

DEFINITIONS

1. TENSILE TEST

Test pieces are used for establishing mechanical properties. When the test is done, four values (1, 2, 3 and 4) are obtained.

2. TENSILE STRENGTH

Definition - The stress required to rupture in tension (pull), expressed in Megapascals (MPa). Also called Breaking Strength, Ultimate Strength and Ultimate Tensile Strength.

3. YIELD STRENGTH

Definition - The stress at which a material exhibits a specified limiting set, commonly taken by the offset method as 0.20 per cent of the specimen's original length, expressed in Megapascals.

4. ELONGATION

Definition - The amount of permanent stretch, after fracture in tension, expressed as a percentage of the specimen's original length.

5. REDUCTION OF AREA

Definition - The difference between the original cross sectional area of a specimen and the least cross sectional area after rupture in tensile tests, expressed in percentage of the original cross sectional area.

6. IMPACT STRENGTH

Definition - A measure of toughness. The force to fracture a notched specimen with a single blow. Expressed in Joules (J) or foot-pounds of energy absorbed. Designated as "Charpy" or "Izod" Impact strength, depending on the testing machine used.

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7. HEAT TREATMENT

Definition - An operation or combination of operations involving the heating and cooling of a metal to obtain certain desirable conditions or properties, and not for the sole purpose of mechanical working.

8. ANNEALING

Definition –

Heating and cooling primarily:

To induce softness

To relieve internal stresses

To obtain the optimum combination of strength and ductility

9. DUCTILITY

Definition - The property which permits deformation under tension without rupture. Values of "Elongation" and "Reduction of area" are generally taken as a measure of ductility.

10. HARDNESS

Definition - Resistance to plastic deformation by indentation, penetration, scratching, or bending. Expressed by means of "Brinell" , "Rockwell" , "Scleroscope" or "Vickers" Hardness numbers, depending upon the testing machine used and should be read in conjunction with specified mechanicals required.

11. STRESS RELIEVING

Definition - Heating and cooling to effect the release of stresses contained in material induced by heat treatment, welding or machining.

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12. TEMPERING

Definition - Bringing about an intermediate condition in steel between being ductile and very hard, to provide a desired combination of hardness and ductility, to achieve prescribed mechanical properties.

13. QUENCHING

Definition - This is the process carried out after the material has been heated to the required hardening temperature. The material is then immersed in specific cooling agents to attain hardnesses which is dependant on the cooling speed which is possible for the hardening temperature concerned.

14. CASE HARDENING

Definition - In applications where it is necessary for components to have a great toughness but, at the same time must have high resistance to wear, the required hardness can be achieved by case hardening the outer surface by means of one of the following methods:

Carburising, Carbonitriding, Nitriding, Nitrocarburising, Tuftriding, Flame Hardening and Induction Hardening.

15. LIMITING RULING SECTION

Definition - The maximum section on which certain mechanical properties are guaranteed according to the British Standard Specification, BS 970 Pt 1 of 1983.

Although every care has been taken in the compilation of this brochure, which is for information only, no responsibility can be accepted for inaccuracies.