

amorphous

materials characterised by certain areas of short-range order; a long-range order does not exist in amorphous substances

anisotropy

engineering property that refers to having a different value when measured in different directions

asbestos

hydrated magnesium silicate; the most common type is fibrous chrysolite (white asbestos); asbestos fibres are variable in length and may be straight or curled

austenite

a face-centred cubic phase in the iron-carbon phase diagram designated as gamma phase, austenite consists of non-magnetic solid solution of carbon in iron

band brake

early version of brake involving an external contracting band wrapped around a hub

castability

the relative ease with which a material may be cast

cast iron

an alloy of iron and carbon in which the carbon is in excess of the amount that can be retained in solid solution in austenite at the eutectic temperature; carbon is usually present in the range of approximately 2% to 4.5%

ceramic

a multi-phase material containing phases composed of compounds of metals and non-metals, ceramics are typically hard and good insulators

coefficient of friction

a ratio of the forces between two surfaces in contact

composites

multi-phase materials formed from a combination of materials which differ in composition or form; remaining bonded together these individual components of composites combine to improve upon the original properties of the component materials

compression

applying pressure to an object to reduce its size or make smaller, a pushing or squeezing force

corrosion

a chemical reaction that results in the conversion of metallic materials into oxides, salts or other compounds; metals undergoing corrosion lose their strength, ductility and other important mechanical properties

ductility

the ease with which a material deforms plastically while undergoing tensile forces such as drawing

elastic limit

the portion of the stress-strain relationship within which a material when loaded and then unloaded will return to its original un-deformed shape; this also equates to the end of the straight line portion of the stress-strain curve

energy

the ability to do work and is measured in joules (J)

engineering stress

calculated using the ratio of the applied load (L) to the undeformed (original) cross-sectional area (A)

friction

a force generated between surfaces opposite to the direction of motion

friction dust

a granular, free-flowing polymerised resin derived from cashew nut shell liquid (CNSL); the main component in processed CNSL is cardanol; cardanol is a naturally occurring material, hydrophobic in nature, and remains flexible and liquid at very low temperatures

Hooke's law

stress is directly proportional to strain within a material's proportional limit

hydraulics

the branch of science that deals with the study and use of liquids, as related to the mechanical aspects of physics; it studies the flow of fluids for which there is virtually no density change