

Glossary of terms

A

ABSORPTION Dissipation or loss of electromagnetic energy in the medium through which the energy passes. Measured in decibels (dB).

ADHESION The attraction of two dissimilar substances. Compare COHESION.

ADHESIVE-SEALANT A material which can perform as both an adhesive and environmental sealant.

AG/BR Silver plated brass.

ARRESTANCE The capacity of an air filter to capture and hold particulate material or dust.

ATTENUATION A loss of energy. Generally expressed in decibels.

B

BLEED To exude a liquid or gaseous material.

BOND, mechanical Joining of objects by means of adhesion.

BUNA-N A synthetic rubber compound useful in applications involving exposure to jet fuels, e.g., JP-1 through JP-6.

BUS A metallic electrical conductor used to make a common electrical connection.

BUTYL A synthetic rubber made by polymerization of butylene and isoprene or butadiene. Useful in applications involving exposure to phosphate type hydraulic fluids.

C

CHOKE FLANGE A waveguide flange having a mating surface designed with a slot to restrict leakage of electromagnetic energy.

CHROMATE CONVERSION COATING A surface protection treatment frequently used in shielding applications. Although non-conductive itself, the chromate conversion coating is easily penetrated by EMI gasket materials when pressure is applied. This low cost finish is usually applied in accordance with MIL-C-5541.

cm Centimeter.

COHESION The mutual attraction by which the elements of a material cling to each other. Compare ADHESION in which the elements of a material cling to the elements of a different material.

COLD FLOW See CREEP.

COMPATIBILITY The ability of two materials to form a chemically stable system. Two or more metals which display no appreciable corrosion when in contact with each other are said to display compatibility.

COMPRESSION The application of pressure to a material as opposed to the application of tension. In the case of cellular or sponge elastomers, compression will result in a decrease in cross-section area. Compression of solid elastomers produces a change in the shape of a cross-section with no change in its area (compare DEFLECTION).

COMPRESSION SET The percent of permanent height reduction in a material caused by compression under specific conditions of load, temperature, and time.

COMPRESSION STOP A material which acts to limit further compression of a gasket material. Used when a specified gap is required to avoid damage to gasket materials due to over-compression.

CONDUCTANCE A measure of the ability of a material to conduct electric current. The reciprocal of the resistance of the material expressed in ohms.

CONDUCTIVITY Conductance of a unit cube of any material. Reciprocal of the volume resistivity, expressed in ohms per centimeter.

CONTACT RESISTANCE The resistance in ohms between two metal objects in contact with each other.

CREEP The diameter change in time of a material under load.

CURE To change the physical properties of a material by chemical reaction through the action of heat or catalysts or a combination of the two.

D

dB See DECIBEL.

DECIBEL (dB) A dimensionless unit for expressing the ratio of two values of power ($10 \log P_1/P_2$) voltage ($20 \log E_1/E_2$).

DEFLECTION The amount of movement of a material as a result of stress. Deflection of elastomers occurs with the application of compression force.

DIELECTRIC STRENGTH The maximum potential gradient an insulating (dielectric) material can withstand before it breaks down, (volts per mil).

DRY BACK Solvent activated dry adhesive for permanent mounting of EMI gaskets which use solid or sponge neoprene rubber.

DYNAMIC RANGE The ratio of the specified maximum signal level capability of a system to its noise level. Usually expressed in decibels.

E

E-FIELD See ELECTRIC FIELD.

ELASTOMER Any of various polymers having elastic properties similar to natural rubber.

ELECTRIC OR E-FIELD The high impedance, or electric, component of an electromagnetic wave. An E-Field induces a charge of a shield. Compare MAGNETIC or H-FIELD.

ELECTROLYTIC CORROSION Corrosion which occurs when a DC current flows between two metals in the presence of a conducting fluid, electrolyte. The rate of corrosion does not depend on the metals (they may be the same) but upon the amount of current and the nature of the corrosive fluid. Compare GALVANIC CORROSION.

ELECTROMAGNETIC COMPATIBILITY (EMC) The ability of electronic equipment or systems to operate in their intended operational environments without causing or suffering unacceptable degradation because of unintentional electromagnetic radiation or response.

ELECTROMAGNETIC INTERFERENCE (EMI) Any electromagnetic interference, periodic or random, which may have a disturbing influence on devices exposed to it.

ELECTROMAGNETIC PULSE (EMP) Broadband, high-intensity, transient electromagnetic fields such as those produced by lightning and nuclear explosions.

ELECTROSTATIC CHARGE An electric charge accumulated on an object, usually by friction.

ELONGATION The fractional increase in length of a material stressed in tension.

EMULSION A suspension of one fluid in another.

EXPANDED METAL A technique whereby metal foil or sheet material is pierced with a pattern of small slits and stretched, or expanded, to yield a screen consisting of one unbroken piece of metal.

F

FILLER Generally, material added to another material in order to improve its existing properties or add new ones. In the case of conductive elastomers (e.g., TECKNIT Consil materials) silver or carbon is introduced to add electrical conductivity.

FLASH The excess material on a rubber part resulting from rubber being forced out of the mold cavity during the molding operation.

FLUOROSILICONE A synthetic rubber useful in applications involving petroleum oils and fuels and silicone oils.

FULL INTEGRITY Said of an enclosure when all seams, joints, and apertures are completely sealed or covered so as to provide no degradation in electromagnetic shielding performance.

FUNGUS Mold, yeast, mildew, and other micro-organisms.

FUNGUS INERT Neither destroying nor supporting fungi.

FUNGUS RESISTANT Unaffected by fungi when tested in accordance with MIL-STD-810, Method 508.

G

G Giga (a multiplier, 10^9).

g Gram (metric unit of mass).

g/cm³ Gram per cubic centimeter. Metric expression

for density (mass per unit volume).

GALVANIC CORROSION Corrosion which occurs between two dissimilar metals in the presence of moisture or some other electrolyte. Under these conditions an electrochemical cell is formed and current will flow from one metal to the other carrying ions of the metal with it (See TECKNIT Report PN 555). Compare ELECTROLYTIC CORROSION.

GASKET, EMI A material, or combination of materials, which conducts electricity and which is used to ensure a continuous low-impedance contact between two surfaces which conduct electromagnetic energy.

GO/NO-GO A test technique in which the object tested is required to perform in a specified manner. If it performs, it passes (GO); if it does not perform, it fails (NO-GO). (e.g., a tapped hole which will (GO) or will not (NO-GO) accept a particular screw-thread gauge).

GROUND A reference potential to which all signal and power voltages are established.

GROUNDING The establishment of an electrically conductive path between two points, with one point generally being a reference point.

GROUNDPLANE A conductive surface or plate used as a common reference point for circuit returns and electrical or signal potentials.

H

HARDNESS Resistance of material to plastic deformation usually by indentation.

HERTZ (Hz) A unit of frequency which is equivalent to one cycle per second (1/s).

H-FIELD See MAGNETIC FIELD.

HONEYCOMB A low air resistance core material used in EMI shielding air vent panels. Generally made of aluminum, brass, or steel, the material consists of multiple hexagonal cells operating as wave guides below cut-off. The material offers extremely low resistance to air flow and high shielding effectiveness.

HYDROSCOPIC Tending to absorb moisture.

Hz See HERTZ (Hz).

I

IMPEDANCE (Z) The total opposition offered by a compound or circuit to the flow of an alternating or varying current. Impedance Z is expressed in ohms and is a combination of resistance R and reactance X, computed as $Z = \sqrt{R^2 + X^2}$. Impedance is also computed as $Z = E/I$, where E is applied a-c voltage and I is the resulting current. In computations, impedance is handled as a complex ratio of voltage to current.

IMPINGEMENT FILTER An air filter coated with a viscous fluid to improve its dust attestance and holding capacity.

INSERTION LOSS The loss in power due to the insertion of a gasket, window, or vent panel in a seam, joint, or aperture. Generally expressed as the ratio in decibels of the power received before insertion to the power received after insertion.

IRIDITE See CHROMATE CONVERSION COAT-ING.

K

k Kilo (multiplier, 10^3).

K kelvin (a unit of temperature).

M

m Milli (a multiplier, 10^{-3}).

M Mega (a multiplier, 10^6).

MAGNETIC or H-FIELD The low impedance, or magnetic component of an electromagnetic wave. A magnetic field induces current in a shield. Compare ELECTRIC or E-FIELD.

MIL 0.001 inch.

MONEL An alloy of nickel and copper.

N

NECKING The localized reduction in cross-section that may occur in a material under tensile stress.

NEOPRENE Polychloroprene Rubber. A general purpose polymer with many desirable characteristics, including high resilience with low compression set and flame resistance. Attacked by ozone and various hydrocarbon fluids including jet fuels.

NOMINAL A stated value as opposed to an actual one. Values expressed as nominals may actually express a mid point between two limits, or an average, normal, or typical value.

NONSETTING Nonhardening.

O

OHM (W) A unit of electrical resistance.

OHM-cm A unit of material volume resistivity.

OVERCOMPRESSION Compression which causes irreparable damage to a material or component.

P

PARAMETER A quantity to which arbitrary values may be assigned.

PASCAL (Pa) The metric unit of pressure or stress equal to one n/m^2 , or 0.000145 psi.

PERMEABILITY (m) A relative measure of the ability of a material to serve as a path for magnetic lines of force based on air = 1. Permeability is the magnetic induction B in gauss divided by the magnetizing force H in oersteds.

PLANE WAVE A simple wave in which all points normal to the direction of propagation are in phase.

PRESSURE-SENSITIVE ADHESIVE An adhesive which, under normal conditions of temperature and humidity, remains tacky. Used on gasket materials as a positioning aid during equipment assembly. It is not intended to be used for permanent mounting. See DRY BACK.

POT LIFE The period of time during which a reacting plastic or rubber compound remains suitable for application after a reaction with an initiating agent or hardener.

R

RADIATION Electromagnetic energy, such as light waves, sound waves, radio waves, x-rays, infra-red and thermal waves traveling through a medium or through space.

RADIO WAVES (or Hertzian Waves) Electromagnetic waves in the frequency range of 3 kHz to 300 GHz propagated in space without artificial guide.

REF. Reference information. Not a requirement.

REFLECTION The loss of electromagnetic energy due to reflection at the air-metal boundary of a shield. The efficiency of the reflecting shield is a complex function of the wave and shield impedance. Compare ABSORPTION.

RELATIVE CONDUCTIVITY A comparative measure of electrical conductivity based on copper = 1.

RESILIENCY The ratio of energy input is a rapid instantaneous full recovery of a deformed specimen.

RFI Radio Frequency Interference. Electromagnetic interference (EMI) within the frequency range 3 kHz to 300 GHz.

RH Relative humidity.

RTV (Room Temperature Vulcanizing) An elastomeric adhesive which cures at room temperature, about 23°C.

S

SHELF LIFE Length of time under specified conditions that a material retains its usability and specified properties.

SHIELD Electrically conductive materials placed around a circuit, component, or cable to suppress the effect of an electromagnetic field within or beyond definite regions.

SHIELDING EFFECTIVENESS The effectiveness of a given material as a shield under a specific set of conditions, measured in decibels (dB).

SHIELD-SEAL A material which provides both EMI and environmental sealing.

SHORE A A scale used for the measurement of hardness with a durometer.

SILICONES Polymeric materials in which the recurring chemical group contains silicon and oxygen atoms as links in the main chain.

SINTERED Metal particles fused together under pressure at a temperature below their melting points.

Sn/Cu/Fe Tecknit designation for a tin coated, copper-clad steel wire used to make EMI gasket materials.

STRESS RELAXATION The decrease in stress after a given time at constant strain.

STRIPLINE A type of transmission line which consists of a single narrow conductor parallel and equi-distant to one or two wide ground planes.

SURFACE RESISTIVITY The resistance of a material between two opposite sides of a unit square of its surface.

T

TEAR STRENGTH The maximum force required to tear a specified specimen the force acting substantially parallel to the major axis of the test specimen.

TENSILE STRENGTH The maximum tensile stress applied during stretching a specimen to rupture.

THERMOPLASTIC A term used to describe those materials which can be repeatedly made to flow under the application of heat.

THERMOSETTING A term used to describe plastic materials that are capable of being changed into substantially infusible or insoluble products when cured by application of heat or by chemical means. Once cured, the plastic cannot be made to flow.

THIXOTROPIC Describes materials that are gel-like at rest but fluid when agitated.

TOGGLE BOOT A component designed to provide EMI shielding and moisture sealing for toggle switches.

V

VISCOSITY The resistance of a material to flow under stress.

VOLUME RESISTIVITY The electrical resistance between opposite faces of a centimeter cube of material, commonly expressed in ohm-centimeters (ohm-cm).

W

W.G. Water gauge.

WICKING Capillary absorption of liquid (including water) along fibers or holes in a base material.

W/m-K Watt per meter-kelvin (metric unit of thermal conductivity).