

# Metal Terms

## General definitions

<b>ALLOY STEEL</b>	Steel containing significant quantities of alloying elements, other than Carbon and the commonly accepted amounts of Manganese, Sulfur and Phosphorus, added to effect physical or mechanical changes in the steel.
<b>ANNEALING</b>	The softening of a steel by re-heating, after forging and holding at a suitable temperature, to refine the grains, and cooling uniformly in the furnace at a suitable rate, depending on steel or alloy.
<b>AUSTENITIC STAINLESS</b>	Normally refers to the Nickel bearing non-magnetic, non-heat treatable grades.
<b>BILLET (BLOOM)</b>	A solid semi-finished round or square product the has been hot worked by forging, rolling or extrusion. This product is then processed further.
<b>BRIGHT ANNEALING</b>	Annealing in a protective medium to prevent discoloration of the bright surface.
<b>BRINELL HARDNESS TEST</b>	A type of hardness testing. The hardness is determined by forcing a hard steel or carbide ball of specified size under specific load.



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<b>BRITTLE FRACTURE</b>	A fracture with little or no plastic deformation.
<b>BUTT WELDING</b>	Joining two edges or ends by playing one against the other and welding them.
<b>CORROSION</b>	The formation of metal carbides when ferrous metal are raised to high temperatures, as in welding, results in increased susceptibility to corrosion.
<b>CARBON STEEL</b>	Commercial or ordinary steel as opposed to alloyed steel, contains carbon up to 2%.
<b>CAST STEEL</b>	Object made by pouring molten steel into mild.
<b>CHAMFER</b>	Bevelling an edge.
<b>CHARPY TEST</b>	An impact test. The metal is usually notched, supported at both ends, and broken by a falling pendulum.
<b>CHROMIUM-NICKEL STEEL</b>	Normally refers to the 18% Chrome 8% Nickel (18-8) stainless steel grades.
<b>CLADDING</b>	The process of covering one metal with another. Done by welding, fusing, electroplating, etc.

<b>COIL</b>	Flat steel or strip in a long length, which is rolled into coils.
<b>COLD FINISH</b>	A smooth finish product by cold working.
<b>COLD ROLLING</b>	Similar to cold reduction. Rolling material at a temperature below the softening point of the metal. This reduces thickness and increases hardness (cold work).
<b>COLD WORK</b>	Plastic deformation by external force such as hammering, drawing, bending which produces hardening of the material. Commercial quality steel sheet, standard quality steel with a ladle analysis of 0,15% max carbon.
<b>CORROSION</b>	The gradual chemical or electro-mechanical attack on metal by atmosphere, moisture or other agent.
<b>CORROSION EMBRITTLEMENT</b>	The severe loss of ductility of a metal resulting from corrosive attack.
<b>COUPON</b>	A piece from which a test specimen may be prepared, usually taken from an integral part of product.
<b>DECARBURIZATION</b>	Loss of Carbon from the surface of a ferrous alloy by heating in oxidizing/reducing atmosphere.



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<b>DRAWING</b>	1 - Forming processed parts by forcing the plastic flow of metals in a die. 2 – Reducing the size or shape of a wire by pulling it through a series of smaller dies.
<b>DRAWN PRODUCT</b>	A product formed by drawing.
<b>DUCTILITY</b>	The ability of a metal to be deformed without fracturing, measured by elongation and reduction of area.
<b>ELECTRICAL CONDUCTIVITY</b>	The capacity of a material to conduct electric current.
<b>ELECTRICAL RESISTIVITY</b>	The electrical resistance of metal.
<b>ELONGATION</b>	In tensile testing, the increase in gage length, measured before fracture of the specimen, given in %.
<b>EXTRUSION</b>	Shaping metal by passing through series of dies.
<b>FATIGUE</b>	The phenomenon leading to the fracture under repeated or fluctuating stress. Fatigue fractures are progressive and minute. Cracks grow under stress.
<b>FATIGUE STRENGTH</b>	The maximum stress that can be sustained for a specific number of cycles without failure.
<b>FERRALLOY</b>	An alloy of iron with a sufficient amount of some element or elements such as Manganese, Chrome or Vanadium for use as

<b>FERROUS</b>	a means of adding these elements to molten steel.
<b>FLAKES</b>	Iron based alloys. “Shatter cracks” or “snowflakes”. Short discontinuous internal fissures in ferrous metals attributed to stress produced by localized transformation and decreased solubility of hydrogen during cooling after hot working.
<b>FLAME ANNEALING</b>	Softening the material by the application of heat from a high temperature flame.
<b>FORGING</b>	Plastically deforming metal, usually hot, into desired shapes with compressive force, with or without dies.
<b>FRACTURE</b>	Surface appearance when surface is broken.
<b>FRACTURE TEST</b>	Breaking of the surface for examination of composition, grain size, case depth and the presence of defects.



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<b>GALLING</b>	When welded areas break off and form an abrasive debris which creates additional abrasion problems and can lead to other type of corrosion.
<b>NORMALIZING</b>	Allow the forging, immediately after forging to cool to defined temperature and re-heating, holding at a suitable temperature, to refine the grain, and cooling in air.
<b>PASSIVATING</b>	To form rapidly an oxide film on the metal surface to prevent corrosion.
<b>PICKLING</b>	Test to detect surface defect of steel by immersion in acid.
<b>QUENCHING</b>	Forgings are fully austenized and rapidly cooled, then reheated to partially re-austenized, followed by quenching in a suitable liquid medium. <u>All quenched forgings shall be tempered.</u>
<b>SEIZING</b>	When one metal piece builds heat against another "weld" together.
<b>TEMPERING</b>	By heating the forgings to a defined temperature ranges for a period related to the maximum section thickness and cooling at suitable rate.

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