

## A

AASHTO: American Association of State Highway and Transportation Officials.

Abatement (R): The removal of scrap tires from stock piles or other sites with accumulations of whole or shredded scrap tires.

Abrasion (NT): Wearing away by scraping or rubbing. The progressive wearing away of a tire tread in service.

Accelerant (F): A substance used to speed up the combustion process.

Accelerator (NT): A substance added in small amounts to uncured rubber compounds prior to the vulcanization process to reduce the time required for vulcanization.

Accidental Fire (F): A fire that occurs unexpectedly and unintentionally.

Aggregate (A): Rock or stone of uniform size or a range of sizes from either naturally occurring deposits or from artificially prepared materials.

Course Aggregate (A): Aggregate predominately retained on number 4 sieve.

Fine Aggregate (A): Aggregate passing the 3/8th inch sieve and almost entirely passing the number 4 sieve.

Aging (NT): Deterioration of physical and chemical properties by oxidation over a period of time.

Air Pressure (NT): Force exerted by air within the tire; expressed in pounds per square inch, kilopascals or bars.

Air Void (A): A space in cement paste, mortar, or concrete filled with air.

Alignment (NT): Adjustment of steering and suspension components to facilitate the most efficient operation of all tire and wheel assemblies as related to vehicle control and tire wear.

All Season Radial (NT): A highway tire designed to meet the weather conditions in all seasons of the year and which meet the Rubber Manufacturers Association definition of a mud and snow tire.

Altered Tire (ST): A scrap tire which has been modified so that it is no longer capable of holding or retaining air, water or being used on a vehicle.

Alternative Means of Protection (F): An application to use another form of fire protection over what is required by code or regulation.

Ambient Temperature (ST): Temperature of the media surrounding an object; such as the air temperature in which a tire may be running or is being processed (shredding); typically this is the same temperature of the room or the outside area being used to process the tire.

Anaerobic: The ability for microorganisms to live without the presence of oxygen.

Annual Take-Off (ST): The number of scrap tires generated in any calendar year.

Antioxidant (NT): A chemical used to retard deterioration specifically caused by oxygen.

Antiozonant (NT): A chemical compounding material used specifically to retard deterioration caused by the ozone.

ARA: The American Retreaders' Association.

Arson (F): The criminal act of burning property.

Asphalt (A): A dark brown to black cement-like material in which the predominant constituents are bitumens which occur in nature or are obtained from petroleum processing.

Asphalt Binder (A): The asphalt-cement portion of an asphaltic concrete mixture.

Asphalt Cement (A): A fluxed or unfluxed asphalt specially prepared as to quality and consistency for direct use in the manufacture of bituminous pavements.

Asphalt Concrete (A) An aggregate mixture with an asphalt cement binder.

Asphalt Rubber (A): A blend of asphalt cement, ground tire rubber, and certain additives in which the rubber component is at least 15 percent by weight of the total blend and has reacted in the hot mix asphalt cement sufficiently to cause swelling of the rubber particles.

Asphalt Rubber Chip Seal (A): A thin layer of crumb rubber-modified asphalt used to bind an aggregate wearing course to a roadway surface.

## **B**

Backing (NT): The material used on the application side of tread rubber, repair units, and tube patches to ensure cleanliness, tackiness and ease in shipping and storing.

Bagel Cut (ST): Cutting the tire in half along its circumference.

Baling (ST): A method of volume reduction whereby tires are compressed into bales.

Balance (NT): The distribution of weight around a tire or tire/wheel assembly. The uniform distribution of weight will produce a balanced tire.

**Batch Plant (A):** A manufacturing facility for producing bituminous paving mixtures that proportions the aggregate constituents into the mix by weighted batches and adds bituminous material by either weight or volume.

**Barrel Stack (ST):** A means of storing tires, where the tires are neatly stacked one upon another.

**Bead (NT):** The anchoring part of the tire which is shaped to fit the rim. The bead is constructed of high tensile steel wires wrapped by the plies.

**Bead Separation (NT):** Loss of adhesion between the components in the bead area of a tire.

**Bead-to-Bead Measurement (RR):** A measurement from the bead across the crown to the opposite bead, taken after buffing to ensure selection of the correct matrix size in which to cure a retread.

**Bead-to-Bead Retreading (RR):** A retreading process which includes veneering of the sidewall from the shoulder to the bead.

**Bead Wire (NT):** A high tensile steel wire, surrounded by rubber, which forms the bead of a tire that provides a firm contact to the rim.

**Bear Claw (ST):** The rough-edged bead wire sticking out from a shredded tire.

**Belt (NT):** An assembly of rubber coated fabric or wire used to reinforce a tire's tread area. In radial tires, it also constrains the outside diameter against inflation pressure and centrifugal force.

**Belt Wire (NT):** A brass plated high tensile steel wire cord used in steel belts.

**Bias Ply Tires (NT):** A tire built with two or more casing plies which cross each other in the crown at an angle of 30 to 45 degrees to the tread centerline.

**Bitumen (A):** A class of black or dark-colored cement-like substances, natural or manufactured, composed principally of high molecular weight hydrocarbons, of which asphalt, tars, pitches and asphaltites are typical.

**Bituminous (A):** Materials containing or treated with bitumen.

**Bleeding (A):** The autogenous flow of mixing water within, or its emergence from newly placed concrete or mortar caused by the settlement of the solid materials within the mass.

**Bleeding A Tire (NT):** The practice, not recommended by the tire manufacturers, of letting hot air out of tires under load and after they have been running in order to reduce inflation.

**Blowout (NT):** Instantaneous rupturing of tire body, causing complete loss of air pressure.

**Blue Triangle (RR):** A bulge due to a section repair is allowed not to exceed 3/8th of an inch (1 cm) in height. This bulge may sometimes be identified by a blue triangle label in the immediate area.

Body (RR): Tire structure not including the tread (also refer to casing and carcass).

Brand Number (NT): A number branded into one or both sidewalls of a tire by the customer for identification purposes.

Break (RR): A rupture or opening in the tire structure.

BTU (ST): British Thermal Unit; defined as the amount of energy required to heat one pound of water one degree Fahrenheit.

Buckle (NT): The wrinkling or abnormal deflection of the sidewall when the tire is under-inflated, over-loaded or under severe strain; the abnormal deflection in the belts as a result of improper retreading.

Buffer (RR): The equipment used to remove the old tread from the tire that is to be retreaded. A powerful rotary rasp that provides a rough, clean, even surface to which new rubber readily adheres. A flexible shaft buffer is used for preparing a small area for repairing.

Buffing (RR): The process of removing worn/used tread from a tire to be retreaded. A rotating rasp that provides a rough, clean, even surface to which new rubber readily adheres. A flexible shaft buffer used for preparing a small area for repairing. Buffings can also be produced during the manufacturing of a tire by grinding to expose white rubber on a finished tire, creating a white sidewall or raised white letters.

Buffing Dust (RR): refer to Buffings.

Buffing Rubber (RR): A term used by ASTM D11, Rubber Committee. Particulate rubber produced as a byproduct of the buffing operation in the carcass preparation stage of tire retreading; characterized by a wide range of particulate sizes which are predominately elongated or acicular in shape. (also refer to Particulate Rubber). The appearance of the unique shape of the particles of this material is only apparent in finished goods or products which contain particles having a dimension greater in size than 600um (30 mesh)

Buffings (RR): Vulcanized rubber usually obtained from a worn/used tire in the process of removing the old tread in preparation for retreading.

Build-Up (RR): The application of retread or repair rubber.

Bulge (RR): A protrusion or raised area, usually in the tire sidewall.

Burn-It (F): A fire fighting strategy that would allow for the free-burn of a tire fire.

Bury-It (F): A fire fighting strategy that suggests burying a tire pile with soil, sand, gravel, cement dust or other cover material.

Butyl Rubber (NT): A general purpose synthetic elastomer (rubber) produced by copolymerizing isobutylene with a small amount of isoprene. Butyl rubber has a low permeability to gases. Its impermeability to air is 70 percent better than natural rubber; for this reason is superior for liner tubes and for tubeless tire inner liners.

## C

**Carbon Black (NT):** A material used in tires that provides strength to rubber compounds. This material consists essentially of elemental carbon in the form of near spherical colloidal particles and aggregates. Carbon black is obtained by partial combustion or thermal decomposition of hydrocarbons.

**Carcass (RR):** Refer to Casing.

**Casing (RR):** The basic tire structure excluding the tread (also referred to as a carcass).

**Casing Jockey (ST):** An individual or an independent business that collects used or scrap tires from tire vendors or automotive disassembly facilities and transports them to another location. (also refer to Tire Jockey).

**Catalyst (NT):** A chemical that in small quantities speeds up the reaction of a resinous material but is not itself a necessary part of the final product.

**Celsius:** A temperature scale in which zero (0) degrees is the freezing point and 100 degrees is the boiling point (formerly called centigrade).

**Change-Over (NT):** The removal of tires on cars or trucks and substitution of a different size or type of tire.

**Char (ST):** The solid residue remaining after pyrolysis of a tire and after removal of steel, fiber or other support material, if present.

**Checking (NT):** Minute cracking in the surface of rubber caused by aging and oxidation.

**Chemical Cure (NT):** Vulcanization at room temperature or above activated by chemical agents without the application of heat from an outside source.

**Chip-Chunk (NT):** Refer to Chunking.

**Chip Seal (A):** A thin layer of sprayed asphalt, with or without rubber, and subsequent aggregate placement used to prolong pavement surface life.

**Chipped Tire (ST):** Pieces of scrap tires that have a basic geometrical shape and generally smaller than 6 inches by 8 inches in size (also refer to Tire Chip).

**Chipping (NT):** Refer to Chunking.

**Chopped Tire (ST):** A scrap tire that is cut into relatively large pieces of unspecified dimensions.

Chunking (NT): The loss of either small or substantial pieces of the tread caused by the cutting or breaking action of rough terrain or poor highway surfaces. This is normally associated with highway tires when incorrectly used off the road. Also referred to as chipping or chip-chunk.

Civil Engineering Application (ST): The use of scrap tires in lieu of natural occurring materials (i.e., rock, sand, dirt, gravel) in construction.

Clam Shell (ST): Refer to Bagel Cut.

Classifier (ST): Equipment designed to separate oversized tire shreds from the desired size.

Combustion (ST): The chemical reaction of a material through rapid oxidation with the evolution of heat and light.

Commercial Tires (NT): Truck and industrial tires.

Compacted Tire (ST): Refer to Baling.

Compound (NT): A mixture of blending chemicals specifically tailored to the needs of the specific components of the tire.

Concrete (A): A composite material that consists essentially of a binding medium within which are embedded particles or fragments of aggregate; in hydraulic cement concrete, the binder is formed from a mixture of hydraulic cement and water.

Conflagration (F): A large, uncontrollable fire.

Containment (F): A fire fighting operation that prevents the further spread of a fire.

Continuous Mix Plant (A): A manufacturing facility for producing bituminous paving mixtures that proportions the aggregate and bituminous constituents into the mix by a continuous volumetric proportioning system without definite batch intervals.

Control (F): The overall fire fighting operation of confinement and suppression. A fire is under control when the advance of the fire has been halted.

Converted Tire (ST): A scrap tire which has been processed into a usable commodity other than a tire.

Copolymer (NT): A polymer formed from two or more types of monomers.

Cords (NT): The strands of wire or fabric that form the plies and belts in a tire.

Cracker Mill (ST): A machine designed to size reduce scrap tires by passing the scrap material through rotating corrugated steel drums with angular grooves.

Cracking (NT): A sharp break or fissure in the surface of rubber particles that develops upon exposure to light, heat, ozone or repeated bending or stretching.

**Crazing (NT):** A surface effect on rubber or plastic articles characterized by many minute cracks.

**CREEL (A):** Cold Regions Research and Engineering Laboratory. A U.S. Army Corps of Engineers testing laboratory. [CREEL has been working on a Chunk Rubber Asphalt Concrete mix, which is designed to enhance ice-disbonding characteristics of several asphalt paving materials.]

**Cross Linking (NT):** When chemical bonds set up between molecular chains, the material is said to be cross linked. Once cross linked, a material can not be reprocessed.

**Crude Rubber (NT):** Natural, unprocessed rubber.

**Crumb Rubber (NT & ST):** (1-NT) A coagulated and dried natural latex rubber. (2- ST) Fine particles of vulcanized rubber resulting from mechanical or cryogenic size reduction of scrap tires or other rubber products.

**Crumb Rubber Modified Asphalt Concrete -- CRMAC (A):** A general term used to identify a group of processes which incorporate crumb rubber modifiers into asphalt paving materials.

**Crumb Rubber Modified Asphalt Hot Mix Asphalt (A):** Refer to CRMAC

**Crumb Rubber Modifier (A):** A general term used by the FHWA to identify a group of processes and concepts which incorporate scrap tire rubber into asphalt paving materials.

**Crushed Gravel (A):** The product resulting from the artificial crushing of gravel with substantially all fragments having at least one face resulting from fracture.

**Crushed Stone (A):** The product resulting from the artificial crushing of rocks, boulders, or large cobblestones, substantially all faces of which have resulted from the crushing operation.

**Cryogenics (ST):** A crumb rubber modifier production process in which scrap tire rubber is frozen using liquid nitrogen or commercial refrigeration methods to embrittle the rubber. In the cryogenic process, the embrittled rubber is crushed in a hammermill to the desired particle size.

**Cure (NT):** To vulcanize; also time, temperature and pressure conditions used to vulcanize rubber.

**Cured-On Tires (RR):** Solid industrial tires vulcanized directly to the steel wheel on which they run. Also called Molded-On Tires.

**Curing (NT):** Process of heating or otherwise treating a rubber or plastic compound to convert it from a thermoplastic or fluid material into the solid, relatively heat resistant state desired in commercial products. When heating is employed, the process is also called vulcanization.

## **D**

Deflection (NT): The distortion of the tire from its normal shape.

Dense Graded Aggregate (A): An aggregate that has a particle size distribution such that when it is compacted, the resulting voids between the aggregate particles, expressed as a percentage of the total space occupied by the material, are relatively small.

Density (ST): A term that denotes the weight per unit of volume of a substance. The density of any substance can be obtained by dividing the weight of the substance by its volume.

Depolymerization (ST): The process of reducing the chain length of polymers by breaking their chemical bonds.

Devulcanization (ST): A process in which there is substantial regeneration of the rubber compound to its original plastic state, thus permitting the product to be processed, compounded or vulcanized. Combined sulfur is not affected. True devulcanization of vulcanized rubber with regeneration of the original rubber and removal of combined sulfur has not been accomplished. The term is synonymous with reclaiming of vulcanized scrap rubber. It is primarily a depolymerization accompanied by some oxidation.

Dewired (ST): The absence of exposed wire on the perimeter of the tire chips. Belt wire typically remains in the chip, but is embedded in the chip.

Discarded Tire (ST): A worn or damaged tire which has been removed from a vehicle.

Disposal Fee (ST): Refer to Tipping Fee.

Dog Tracking (NT): A condition where the rear wheels of a vehicle do not follow the path of the front wheels.

DOT Number (NT): An identification number molded by the manufacturer into the sidewall of a highway use tire in compliance with federal motor vehicle safety standard requirements.

Drown-It (F): A fire fighting strategy that suggests using copious amounts of water on a tire fire.

Dry Process (A): A paving product made with ground rubber as an aggregate component. The rubber is mixed with the aggregate prior to blending in the asphalt cement in quantities ranging up to three percent rubber. This process is also referred to as Rubber Modified Asphalt Concrete -- RUMAC).

Duals (NT): The term used to describe a set of two tires and wheels used on each end of an axle.

## E

Elasticity (NT): The property of material by virtue of which it tends to return to its original size and shape after removal of the stress which caused its deformation.



Elastomer (NT): A polymeric material which, at room temperature, is capable of recovering substantially in shape and size after removal of a deforming force. This term generally refers to synthetic polymers as opposed to rubber, which generally refers to the natural material.

Embrittlement (NT): A rubber compound becoming brittle during low or high temperature exposure or as a result of aging.

End User: (ST): The facility which utilizes the heat content or other forms of energy from the combustion of scrap tires (*for energy recovery*). The last entity who uses the tire, in whatever form, to make a product or provide a service with economic value (*for other uses*).

Energy Recovery (ST): A process by which all or part of the tire (TDF) is utilized as fuel to recover its BTU value.

Exothermic (NT): A chemical reaction in which heat energy is liberated.

Extender (NT): (1) An inert material added to a compound to increase volume and lower cost. (2) An organic material used to augment or replace part of the polymer in a compound.

Extruder (ST): A machine with a driven screw for continuous forming of rubber by forcing it through a die.

## F

Fabric (NT): Textile cords used in tire manufacturing.

Face - of a tire (NT): A term commonly used to denote the surface area of the tread of an off-the-road tire.

Fatigue Cracking (A): Cracks in a road surface resulting from repeated compression by vehicle weight.

FHWA (A): Federal Highway Administration, an agency of the Federal Department of Transportation.

Filler (NT): A solid compounding material which may be added, usually in finely divided form, in relatively large proportions, to a polymer.

Financial Assurance (ST): A performance bond, letter of credit, cash deposit or other mutually acceptable financial instrument used to guarantee performance.

Fines (A): Small particles of graded aggregate used in asphalt concrete composition.

Fines (ST): Small particles of ground rubber that results as a by-product of processing scrap tires into granules.

Fishhooks (ST): Strands of belt or bead wire exposed from a processed scrap tire or an individual piece of belt or bead wire (also refer to Bear Claw).

Flash (NT): Excess rubber squeezed between the edges of mold segments during the curing process.

Fleet Service (NT): The professional rendering of tire maintenance service to the truck operator or other user. Usually includes the periodic inspection of all rolling wheels at the fleet's place of business.

Fluff (ST): The fibrous, non-rubber, non-metal portion of a tire which remains after the scrap tire is processed (i.e., cotton, rayon, polyester, fiberglass or nylon).

Footprint (NT): The impact made by a tire's tread that comes in contact with the ground.

Full Cap (RR): A retread process that includes replacing the shoulder area as well as the tread area of the tire.

Full Retreading (RR): The process of buffing across the top of the tread and down over the shoulder to the upper sidewalls and replacing the tread and or sidewall rubber. This retread method will give the shoulders a finished appearance similar to that of a new tire.

## G

Gasification (ST): A process that occurs when tires are subjected to a high temperature, low oxygen environment.

Generic Dry Process (A): A non-patented procedure for incorporating ground rubber into conventional dense or gap graded hot mix asphalt using the dry process.

Granulated Rubber (ST): A term defined by ASTM D11, Rubber Committee as particulate rubber composed of mainly non-spherical particles that span a broad range of maximum "particle dimension", from below 425um (40 mesh) to 12mm (0.47 in). The key feature of this type of particulate rubber is the fraction of the material in the greater than 2mm (0.08 in) up to 12mm (0.47 in) maximum "particle dimension" range. (also refer to particulate rubber).

Granulator (ST): A machine that shears apart scrap tire rubber with revolving plates and produces ground particles, generally 3/4 inch to 200 mesh (also refer to Granulated Rubber).

Gravel (A): Course aggregate resulting from the natural disintegration and abrasion of rock or processing of weakly bound conglomerate.

Green Tire (NT): A tire which has not been vulcanized or cured.

Grooves (NT): The channels between the tread ribs of a tire.

Ground Rubber (ST): The term used by ASTM D11, Rubber Committee that defines particulate rubber composed of mainly non-spherical particles that span a range of maximum "particulate dimension", from well below 425um (40 mesh) to 2mm (0.08 in) as a maximum "particle dimension" (also refer to Particulate Rubber). The smallest reported mesh size for ground rubber is 450 mesh.

## H

Hair (ST): Wire protruding from the perimeter of a tire chip or shred (also refer to Fish Hook).

Hammermill (ST): A machine that mechanically processes cryogenically frozen scrap tire rubber using rotating impact hammers.

Heat Build Up (NT): The generation of heat due to hysteresis when rubber is rapidly or continually deformed.

Heavy-Duty Tires (NT): Tires weighing more than 40 pounds, used on truck, buses and off-the-road vehicles in heavy duty applications.

Horsetail (ST): A rough piece of shredded tire with a width of two to four inches, and a length greater than six inches.

Hot Mix Asphalt (A): A composition consisting primarily of graded aggregate and asphalt cement widely used for paving .

Hydrocarbon (NT): An organic chemical compound containing only the elements carbon and hydrogen.

Hydroplaning (aquaplaning) of Pneumatic Tires (A & NT): A phenomenon that occurs when the road contact surface of a pneumatic tire is separated from the road by a fluid, usually water.

Hysteresis (NT): 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 material.

## I

Incipient (F): The beginning or early phase of a fire where the heat being generated has not extended to the surrounding materials.

Inflation (NT): The amount of air pressure in a tire.

India Rubber (NT): An early name for natural rubber, as it came from the "Indes".

Injection Molding (NT): A molding operation wherein a rubber compound is heated in the barrel of an extruder and injected into the mold cavity while in a fluid state.

Injury (RR): Any damage caused by a penetrating object, severe scuff or impact.

Innerliner (NT): The layer or layers of rubber laminated to the inside of a tubeless tire to contain the inflation medium.

ISTEA (A): Intermodal Surface Transportation Efficiency Act of 1991.

## **J**

Jockey (ST): Refer to Casing Jockey or Tire Jockey.

## **K**

Kilojoules: A metric measurement of the release of energy. One kilojoule/kilogram is equal to 2.33 BTU/pound.

Kilopascals (Kpa): Metric unit of measurement for air pressure.

## **L**

Laced Tires (ST): A method of stacking tires which conserves space.

Latex (NT): Milk-like liquid that comes from the rubber tree. Crude rubber is coagulated from latex.

Light-Duty Tires (NT): Tires weighing less than 40 pounds, used on passenger cars and light trucks.

Light Truck Tire (NT): Tires with a rim diameter of 16 to 19.5 inches, manufactured specifically for light truck use.

Logger Tire (NT): A special tire designed for the logging industry.

## M

Maintenance Mix (A): A mixture of bituminous material and mineral aggregate applied at ambient temperature for use in patching holes, depressions, and distressed areas in existing pavement.

Managed Site (ST): A tire pile or storage facility where the owner/operator stores or processes scrap tires in compliance with the appropriate regulations.

Matrix (RR): The retreading equipment in which the new tread is cured to the worn casing and where the tread design is formed.

Mesh (ST): A size unit describing the number of openings per inch in a screen. For example a 50 mesh screen has 50 openings per lineal inch.

Micro Milling (ST): A mechanical process that further reduces ground rubber to very fine particles. The process combines ground rubber and water, forming a slurry which is forced between rotating abrasive discs.

Micron: A unit of length equal to 0.0001 centimeters or 10,000 angstrom units. This term has generally been replaced by the term micrometer

Millimeter: A metric unit of measurement. 1 millimeter (mm) equals 0.039 inches. 25.4 mm equals 1 inch.

Mixing Tires (NT): Use of different constructions (radial, bias, bias-belted) on a vehicle.

Mold (RR): The heated cavity in which tires are vulcanized. Includes the steam chamber, matrices and adjusting devices.

Mold Cure (RR): A retreading process using uncured tread compounds, where the vulcanization takes place in molds.

Monomer (NT): Any molecule that can be united (bound) chemically as part of a unit of a polymer.

Mucker Tire (NT): A flotation type of tire specifically designed for use in soft grounds (also referred to as a Mudder).

## N

NAPA: National Asphalt Paving Association.

Natural Rubber (NT): The material processed from the sap (latex) of *Hevca Brasiliensis* (rubber trees).

New Tire (NT): A tire which has never been mounted on a rim.

Nominal (ST): A term commonly used to refer to the average size product (chip) that comprises 50 percent or more of the through put in a scrap tire processing operation. It should be noted that any scrap tire processing operation will also generate products (chips) above and below the "nominal" range of the machine.

NTDRA: National Tire Dealers and Retreaders Association.

## O

Open Graded Aggregate (A): An aggregate that has a particle size distribution such that when compacted, the voids between the aggregate particles, expressed as a percentage of the total space occupied by the material, remain relatively large.

Original Equipment Tire (NT): The tires supplied with new vehicles from vehicle manufacturers.

OTR (NT): Off the Road Tire; tire designed primarily for use on unpaved roads or where no roads exist. Built for ruggedness and traction rather than for speed.

Overinflation (NT): The inflation of a tire above the recommended pressure for the load it carries; negative byproducts are rough ride, bruise and impact damage and suspension system damage.

Overloading (NT): The practice of putting more weight on a tire than the tire is designed for or can carry due to low inflation pressure. This is a dangerous practice and is not recommended.

Oversizing (NT): Mounting larger tires than specified on a vehicle to carry heavier loads, to provide increased flotation or to provide other performance changes.

Oxidation (NT): The reaction of oxygen with a rubber product, usually accompanied by a change in feel, appearance of surface or a change, usually adverse, in physical properties.

Ozone (NT): An allotropic form of oxygen. A gas with characteristic odor which is a powerful oxidizing agent. It is present in the atmosphere at low levels and causes cracking in certain types of elastomeric compounds.

## P

**Particulate Rubber (ST):** The term used in ASTM D11, Rubber Committee to define raw, uncured, compounded or vulcanized rubber that has been transformed by means of a mechanical size reduction process into a collection of particles, with or without a coating of a partitioning agent to prevent agglomeration during production, transportation, or storage (also refer to Buffing Rubber, Granulated Rubber, Ground Rubber, and Powered Rubber).

**Passenger Car Tire (NT):** A tire with less than an 18-inch rim diameter for use on cars only.

**Pavement Distress (A):** The physical manifestation of defects or deterioration in a pavement.

**Pavement Performance (A):** The ability of a pavement to fulfill its purpose as reflected in the measurable change in conditions over time.

**Plantation Rubber (NT):** Crude natural rubber obtained from cultivated rubber trees as opposed to wild or uncultivated trees.

**Plies (NT):** Layers of rubber coated cords.

**Pneumatic Tire (NT):** A tire which depends on the compressed air it holds to carry the load. It differs from a solid tire in that the tire itself carries the load.

**Polybutadiene (NT):** A synthetic rubber made by combining many molecules of butadiene into long chain polymers. This rubber is noted for superior tread wear, resiliency and flexing qualities at low temperatures.

**Polymer (NT):** A macromolecular material formed by the chemical combination of monomers having either the same or different chemical compositions.

**Polymer Chain (NT):** The chain of elements that form the basis of the structure of a polymer.

**Polymerization (NT):** A chemical reaction in which the molecules of a monomer are linked together to form large molecules whose molecular mass is a multiple of the original substance. When two or more different monomers are involved, the process is called copolymerization.

**Pounds Per Square Inch (NT):** PSI -- a measure of pressure.

**Powdered Rubber (ST)** The term used by ASTM D11, Rubber Committee to define particulate rubber composed of mainly non-spherical particles that have a maximum "particle dimension" equal to or below 425um (40 mesh). (also refer to Particulate Rubber)

**Pre-cure Process (RR):** A process of using pre-manufactured treads and vulcanizing these treads to a prepared casing with a thin layer of cushion gum (natural rubber).

Pre-cured Tread (RR): Tread which is vulcanized with the tread configuration molded into it prior to being placed on the buffed casing.

Pre-drying (RR): Drying of a tire in a heated room to remove moisture before retreading.

Pre-Incident Planning (F): A method of anticipating the response to a particular fire incident and planning the tactics and strategies based on information collected before a fire occurs.

Pressure Build-Up (NT): The increase of air pressure in a tire caused by an increase in the temperature of the contained air.

Preventive Maintenance (NT): Maintenance performed prior to any failure. Designed to lengthen product life, prevent high maintenance costs and to reduce equipment breakdown.

Private Brand (NT): A specialty line of tires or tubes manufactured for and to the specifications of a private buyer who sells these products under its company name.

Processed Tire (ST): A scrap tire which has been altered, converted or size reduced.

PTE (ST): Passenger Tire Equivalent; a measurement of mixed passenger and truck tires, where five passenger tires are equal to one truck tire.

Pugmill (A): A device for mixing the separate hot aggregate and bituminous components into a homogenous bituminous concrete ready for discharge into a delivery system.

Pulverized Rubber (ST): Refer to Ground Rubber

Pull (ST): The tendency of a vehicle to veer to one side.

Pyrolysis (ST): The process of thermal decomposition in the absence of oxygen. Pyrolyzing scrap tires yields gas, char, oil and steel.

## Q

## R

Radial Cracking (NT): Cracking, perpendicular to the bead, usually in or near the sidewall area.

Radial Tire (NT): A tire constructed so that the ply cords extend from bead to bead at a 90 degree angle to the centerline of the tread.

Rate of Cure (NT): The relative time required to reach a predetermined state of vulcanization under specific conditions.



Raw Rubber (NT): Unprocessed, vulcanized elastomer, normally implying the natural product.

Recapping (RR): An improper term for retreading. Often, this term refers to the process of top capping, in which rubber is applied to the tread surface only.

Reclaim (ST): The product from the degradation of rubber by mechanical, thermal, and/or chemical processes, resulting in a depolymerized material.

Reclaimed Asphalt Pavement -- RAP (A): Asphalt pavement or paving mixture removed from its original location for use in recycled asphalt pavement mixtures.

Recovery (NT): The degree to which a rubber product returns to its normal dimensions after being distorted.

Recycle or Recycling (ST): Any process by which worn tires are transformed into new products, including retreads, fuel, or ground rubber.

Recycled Asphalt Paving Mixture (A): A mixture of reclaimed asphalt pavement (RAP) with the inclusion, if required, of asphalt cement, emulsified asphalt, cut back asphalt, recycling agent, mineral aggregate, and mineral filler.

Recycled Rubber Product (ST): Products which contain recycled rubber.

Reinforcement (RR): Any material, usually rubber and fabric, vulcanized to the inside of a tire to add strength to the cord body at an injury.

Reinforcement Repair (RR): Repairs made to the casing when an injury has extended through more than 25 percent, but less than 75 percent of the tire body, requiring both hole-filling material and reinforcement units.

Remanufactured Tire (RR): A worn tire that has been properly inspected and/or repaired and has had new rubber applied bead-to-bead to extend its serviceable life (also referred to as a remolded tire).

Repair Materials (RR): Specifically designed materials (repair units, repair gums, cements) used during the repair process of a tire or a tube.

Repaired Tire (RR): A tire that has been injured by cuts, puncture or breaks, and which has been reconditioned to restore its strength for additional service.

Replacement Tire (NT): Any new tire other than those sold as original equipment.

Retail Tire Vendor (NT): A term used to describe retail outlets for tires.

Retreadability (RR): The ability of a tire casing to be retreaded and provide acceptable performance.

Retreaded Tire (RR): A casing to which a new tread rubber and sometimes, shoulder and sidewall rubber has been vulcanized to extend the usable life of the tire.

Reused Tire (NT): A passenger car tire taken off the rim of a vehicle and placed on the rim of another vehicle without any repair or other form of alteration.

Ribs (NT): The part of a tire tread pattern created by grooves which run circumferentially around the tire.

Rim (NT): The metal support for the tire and tube assembly on the wheel. The beads of a tire are seated on the rim.

Rip-Shear Shredders (ST): A tire shredder designed to reduce a scrap tire to pieces. The size and shape of the rubber particle is dependent on the processing action of the shredder (i.e., cutting blades, rotary shear or rip-shear).

RMA: Rubber Manufacturers Association; The trade association which represents the United States tire manufacturers and the United States based manufacturers of non-tire rubber products

Road Hazard (A): Any road or highway condition or obstacle which can damage a tire.

Rough Shred (ST): A piece of a shredded tire that is larger than 2" x 2" x 2", but smaller than 30" x 2" x 4".

RPA: (A): Rubber Pavements Association.

Rubber (NT): An elastomer, generally implying natural rubber, but used loosely to mean any elastomer, vulcanized and unvulcanized. By definition, rubber is 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 in a boiling solvent.

Rubber Latex: Refer to Latex.

Rubber Modified Asphalt (A): A general term used to identify the incorporation of scrap tire rubber into asphalt paving materials (also refer to Crumb Rubber Modified Asphalt Concrete).

Rubber Modified Asphalt Concrete -- RUMAC (A): A pavement product made with rubber. The rubber acts as an aggregate, and is blended into asphalt cement along with the aggregate in quantities ranging up to three percent rubber. This process is also referred to as the Dry Process.

Rubber Reclamation (ST): The process of degradation of the rubber's structure through the use of mechanical, thermal or chemical processes.

Rubberized Asphalt (A): Refer to Crumb Rubber Modified Asphalt Concrete.

RUMAC (A): Refer to Rubber Modified Asphalt Concrete.

Run Flat (NT): Tire damage resulting from operating with low or no air pressure, sometimes identified by repetitive liner cracking or discoloration. Also refers to a class of passenger car tires capable of safely operating without air pressure in event of air loss.

## S

Salt & Pepper Granules (ST): Granulated rubber that was made from white wall tires.

SAM (A): Stress Absorbing Membrane; A rubberized asphalt layer applied over existing pavement to retard fatigue cracking.

SAMI (A): Stress Absorbing Membrane Interlayers; A rubberized asphalt layer applied over an existing surface before application of a surface asphalt concrete, used to retard reflective cracking.

Scrap Pile Analysis (ST): The inspection of tires in a scrap pile of a commercial account to determine causes of tire failures.

Scrap Tire (ST): A tire which can no longer be used for its original purpose, due to wear or damage.

Scrap Tire Pile (ST): An accumulation of whole or processed scrap tires.

Scrap Tire Processing (ST): Any method of size reducing whole scrap tires to facilitate recycling, energy recovery or disposal.

Screen (A): An apparatus for separating sizes of granules.

Secondary Material (ST): Fragments or finished products or leftovers from a manufacturing process which converts a primary material into a commodity of economic value.

Section Repair (RR): Repairs made to the casing when an injury has extended through the tread or sidewall of a tire. The damaged cord is removed and replaced by a repair unit.

Sectioned Tire (ST): A tire that has been cut into at least two parts.

Shoulder (NT): The part of a tire between the tread and the sidewall.

Shred Sizing (ST): A term which generally refers to the process of particles passing through a rated screen opening rather than those which are retained on the screen. Examples of which are:

1" x 1": A size reduced scrap tire with all dimensions one inch maximum.

2" x 2": A size reduced scrap tire, 2" x 2" x 2" maximum.

X" minus: Size reduced scrap tires, the maximum size of any piece has a dimension no larger than one inch, but 95 percent of which is less than X inches in any dimension (i.e., 1" minus; 2" minus; 3" minus, etc.).

Shredded Tire (ST): A size reduced scrap tire. The reduction in size was accomplished by a mechanical processing device, commonly referred to as a "shredder".

Shredder (ST): A machine used to reduce whole tires to pieces.

Shredded Rubber (ST): Pieces of scrap tires resulting from mechanical processing.

Sink Holes (F): An event that occurs in shredded scrap tire piles that develop as material under the surface is consumed in an internal fire, and the surface caves in.

Sidewall (NT): The side of a tire between the tread shoulder and the rim bead.

Sieve (A): An apparatus for separating sizes of materials (also refer to Screen).

Single Pass Shred (ST): A shredded tire that has been processed with a shear type shredder and the piece has not been classified.

Sipes (NT): Small cuts purposely made in the surface of a tread to improve traction.

Skid Resistance (A & NT): The ability of the road surface and the tread to prevent the loss of tire traction.

Skiving (RR): The removal of damaged material prior to making a repair.

Source Reduction (ST): Any of a series of practices which act to reduce the number of scrap tires generated annually. These practices include, but are not limited to using longer mileage tires; maintaining proper inflation; rotating tires; balancing tires; maintaining alignment; repairing tires and retreaded tires.

Speed Rating (NT): Maximum speed capabilities of new passenger and light truck tires are indicated by means of a speed symbol. The following table lists these symbols and their applicability.

SPEED SYMBOL	MAXIMUM SPEED	APPLIES TO	
		PASSENGER CAR TIRES	LIGHT TRUCK TIRES
Z (no service description)	*above 149 mph (240 km/h)	YES	
Y**	186 mph (300 km/h)	YES	
W**	168 mph (270 km/h)	YES	
V (with service description)	149 mph (240 km/h)	YES	
H	130 mph (210 km/h)	YES	YES
U	124 mph (200 km/h)	YES	YES
T	118 mph (190 km/h)	YES	YES
S	112 mph (180 km/h)	YES	YES
R	106 mph (170 km/h)		YES
Q	99 mph (160 km/h)		YES
P	93 mph (150 km/h)		YES
N	87 mph (140 km/h)		YES
M	81 mph (130 km/h)	YES	

\*consult tire manufacturer for maximum speed.

\*\*a "ZR" may appear in the tire size designation.

Specifications (ST): Written requirements for processes, materials or equipment.

Speculative Accumulation (ST): The stockpiling of scrap tires without the benefit of a business or business plan, but with the expectation that a market will be found.

Split Rubber (ST): A process in which tread is stripped from a tire for subsequent processing.

Spontaneous Combustion (F): A term often used to explain the cause of internal, processed scrap tire fires. This is an inappropriate use of the term. (Refer to Spontaneous Ignition.)

Spontaneous Ignition (F): Heat generated by a chemical or bacterial action in a combustible material.

Squirrel Foot (ST): Exposed, rough pieces of belt or bead wire (also refer to Fish Hooks).

Steel Belt (ST): Rubber coated steel cords that run diagonally under the tread of steel radial tires and extend across the tire approximately the width of the tread. The stiffness of the belts provides good handling, tread wear and penetration resistance.

Steel Belted Radial (ST): A radial tire made with steel belts as opposed to textile belts.

STMC: Scrap Tire Management Council.

Stockpiles (ST): Places where tires are stored either for disposal or for future use.

Structural Plies (NT): Body and belt plies that contribute to casing strength.

Supplemental Fuel (ST): A combustible material which displaces a portion of traditional fuel source.

Surface Treatment (A): An application of bituminous material followed by a layer of mineral aggregate on a roadway.

Synthetic Rubber (NT): Rubber that is obtained by polymerizing petrochemical based monomers.

## T

Tactics (F): The method of securing the objectives laid out in a strategy through the use of personnel and equipment to achieve optimum results.

Take-Off Tire (ST): A tire that has been removed from a vehicle's rim. This includes tires that are used, are candidate casings for repair, retreading, and to be scraped.

TDF (ST): Refer to Tire Derived Fuel.

Thermoplastic (NT): A material with the capability (property) of being repeatedly softened by an increase of temperature and hardened by a decrease in temperature.

Thermoset (NT): The capability of maintaining a physical state across a wide range in temperatures.

Thermoset Plastic (NT): A solid macromolecular material which is incapable of continuous inelastic deformation by raising the temperature without chemical decomposition.

Thermosetting (NT): The property of a substance which undergoes a chemical change when heated, whereby a hardened non-thermoplastic product is formed.

Three Dimensional Fire (ST): A fire occurring within a material that has three surfaces. In the case of scrap tire fires, fire would be present on the upper surface, interior section and the bottom of the tire.

Tipping Fee (ST): Amounts charged by a facility operator for disposing of a scrap tire at that facility (also referred to as Disposal Fee).

Tire (NT): A continuous solid or pneumatic rubber covering encircling the wheel of a vehicle.

Tire & Rim Association: An industrial association of tire, rim and wheel manufacturers which provides tire, rim and wheel standards.

Tire Bounty (ST): An amount paid for the collection and retrieval of illegally dumped or stockpiled scrap tires.

Tire Buffings (RR): Refer to Buffings.

Tire Chip (ST): A classified scrap tire particle that has a basic geometrical shape, which is generally two inches or smaller and has most of the wire removed (also refer to Chipped Tire).

Tire Dealer (NT): A term used to define independent retail tire vendors.

Tire-Derived Fuel -- TDF (ST): A uniformly shredded product obtained from whole tires, used as a fuel.

Tire Jockey (ST): An independent business that hauls scrap tires for a fee from retail tire vendors to another location. Also known as a Casing Jockey.

Tire Maintenance (NT) The practice of establishing and ensuring proper air inflation, tire rotation, balancing, and alignment.

Tire Rotation (NT): The repositioning of the tires on a vehicle periodically to extend tire tread life.

TISC: Tire Industry Safety Council.

Top Retreading (RR): Only the top, or tread area, is buffed away during the retread process and a tread rubber with abrupt shoulders is applied. This type of retreading is usually requested when tires are used in highway service where a special shoulder is not required and when appearance is secondary.

Transformation (ST): The process of incineration, pyrolysis, gasification, chemical and/or biological conversion of a scrap tire.

Tread (NT): That portion of the tire which contacts the road.

Tread Buffing (RR): Refer to Buffings.

Tread Depth (NT): The measurement from the tread surface to the bottom of the grooves.

Tread Depth Gauge (NT): An instrument used to measure the depth of a tire's tread grooves in 32nds of an inch.

Tread Design (NT): The non-skid pattern (design) on the tread portion of a tire.

Tread Life (NT): The length of service in miles or hours of operation before the tread wears out.

Tread Peels (RR): Refer to Buffings.

Tread Rubber (NT): Compounded, natural or synthetic rubber which is placed on a buffed casing and vulcanized to it to provide a new wearing surface.

Tread Shaving (RR): The shaving of tread from a tire with a blade (usually to half the original tread depth) to reduce tread squirm and tearing in racing applications.

Tread Wear Indicators (NT): Narrow bars of rubber molded at a height of 2/32nds of an inch across the bottom of the tread grooves. When the tread wears down to these bars, the tire should be replaced (legal limits of a tire is 3/32nd of an inch of tread).

TRIB: Tire Retread Information Bureau.

TRRMMG: Tread Rubber and Repair Materials Manufacturers Group; formerly the Tread Rubber Manufacturers Group.

Trommel (ST): A mechanical device that sorts size reduced scrap tires.

Truck Tire (NT): Tires with a rim diameter of 20 inches or larger.

Tubeless (NT): A pneumatic tire that does not require an inner tube for air retention.

Tube-Type (NT): A pneumatic tire that requires an inner tube for air retention.

Two Dimensional Fire (ST): Fires that occur in a flat plane as in flammable liquid or processed scrap tire fires.

## U

Undercure (RR): A condition in which complete vulcanization was not achieved.

Underinflation (NT): A condition in which a tire is inflated below the recommended pressure, resulting in sluggish response, greatly increased tread wear, reduced gas mileage and casing failure.

Uniformity (NT): A measure of the tire's ability to run smoothly and vibration free.

Unmanaged Site (ST): A scrap tire pile or facility where tires are stored that are not in compliance with the appropriate regulations or at a dump site where scrap tires are stockpiled with no intention of reuse, recycling or processing.

Used Tire (NT): A tire removed from a vehicle's rim which cannot be legally described as new, but which is structurally intact and has a tread depth greater than the legal limit. This tire can be remounted onto another vehicle's rim without repair.

## V

Valve (NT): A device used to admit, retain, check or exhaust air in a tube or mounted tubeless tire.

Velcro Effect (ST): The interlocking of wire protruding from tire chips.

Venting (RR): An operation in which bias tires are punctured before retreading to guard against trapped air which causes casing separation.

Virgin Material (NT): Raw material, such as crude oil or aggregate taken from a quarry, that has not been previously used in any manufacturing process.



Vulcanization (NT): An irreversible process in which the chemical structure of rubber is changed (cross linked) to become less plastic (sticky, putty-like) and more elastic (bouncy) (also refer to Curing).

Vulcanized Rubber (NT): The product of vulcanization in which rubber which has been chemically reacted with sulfur and accelerators (or other acceptable materials) under suitable conditions to achieve modified physical properties over a wide range of temperatures.

Vulcanizing Agent (NT): Any material that can produce in rubber the change in physical properties known as vulcanization, such as sulfur, peroxides, polysulfides, etc.

Vulcanizing Cement (NT): A rubber cement used to bond the new rubber to the old tire.

## W

Waste Tire (ST): A tire which is no longer capable of being used for its original purpose, but which has been disposed of in such a manner that it can not be used for any other purpose.

Weather Checking (NT): Fine cracks in the sidewall surface of a tire caused by oxidation and other atmospheric effects.

Weaving (ST): Refer to Laced Tires.

Wet Process (A): Any method that blends ground rubber with the asphalt cement prior to incorporating the binder in the asphalt paving project.

Wheel Alignment (NT): Adjustment of wheel ends and axles to ensure the proper orientation of the tires to the chassis and to each other, which ensures the vehicle and the tires roll in a straight line.

Whole Tire (ST): A scrap tire that has been removed from a rim, but which has not been processed.

Wild Rubber (NT): Rubber collected from trees growing wild in nature, as opposed to trees cultivated on plantations.

Wires (NT): High tensile, brass plated steel wires, coated with a special adhesion-promoting compound, that are used as tire reinforcement. Belts of radial tires plies and beads are common uses.

Wobble (NT): A performance irregularity in tire and wheel assemblies, characterized by a side to side motion.

Worn Tire (NT): Any tire which has been removed from a vehicle because of wear or damage. Worn tires can be retreaded, repaired or scrapped.

WSW (NT): White sidewall tires.

**X**

**Y**

**Z**

Zipper (RR): Circumferential rupture of sidewall body cables.