

Metal Terms

General definitions

ALLOY STEEL	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.
ANNEALING	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.
AUSTENITIC STAINLESS	Normally refers to the Nickel bearing non-magnetic, non-heat treatable grades.
BILLET (BLOOM)	A solid semi-finished round or square product the has been hot worked by forging, rolling or extrusion. This product is then processed further.
BRIGHT ANNEALING	Annealing in a protective medium to prevent discoloration of the bright surface.
BRINELL HARDNESS TEST	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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BRITTLE FRACTURE	A fracture with little or no plastic deformation.
BUTT WELDING	Joining two edges or ends by playing one against the other and welding them.
CORROSION	The formation of metal carbides when ferrous metal are raised to high temperatures, as in welding, results in increased susceptibility to corrosion.
CARBON STEEL	Commercial or ordinary steel as opposed to alloyed steel, contains carbon up to 2%.
CAST STEEL	Object made by pouring molten steel into mild.
CHAMFER	Bevelling an edge.
CHARPY TEST	An impact test. The metal is usually notched, supported at both ends, and broken by a falling pendulum.
CHROMIUM-NICKEL STEEL	Normally refers to the 18% Chrome 8% Nickel (18-8) stainless steel grades.
CLADDING	The process of covering one metal with another. Done by welding, fusing, electroplating, etc.

COIL	Flat steel or strip in a long length, which is rolled into coils.
COLD FINISH	A smooth finish product by cold working.
COLD ROLLING	Similar to cold reduction. Rolling material at a temperature below the softening point of the metal. This reduces thickness and increases hardness (cold work).
COLD WORK	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.
CORROSION	The gradual chemical or electro-mechanical attack on metal by atmosphere, moisture or other agent.
CORROSION EMBRITTLEMENT	The severe loss of ductility of a metal resulting from corrosive attack.
COUPON	A piece from which a test specimen may be prepared, usually taken from an integral part of product.
DECARBURIZATION	Loss of Carbon from the surface of a ferrous alloy by heating in oxidizing/reducing atmosphere.



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

FERROUS	a means of adding these elements to molten steel.
FLAKES	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.
FLAME ANNEALING	Softening the material by the application of heat from a high temperature flame.
FORGING	Plastically deforming metal, usually hot, into desired shapes with compressive force, with or without dies.
FRACTURE	Surface appearance when surface is broken.
FRACTURE TEST	Breaking of the surface for examination of composition, grain size, case depth and the presence of defects.



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GALLING	When welded areas break off and form an abrasive debris which creates additional abrasion problems and can lead to other type of corrosion.
NORMALIZING	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.
PASSIVATING	To form rapidly an oxide film on the metal surface to prevent corrosion.
PICKLING	Test to detect surface defect of steel by immersion in acid.
QUENCHING	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>
SEIZING	When one metal piece builds heat against another "weld" together.
TEMPERING	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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