



Alloy Steel

Steel containing significant quantities of alloying elements (other than carbon and the commonly accepted amounts of manganese, silicon, sulfur, and phosphorus) added to effect changes in the mechanical or physical properties.

Brinell Hardness Test

A test for determining the hardness of a material by forcing a hard steel or carbide ball of specified diameter into it under a specified load.

Charpy Impact Test

A pendulum-type single-blow impact test in which the specimen, usually notched, is supported at both ends as a simple beam and broken by a falling pendulum. The energy absorbed, as determined by the subsequent rise of the pendulum, is a measure of impact strength or notch toughness.

Check Analysis

An analysis of the metal after it has been rolled or forged into semi-finished or finished forms. It is not a check on the ladle analysis, but is a check against the chemistry ordered, i.e. Product Analysis.

Dye Penetrant Inspection

Non-destructive test employing dye or fluorescent chemical and sometimes black light to detect surface defects.

Elongation

The amount of permanent stretch, usually referring to a measurement of a specimen after fracture is a tensile test. It is expressed as a percentage of the original gauge length.

Hardness

A measure of the degree of a material's resistance to indentation. It is usually determined by measuring resistance to penetration, by such tests as Brinell, Rockwell, and Vickers.

Heat

A Generic term denoting a specific lot of steel, based upon a steel making and casting consideration.

Heat-Affected Zone

That portion of the base metal which was not melted during brazing, cutting, or welding, but whose microstructure and physical properties were altered by the heat.

Heat Analysis

The Chemical Analysis determined by the steel producer as being representative of a specific heat of steel.

Heat Number

The alpha, numeric, or alphanumeric designator used to identify a specific heat of steel.

Heat Treatment

Heating and cooling a steel object in such a way as to obtain desired conditions or properties.

Inspection

The Process of measuring, examining, testing, gauging, or otherwise comparing the unit of product with the applicable requirements. Ladle Analysis: Chemical analysis obtained from a sample taken during the pouring of steel, i.e. heat analysis.

Lap

A surface defect, appearing as a seam, caused by folding over hot metal, fins, or sharp corners and then rolling or forging them into the surface, but not welding them.

Magnetic-Particle Inspection

A nondestructive method of inspection for determining the existence and extent of possible defects in ferromagnetic materials. Finely divided magnetic particles, applied to the magnetized part, are attracted to and outline the pattern of any magnetic-leakage fields created by discontinuities.

Manufacturer

The organization responsible for the conversion of materials into products meeting the requirements of a product specification.

Quenching

Rapid Cooling.

Reduction of Area

(1) Commonly, the difference, expressed as a percentage of original area, between the original cross-sectional area of a tensile test specimen and the minimum cross-sectional area measured after complete separation.
(2) The difference, expressed as a percentage of original area, between original cross-sectional area and that after straining the specimen.

Solution Anneal

Heating steel into a temperature range wherein certain elements or compounds dissolve, followed by cooling at a rate sufficient to maintain these elements in solution at room temperature. The expression is normally applied to stainless and other special steels.

Stabilizing Treatment

Any treatment intended to stabilize the structure of an alloy of the dimensions of a part. Heating austenitic stainless steels that contain titanium, columbium, or tantalum to a suitable temperature below that of a full anneal in order to inactivate the maximum amount of carbon by precipitation as a carbide of titanium, columbium, or tantalum.

Stainless Steel

A Steel that conforms to a specification that requires, by mass percent, a minimum chromium content of 10.5 or more, and a maximum carbon content of less than 1.20.

Steel

A material that conforms to a specification that requires, by mass percent more iron than any other element and a maximum carbon content of generally less than 2.

Tensile Strength

In tensile strength, the ratio of maximum load to original cross-sectional area. Also called ultimate strength.

Ultrasonic Testing

The method of detecting defects or welds by passing high-frequency sound waves into a material, then monitoring and evaluating the reflected signals.

Yield Strength

The stress at which a material exhibits a specified deviation from proportionality of stress. An offset of 0.2% is used for many materials.