Downey Metal Products
A Family Tradition of Handcrafted Metal Products Since 1964
907 Oothcalooga Street Calhoun GA 30701 PH: 706.602.0955 FAX: 706.602.1545 www.dowmet.com sales@dowmet.com

ALLOYING ELEMENTS - Chemical elements added for improving the properties of the finished products. Some alloying elements are: nickel, chromium, manganese, molybdenum, vanadium, silicone, copper.

ANNEALING – The process of putting material in its softest condition for further processing. This is normally done by heating material to a certain temperature, then cooling it under controlled conditions.

BRINELL HARDNESS – A measurement of a metal's hardness (or ability to resist penetration). A ball is pressed into a sample under a 3000 kilogram load. The diameter of the depression is measured, and the hardness is the ratio of the load to spherical area of the impression.

CAMBER – A bend in a plate or sheet which results because one edge or side is longer than the other. Camber in flat products is often caused by rolls which are closer together at one end than at the other, or by uneven temperatures in the slab. In rails and structural shapes, the camber is the "up or down" curvature, as distinguished from the sidewise curvature or "sweep."

CASE HARDENING – A process of hardening a ferrous alloy so that the surface layer or case is made substantially harder than the interior core. Typically case-hardening processes are carburizing and quenching, cyaniding, carbonitriding, nitriding, induction hardness and flame hardening.

COLD ROLLING (OR **COLD FINISHING**) – A forming process in which metal is rolled or drawn through dies, usually at room temperature. This produces a product with certain advantages over hot rolled steel, such as tighter tolerances, increased properties, improved finish and straightness.

CORROSION – Chemical or electrochemical deterioration of a metal or alloy. A more general definition is the destruction of a material through interaction with its environment.

DUCTILITY – The property that permits permanent deformation before fracture by stress in tension.

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EDGE CONDITION – Mill edge is the normal edge produced in rolling, and does not conform to any definite contour. A cut edge is one that has been cut after rolling. This may be done by shearing or flame cutting. A slit edge results when a coil is cut into multiple widths by means of a rotary knife.

ELONGATION – The change in length of a tensile specimen expressed as a percent of the original gauge length.

FATIGUE RESISTANCE – The ability of a metal to withstand repeated and varying loads.

FINISH – In the steel industry, refers to the type of surface condition desired or existing in the finished product. For cut plates, finish refers to the quality of an edge or surface required for the part to be acceptable.

FORGING – A hot working operation generally involving plastic deformation of metal into desired shapes with compressive force.

FREE MACHINING – (also IMPROVED MACHINING) – A term to describe a type of steel that has been modified, usually by adding sulfur, lead, or selenium to increase its machinability.

GALVANIZING – The process of applying a coating of zinc to cold- reduced sheet, bar, structurals, or to fabricated parts made from steel. The coating is applied by hot dipping or electrolytic deposition and is applied to make the products more corrosive resistant.

HARDNESS – The ability of a metal to resist penetration, defined in terms of the measurement (Brinell, Rockewell, etc.)

HARDENABILITY – The ability of a steel to harden deeply upon quenching.

HEAT – The quantity of steel produced by a furnace in one melting.

HEAT TREATMENT – Any process involving heating metal to an elevated temperature to obtain change in properties or metallurgical structure.

HOT ROLLED – Hot rolled products are those products are those products that are rolled to finish at temperatures above the recrystallization temperature.

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INCLUSIONS – Particles of non-metallic impurities, usually oxides, sulphides, silicates, and such, which are mechanically held in steel during solidification.

KERF – That part of the material lost through processing. The amount will vary, depending on the type and thickness of material, and the process used.

LEVELING – Flattening of coiled metal sheet or strip.

MECHANICAL PROPERTIES – Those properties of a material that reveal the elastic and inelastic reaction when force is applied, or that involve the relationship between stress and strain; for example, the modulus of elasticity, tensile strength and fatigue limit.

PHYSICAL PROPERTIES – Those properties familiarly discussed in physics, exclusive to those described under mechanical properties; for example, density, electrical conductivity, coefficient of thermal expansion.

PICKLE – Chemical or electrochemical removal of surface oxides (surface scale). Pickled steels must be oiled or they will rust rapidly.
PREHEATING – Heating a plate to a specific temperature prior to flame cutting or welding. Preheating reduces the chance of edge cracking caused by stresses due to the thermal gradients and hardness developed in the heat affected zone.

QUENCHING – A process of rapid cooling from an elevated temperature by contact with liquids, gases or solids.

ROCKWELL HARDNESS – A method of measuring the hardness of materials (resistance to penetration). Rockwell measures the hardness by pressing an indenter into the surface of the steel with a specific load, then measuring how far the indenter was able to penetrate. There are a number of Rockwell test; the most common is Rockwell B.

RMS – A means of measuring surface roughness – Root Mean Square. A surface with a theoretical zero value has no surface deviations. As the value increases, the roughness increases.

SCALE – An oxide of iron which forms on the surface of hot rolled material.

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STRESS RELIEVING – A process of reducing residual stresses in material by heating to a suitable temperature and holding for a sufficient time. This treatment may be applied to relieve stresses induced by casting, quenching, normalizing, machining, cold working or welding.

TEMPER- A condition produced in a metal or alloy by mechanical or thermal treatment and having characteristics structure and mechanical properties.

TENSILE STRENGTH – The maximum load in pounds per square inch (PSI) that a material sample will carry before breaking under a slowly applied, gradually increasing load.

TOLERANCE – The permissible deviation from the desired value. The deviation is generally expressed as an upper and lower limit of dimensional acceptance. Material measuring outside the tolerance limits is subject to rejection.

WELDING – A process used to join metals by the application of heat. Parts being welded are pressed together and heated simultaneously, so that recrystallization occurs across the interface.

WORK HARDENING – Increase in resistance to deformation (hardness) produced by cold working.

YIELD STRENGTH – Point at which a material exceeds the elastic limit and will not return to its original length or shape if the stress is removed. This value is determined by evaluating a stress-strain diagram produced during a tensile test, and is expressed in pounds per square inch (PSI)