MERCER
Gasket & Shim

GASKET GLOSSARY

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A

Abrasion - The wearing away of a material surface by friction. Particles become detached by a combined cutting, shearing and tearing action. Furnace carbon blacks are the best ingredients found for increasing the resistance of rubber compounds to abrasion.

Abrasion resistance - The resistance of a material to loss of surface particles due to friction

Accelerated Aging - Procedures for subjecting pressure- sensitive label stock to special environmental conditions in order to predict the course of natural aging.

Acetate - A plastic synthesized from cellulose dissolved in acetic acid which exhibits rigidity, dimension stability, and ink receptivity.

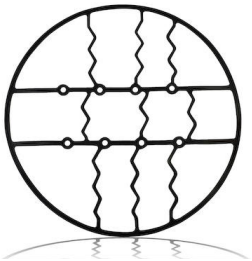
Acid Resistant - Withstands the action of acids.

Acrylic Adhesive - Adhesive made from acrylic monomers that have been polymerized. They have good resistance to UV radiation, plasticizer and extreme temperatures.

Adapters - A "V" shaped ring either male or female to fit together with "V" shaped rings to form a set of adjustable hydraulic packing.

Adhesion (a) - The state in which two surfaces are held together by interfacial forces which may consist of molecular forces or interlocking action, or both.

Adhesion (b) - The clinging or sticking of two (2) material surfaces to one another. In rubber parlance, the strength of bond or union between two (2) rubber surfaces or plies cured or uncured. The bond between a cured rubber surface and a non-rubber surface, e.g., glass, metal, wood, fabric.



Adhesion Failure - The separation of two materials at the surface interface rather than within one of the materials itself.

A

Aging (a) - (1) The irreversible change of material properties after environmental exposure for an interval of time;

(2) Exposing materials to an environment for an interval of time.

Aging (b) - Changes in physical and mechanical properties that occur when low carbon steel is stored for some time. Aging is also accelerated by exposure of steel to elevated temperatures.

Aging (c) - A progressive change in the chemical and physical properties or rubber, especially vulcanized rubber, usually marked by deterioration. Aging may be retarded by the use or antioxidants.

Artificial Aging - Speeding up the natural aging cycle by heating the metal for a short time.

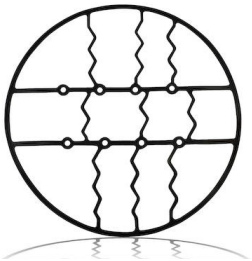
Air Curing – The vulcanization of a rubber product in air, as distinguished from vulcanizing in a press or steam vulcanizer.

Aluminum - A pliable, lightweight metal that has good electrical and thermal conductivity, high reflectivity, and resistance to oxidation.

Aluminum Seal Rings - Sealing rings for pistons made from high grade aluminum alloy

Annealing - A process involving high-temperature heating and cooling of the as-rolled cold rolled steel substrate to make it softer and more formable

Anodize - The controlled oxidation of aluminum using an electro-chemical process to create a porous surface that is receptive to color dying.



Anti-Extrusion Rings - Also, called back-up rings or anti-extrusion rings, used to fit behind rubber o-ring seals to prevent extrusion into the gap between the metal pieces

A-B

Antioxidant - Usually organic and nitrogenous. A substance which inhibits, or retards, oxidation and certain other kinds of aging. Some antioxidants cause staining or discoloration of the rubber compound on exposure to light and are used only in black or dark-colored goods. Others (phenolic), described as non-staining, are used in white or light-colored goods.

Anti-vibration Mounts - Rubber molded pieces used as padding between a motor and the frame to prevent vibration transfer to the machine to which it is mounted.

Apportion-ment - Referred to here as a part of Reliability Engineering. Synonymous with the term Reliability Apportionment, which is the assignment of reliability goals from system to subsystem in such a way that the whole system will have the required reliability?

Assortment Kits – A convenient package containing several sizes of the same seal, o-ring or retainer ring.

Automatic U-joints - Also called u-cups, u-cups or u cups. A "U" shaped sealing ring made from a strong pliable plastic or rubber.

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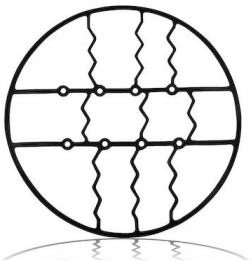
Backer Coat - Usually refers to the coating on the reverse side of a prepainted sheet. The backer coating is generally not as narrowly specified with reference to its color, thickness and composition as is the topcoat.



Backrinding - Defect in which the rubber adjacent to the mold parting line shrinks below the level of the molded product, often leaving the parting line ragged and torn.

B

Backringing - Distortion at the mold parting line usually in the form of wrinkles, folds, tears or indention's. In severe cases may cause over-all dimensional changes.

Baffle Rings - A ring used to slow the flow of fluids along a shaft.

Ball Valve Seats - A PTFE ring shaped to fit against the ball in a flow control valve.

Batch - The product of the one mixing operation in an intermittent process.

Bearings - A machined or molded plastic ring used as a guide ring or wear ring in a hydraulic cylinder.

Bearing Seals - A seal ring made to snap-fit into a ball, roller or spherical bearing to exclude dust, dirt or trash.

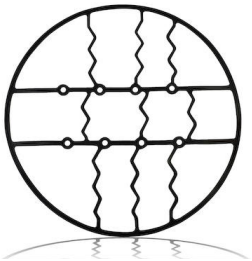
Bellows - A corrugated rubber or plastic piece which can stretch with a shaft to keep the shaft clean.

Belts - A v-belt, flat belt or drive belt made from plastic or rubber.

Bezel - A grooved rim, which holds another covering or item. Similar to a frame.

Bias Angle - (1) Acute angle between the direction of the cut and the diameter of the wrap in the production of wrapping for hose; (2) Acute angle between the direction of the cut and the direction of the cords in the production of fabric plies.

Bill of Material - Total list of all components/materials required to manufacture the product.



Blister - A cavity or sac that deforms the surface of a material.

Bond - The union of materials by use of adhesives, usually used in related parts vulcanized after attaching.

B

Bonded Seals - A flat steel washer with a rubber sealing ring molded into the center to fit over a bolt to provide a seal.

Bonding Agents - Substances or mixtures of substances that are used for attaching rubber to metal, fabrics or other substrates. Generally the rubber compound is vulcanized by heat in the process. Cyclized rubber or rubber isomers, halogenated rubber, rubber hydrochloride, reaction product of natural rubber and acrylonitrile, polymers containing diisocyanates, are all used.

Brittleness - Tendency to crack when subjected to deformation.

Bumpers - A rubber or plastic part used to prevent metal-to-metal contact.

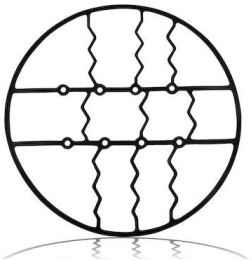
Buna N - A general term for the copolymers of butadiene and acrylonitrile. Typical commercial polymers are Hycar and Paracril.

Buna S - A general term for the copolymers of butadiene and styrene.

Bushing - A rubber or plastic spacer to provide a wear surface around a shaft.

Butadiene - $CH_2=CH-CH=CH_2$. A gaseous hydrocarbon of the diolefin series, boiling at 5~C. Also known as erythrene, divinyl, pyrollylene, polymerizable to a synthetic rubber, polybutadiene. Butadiene is the chief raw material for making the synthetic rubbers today. Co polymerized with styrene it yields SBR or GR-S; with acrylonitrile the various Buna N or nitrile synthetic rubbers are obtained.

Butt Joint - Joining two ends of material whereby the junction is perpendicular to the ID of an O-ring.



Butyl - A synthetic rubber of the polybutene type exhibiting very low permeability to gases.

B-C

Butyl Rubber - A copolymer of isobutylene and isoprene, polymerized almost instantaneously in methyl chloride with aluminum chloride at about ñ140F. Butyl is resistant to ozone and the action of many other corrosive chemicals. Butyl rubber is resistant to permeation by gases.

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CALIPER - The thickness of a sheet material. The thickness is usually expressed in one thousands of an inch and in millimeters (i.e. 0.050 is expressed as 50 mils).

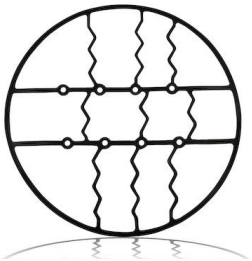
Camber - The deviation of a side edge from a straight line, the measurement being taken on the concave side with a straight edge.

Carbon black (a) - Elemental carbon in finely divided form used to reinforce elastomeric compounds.

Carbon Black (b) - Finely divided carbon formed by the incomplete combustion of natural gas or petroleum in large, closed furnaces.

Carbon Steel - Steel which owes its properties chiefly to carbon without substantial amounts of other alloying elements; also known as straight carbon steel or plain carbon steel.

Catalyst - A chemical in small quantities which accelerates a chemical reaction without itself necessarily becoming part of the final product.



Cavity - The area on a die where blades are formed to cut. A die with 1 or more cutouts that are the same size for each label cut.

C

Cellular Rubber - Rubber products which contain cells or small hollow receptacles. The cells may either be open or interconnecting or closed and not interconnecting.

Characteristics Matrix - An analytical technique for displaying the relationship between process parameters and manufacturing stations.

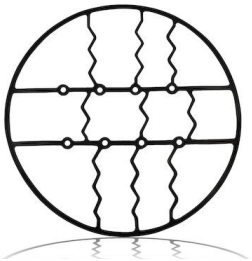
Checking - The short, shallow cracks on the surface of a rubber product, resulting from damaging action by environmental conditions.

Checking. Sunlight - The development of minute surface fissures as a result of exposing rubber articles to sunlight, generally accelerated by bending or stretching.

Chemical Resistance - The resistance offered by elastomer products to physical or chemical reactions as a result of contact with or immersion in various solvents, acids, alkalis, salts, etc..

Chemical Treatment - An aqueous solution of corrosion-inhibiting chemicals, typically chromates or chromate/phosphate.

Chevron Packings - Also called V-Packing, Vee packing, Chevron Packing, Parachute packing or v-set packing. A complete vee packing set contains multiple "V" shaped sealing rings stacked and nested together with a male adapter on one end and a female adapter on the other end.



Chloroprene - 2-Chloro-l, 3-butadiene, a volatile, colorless liquid which boils at 59c., synthesized from acetylene. It is used in the manufacture of neoprene, which is obtained by polymerizing chloroprene under suitable conditions.

C

Chevrons - See Chevron Packing above.

C.I. - The abbreviation for cloth- inserted, indicating a sheet of rubber containing one or more plies of fabric covered with rubber.

Closed Cell - A cell totally enclosed by its walls and hence not interconnecting with other cells.

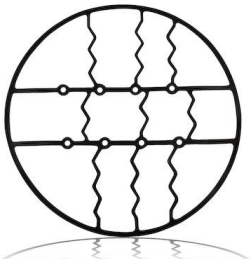
Coil Breaks - Creases or ridges in sheet that appear as parallel lines across the direction of rolling, and that generally extends the full width of the sheet or strip.

Cold Flow - Continued deformation under stress.

Cold Rolled Products - Flat rolled products for which the required final thickness has been obtained by rolling at room temperature.

Cold Working - Applying a mechanical force (such as deep drawing) to metal at room temperature at such a rate that strain-hardening occurs.

Color Standard - A painted sheet panel with a prescribed color of paint representing the precise color it is intended to produce in the prepainted sheet. The color standard will preferably also be expressed in terms of physical attributes of hue, lightness and saturation called tristimulus values or derivatives of these values. A complete color standard definition will usually include painted panels representative of the limits of acceptable deviation from the precise standard color as well.



Coefficient of Expansion - The coefficient of linear expansion is the ratio of the change in length per degree to the length at 0 Celsius. The coefficient of surface expansion is two (2) times the linear coefficient. The coefficient of volume expansion (for solids) is three (3) times the linear coefficient. The coefficient of volume expansion for liquids is the ratio of the change in volume per degree to the volume at 0 Celsius.

C

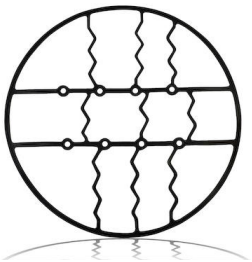
Commercial Steel (CS) - Sheet of this quality is for simple bending or moderate forming. Commercial Steel sheet can be bent flat upon itself in any direction at room temperature.

Compact Seals - Multi-piece seal sets, generally used as piston seals in a hydraulic cylinder. Made to fit in a limit space, compact piston seals contain a primary sealing component, guide rings and back-up rings in one convenient set.

Compound (a) - A term applied to either vulcanized or unvulcanized mixtures of elastomers and other ingredients necessary to make a useful rubber-like material.

Compound (b) - In chemistry, it is the material resulting from the chemical union of two or more elements in definite proportions and in which the properties of the individual elements have disappeared. – 2). In rubber manufacture, it is the composition or formula of stock, the ingredients of which, however, may not all be chemically combined and is therefore more of a physical mixture.

Compression Deflection Characteristics - The tests for compression-deflection characteristics constitute methods of compression stiffness measurement. One compression test involves the determination of a load required to case a specified deflection, and another is a compression test in which a specified weight or compressive force is placed on the specimen and the resulting deflection is measured and recorded.



Compression Set - The residual decrease in thickness of a test specimen measured 30 minutes after removal from a suitable loading device in which the specimen has been subjected for a definite time to compressive deformation under specified conditions of load application and temperature. Method a measures compression set of vulcanized rubber under constant load. Method B employs constant deflection.

C

Compression Set - The residual deformation of a material after removal of the compressive stress.

Conductive - To conduct or transmit heat or electricity.

Conductive Adhesive - An adhesive that incorporates conductive fibers. These fibers have the ability to conduct electricity through the thickness of the adhesive and/or in the plane of the adhesive. Ideal for EMI/RFI shield and EMI/RFI gasket attachment.

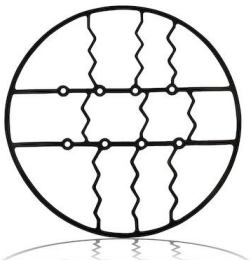
Conformability - The ability of an adhesive tape to mold itself to the shape of an object without wrinkling or creasing. Converting – The process of taking a material or adhesive and altering it from one form to another.

Contact stain - Discoloration of a product by another material or by a rubber article in the area directly touching it.

Copolymer (a) - A polymer consisting of two different monomers chemically combined.

Copolymer (b) - A copolymer is a high polymer consisting of molecules containing large numbers of units of two or more chemically different types in irregular sequence. Butadiene (78) and styrene (22) forms a copolymer known as GR-S.

Copper Seal Rings - Rings made from thin copper formed over fibrous filler to seal in high temperature.



Corrosion - Gradual chemical or electrochemical attack on a metal by atmospheric moisture or other agents.

Crazing - A surface effect on rubber articles characterized by many minute cracks.

Creep - The deformation, in either cured or uncured rubber under stress, which occurs with lapse of time after the immediate deformation.

C

Creep Relaxation - In a flange gasket, loss of stress accompanied by constantly decreasing compressed thickness. This type of relaxation is encountered in bolted flange joints.

Cross linked - The establishment of a chemical bond between the molecular chains of a given polymer, thereby enhancing physical properties.

Critical Surface - Intended for material applied to critical exposed/painted applications where cosmetic surface imperfections are objectionable. The prime side surface will be free of repetitive type imperfections, gouges, scratches, scale and slivers. This surface can only be furnished as a pickled product.

Cross Section - An O-ring as viewed if cut at right angles to the axis showing internal structure.

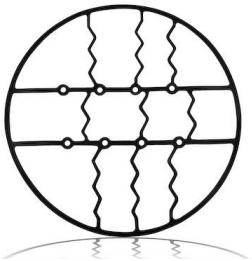
Crush Washers - A washer made to be crushed to form a seal.

Crown - A contour on a sheet where the thickness increases from some edge measurement to the center.

Cup Packing - Sealing devices made in the shape of a cup with outer lips curved upward usually made from rubber, fabric reinforced rubber or polyurethane.

Cure - The act of vulcanization. See Vulcanization.

Cushioning Seals - Sealing rings mounted into a cylinder to cushion the stroke or prevent metal to metal contact.



Custom Molded Products - Special shaped parts molded from rubber or plastic made to fit the machine or device it is used in.

C-D

Cut - The distance between cuts or parallel faces of articles produced by repetitive slicing or cutting of long preshaped rods or tubes such as lathe cut washers. Cut Edge – Removal of the as-rolled hot mill edge. Coil ends are cropped back to gauge when cut edge is ordered.
Cut Outs – The spaces or holes designated in the label. This material is punched and removed during the manufacturing process.

Cystalinity - Stretched natural rubber forms a high oriented state and shows X-ray diffraction patterns and other properties common to truly crystalline materials. The amorphous and crystalline regions are not mechanically separable phases, but the same molecule may at the same time have part of its length in a crystalline, and the remainder in an amorphous region.

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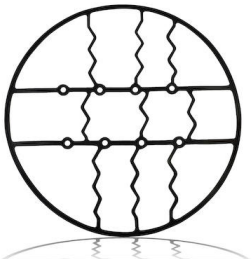
Damper - The use of a variety of materials to deaden or damp a vibration.

Deep Drawing - The process of working metal blanks in dies on a press into shapes which are usually more or less cup-like in character.

Deep Drawing Steel (DDS) - Sheet of this designation should be used when Drawing Steel will not provide a sufficient degree of ductility for fabrication of parts having stringent drawing requirements, or applications that require the sheet be free from aging. This quality is made by special steelmaking and finishing practices.

Density - The weight per unit volume of a material – usually expressed in PCF (pounds per cubic foot).



A

Dent Resistant - BH Series- Sheet of this designation is produced from partially stabilized steel and offers a unique combination of as-received formability and final properties after fabrication. Sheet of this designation combines strength and high formability. Although this steel is non-aging at room temperature, it gains strength from work-hardening during fabrication and from carbon-aging during paint-baking. (Sometimesreferred to as "bake hardenable.")

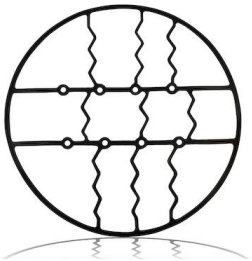
Design Failure Mode and Effects Analysis (DFMEA) - An analytical technique used by a design responsible engineer/team as a means to assure, to the extent possible, that potential failure modes and their associated causes/mechanisms have been considered and addressed.

Design for Manufacturability and Assembly - A simultaneous engineering process designed to optimize the relationship between design function, manufacturability; and ease of assembly.

Design Information Checklist - A mistake proofing checklist designed to assure that all important items are considered in establishing design requirements.

Design Reviews - A proactive process to prevent problems and misunderstandings.

Design Validation - Testing to ensure that product conforms to defined user needs and/or requirements. Design validation follows successful design verification and is normally performed on the final product under defined operating conditions. Multiple validations may be performed if there are different intended uses.



A

Design Verification - Testing to ensure that all design outputs meet design input requirements. Design verification may include activities such as:

Design Review - Performing Alternate Calculations – Understanding Tests and Demonstrations – Review of Design Stage Documents Before Release

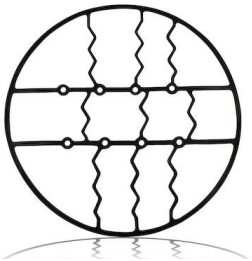
Dielectric strength - The measure of a product's ability to resist passage of a disruptive discharge produced by an electric stress; the voltage that an insulating material can withstand before breakdown occurs.

Die Cutting - When parts are cut into individual pieces using a steel rule die. Sharp steel rule dies are formed to desired shape in a wooden carrier for cutting labels. A die may be one or more "up" (one cavity or more). Common knife refers to a multiple-up die with a kiss cut or a single knife cut to the release liner between labels, known at LustreCal as a strip die. The other basic format is a multiple die with space between cavities, known at LustreCal as an individual units die. The space between cavities allows for cutting down to individual units.
A single cavity die is an individual unit's die.

Die Guide - A guide around a label that assists with positioning of die and /or keeping art to edge tolerances. Die Impression – A piece of material that has been cut with a die, but not cut all the way through.

Discs - Flat, round saucer shaped pieces made from rubber or plastic.

Disperse - To cause particles or molecules of matter to separate and become uniformly scattered throughout a medium. In a rubber compound, the particles of compounding ingredients are dispersed in the rubber. In latex, rubber globules are dispersed in an aqueous medium.



Distributor Seals - Sealing rings used to seal in oil and seal out dust, dirt or trash on an automobile engine electric spark distributor.

D

Double Acting Seals - Seal rings which seal in two directions, on the push and the pull stroke of a hydraulic or pneumatic cylinder.

Double-Coated - Tape with adhesive on both sides.

Drawing Steel (DS) - Sheet of this quality has a greater degree of ductility and is more consistent in performance than Commercial Steel because of higher standards in production, selection and melting of the steel.

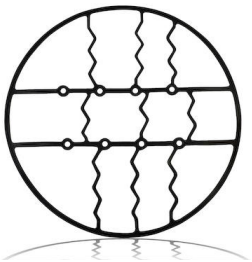
Duck - A compact, firm, heavy, plain weave fabric made from cotton or synthetic fibers, or a combination of both. Duck is also known as canvas, army duck, belt duck harvester duck, hose duck and shoe duck.

Ductility - The ability to permit change of shape without fracture. In flat rolled steel, ductility is usually measured by hardness or mechanical properties in a tensile test.

Dumb-Bell (Test-Piece) - In the physical testing of rubber, a strip test-piece is used that is shaped like a dumb-bell, i.e., constricted in the middle and flaring out at the ends, as distinguished from circular or ring test-piece. The dumb-bell is the most commonly used form or test-piece. Dimensions are set by ASTM standards.

Duocone Seals - A special cone-shaped sealing ring.

Durability - The probability that an item will continue to function at customer expectation levels, at the useful life without requiring overhaul or rebuild due to wearout.



D-E

Durometer - The most common Durometer. Type A or A-2 is an instrument for determining the hardness or rubber by measuring its resistance to the penetration (without puncturing) of a blunt indentor point impressed on the rubber surface against the action of a spring; a hand and special scale indicate the resistance to penetration 01. "Hardness". The scale reads from zero (0) to 100, zero (0) being very soft and 100 being very hard. The Type D durometer has a sharp indentor point and is used to measure varying degrees of hard rubber up to ebonite.

Dust Seals - Seals used to exclude dust from a machine or device.

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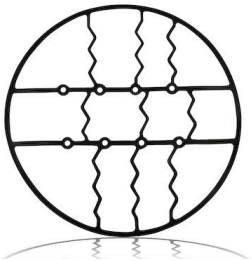
Elasticity – The property of an article which tends to return to its original shape after deformation.

Elastic Modulus – The value of the load (in pounds per square inch of original cross-section) required to give an intermediate elongation, is usually called the modulus at that elongation. The expression used is "modulus at 300 percent elongation." Tensile-stress observations of this sort arc exceedingly useful in characterizing a particular compound, since by indicating the position and shape of the stress-curve. They show the relative toughness of the vulcanization.

Elastomer – A macromolecular material which, in the vulcanized state, at room temperature can be stretched repeatedly to at least twice its original length and which, upon release of the stress, will immediately return to approximately its original length.



Elongation – In the physical testing of rubber, the increase in length of a test-piece when stretched, usually expressed as a percentage of the original length; for example a 1"piece stretched (0 6"has an elongation of 500%. Elongation at break — the elongation of a test-piece at the moment of rupture, usually expressed as percentage of the original length.

E

Emboss – A process of forming a portion of the substrate to rise above the normal level of the substrate. An example is a button or a raised logo.

Embossed sheet – An embossed sheet is one having a prominent, impressed texture or pattern on its surface(s). If the defined texture is applied to essentially on surface only, it is most properly termed a coined surface. If the texture or pattern carries through the entire body of the sheet and appears on both surfaces it is a true embossed surface.

Embrittlement – A rubber compound becoming brittle during low or high temperature exposure or in the process or aging.

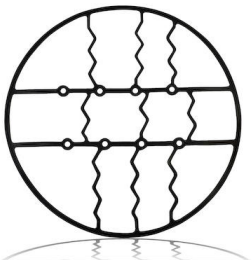
Encapsulated O-rings – A rubber o-ring with a thin jacket of PTFE or PTFE surrounding the softer core material, which allows it to be used in chemical applications.

Etching – To produce a pattern or design on a hard material by eating into the material's surface.

Excluders – Also called wipers or scrapers – used in a hydraulic or pneumatic cylinder to exclude and scrape the rod clean.

Expanded Rubber – Cellular rubber having closed cells made from a solid rubber compound.

Extra Deep Drawing Steel – Sheet of this designation has superior formability and excellent uniformity. It is produced from steel having a very low carbon content with stabilizing elements added to make it interstitial free. It is a non-aging steel sheet with high resistance to thinning during drawing and is suitable for critical forming applications.



E-F

Extra Smooth Galvanized – An Extra-Smooth finish is imparted to hot-dip metallic-coated steel sheet by temper rolling after coating to decrease the surface relief that occurs when the molten coating solidifies. The spangle pattern (grain pattern) is made distinctly less visible by the matte finish imparted by the rolling operation. Most Extra-Smooth sheet is intended for either prepainted or post painted applications.

Extrusion – 1) Distortion, under pressure, of portion of seal into clearance between mating metal parts.

2) Material, under pressure, which is forced through the opening of a die in order to obtain a desired cross sectional shape.

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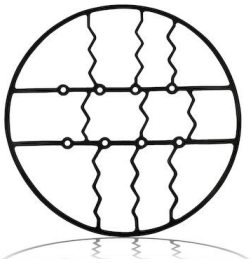
Face Seals – Rubber rings used like a gasket between two flat pieces of metal.

Failure Modes Analysis (FMA) – A formal, structured procedure used to analyze failure mode data from both current and prior processes to prevent occurrence of those failure modes in the future.

Fastener Seals – See Bonded Seals.

Feasibility – A determination that a process, design, procedure, or plan can be successfully accomplished in the required time frame.



Fiber Seal Rings – A gasket or other die cut, waterjet cut or formed ring used to seal between two surfaces.

Filler – Any compounding material, usually in powder form, added to rubber in a substantial volume to improve quality or lower cost. The most important reinforcing filler is carbon black. The most important inert filler, diluent or extender is whiting.

F

Finish, Mold – The quality or appearance of the machined surface of a mold.

Finish, Product – The quality or appearance of the surface of a rubber product.

Finite Element Analysis – A technique for modeling a complex structure. When the mathematical model is subjected to known loads, the displacement of the structure may be determined.

Flange Packing – A pipe flange gasket.

Flange Seals – A seal used on the bolt-up flange on a hydraulic system – usually on the hose fitting or pipe flanges.

Flash – Excess rubber on a molded product resulting from cavity overflow at the parting lines where the mold sections are separated.

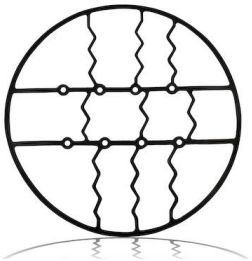
Flatness – Flatness is a measure of a cut length sheet's ability to conform to a flat horizontal surface. Maximum deviation from that surface is the degree to which the sheet is out of flat. Flatness is often expressed quantitatively in either Steepness or I-Units.

Flex cracking – A cracking condition of the surface of rubber articles such as tires and footwear, resulting from constantly repeated bending or flexing in service.

Flow Marks – Surface imperfections due to improper flow and failure of stock to knit or blend with itself during the molding operation.

Foil – Another name for thin gauge aluminum (see Aluminum).

Friction – Resistance to motion due to the contact of surfaces.



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G

Gap Seals – A seal ring used to seal between the gaps of metal or plastic.

Gasket – A flat, non-moving, compressible rubber-like device squeezed between two flat surfaces forming a static seal. Gaskets can be made from homogeneous rubber, fabric reinforced rubber, fibrous materials with rubber binders, flexible graphite, PTFE and many other materials. Some gaskets are made from a combination of metal and fibrous materials and some are all metal. An o-ring, while not flat is also referred to as a gasket at times.

Gate – (**rubber injection or transfer mold**) – The orifice used to control the flow of rubber, and through which a shaped cavity in a mold is filled with rubber.

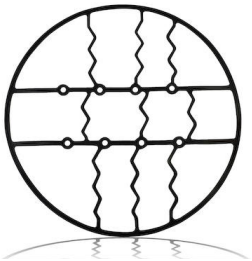
Gland Bearing Rings – Also called guide rings or wear rings used as a bearing surface for the rod of a hydraulic ram or cylinder.

Gland Seals – Seals or packings used as the main sealing device in a ram or cylinder.

Glandsele – The brand name of a type of rod seal.

Glass Temperature (Tg) – The temperature at which a rubber becomes glass-like. A more recent name for Second Order Transition point.

Glass transition point – Temperature at which a material loses its glass-like properties and becomes a semi-liquid.



Globe Valve Discs – PTFE rings used to seal in a globe valve.

G

Gloss – The property of a surface related to its ability to reflect light. The most common type of gloss of interest to appearance attributes is specular gloss. The parameters which must be specified for the determination of this property are the angles of incidence of the light source, the angle of viewing of the gloss and the angular dispersions of the measuring beams.

Glyd Ring – Also known as wear rings or guide rings – made from plastic, PTFE or soft metal to act as a bearing surface for a cylinder rod.

Grain – The unidirectional orientation of rubber or filler particles occurring during processing (extrusion, milling, calendering) resulting in anisotropy of a rubber vulcanizate.

Grain Direction – The arrangement of a pattern on the material.

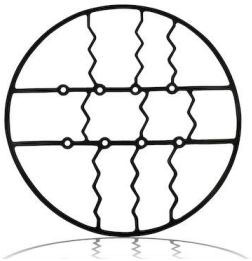
Grease Seals – Also called oil seals, rotary seals or shaft seals. Made of rubber to seal grease in a housing with a rotating shaft.

Green strength – (1) The resistance to deformation of a rubber stock in the uncured state.

(2) Uncured adhesion between plied or spliced surfaces.

Grommets – A rubber ring used to fit into a hole in sheet metal allow wires, shafts or rod to exit the housing without touching the metal.

Guiding Elements – Wear rings, guide rings, guiding rings, bearing rings for hydraulic cylinder rods.



Gauge – The thickness of a material.

Guide Rings – See also wear rings, guide rings or bearing rings. Usually made from a form of PTFE or PTFE.

H

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H-ring – Also called H-Wiper. An "H" shaped rod wiper ring made from NBR or polyurethane for a hydraulic or pneumatic cylinder.

Hardness (a) – The relative resistance of rubber to the penetration (without puncturing) of a blunt point impressed on its surface.

Hardness (b) – Resistance of metal to penetration of the surface.

Hat Packings – Usually made from leather, it is used as a rod seal or ram seal in a hydraulic cylinder.

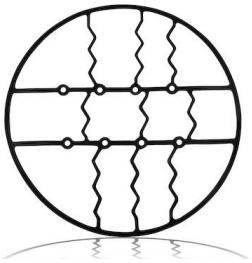
Heat history – The accumulated amount of heat a rubber stock has been subjected to during processing operations, usually after incorporation of the vulcanizing agents. Incipient cure or scorch can take place if heat history has been excessive.

Heavy Gauge Foil – Aluminum foil greater than .008" thick (8 mils).

HiClean – A brand name for rod wipers.

High Pressure Seals – Seals to be used in high pressure hydraulic applications made from PTFE, urethane or fabric reinforced material.

Hot Rolled Sheet – Steel sheet that is processed to its final thickness by rolling at high temperatures on a specially designed hot-rolling facility. Also commonly known as hot rolled unprocessed.



Hot Rolled Sheet Non-Temper Rolled – A U. S. Steel definition for product supplied as a coil directly off the Hot Strip Mill with no additional processing.

H-I

Hot Rolled Sheet Pickled – A U. S. Steel definition for a mill edge coil that is pickled, oiled and temper rolled with coil ends cropped back to meet gauge tolerances.

Hot Rolled Sheet Pickled Non-Temper Rolled – A U. S. Steel definition for a mill edge coil that is pickled and oiled with coil ends cropped back to meet gauge tolerances.

Hydraulic Cylinder Kits – A selection of seals used to completely repair a cylinder or ram.

Hydraulic Packings – Packing rings used in a hydraulic ram or cylinder.

Hydrolysis – Chemical decomposition of a substance involving the addition of water.

Hysteresis (a) – The heat generated by rapid deformation of a vulcanized rubber part. It is the difference between the energy of the deforming stress and the energy of the recovery cycle.

Hysteresis (b) – Hysteresis or energy loss is the difference between the work input and the work output as measured under the curves or extension and retraction (stress and elongation curves). The difference becomes heat build-up.

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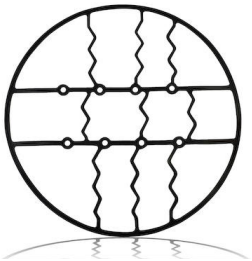

Inclusions – Particles of foreign material (such as oxides, sulfides or silicates) in steel as cast.

Impact Test – A test which is intended to evaluate the brittleness, toughness, adhesion and hardness of paint films applied to metals by subjecting them to an indent impact force.

Injection

I-K

Molding – A method of forming articles (such as plastic) by heating the molding material until it can flow and injecting it into a mold

Insert – A part, usually metal, which is placed in a mold and appears as an integral part of the molded product.

Internal Mixer – An enclosed mixing machine for rubber or other suitable material, inside or which are two (2) heavy mixing rotors which revolve in opposite directions with a small clearance between themselves and tine enclosing walls. The mixing chamber is jacketed or otherwise arranged for water-cooling, and is provided with a feeding hopper which can be closed by means of a pneumatically operated, vertical ram. Leading examples are the Banbury, the Boiling and the Shaw mixers.

IRHD (International Rubber Hardness) – For complete definition see ASTM D 1415-68 Standard Method of Test for International Hardness of Vulcanized Natural And Synthetic Rubbers.

Isolators – A term used to describe a bearing seal – which replaces an oil seal providing more reliable sealing.

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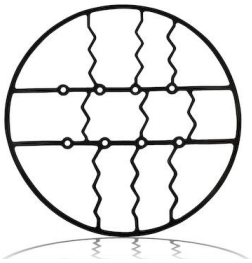
Kantseal – A brand name of a special seal. Kiss-Cut – Die-cutting material so that it stays in roll form. The finished pieces are easily peeled from the release liner.



Knit mark – Where raw stock did not unite into a homogeneous mass during the vulcanization. This is also called poor knitting. See Flow marks

K-L

K-Type Fluid Seals – A "K" shaped sealing ring used in a hydraulic or pneumatic cylinder.

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Labyrinth Seals –A non-contacting, rotary seal with a series of internal grooves to divert the flow and lubricating fluids in the direct of its source used on a shaft.

Laminate – Product made by bonding together two or more layers of like, or unlike materials.

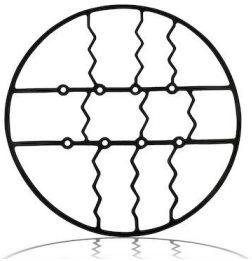
Lantern Rings – A spacer ring with grooves and port holes used in the stuffing box of a pump or other rotating equipment utilizing braided packings, to allow an outside source of lubrication.

Lathe Cut Seals – A seal or gasket ring cut square on a lathe.

Liner Side – The adhesive side covered by the release liner.

Lip Packing & Rings – Could be the description of a u-cup or of an oil seals. A seal with a lip design to provide sealing.

Lip Seals – Seal rings having lips to provide a flexible, dynamic sealing against a shaft.



Loaded Lip Seals – A hydraulic u-cup which has an o-ring or quad ring fitted into the u-shaped groove to assure good low pressure sealing on a reciprocating shaft.

Loaded U-Cups – Same as loaded lip seals.

L-M

Low Film – A thin film of oil on the shaft of a hydraulic cylinder.

Low temperature flexibility – The ability of a rubber product to be flexed, bent, or bowed at specified low temperature without loss of serviceability.

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Magnesia – (a) Heavy calcined: Magnesium oxide by calcination of magnetite (natural magnesium carbonate), and then ground for use as a compounding ingredient for molded goods and hard rubber.

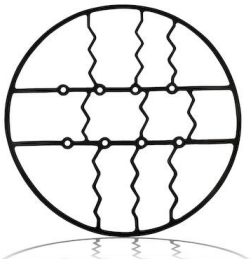
(b) Light calcined: Magnesium oxide by calcinations of purified magnesium carbonate and/or magnesium hydroxide. It has a fine particle size and a bulk factor of 10 to 30 pds. Per cubic ft. Used chiefly in neoprene stocks.

(c) Extra light calcined: Prepared similarly by calcinations of magnesium carbonate, but with a bulk factor of 4 to 6 pds. Per cubic ft. Used chiefly in neoprene stocks.

Maintainability –The probability that a failed system can be made operable in a specified interval or downtime.

Mandrel – A bar, serving as a core, around which rubber is extruded, forming a center hole.

Masterbatch – A preliminary mixture of rubber and one or more compound ingredients for such purposes as more thorough dispersion or better processing, and which will later become part of the final compound in a subsequent mixing operation.



M

Master Batch – A mixture of rubber with one (1) or more ingredients in definite but higher concentrations than those in which they normally occur in a complete rubber mix. Used for efficiency in compounding, and also to avoid the handling of small quantities of accelerators, antioxidants, color, etc...

Masticate – To work rubber on a mixing mill or in an internal mixer till it becomes soft and plastic. To break down. MASTICATOR – A machine for plasticizing rubber by mechanical work.

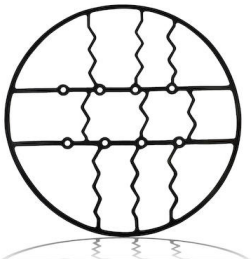
Matte – A satin or flat finish on the surface of a label.

Matte Finish – A more uniform surface finish imparted to the sheet surface by temper rolling with shot-blasted rolls.

Mechanical Properties – The properties of a material that reveal its elastic and inelastic behavior when force is applied, thereby indicating its suitability for mechanical applications.

Metal O-rings – An o-ring usually made from hollow stainless steel tubing, with a small vent hole.

Micrometer – A caliper for making precise measurements that has a spindle moved by a finely threaded screw.



M

Mill – A machine consisting of two (2) adjacent, heavy, chilled iron rolls set horizontally, and which revolve in opposite directions (i.e., upper surfaces rotate), used for the mechanical working of rubber Mills are of different types. For masticating, and mixing compounds the rolls are smooth and revolve with differential speed. For creeping and washing rubber, mills have scored or fluted rolls and differential speeds and may be equipped to spray the rubber with water. Mills with even-speed rolls are occasionally used for different purposes. Mills are corridor hollow and equipped for internal heating with steam or cooling with water.

Mils – Thousandths of an inch.

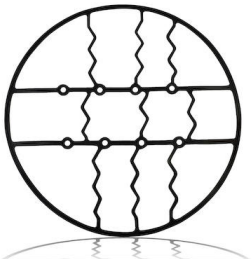
Mixing – The process of incorporating the ingredients or a rubber compound into the rubber, usually done on a mixing mill or in an internal mixer. The mixing process consists in (1) breaking down the rubber, (2) gradual incorporation or compounding ingredients, (3) final working of the rubber after all ingredients are in, and (4) removing the mixed compound from the mill in sheets.

Modulus – The ratio of stress to strain. In the physical testing of rubber, the load necessary to produce stated percentage of elongation, compression or shear.

Modulus – In the physical testing of rubber, the ratio of stress to strain, i.e., the load in pounds per square inch or kilos. Per square cm. of initial cross-sectional area necessary to produce a stated percentage-elongation. It is a measure of toughness, is influenced by pigmentation, state of cure, quality or rubber and other factors.

Mold Register – Means used to align the parts of a mold.

Monomer – A simple chemical compound that enters into the production of a polymer.



M-N

Mooney scorch – A measure of the incipient curing characteristics of a rubber compound using the Mooney viscometer.

Mooney Viscometer – A laboratory testing machine for measuring the plasticity of raw rubber or unvulcanized rubber compounds. A knurled steel rotor disc winch is centrally embedded iii the heated rubber specimen firmly held in a cavity under pressure is caused to rotate at a low speed (2 rpm). The resistance offered by the plastic rubber mass to the rotation of the rotor disc is the measure of the plasticity of the rubber. The machine is also used to determine the scorch characteristics of rubber mixes.

Mooney viscosity – A measure of the viscosity of a rubber or rubber com- pound determined in a Mooney shearing disc viscometer.

Mounts – A rubber molded part used as a motor mount or to mount device against a frame without allowing vibration to pass through the mounting.

Mylar – A non-metallic material derived from polyester.

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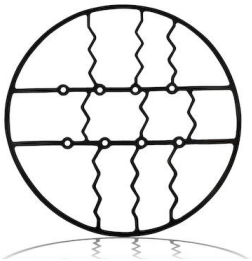
Nebar – A special type of gasket material used in electrical transformers.

Neoprene – Synthetic rubber made by polymerizing 2-chlor-1, 3-butadiene. Neoprene compounds are rioted for their resistance to oil, sunlight and ozone. There are various types, most of which are vulcanizable without the use or sulfur.



Nerve – The elastic resistance of unvulcanized rubber or rubber compounds to permanent deformation during processing.

Nilos Rings – A special seal ring.

N-O

Nitrile Rubber – A generic term comprising the various copolymers of butadiene and acrylonitrile. The copolymers vary essentially in butadiene-acrylonitrile ratios, Mooney values and staining properties. They are resistant to solvents, oils, and greases and to bent and abrasion. Some trade names are Chemigum, Krynac, Nipol, Hycar, and Paracril. The Germans first produced the nitrile rubbers and called them Buna N and Perbunan.

Non-Blooming – The absence of a bloom.

Non-Metallic – Any material that lacks the characteristics of a metal.

Novathan – A name for a type of polyurethane sealing material.

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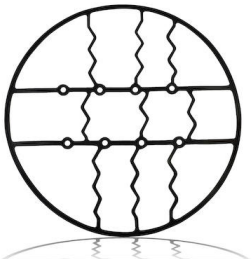
O.D. – Outside diameter measured at tangency between bottom radius (R1) and side.

Oil Resistance – Ability to withstand swelling by a specified oily liquid for specified time and temperature, expressed as percentage swelling or volume increase of specimen.

Oil Resistance – as applied to vulcanized elastomer compositions: resistance to change in size and shape and resistance to loss in physical (mechanical) properties due to contacts with or immersion in an oil.

Oil Resistant – Ability of a vulcanized rubber to resist the swelling and deteriorating effects of various types of oils.



Oil Seals – Also called grease seals, rotary seals or shaft seals. Made of rubber to seal grease in housing with a rotating shaft.

Open Cell – A cell not totally enclosed by its walls and hence interconnecting with other cells.

O

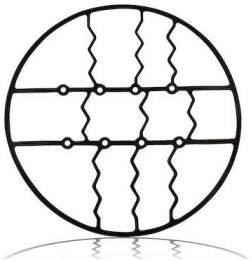
Open Steam Cure – A vulcanization process that takes place under direct steam pressure in an autoclave. It is used where direct pressure molding is not possible. In -the case of vulcanization of sheeting, or coated fabrics, rolls of product are wound onto steel drums (with suitable interleaf) which are placed in the autoclave for cure. Some tubing arid shaped products are placed on pans for extra curing.

Optimum Cure (a) – State of vulcanization at which maximum desired property is attained.

Optimum Cure (b) - The physical properties of a rubber compound vulcanized at a given temperature for increasing periods of time undergo continuous change. For example, tensile strength may rise to a maximum, continue on a plateau, and then decline; whereas breaking elongation may continuously decrease. Therefore it is impossible to choose any one time of cure at which every property will be at its optimum, hence optimum cure is a compromise and may be considered as that time required obtaining the combination of properties most desirable for the article under consideration.

Opti-Seal – A special seal ring to provide optimum sealing.

O-rings – O-ring seals are circular rings of various cross-sectional configurations installed in a gland to close off a passageway and prevent escape or loss of a fluid or gas. An oring is specified by three of its features: its dimensions, material, and hardness. Material and hardness specify the elastomeric compound and Shore A (durometer) hardness of the compound that is used to manufacture the o-ring. An O-ring's dimensions are described by stating its inside diameter (I.D.) and its cross-section. Designing for o-rings depends on three major and interrelated variables: the operating conditions or environment the seal will experience, the gland geometry into which the seal will be installed and the three variables account for the fact that there are so many different types of seals and applications.



O-P

Overcure – A state of excessive vulcanization resulting from overstepping the optimum cure, i.e., vulcanizing longer than necessary to attain full development of physical strength. Manifested by softness or brittleness, and impaired age resisting quality of the vulcanization.

Oxidation – Active oxygen organic materials. This is called oxidation. Rate of degradation will increase with rising temperatures.

Ozone – An allotropic from oxygen, (03), produced by (he action of electrical discharges in air. It is a gas with a characteristic odor, and Is a powerful oxidizing agent. Rubber compounds in a stretched condition are susceptible to the deteriorating action of ozone in the atmosphere, which results in a cracked condition.

Ozone cracking – The surface cracks, checks, or crazing caused by exposure to an atmosphere containing ozone.

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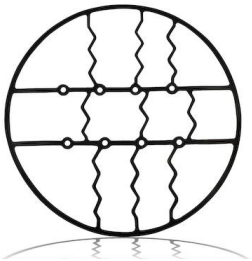
Packaging – A unit that provides protection and containment of items plus ease of handling by manual or mechanical means.

Packing – An adjustable sealing device on a ram, valve stem or pump shaft — old technology and leakage is required for lubrication. If packing leaks, it is simply tightened slightly to 'control' the leakage. For pumps and valves, packings can be rope-like, braided into continuous lengths and then cut to size to fit a shaft. For hydraulic applications, v-shaped fabric reinforced rubber rings are used. Early hydraulic packings were made from leather. For a rubber o-ring, that particular item can be found called a seal, a gasket and a packing ring – even in U.S. government technical specifications dating back 50 years



Pads – A rubber part used as an anti-vibration device.

P

Parachute Packings – Also called V-Packing, Vee packing, Chevron Packing, Parachute packing or v-set packing. A complete vee packing set contains multiple "V" shaped sealing rings stacked and nested together with a male adapter on one end and a female adapter on the other end.

Parbacks – A back-up ring with a concave shape on one side, used as an anti-extrusion ring for an o-ring.

Perforated – To make a line of holes for purposes of easing the separating of two or more items.

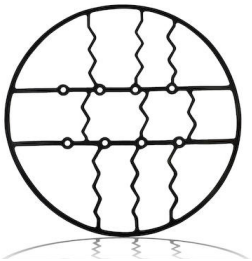
Permanent Set – The amount by which an elastic material fails to return to its original form after a deformation. In the case of elongation, the difference between the length after retraction and the original length, expressed as a percentage of the original length, is called the permanent set. Permanent set is dependent on quality and type of rubber, degree and type of filler loading, state of vulcanization, and amount of deformation.

Permeability – To permit passage of gas through the molecular structure of a given material.

Pickling – Removing surface oxides from metals by a chemical reaction.

Piston Bearing Rings – Also called guide rings, wear rings, piston guide rings.

Piston Guide Rings – Also called guide rings, wear rings, piston rings usually made from nylon or POM.



Piston Rings – Any ring used on the piston of a hydraulic or pneumatic cylinder.

Piston Seals & Packings – Any seal or packing ring used on the piston of a hydraulic or pneumatic cylinder.

P

Piston T-Seals – A "T" shaped rubber seal, with back-up rings of a harder material on each side, used as a piston seal.

Plasticity – (1) A measure of the resistance to shear of an unvulcanized elastomer; (2) A tendency of a material to remain deformed after reduction of the deforming stress to or below its yield stress.

Plasticizer – A substance that softens or plasticizes another substance through its solvent action.

Plunger Pump Seals – Packing seal rings used to seal the plunger of a reciprocating pump.

Plunger Seals – Sealing rings used on a plunger.

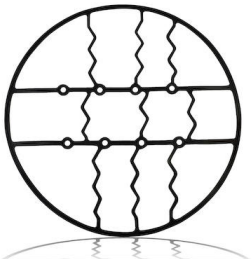
Plugs – A cone shaped rubber part used to be forced into a tube end or hole to make a complete seal.

Pneumatic Seals – Any seal or packing ring, usually flexible rubber, used to seal against compressed air instead of hydraulic fluid or other liquid.

Pock marks – Uneven blister-like elevations, depressions, or pimpled appearance.

Points of Tangency – The points at which the straight portions of the shell walls intersect the beginning of the radius corners.

Poisson's Ratio – The ratio of lateral concentration per unit of diameter to longitudinal extension per unit of length in a bar of material longitudinally stressed. For a body which does not change its volume on deformation, it is 0.5. For metals, the ratio is usually considerably less than 0.5. In the case of vulcanized rubber, pure gum, having practically no volume change on extension, shows a ratio of approximately 0.5 for small deformations; compounded rubber may increase in volume on extension, consequently the ratio drops below 0.5. For rubber the ratio is constant only for small extensions.



P

Polyester – A durable substrate that is resilient to moisture, solvents, oils, and chemicals. It is available as clear or white material and with a moralized finish.

Polymer (a) – A material formed by the joining together of many (poly) individual units (mar) of a monomer.

Polymer (b) – A polymer is a very long chain of units of monomers prepared by means of an addition and/or a condensation polymerization. The units may be the same or different. There are copolymers, dipolymers, tri- or terpolymers, quadripolymers, high polymers, etc...

Porosity – The presence of numerous small holes or voids.

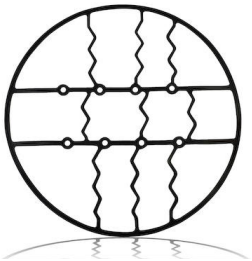
Post cure – Heat or radiation treatment, or both, to which a cured or partially cured thermosetting plastic or rubber composition is subjected to enhanced the level of one or more properties.

Preliminary Bill of Material – An initial Bill of Material completed prior to design and print release.

Preliminary Process Flow Chart – An early depiction of the anticipated manufacturing process for a product.

Press-in Wipers – A wiper or scraper ring for a hydraulic cylinder which has a metal outside diameter so that it can be press-fitted into a housing.

Pressure – (No, Low, Poor) – May refer to inadequate pressure in mold/press, oven heater or autoclave during Cure. Symptoms may be porosity, unfills, blister, low adhesions, etc...



Pressure Sensitive – Adhesive that can be applied to a substrate by using light pressures.

P

Pressure Vessel Steel (PVS) – Product intended for pressure vessels and similar end use applications.

Process Failure Mode and Effects Analysis (PFMEA) -An analytical technique used by a manufacturing responsible engineer/ team as a means to assure that, to the extent possible, potential failure modes and their associated causes/mechanisms have been considered and addressed.

Processing Aids – Waxes, low molecular weight polyethylene, metal soaps, petroleum oils, and other agents which dissolve or lubricate rubbers, soften them and act as processing aids.

Product Assurance Plan –A part of the Product Quality Plan. It is a prevention-oriented management tool that addresses product design, process design, and when applicable software design.

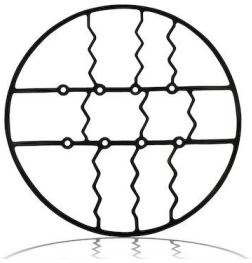
Production Trial Run – Product made using all production tools, processes, equipment, environment, facility; and cycle time.

Protectors – A rubber or plastic cap or cup shaped ring used to protect threads or fragile items during shipping or assembly.

Proto-Types – A part that is made during the design process to determine the feasibility or suitability of a project.

Proto Types – See proto-types

Pusher Rings – A ring that fits against another sealing device to push it in order to activate it or energize it in the absence of pressure or in low pressure applications.



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R

Radial Shaft Seals – Also called grease seals, rotary seals or shaft seals. Made of rubber to seal grease in housing with a rotating shaft.

Radius Corners –Rounded corners. Measurement from the center of a diameter to its circumference.

Rebound – Rebound is a measure of the resilience, usually as the percent- age of vertical return of a body which has fallen and bounced.

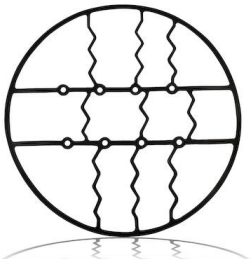
Rebound test – Method of deter- mining the resilient properties of vulcanized rubber, by measuring rebound of a steel ball or pendulum falling from a definite height onto a rubber sample.

Register – The accurate matching of the plates of a mold.

Reinforcing Agent – In rubber compounding, a finely-divided substance or filler which, when properly dispersed in rubber, produces improved physical properties in the vulcanized product, i.e., greater energy of resilience, greater resis- tance to abrasion, higher modules of elasticity and tensile strength Cer- tain grades of furnace blacks are the most important reinforcing agents for black stocks. For light-colored stocks, calcium silicate, precipitated calcium carbonates, silica and clay are the most commonly used?

Release Liner – Coated paper applied to the adhesive to protect it until ready for use.

Reliability – The probability that an item will continue to function at customer expectation levels at a measurement point, under specified environmental and duty cycle conditions.



Removable Adhesive – Adhesive that can be removed from a surface without leaving a residue.

R

Reproducibility – The variation in the average of measurements made by different operators using the same gage when measuring identical characteristics of the same parts.

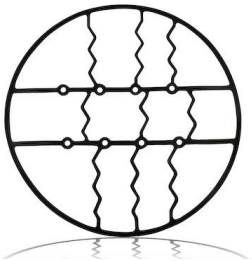
Resilience (a) – The property of a material that enables it to return to its original size and shape after removal of the stress which causes the deformation.

Resilience (b) – The energy returned by vulcanized rubber when it is suddenly released from a state of strain or deformation. The returned energy, expressed as a percentage of the original potential energy, is a measure of the resilience. Various rebound testers are used to measure rebound (Bashore, Lupke).

Retarder – Any substance whose presence in relatively small proportions retards a chemical reaction. Specifically, a substance which when added in small proportion to a rubber compound retards the rate of vulcanization. An anti-scorching agent; examples, phthalic anhydride, salicylic acid.

Reversion (a) – A deterioration of physical properties that may occur upon excessive vulcanization of some elastomers, evidenced by a decrease in hardness and tensile strength, and an increase in elongation; (2) A similar change in proper- ties after air aging at elevated temperatures. Natural rubber, butyl, polysulfide and epichlorobydrin polymers exhibit this effect (extreme reversion may result in tackiness). Most other polymers will harden and suffer loss of elongation on hot air aging.

Reversion (b) – The softening of some vulcanized rubbers when they are heated too long. Usually accompanied by an increase in extensibility, a decrease in tensile strength and a lowering of the stress required to produce a given elongation. Extreme reversion may result in tackiness; the rubbers "revert" to an unvulcanized then to a non-polymeric condition.



Rheology – The science of deformation and flow of matter. Deals with the laws of plasticity, elasticity and viscosity and their connections with paints, plastics, rubber, oils, glass, cement, etc...

R

Rheometer (Monsanto) – An oscillating disk cure meter used for determining vulcanization characteristics of a rubber compound.

Rimseal – A sealing device used on the rim of round plate or rim of a wheel.

Rings – Round sealing devices.

RMS – Root Mean Square – The measure of surface roughness, obtained as the square root of the sum of the squares of micro-inch deviation from true flat.

Rod Seals – Any seal used on the rod of a hydraulic or pneumatic cylinder made from rubber or plastic.

Rollers – A round, flat ring used as a wheel or guide.

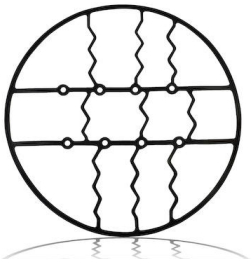
Rotary Seals – Seals used on rotating shafts – see lips seals, grease seals, oil seals.

Roto Glyd – A flat plastic, PTFE or PTFE ring used on a rotating shaft.

Rubber – A material that is capable of recovering from large deformations quickly and forcibly, and can be, or already is, modified to a state in which it is essentially insoluble (but can swell) in boiling solvent, such as benzene, methyl ethyl ketone, and ethanol-toluene azeotrope. A rubber in its modified state, free of diluents, retracts within 1 minute to less than 1.5 times its original length after being stretched at room temperature (18 to 29oC) twice its length and held for 1 minute before release.

Rubber Based Adhesive – Made from natural and synthetic rubber compounds. They have excellent initial tack but low temperature and aging resistance.

Rubber Latex – Colloidal aqueous emulsion of an elastomer.



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S

Scorch – Premature vulcanization of a rubber compound, generally due to excessive heat history. Also see Mooney Scorch;

Scorching – A term frequently used to denote premature vulcanization of a rubber compound, occurring on a mill or calendar, or in an extruder. Same as burning or "setting up".

Scoring – Marking the substrate with lines, grooves, or notches for bending or contouring purposes.

Scraper Rings – A ring which rides tight against a rod, with a sharp lip to scrape or wipe off excess oil, dirt or dust in a hydraulic or pneumatic cylinder.

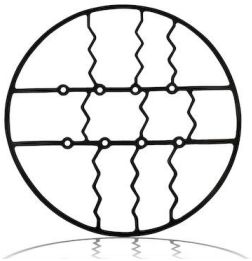
Scrapers – Also, called a wiper ring – A ring which rides tight against a rod, with a sharp lip to scrape or wipe off excess oil, dirt or dust in a hydraulic or pneumatic cylinder.

Seal – An elastomeric ring-shaped component used in a constantly moving, dynamic application – either reciprocating or rotating shaft – providing a near positive no leak mode in a hydraulic cylinder, ram, mixer or gear box – as examples. (Note: no sealing device is absolutely 100% positive). Seal rings can be u-shaped, v-shaped, o-shaped, metal inserted, radial lipped, multiple lipped or a simple flat ring.

Seal Cages – A special device used to assist a seal ring.

Seal Kits – Any group of seals, o-rings, wiper rings and back-up rings used to repair a specific hydraulic cylinder.

Seams – A line, groove, or ridge formed by the joining of edges. A seam can be a weak or vulnerable area, especially for EMI considerations.



S

Seats – A stationary ring which is pressed into housing and acts as the matching face of a mechanical seal.

Seamless Construction – An exceptional attribute of deep drawn shells. Deep drawn shells have no seam.

Shaft Repair Kits – A package of seals which includes all seals needed to repair the rod end of a hydraulic or pneumatic cylinder.

Shaft Seal & Packings – Any seal ring used on the rod of a hydraulic ram.

Shallex – A brand name for vee packings, chevron or parachute packings.

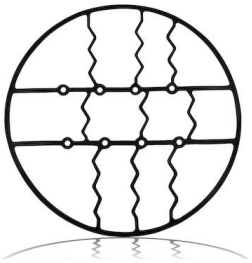
Sheet Materials – Rubber or fibrous material used to make gaskets.

Shelf Life – The length of time a product can be stored, under specific conditions, before the product expires. Each product varies depending on the material, adhesive, and printing process (check with Production for specifics).

Shims – Flat, thin metal gasket-like parts used as spacers to position machinery or align equipment.

Shore A Hardness – An indentation method of rating the hardness of rubber using a Shore Durometer with the A scale from 0 to 100.

Shrinkage – Contraction of molded rubber upon cooling.



Skin – A relatively dense layer at the surface of a cellular material.

Silicone Adhesive – Adhesives made from silicone polymers that have excellent high temperature resistance.

S

Simulation – The practice of mimicking some or all of the behavior of one system with a different, dissimilar system.

Single Acting Seals – Rings which are designed to seal only in one axial direction.

Slip O-rings – A type of ring which fits over an o-ring to relieve friction.

Smoke sheets – Plantation natural rubber sheets that, after passing through a mill that puts the conventional ribbing design on them, are washed and hung on racks in a smoke house where they undergo a combined smoking and drying process.

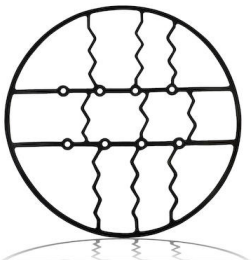
Snap-in Wipers – A rod wiper which is made from one homogeneous material, either rubber or polyurethane, which is designed to snap-fit into a matching machined groove.

Spacers – A ring with flat sides to provide specific dimensional spacing between two components.

Special Characteristics – Product and process characteristics designated by the customer including govern- mental regulatory and safety; and/or selected by the supplier through knowledge of the product and process.

Specific gravity – The ratio of the mass of a unit volume of a material to that of the same volume of water at a specified temperature.

Specifications (Specs) – The details of a part: dimensions, material call outs, type style, size information, etc.



S

Speedy Sleeves – The name of a thin, round tube which slips over a rotating shaft to provide a new, clean sealing surface for rubber lip oil or grease seal.

Sponge Rubber – Cellular structure produced by adding gasifying substance to rubber compound, expanding and curing in heated mold. Cells may be open (interconnecting) or closed.

Splice – A joint or junction made by lapping or butting edges, straight or on a bias, and held together through vulcanization or mechanical means.

Spring Energized Seals – Any sealing ring that utilizes a metal garter spring or finger spring to assist in energizing the seal when there is not sufficient pressure.

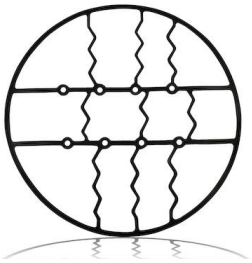
Spring Loaded Seals – See spring energized seals above.

Sprue – (1) The primary feed channel that runs from the outer face of an injection or transfer mold to mold gate in a single cavity mold or to runners in a multiple cavity mold;

(2) The piece of material formed or partially cured in the primary feed channel.

Sprue mark – A mark, usually elevated, left on the surface of an injection or transfer molded part, after removal of the sprue.

Squeeze – Cross section diametrical compression of O-ring between bottom surface of the groove and surface of other mating metal part in the gland assembly.



State of cure – The cure condition of vulcanization relative to that at which optimum physical properties are obtained.

Stem Packing – A type of homogeneous or multi-braided packing used on the stem of a valve to stop leakage.

S

Stepseal – A seal ring with a step cut groove to match up against a housing machine to fit.

Strain Harden – Tempering through strain. Same as work harden.

Strength-to-Weight Ratio – The ratio of tensile strength to the weight of a material.

Stress – Force per unit of original cross sectional area required to stretch a specimen to a stated elongation.

Stress relaxation – The decrease in stress after a given time of constant strain.

Substrate – A material upon the surface of which an adhesive promoter is applied for any purpose such as bonding or coating.

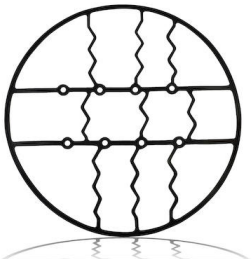
Subsystem – A major part of a system which itself has the characteristics of a system, usually consisting of several components.

Swelling – The increase in volume or linear dimensions of a specimen immersed in a liquid or exposed to a vapor.

Swelling – The property of raw or unvulcanized rubber absorbing organic liquids such as benzene, gasoline, etc., arid swelling too many times its original volume. In a general sense, it may be any increase in volume of a solid substance caused by the absorption of a liquid.

Switch Seals – Seals used in electrical switching devices to keep moisture out.

System – A combination of several components or pieces of equipment integrated to perform a specific function.



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T

Tack – The ability to adhere to itself; a sticky or adhesive quality.

Team Feasibility Commitment – A commitment by the Product Quality Planning Team that the design can be manufactured, assembled, tested, packaged, and shipped in sufficient quantity at an acceptable cost, and on schedule.

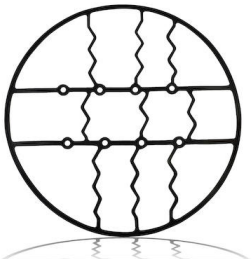
Tear Resistance – Resistance to tearing, measured as the force required to tear completely across a specially-designed nicked rubber test piece or right-angled test piece by elongating it at a specified rate. Express in lbs. per inch of thickness of specimen.

Tear Strength – The maximum load required to tear apart a specified specimen, the load acting substantially parallel to the major axis of the test specimen.

Telescopic Packing – Packing sets used on telescopic cylinders, each stage having a different diameter.

Temperature Range – Lowest temperature at which rubber remains flexible and highest temperature at which it will function.

Tensile Strength – The capacity of a materiel to resist a force tending to stretch it. Ordinarily the term is used to denote the force required to stretch a material to rupture, and is known as “breaking load”, “breaking stress “ultimate tensile strength”. lit rubber testing, it is the load in lbs. per square inch or kilos per square centimeter of original cross-sectional area, supported at the moment of rupture by a piece of rubber being elongated at a constant rate.



Tensile Stress – The applied force per unit of original cross sectional area of a specimen.

T

Tensile Stress at Given Elongation – The tensile stress required to stretch a uniform section of a specimen to a given elongation.

Tension Set – The extension remaining after a specimen has been stretched and allowed to retract.

Texture – A screen-printing process that applies a coating to the surface of the substrate. The coatings are available in fine or coarse finishes. This process allows for the protection from chemical attack, it can improve the light distribution of a LED, and it can protect the surface of an overlay from scratches.

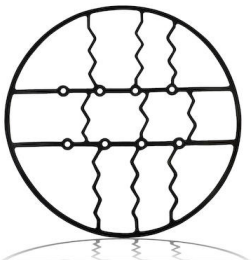
Thermal Deterioration – The elongation at the moment of rupture.

Thermoplastic Rubber – Rubber that does not require chemical vulcanization and will repeatedly soften when heated and stiffen when cooled; and which will exhibit only slight loss of its original characteristics.

Thermosetting Rubber – Chemically vulcanized rubber that cannot be remelted or remolded without destroying its original characteristics.

Thorseals – A brand name for a polyurethane hydraulic u-cup seal.

Timing Plan – A plan that lists tasks, assignments, events, and timing required to provide a product that meets customer needs and expectations.



Tips – A rubber cup-shaped part used on the end of a rod or shaft to provide shock resistance or cushioning.

Tolerance – The specification of allowable deviation from exact original (measurable) specifications.

T-U

Transfer Tape – An unsupported adhesive on a liner.

Trim – The process Involving removal of mold flash.

T-Seals – A "T" shaped rubber sealing ring with harder back-up rings on each side for rod or piston sealing.

Tube Springs – A rubber or plastic cushioning device used to assist spring or cover the outer portion of a coil spring.

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U-Cup – a type of seal used in a hydraulic or pneumatic cylinder. It's cross section is U-shaped to allow oil to energize the seal body to properly block oils and seal correctly.

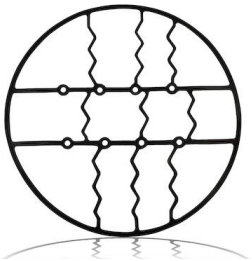
U-cups – A "U" shape cup sealing ring designed to seal in one direction along a shaft or rod in a hydraulic or pneumatic cylinder.

Undercure – Degree of cure less titan optimum. May be evidenced by tackiness, loginess (lack of snap or resilience), or inferior physical properties.

UL94 – Underwriters Laboratory's rating for flame spread.

Ultimate Elongation – The maximum elongation prior to rupture.

Undercure – State of vulcanization less than optimum. It may be evidenced by tackiness or inferior physical properties.



U-Packings – A "U" shape cup sealing ring designed to seal in one direction along a shaft or rod in a hydraulic or pneumatic cylinder.

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V

V-Packing – Also known as Vee Packing, Vee Sets, Chevron Packing, and Parachute Packing. A multiple ring set of packings whose center rings or sealing rings are V-shaped to form sealing lips. The V-rings stack on top of each other and have a male and female adaptor on each end to make the set flat. This packing type is adjustable.

Valve Discs – A PTFE or PTFE disc used on a valve as a seat to provide positive sealing when shut off.

Value Engineering (Value Analysis) – A planned, clean sheet approach to problem solving, focusing on specific product design and process characteristics. Where value analysis is employed to improve value after production has begun, value engineering is employed to maximize value prior to expenditures of facilities and tooling money.

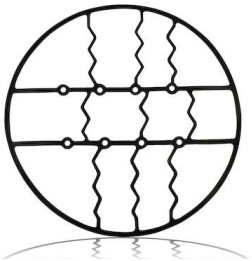
Valve Packing – Braided packing used in the stuffing box of a valve stem to make a positive seal.

Valve Seats – A PTFE or PTFE disc or ring used on a valve as a seat to provide positive sealing when shut off.

Valve Stem Packing – Braided packing used in the stuffing box of a valve stem to make a positive seal.

Vee Packing – Also called V-Packing, Vee packing, Chevron Packing, Parachute packing or v-set packing. A complete vee packing set contains multiple "V" shaped sealing rings stacked and nested together with a male adapter on one end and a female adapter on the other end.

Vibration Mounts – A rubber piece used to eliminate vibration between to components.



V

Vinyl – Vinyl is cost effective and highly versatile. Vinyl is strong, durable, abrasion and moisture resistant; withstands rust and corrosion; is electrically non-conductive and has excellent fire performance properties. Vinyl can be produced in almost any color, with products ranging from opaque to crystal-clear.

Viscosity – The resistance of a material to flow under stress.

Voice of the Customer – Customer feedback both positive and negative including likes, dislikes, problems and suggestions.

Voice of the Process – Statistical data that is feedback to the people in the process to make decisions about the process stability and/or capability as a tool for continual improvement.

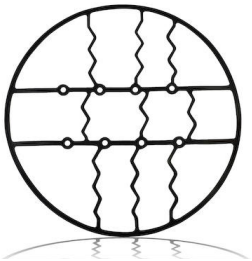
Voids – The absence of material or an area devoid of materials where not intended.

V-Packings – Also called V-Packing, Vee packing, Chevron Packing, Parachute packing or v-set packing. A complete vee packing set contains multiple "V" shaped sealing rings stacked and nested together with a male adapter on one end and a female adapter on the other end.

V-Rings – Also called V-Packing, Vee packing, Chevron Packing, Parachute packing or v-set packing. A complete vee packing set contains multiple "V" shaped sealing rings stacked and nested together with a male adapter on one end and a female adapter on the other end.

Vulcanizate – Rubber in its cured or vulcanized state.

Vulcanizating Agent – Any material which can produce in rubber the change in physical properties known as vulcanization, such as sulfur, polysulfides, organic polynitro derivatives, peroxides arid quinone dioximes.



V-W

Vulcanization – An irreversible process during which a rubber compound through a change in its chemical structure (for example, cross-linking) becomes less plastic and more resistant to swelling by organic liquids and elastic properties are conferred, improved, or extended over a greater range of temperature.

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Washers – Round, flat rings used as spacers, gaskets or slip devices under the head of a bolt.

Water Absorption – The increase in weight and volume after immersion in water.

Water resistance – The ability to withstand swelling by water for a specified time and temperature.

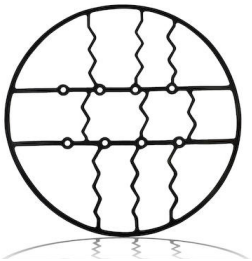
Wear Rings – Wear rings, guide rings, guiding rings, bearing rings for hydraulic cylinder rods.

Wear Sleeves – Wear rings, guide rings, guiding rings, bearing rings for hydraulic cylinder rods.

Wear Strips – Strips of abrasion resistant plastic, PTFE or PTFE material – Wear rings, guide rings, guiding rings, bearing rings for hydraulic cylinder rods.

Wetting – Completeness of contact between particles dispersed in a medium, such as carbon black rubber.

Wheels – Round rollers to provide easy movement of a machine or component.



W-Y

Wiper Rings – Also, called a wiper ring – A ring which rides tight against a rod, with a sharp lip to scrape or wipe off excess oil, dirt or dust in a hydraulic or pneumatic cylinder.

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Rings – Also called quad rings or quatro rings, rubber rings of a special shape used to replace o-rings and eliminate the rolling found when using o-rings.

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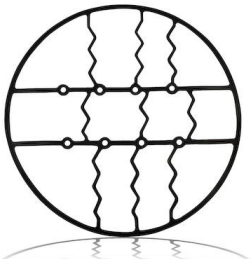
Yield Point - The load or stress at which a marked increase in the deformation of the sheet occurs without increasing the applied load. Yield point is one of the characteristics of low-carbon steels after they have been annealed. The yield point is usually calculated using a tensile-test specimen, and it is the load that is commensurate with the point beyond the elastic limit at which the specimen lengthens considerably without an additional increase in load.

Yield Strength - The stress at which a material exhibits a specified deviation from a linear proportionality between load and elongation. In the tension test, the load associated with an offset of 0.2% from linearity is used for many metals to calculate the yield strength.

Young's modulus – The ratio of normal stress to corresponding stress or compressive stresses below the proportional limit of the material.



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Z

Zinc Oxide, Activator – Accelerators of vulcanization do not always exert their full influence unless the rubber mixture contains substances known as activators. Zinc oxide is an activator and gives its best activity in the presence of an organic acid like stearic acid with which it forms a rubber-soluble soap.

Zurcon – A type of material used to make guide rings, wear rings, bearings or seals.

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