. (NAAMM)

**ANCHOR:** Any device used to secure a building part or component to adjoining construction or a supporting member. See also FLOOR ANCHOR and JAMB ANCHOR. (NAAMM)

**ANGLED STAIR:** A stair in which successive flights are at an angle of other than 180° to each other (often 90°), with an intermediate platform between them. (NAAMM)

**ANNEAL:** To heat above the critical or recrystallization temperature, then cool, metal, glass, or other materials, to eliminate the effect of cold working, relieve internal stresses or improve electrical, magnetic, or other properties. (NAAMM)

**ANODIC COATING:** The surface finish resulting from anodizing. See ANODIZE. (NAAMM)

**ANODIZE:** To provide a hard non-corrosive oxide film on the surface of a metal, particularly aluminum, by electrolytic action in which the metal being treated serves as the anode. (NAAMM)

**APPLIED TRIM:** A separately applied moulding used as face trim at the periphery of an opening. (NAAMM)

**ARC WELDING:** A process for the joining of metal parts by fusion, with the necessary heat being produced by an electric arc struck between an electrode and the metal or between two electrodes. (NAAMM)

**ARMORED FACEPLATE:** A tamper-proof faceplate or lock front, mortised in the edge of a door to cover the lock mechanism. (NAAMM)

**AS FABRICATED:** (NAAMM)

A term referring to the surface appearance and texture produced on metal mill products by the original forming process.

A term referring to the surface appearance of a fabricated metal product before the removal of any disfigurements caused by the fabricating process.

**BACKBEND (OR BACKBAND):** The return face to the wall surface, at the outer edge of the frame trim around a door, window, or wall opening. (NAAMM)

**BACK PUTTY:** The bedding of glazing compound or sealant which is placed between the face of glass or a panel and the frame or sash containing it. (NAAMM)

**BALUSTER:** One of a series of closely spaced upright members which support the handrail in a railing. (NAAMM)

**BAND (Grating):** A flat welded to a side or end of a grating panel, or along the line of a cutout, and extending neither above nor below the bearing bars. (NAAMM)

**Load-Carrying Band:** A band used in a cutout to transfer the load from unsupported to supported bearing bars.

**Trim Band;** A band which carries no load, but is used chiefly to improve appearance.

**BAR:** A metal section having a square, rectangular, round, hexagonal, or other simple symmetrical cross-sectional shape and a length much greater than its width. (NAAMM)

**BAR SCREEN:** An assembly of equally spaced heavy bars used to stop the passage of large objects in a waste treatment plant. (NAAMM)

**BAR SIZE SECTION:** A hot rolled angle, channel, tee or zee having a greatest cross-sectional dimension less than three inches. (NAAMM)

**BEAM:** A structural member which usually, though not necessarily, extends horizontally and is subjected principally to transverse forces which induce bending. (NAAMM)

**BEARING BAR (Grating):** A load-carrying bar extending in the direction of the grating span. (NAAMM)

**BEARING BAR CENTERS:** The distance between centers of bearing bars in a metal grating. (NAAMM)

**BEARING PLATE:** A steel plate used under the end of a beam or column to distribute the concentrated load. (NAAMM)

**BLOCKING:** (NAAMM)

(Noun): The shims required to level and/or plumb a product in its proper position.

(Verb): The cutting out of a portion of a member to provide clearance.



- BLOW MOLE:** A hole or void in a casting, resulting from entrained gases. (NAAMM)
- BOSS:** An increase of metal thickness for a mechanical connection. (NAAMM)
- BRACKET:** A projecting member attached to a vertical or other surface to support another member. (NAAMM)
- BRAKING:** A mechanical bending operation performed on sheet or plate material, using a press brake or a folding brake. (NAAMM)
- BRAZING:** The joining of metal parts by heating them and, by capillary action, drawing a molten copper-zinc or other brazing alloy between them. (NAAMM)
- BUFFING:** The process of providing a lustrous finish by means of power-operated soft fabric wheels coated with a wax compound containing fine abrasive particles. (NAAMM)
- BULLNOSE STEP:** A stair tread with one or both ends having a semi-circular shape in plan view; usually the first tread at the bottom of a flight. (NAAMM)
- BUMPER BAR:** See GUARD BAR. (NAAMM)
- BURNISHING:** The process of developing a smooth lustrous surface on metal parts by tumbling in a drum with small steel balls or by rubbing with hard metal pads. (NAAMM)
- BUTT JOINT:** A joint formed by placing the squared edge or end of one member against the squared edge or end or the face of another. (NAAMM)
- CAMBER:** A slight curvature intentionally provided in a horizontal load-carrying member to compensate for predicted deflection. (NAAMM)
- CANTILEVER:** A structural member which projects beyond its support(s) sufficiently to induce bending in the projecting part(s) when subjected to transverse loading. (NAAMM)
- CAP:** A fitting used to close the end of a pipe rail or post or the top end of tubular newel. (NAAMM)
- CAP PLATE:** A load-carrying plate placed at the top end of a structural column. (NAAMM)
- CARBON STEEL:** Steel having either: 1) no specified minimum content of alloying elements, 2) a specified minimum copper content not exceeding 0.40%, or 3) maximum specified percentage contents as follows: Manganese 1.65, silicon 0.60, copper 0.60. (NAAMM)
- CARBURIZE:** To produce a hard surface layer on steel by heating in a carbonaceous medium, then quenching to increase the carbon content, also referred to as "case-hardening". (NAAMM)
- CARRIER ANGLE:** An angle connected to the inside face of a stair stringer to form a supporting ledge for the end of a tread or riser. (NAAMM)
- CARRIER BAR:** A flat bar used in the same way as a carrier angle. (NAAMM)
- CARRIERS:** A term for carrier angles or bars used to support treads formed from metal grating. (NAAMM)
- CAULKING CARTRIDGE:** An expendable cylindrical container, fitted with a nozzle and filled with caulking compound, for use in a caulking gun. (NAAMM)
- CAULKING COMPOUND:** A soft, adhesive dough-like material used for sealing joints and openings in buildings and other structures to prevent leakage; usually available in both "gun grade" and "knife grade" consistencies. (NAAMM)
- CAULKING GUN:** A device for applying caulking compound by extrusion under either hand pressure or pneumatic pressure. (NAAMM)
- CAUSTIC DIP:** Immersion of metal in an alkaline solution to clean the surface. (NAAMM)
- CAUSTIC ETCH:** A decorative matte texture produced on aluminum alloys by treatment in an alkaline solution, generally caustic soda (sodium hydroxide); also known as "frosted finish". (NAAMM)
- CEILING STRUT:** An adjustable member extending vertically from the head of a door frame to a rigid support above, to hold the frame in place. (NAAMM)
- CIRCULAR STAIR:** A stair which, in plan view, has an open circular form with a single center of curvature. (NAAMM)
- CLEARANCE:** A space intentionally provided between building parts, either to facilitate operation or installation to insure proper separation, to accommodate dimensional variations or for other reasons. See DOOR CLEARANCE, EDGE CLEARANCE, and FACE CLEARANCE. (NAAMM)
- CLEAR OPENING (Grating):** The distance between faces of bearing bars in a rectangular grating, or between a bent connecting bar and a bearing bar in a riveted grating. (NAAMM)
- CLIP:** (NAAMM)
- A small device, usually of metal, for holding larger parts in place by friction or mechanical action.
- In glazing, a metal spring device used to hold glass in a metal sash.

**CLOSURE BAR (Stairs):** A flat metal bar connected in the field to the top and/or bottom surface or edge of a wall stringer to close gaps between the stringer and the wall. (NAAMM)

**COEFFICIENT OF THERMAL EXPANSION:** The change in dimension of a material due to temperature change per unit of dimension per degree change in temperature; usually expressed in inches per inch per degree F. (NAAMM)

**COLD FINISHED STEEL:** Carbon steel which has been cleaned and pickled, then rolled or drawn through dies to produce a dimensionally accurate section with improved surface finish and often other improved properties. (NAAMM)

**COLD ROLLED:** A term applied to metal sheet or plate which is brought to final thickness and finish by being passed, unheated, between heavy rollers. (NAAMM)

**COLD SHUT:** A defect in a casting having the appearance of a fold or wrinkle. (NAAMM)

**COLD WELDING:** A method of joining metals such as aluminum, by subjecting the thoroughly cleaned joining surfaces to great pressure at normal temperatures, in specially shaped dies. (NAAMM)

**COLUMN:** A structural member which is subjected principally to axial compression loading. (NAAMM)

**CONDENSATION GUTTER:** A trough-like depression in the top of the interior sill of a glazed opening, to collect moisture forming on the indoor face of the glass. (NAAMM)

**COPE:** To cut a portion of one member, either to form a close-fitting joint with, or provide clearance for, another member. (NAAMM)

**CORE:** The portion of a mold used to form the hollow interior of a casting during the casting process. (NAAMM)

**CORROSION:** The deterioration of metal by chemical or electrochemical action due to exposure to weather, moisture, chemicals or other agents or media. (NAAMM)

**COR-TEN:** The trade name used by the United Steel Corporation for its weather type of steel. (NAAMM)

**COUNTERBORE:** To enlarge a hole to receive the head of a bolt or a nut. (NAAMM)

**COUNTERSINK:** To bevel the edge of a hole to receive the conical head of a flat or oval head screw, bolt, or rivet. (NAAMM)

**COVER PLATE:** (NAAMM)

In reference to door hardware, a finish plate used to cover the exposed face of either a floor closer not covered by the threshold or a closer mounted in the head or a door frame.

A reinforcing plate attached to the flange of a structural column or girder.

**CRASH BAR: (HARDWARE):** The cross bar of a panic exit device, serving as a push bar to actuate the panic hardware.

**CRASH BAR HOUSING:** The housing at either end of a crash bar which is mounted on the surface of a door.

**CRIMPING:** (NAAMM)

A process similar to corrugating, but providing a surface which is essentially flat, with regularly spaced small ridges.

A process of preparing wire for weaving into wire mesh.

**CROSS BARS (Grating):** The connecting bars which extend across bearing bars, usually perpendicular to them. They may be bent into a corrugated or sinuous pattern, and where they intersect the bearing bars, are welded, forged or mechanically locked to them. (NAAMM)

**CROSS BAR CENTERS:** The distance center-to-center of the cross bars in a metal grating. (NAAMM)

**CURTAIN WALL, METAL:** An exterior building wall which carries no roof or floor loads and consists entirely or principally of metal, or a combination of metal, glass and other surfacing materials supported by a metal framework. There are two basic types: (NAAMM)

**Custom:** Walls designed specifically for one project, and using parts and details specially made for this purpose.

**Standard:** Walls made up principally of parts and details standardized by their manufacturer and assembled in accord with either the architect's design or the manufacturer's stock patterns.

**CURVED CUT (Grating):** A cutout following a curved pattern. (NAAMM)

**CUTOUT (Grating):** An area where grating has been removed to clear an obstruction or to permit the penetration of a pipe, column, duct, or similar object. (NAAMM)

**DECKING:** Light gage sheets of metal which are ribbed, fluted or otherwise integrally stiffened for use in constructing a floor or roof. (NAAMM)

- DEFLECTION:** A bending deformation in a structural member, usually within the elastic limit of the material. (NAAMM)
- DEFLECTOMETER:** A device for measuring the amount of bending induced in a beam by transverse loading. (NAAMM)
- DEFORMED BAR:** A reinforcing bar having roll-formed lugs or other protrusions. (NAAMM)
- DRAWING:** The process of pulling metal in solid form through dies to alter its finish, mechanical properties or cross-sectional direction. (NAAMM)
- DRESS PLATE:** See COVER PLATE.
- DRIFT PIN:** A tapered round rod used to align holes in two or more pieces of metal. (NAAMM)
- DRIP:** A projecting fin or a groove at the outer edge of a sill, projecting wall element or soffit, designed to interrupt the flow of water downward over the wall or inward across the soffit. (NAAMM)
- DROP (Stairs):** A fitting used to close the bottom end of a tubular newel. (NAAMM)
- DURANODIC:** Trade name used by the Aluminum Company of America for its hard anodic coatings. See HARD ANODIC COATING. (NAAMM)
- DUROMETER:** An instrument for measuring the hardness of relatively soft materials such as rubber. A term often used as a synonym for relative hardness of rubber-like materials. (NAAMM)
- DUST-FREE TIME:** See TACK-FREE TIME. (NAAMM)
- DUSTPROOF STRIKE:** See STRIKE. (NAAMM)
- DUTCH DOOR:** A door consisting of two separate leaves, one above the other, which may be operated either independently or together, the lower leaf usually having a service shelf at its hinge side top edge. (NAAMM)
- EASEMENT (Stairs):** That curved portion of a handrail which forms a transition, in a vertical plane, between a horizontal and an inclined section of the handrail. (NAAMM)
- EDGE CLEARANCE:** The distance between the edge of glass or panel and its surrounding frame, measured normal to the edge in the plane of the glass or panel. (NAAMM)
- ELASTIC LIMIT:** The maximum unit stress which can be applied to a material without causing permanent deflection. (NAAMM)
- ELECTROGALVANIZING:** The coating of ferrous metal with zinc by an electric plating process. (NAAMM)
- EMBOSSSED:** Having a raised and/or an indented pattern impressed on either one or both surfaces (of a sheet of material) by means of patterned rolls or stamping dies. (NAAMM)
- EXPANDED METAL:** An open mesh formed by slitting and drawing metal sheet; made in various patterns and metal thicknesses, with either flat or irregular surfaces. (NAAMM)
- EXPANSION JOINT:** A control joint designed to allow for differential movement of the joining parts due to expansion and/or contraction. (NAAMM)
- EXTENSION BOLT:** See FLUSH BOLT. (NAAMM)
- EXTRUSION:** (NAAMM)  
The process of producing metal shapes by forcing heated metal through an orifice in a die by means of a pressure ram.  
Any item made by this process.
- FACTOR OF SAFETY:** The ratio of yield stress to design or working stress. (NAAMM)
- FASCIA:** (NAAMM)  
In general, a horizontal band treatment on a wall, or the edge facing of a projecting element.  
In metal stairs, the exposed facing of the outer edge of a platform or floor; usually similar in detail to the face stringer.
- FASCIA MOUNT:** See SIDE MOUNT. (NAAMM)
- FATIGUE:** Structural failure of a material caused by repeated or fluctuating application of stresses, none of which individually is sufficient to cause failure. (NAAMM)
- FIELD JOINT:** A connection between two adjoining members or parts, made at the time of installation. (NAAMM)
- FILL (Stairs):** A cementitious material, such as concrete or terrazzo, which is placed over a metal substructure to provide the wearing surface of a tread or platform. (NAAMM)
- FILLER PLATE:** A metal plate used to fill unwanted mortise cutouts in a door or frame. (NAAMM)
- FINS:** (Castings) Metal which has flowed into mold joints and must be removed from the casting. (NAAMMO)
- FLATS:** Metal bars having a rectangular cross-sectional shape. Steel flats have a minimum thickness of 0.203" (5.16mm) and a maximum width of 8" (203mm). (NAAMM)

**FLIGHT:** An interrupted consecutive series of steps. (NAAMM)

**FLIGHT HEADER:** See HEADER, FLIGHT. (NAAMM)

**FLIGHT RISE:** The vertical distance between the floors or platforms connected by a flight of stairs. (NAAMM)

**FLIGHT RUN:** The horizontal distance between the faces of the first and last risers in a flight of stairs. (NAAMM)

**FLOOR ANCHOR:** A metal device attached to the back of a door frame jamb at its base, to secure the frame to the floor; may be either fixed or adjustable in height. (NAAMM)

**FLUSH FITTING:** A pipe or tube fitting having the same outside diameter as the pipe or tube to which it is joined. (NAAMM)

**FLUX:** A substance used in welding, soldering or brazing to promote fusion by preventing oxidation of the surfaces being joined. (NAAMM)

**FORMING:** The process of shaping metal by mechanical action other than machining, forging or casting. (NAAMM)

**GAGE:** (NAAMM)

A number indicating the thickness of metal sheet or the diameter of wire or a screw, in accordance with a standard series of numbers, each of which represents a certain decimal fraction of an inch (or number of millimeters.)

The distance, in inches (millimeters) between adjacent parallel lines of holes, bolts, or rivets.

**GALVANIC ACTION:** See GALVANIC CORROSION. (NAAMM)

**GALVANIC CORROSION:** The electrochemical action which takes place when dissimilar metals are in contact in the presence of an electrolyte, the extent of corrosion being governed by both the difference in potential between the two metals and the relative areas of the metal parts. (NAAMM)

**GALVANIZING:** The process of coating metal with zinc, either by dipping in a bath of molten zinc or by electrolytic action. (NAAMM)

**GASSING:** The addition of a small amount of unleaded gasoline to oil-base glazing compound, to soften its consistency. (NAAMM)

**GLUE LINE:** The plane in which glue or adhesive occurs, in a glued or laminated assembly. (NAAMM)

**GRAB RAIL:** A short length or wall handrail, usually less than 3 feet (91.44 cm) long. (NAAMM)

**GRATING, BAR TYPE:** An open grid assembly of metal bars in which the bearing bars, running in one direction, are spaced by rigid attachment to cross bars running perpendicular to them or by bent connecting bars extending between them. (NAAMM)

**GRATING, PLANK TYPE:** An aluminum extrusion used primarily as a structural flooring member, and consisting of a tread plate reinforced by integral I-beam ribs, with perforations in the tread plate between ribs. (NAAMM)

**GRIT:** A granular abrasive material such as aluminum oxide or silicon carbide, which may be coated on cloth, paper, or wheels for sanding, grinding, or polishing purposes or cast into a metal surface to provide a nonslip finish. (NAAMM)

**GUARD BAR:** A protective bar applied to the lower portion of door or sidelight to prevent collision with the glass. (NAAMM)

**GUARD RAIL:** A railing used in conjunction with an automatically operated door for traffic separation and control. See RAILING. (NAAMM)

**GUN GRADE OR GUN CONSISTENCY:** In reference to caulking or glazing compound, of suitable degree of softness for proper application by caulking gun. (NAAMM)

**GUSSET:** A piece of metal plate used to construct or reinforce a joint between two or more metal members. (NAAMM)

**HAIR-LINE JOINT:** A joint not wider than 1/64" (0.40mm), between abutting members. (NAAMM)

**HAND OF SPIRAL STAIR:** A term used to designate the direction of turn of a spiral stair. Right-hand refers to a stair on which the user turns counterclockwise as he ascends; left hand refers to a stair on which the user turns clockwise as he ascends. (NAAMM)

**HANDRAIL:** The member of the railing which is normally grasped by the hand for support. On a railing at floor level it is the top horizontal member; on a stair flight railing it is a member paralleling the flight and it is often, but not necessarily, the top member. (NAAMM)

**HANDRAIL BRACKET:** A device attached to wall, post, or other surface to support a handrail. A left-hand handrail bracket is one which is located on the user's left as he ascends the stairs; a right-hand handrail bracket is one which is located on the user's right as he ascends. (NAAMM)

- HANGER (Stairs):** A load-carrying tension member used to support a stair framing member by suspension from floor construction or other support above. (NAAMM)
- HARD ANODIC COATING:** A coating provided on aluminum by a proprietary anodizing process, without the use of dyes or pigments. It provides a high resistance to abrasion and corrosion, and is produced in various shades of bronze and gray, as well as black. (NAAMM)
- HARDNESS:** The measure of the resistance of a material to indentation, wear, or abrasion. (NAAMM)
- HEADER, FLIGHT:** A horizontal structural member used in stair construction at a floor or platform level to support the end(s) of one or more stringers. (NAAMM)
- HEADER, PLATFORM:** A horizontal structural member supporting stair platform construction but carrying no stringers. (NAAMM)
- HEADING:** The process of "upsetting" or enlarging the end of a piece of metal. (NAAMM)
- HEADROOM:** The minimum vertical distance from the top surface of a stair tread or platform to the ceiling, soffit or other overhead obstruction, measured at the outer edge of the tread. (NAAMM)
- HIGH STRENGTH LOW ALLOY STEEL:** Steel having a chemical composition specifically developed to impart higher mechanical property values and, in some cases, greater resistance to atmospheric corrosion than is obtainable from conventional carbon structural steels. (NAAMM)
- HOT DIP GALVANIZING:** The process or result of applying a protective coating of ferrous metal by dipping in a bath of molten zinc. (NAAMM)
- HOT ROLLED:** Shaped by passing a heated billet between rollers. (NAAMM)
- HOT WORKING:** The process of forming a metal when its temperature is higher than its recrystallization temperature. (NAAMM)
- I-BAR (Grating):** An extruded aluminum bearing bar having a cross-sectional shape resembling the letter "I". (NAAMM)
- I-BEAM:** A metal member having a constant I-shaped cross-sectional form. (NAAMM)
- I.P.S.:** Iron pipe size; a nominal inside diameter dimension. (NAAMM)
- JUNIOR BEAM or CHANNEL:** A lightweight structural I-beam or channel. (NAAMM)
- KALCOLOR:** The thermal conductivity, or time rate of heat flow, through a unit area of a homogenous material under steady conditions, perpendicular to the temperature gradient. Its value is expressed in BTU per (hour) (square foot) (Fahrenheit degrees per inch or thickness) or in  $W/m \cdot ^\circ K$ . (NAAMM)
- KNOCKED DOWN:** A term used in reference to any product that is shipped disassembled, for assembly at the building site; commonly abbreviated "KD". (NAAMM)
- LANDING:** See PLATFORM. (NAAMM)
- LAP SEAM:** A joint formed by overlapping the edges of metal sheets or plates and joining them by mechanical or other means. (NAAMM)
- LATERAL SCROLL:** A fitting which curves in a horizontal plane, used to terminate a stair handrail. (NAAMM)
- LEADING EDGE:** That vertical edge of a swinging door or window which is opposite the hinge edge; also referred to as "lock edge" or "strike edge". (NAAMM)
- LENGTH (Grating):** The dimension of a grating panel measured to the bearing bars. (NAAMM)
- LINTEL:** A horizontal structural member spanning a wall opening at its head to support the wall above the opening. (NAAMM)
- LOAD-CARRYING BAND (Grating):** See BAND. (NAAMM)
- MECHANICAL CONNECTION (Railing):** A connection between railing members made by means other than welding or adhesive bonding. (NAAMM)
- MECHANICAL PROPERTIES:** Those properties of a material which characterize its response to applied forces; in general, the properties of strength, stiffness, ductility and elasticity. (NAAMM)
- MILLED SURFACE:** A flat metal surface which is finished, by milling, to a specified degree of smoothness. (NAAMM)
- MILL FINISH:** The original surface finish produced on a metal mill product by cold rolling, extruding, or drawing. (NAAMM)
- MILL SCALE:** The scaly oxidized surface produced on steel by heating and hot rolling. (NAAMM)
- MOCKUP:** A section of a wall or other assembly, built full size or to scale, for purposes of testing its performance, studying its construction in the form of water vapor, due to a difference in vapor pressure at the two faces. (NAAMM)

**MOLD:** A form into which molten metal is poured to produce a casting. (NAAMM)

**NEWEL:** A post member usually square or rectangular in cross-section, supporting the end of a stair railing or serving as a common support for two stair railings. (NAAMM)

**NOSING:** That part of a stair tread or platform which projects as a square, rounded or rounded and moulded edge beyond the vertical face of the riser below it. (NAAMM)

**ORGANIC COATING:** A coating such as paint, lacquer, enamel or film in which the principal ingredients are derived from animal or vegetable matter or from some compound of carbon. (NAAMM)

**OXYGEN STARVATION:** Localized corrosion of metals, in the presence of an electrolyte, due to a smothering or "poultice" action or resulting from a crevice between metal and another material. (NAAMM)

**PAN BRACKET (Stairs):** See CARRIER ANGLE or CARRIER BAR. (NAAMM)

**PANEL:** A term used loosely to denote:

A solid filler or facing material either of one piece or an assembly, for use within a surrounding frame, e.g. a spandrel in a wall.

A length of formed metal sheet, or an assembly of such sheets in sandwich form, often with insulation between, for use as a wall material, or

A pre-assembled section of wall, including framing, if any, glazed area and solid area.

The latter definition is not recommended usage. (NAAMM)

**PAN TREAD (Stairs):** See TREAD, PAN TYPE. (NAAMM)

**PARALLEL STAIR:** A stair consisting of flights which parallel each other and are separated only by one or more intermediate platforms. (NAAMM)

**PASSIVATION:** See PICKLING. (NAAMM)

**PERFORATING:** Punching or drilling an overall pattern of holes or openings in sheet metal. (NAAMM)

**PERM:** The unit of measure of the rate of water vapor transmission through a material, expressed in grains per (square foot)(hour) (inches of mercury pressure difference on the two faces), or in  $\text{kg}/\text{Pa}\cdot\text{m}\cdot\text{s}^2$ . (NAAMM)

**PERMANENT SET:** The extent to which a material is permanently deformed by an applied load, after the removal of the load. (NAAMM)

**PHOSPATIZING:** The process of producing a phosphate conversion coating on metal by dipping it in a suitable aqueous solution of phosphoric acid, to improve paint adhesion and increase corrosion resistance. (NAAMM)

**PHYSICAL PROPERTIES:** Those properties of a material such as specific gravity or density, electrical and thermal expansion, which serve to characterize and distinguish between different kinds of matter. (NAAMM)

**PICKLING:** The treatment of metal surfaces with a strong oxidizing agent such as nitric acid, to make them chemically clean and provide a strong inert oxide film. (NAAMM)

**PIPE, ROUND:** A hollow round section of metal, the size of which is usually designated by nominal inside diameter in inches (or millimeters). (NAAMM)

**PITCH (Stairs):** The angle of slope of a flight, measured either in degrees or by the ratio of rise to run. (NAAMM)

**PITCH DIMENSION (Stairs):** The distance between the bases of the top and bottom risers in a flight, measured parallel to the slope. (NAAMM)

**PITTING:** Localized surface defects on metal, in the form of small depressions or "pits", usually caused by electro-chemical corrosion. (NAAMM)

**PLATE:** A flat rolled product having the following dimensional limitations: hot rolled steel, minimum thickness 0.18" (4.76mm) and width exceeding 6" (152mm); stainless steel, minimum thickness 3/16" (4.76mm) and width exceeding 10" (254mm); aluminum, minimum thickness 1/4" (6.35mm), no minimum width specified; copper alloys, thickness exceeding 3/16" (4.76mm) and width greater than 12" (305mm). (NAAMM)

**PLATFORM (Stairs):** A horizontal surface having a dimension parallel to the stringer greater than a tread width and occurring in a stair at the end of a flight or between flights, either at a floor level or between floors. In the latter case it is sometimes referred to as an intermediate platform or landing. (NAAMM)

**PLATFORM HEADER:** See HEADER, PLATFORM. (NAAMM)

**PLINTH:** A section of sheet metal, usually stainless steel, used as a base for a door frame at the floor. It has the same gage and profile as the jamb section and is flush with the jamb on all surfaces. (NAAMM)

**POST (Railing):** A vertical supporting member of a railing. (NAAMM)

**PRESSURE-LOCKED GRATING:** Grating in which the cross bars are mechanically locked to the bearing bars at their intersections by deforming or swaging the metal. (NAAMM)

**PRIMER:** A liquid coating applied to a surface prior to application of one or more coats of paint or other applied finish. (NAAMM)

**QUENCHING:** The process of cooling heated metal by contact with a liquid, gas, or solid, for purposes of hardening or tempering. (NAAMM)

**RADIAL GRATING:** Non-rectangular grating, in which the bearing bars extend radially from a common center and the cross bars have a pattern of concentric circles. (NAAMM)

**RADIALLY CUT GRATING:** Rectangular grating which is cut into panels shaped as annular segments, for use in circular or annular areas. (NAAMM)

**RAIL:** (NAAMM)

A horizontal structural member forming the top or bottom edge of a door or sash, or located at an intermediate height in a door, separating panels or glazed areas.

A horizontal or inclined member of a railing.

**RAILING:** A framework of vertical, horizontal, or inclined members or panels, or some combination of these, supporting a handrail and located at the edge of a stair flight, platform, or floor as a safety barrier. (NAAMM)

**RAKE:** See PITCH. (NAAMM)

**RAKE DIMENSION:** See PITCH DIMENSION. (NAAMM)

**RETICULINE BAR (Grating):** A sinuously bent connecting bar extending between two adjacent bearing bars, alternately contacting and being riveted to each. (NAAMM)

**RETURN:** A rail bend of 180°, as at a stair platform or railing terminal. See also WALL RETURN. See BACKBEND. (NAAMM)

**REVERSE BEVEL:** A term used to designate the hand of a door when the key is on the exterior and the door swings to the exterior. See HAND OF DOOR. (NAAMM)

**REVERSE GRATING:** Grating so constructed that it may be installed either side up, with no difference in appearance or carrying capacity. (NAAMM)

**RIB:** A raised ridge or fold formed in sheet metal, or a formed section attached thereto, to provide stiffness. (NAAMM)

**RISE:** See FLIGHT RISE. (NAAMM)

**RISER:** The vertical or inclined face of a step, extending from the back edge of one tread to the outer edge of the tread or lower edge of the nosing next above it. (NAAMM)

**RISER, OPEN:** A term used to describe a stair having open spaces rather than risers between treads. (NAAMM)

**RISER HEIGHT:** The vertical distance between the top surfaces of two successive treads. (NAAMM)

**RIVET CENTERS:** The distance center-to-center of rivets along one bearing bar, in a riveted grating. (NAAMM)

**RIVETED GRATING:** Grating composed of straight bearing bars and bent connecting bars, which are joined at their contact points by riveting. (NAAMM)

**ROUNDS:** A term referring to cylindrical metal rods. (NAAMM)

**RUN:** See FLIGHT RUN and TREAD RUN. (NAAMM)

**SAFETY NOSING:** A stair nosing having an abrasive nonslip surface flush with the tread surface. (NAAMM)

**SAFETY TREAD:** A stair tread which is covered on its top surface with an abrasive or nonslip material. (NAAMM)

**SAND BLASTING:** Subjecting to a stream of sand projected at high velocity under air or steam pressure, for the purpose of removing scales or encrusted material or to provide a textured finish. (NAAMM)

**SANDWICH PANEL:** A panel made by laminating a core material, usually of low density, between sheets or "skins" of a material or materials of higher density and strength. (NAAMM)

**SANITARY COVE (Stairs):** A small projection formed in the face of a metal riser along its full length to provide an angled or curved transition between the tread surface and the riser face, to facilitate cleaning. (NAAMM)

**SCALE:** See MILL SCALE. (NAAMM)

**SEAMING:** The joining of the edges of a metal sheet or sheets by bending over or doubling and pinching together. (NAAMM)

**SERRATED GRATING:** Grating which has the top surfaces of the bearing bars or the cross bars, or both, notched. (NAAMM)

**SHEET:** A thin flat rolled metal product having mill or cut edges and the following dimensional limitations: hot rolled steel, thickness from 0.449" to 0.5" (1.14 to 12.7mm) and minimum width of 12" (305mm); cold rolled steel, minimum thickness of 0.0142" (0.37mm) and minimum width of 24" (610mm); stainless steel, thickness from 0.006" to 0.249" (0.15 to 6.32mm) and minimum width of 24" (610mm); aluminum, same thickness range as stainless steel, no minimum width specified; copper alloys, thickness no greater than 3/16" (4.76mm) and width greater than 20" (508mm). (NAAMM)

**SHOT BLASTING:** A process similar to sand blasting, except that steel shot is substituted for sand and centrifugal force may be used as a means of projection. See SAND BLASTING. (NAAMM)

**SIDE MOUNT:** A method of railing support, in which the posts are anchored to a vertical surface such as a stringer face or a fascia. (NAAMM)

**SLAG:** The crusty residue resulting from the melting or welding of metal. (NAAMM)

**SLEEVE:** (NAAMM)

A tubular section of sheet metal or other material placed in concrete or masonry to provide either a pocket or opening for the insertion or the penetration of another item.

An internal tubular splice between abutting sections of pipe, tubing, or tube-like members.

**SLIP JOINT:** A joint which permits relative sliding movement of the joining parts. (NAAMM)

**SPAN of GRATING:** The distance between the points of support, or the direction of this dimension. (NAAMM)

**SPINNING:** The process of shaping sheet metal under pressure applied by a hand-held tool while the metal is being rapidly revolved about an axis perpendicular to the plane of the sheet. (NAAMM)

**SPIRAL STAIR:** A stair having triangular-shaped radiating treads, the smaller of which are all attached to and supported by a vertical pipe, or center post. (NAAMM)

**SPLICE PLATE:** A plate used for fastening two or more members together. (NAAMM)

**SPRAYING:** The process of coating metal with paint, another metal or any other material by use of air or hydraulic pressure. (NAAMM)

**SQUARES:** A term used in reference to square metal bars having either slightly rounded or square corners. (NAAMM)

**STAIR:** A flight or series of connected flights extending between two or more floors within a given floor area or stairwell. (NAAMM)

**STAIRWAY:** See STAIR. (NAAMM)

**STAIR WELL:** The vertical shaft space in a building occupied by a stair; also, the open well space between a series of flights. (NAAMM)

**STEP:** The combination of a riser and the tread immediately above it. (NAAMM)

**STIFFENER:** A reinforcing member which serves to prevent or limit the deformation of the member to which it is attached. (NAAMM)

**STRAIGHT RUN STAIR:** A stair extending in a straight line between one floor and the next, and consisting of one flight or a series of flights with one or more intermediate platforms. (NAAMM)

**STRETCHER LEVELING:** The process of flattening metal sheets by subjecting them to a mechanically applied tensile force. (NAAMM)

**STRING:** See STRINGER, the preferred term. (NAAMM)

**STRINGER (Stair):** An inclined structural member supporting a flight of stairs, or a structural member having an inclined section with a horizontal section at one or both ends, supporting a flight and one or two platforms. (NAAMM)

**STRINGER, BOXED:** A stringer having a hollow square or rectangular cross section formed by a channel and plate, two channels welded by a channel and plate, two channels welded flange tip to flange tip, four pieces of plate, or an I-beam section and two plates. (NAAMM)

**STRINGER, CENTER:** A stringer located under a flight at its mid-width and supporting the treads, or treads and risers, by cantilever action. (NAAMM)

**STRINGER, CLOSED:** See STRINGER, BOXED. (NAAMM)

**STRINGER, FACE:** A stringer which supports, on one side, the ends of treads and risers, and is exposed on the other side. (NAAMM)

**STRINGER, OPEN:** A structural channel used as a stringer. (NAAMM)

**STRINGER, PLATE:** A flat plate used as a stringer. (NAAMM)

**STRINGER, PLATFORM:** A stringer, or that part of a stringer, which is used to support a platform. (NAAMM)

**STRINGER, TUBE:** A stringer made from a metal tube section. (NAAMM)



**STRINGER, WALL:** A stringer placed alongside a wall, and usually carrying no railing. (NAAMM)

**STRIP:** A thin flat rolled metal product, narrower than sheet and having sheared or slit edges and the following dimensional limitations: hot rolled steel, thickness from 0.0255" to 0.5" (0.65 to 12.7mm) and maximum width of 12" (305mm); cold rolled steel, thickness less than 1/4" (6.35mm) and width less than 24" (610mm); stainless steel, thickness from 0.006" to 3/16" (0.15 to 4.76mm) and width less than 24" (610mm); copper alloys, thickness no greater than 3/16" (4.76mm) and maximum width of 20" (508mm). (NAAMM)

**STRUT:** A secondary structural member designed to carry axial compression loads. See FLOOR STILT. (NAAMM)

**SUB-BUCK:** See SUB-FRAME. (NAAMM)

**SUB-PLATFORM:** The metal subfloor over which a fill is placed, in metal stair construction, to provide a platform. (NAAMM)

**SUB-TREAD:** See TREAD, PAN TYPE. (NAAMM)

**SURFACE BOLT:** A rod or bolt mounted on the face of the inactive door of a pair to lock it to the frame and/or sill; operated manually by means of a small knob. (NAAMM)

**SWAGGING:** The local deformation or shaping of unheated metal by the application of pressure through a die or dies. (NAAMM)

**TACK-FREE TIME:** The time required for a freshly applied sealant, paint or other compound to form a sufficiently dry surface skin so that dust will not adhere to it. (NAAMM)

**TACK WELD:** (NAAMM)

A small temporary weld applied to metal parts to hold them in correct position while completing an assembly.

One of a series of small welds applied where a continuous weld is unnecessary.

**TEE:** A metal member having a constant T-shaped cross-sectional form. (NAAMM)

**TEMPERING:** The process of heating metal, glass, or other material to a temperature below the transformation stage, then cooling it at a controlled rate to change its hardness, strength, toughness, or other property. (NAAMM)

**TEMPLATE:** (NAAMM)

A pattern used as a guide in fabricating a part.

A precise detailed layout or pattern for providing the necessary fabrication of a door or frame to receive hardware.

**THERMAL BREAK:** An element of low heat conductivity incorporated in an assembly of metal parts to reduce or prevent the flow of heat across the assembly. (NAAMM)

**THERMAL STRESS:** Stress within a material caused by temperature variations. (NAAMM)

**TIN-CANNING:** See OIL-CANNING. (NAAMM)

**TOE BOARD:** See KICK PLATE. (NAAMM)

**TOEPLATE:** In reference to metal grating: A flat bar attached against the outer edge of a grating or rear edge of a tread, and projecting above the top surface of the grating or tread to form a lip or curb. (NAAMM)

**TOLERANCE:** Permissible deviation from a nominal or specified dimension or value. (NAAMM)

**TREAD:** (NAAMM)

The horizontal surface of a step.

A panel of metal grating having carriers and nosing attached by welding, and designed to serve as a stepping surface in a stair.

**TREAD BRACKET:** See CARRIER ANGLE or CARRIER BAR. (NAAMM)

**TREAD, GRATING TYPE:** A tread fabricated from metal grating. (NAAMM)

**TREAD LENGTH:** The dimension of a tread measured perpendicular to the normal line of travel on a stair. (NAAMM)

**TREAD, PAN TYPE:** A section formed from metal sheet to receive a fill and provide, when filled, either a tread or a combination tread and riser. (NAAMM)

**TREAD, PLATE TYPE:** A tread, or a combination of tread and riser, fabricated from metal plate, floor plate, tread plate, or combination of plates. (NAAMM)

**TREAD PLATE:** A product similar to floor plate, but made of aluminum. (NAAMM)

**TREAD RUN:** The horizontal distance between two consecutive risers, or on an open riser stair, the horizontal distance between nosings or the outer edges of successive treads, all measured perpendicular to the front edges of the nosings or treads. (NAAMM)

**TREAD DEPTH:** The tread run plus the projection of the nosing, if any. (NAAMM)

**TRIMMED OPENING:** See CASED OPENING. (NAAMM)

**TUBING:** A hollow section of metal having a round, square, rectangular, or other cross-sectional form. Size is designated by outside dimension(s) in inches or millimetres, and wall thickness in gage number, thousandths of an inch, or millimetres. (NAAMM)

**ULTIMATE SET:** The final degree of firmness obtained by a plastic compound after cure, evaporation of volatiles, or surface polymerization. (NAAMM)

**UNITED INCHES:** A term used in reference to the size of a light of glass; the sum of the length and width of the piece. (NAAMM)

**UPSETTING:** A hot-forging operation by which the cross-sectional area of a bar or rod is locally increased. (NAAMM)

**VOLUTE (Stairs):** A spiral or scroll-shaped fitting used to terminate a stair handrail. (NAAMM)

**WALL HANDRAIL:** A member similar to a handrail, attached independently to a wall, often adjacent to a stair and paralleling the pitch of the flight. Also referred to as Wall Rail. (NAAMM)

**WALL POST:** A vertical end member framing the enclosure wall of a revolving door. (NAAMM)

**WEATHEROMETER:** A device or machine in which specimen materials can be subjected to artificial and accelerated weathering tests, the effects of sun, rain, and temperature change being simulated by electric arcs, water spray, and heating elements respectively. (NAAMM)

**WEEPHOLE:** A small opening provided to permit the drainage of moisture. (NAAMM)

**WELDED GRATING:** Grating in which the bearing bars and cross bars are joined at their intersections by welding or forging. (NAAMM)

**WELDING ROD:** Metal rod of suitable composition to be used as a source of filler metal in arc or gas welding. (NAAMM)

**WET GLAZING:** The sealing of glass or other sheet material in a frame by use of a glazing compound or sealant. (NAAMM)

**WIDE FLANGE:** A term usually designating a hot rolled steel I or H-shaped section having relatively wide flanges with substantially parallel surfaces and square edges. Similar structural shapes are also available in aluminum. (NAAMM)

**WIDTH (Grating):** The overall dimension of a grating panel, measured normal to the bearing bars. (NAAMM)

**WIDNER:** A tread having less width at one end than at the other. (NAAMM)

**WINDOW WALL:** A metal curtain wall which extends between rather than outside of, the edges of building floors. (NAAMM)

**ZEE:** A metal member having a constant Z-shaped cross-sectional form. (NAAMM)