



Glossary

Abrasion: External damage to a hose assembly caused by its being rubbed on a foreign object.

Ambient or Atmospheric Conditions: The surrounding conditions, such as temperature, pressure and corrosion, to which a hose assembly is exposed.

Amplitude of Vibration and/or Lateral Movement: The distance a hose assembly deflects laterally to one side from its normal position, when this deflection occurs on both sides of the normal hose centerline.

Anchor: A restraint applied to a pipeline to control its motion caused by thermal growth.

Annular: Refers to the convolutions on a hose that are a series of complete circles or rings located at right angle to the longitudinal axis of the hose (sometimes referred to as bellows).

Application: The service conditions that determine how a metal hose assembly will be used.

Armor or Casing: Flexible interlocked tubing placed over the entire length or in short lengths at the end of a metal hose to protect it from physical damage and to limit the bending radius.

Attachment: The method of fixing end fittings to flexible metal hose-welding, brazing, soldering, swaging or mechanical.

Axial Movement: Compression or elongation of the hose along its longitudinal axis.

Basket Weave: A braid pattern in which the strands of wire alternately cross over and under two braid bands (two over – two under).

Bend Radius: The radius of a bend measured to the hose centerline.

Braid: A flexible wire sheath surrounding a metal hose that prevents the hose from elongation due to internal pressure. Braid is composed of a number of wires wrapped

helically around the hose while at the same time going under and over each other in a basket weave fashion.

Braid Angle: The acute angle formed by the braid strands and the axis of the hose.

Braid Construction: Term applies to description of braid, i.e., 36 x 8 x .014, 304L SS.

- 36 = number of carriers or bands in a braid
- 8 = number of wires on each carrier
- .014 = wire diameter in inches
- 304L = material, Type 304L stainless steel

Braid Sleeve, Braid Band or Ferrule: A ring made from tube or metal strip placed over the ends of a braided hose to contain the braid wires for attachment of fittings.

Braid Wear: Motion between the braid and corrugated hose which normally causes wear on the O.D. of hose.

Braided Braid: In this braid, the strands of wire on each carrier of the braiding machine are braided together, and then braided in normal fashion, hence the term braided braid.

Brazing: A process of joining metals using a non-ferrous filler metal, which melts above 800°F, yet less than the melting of the “parent metals” to be joined.

Butt Weld: A process in which the edges or ends of metal sections are butted together and joined by welding.

Casing: (See definition under Armor)

Controlled Flexing: Controlled flexing occurs when the hose is being flexed regularly, as in connections to moving components.

Examples: Platen presses, thermal growth in pipe work.

Convolution: The annular or helical flexing member in corrugated or strip wound hose.

Corrosion: The chemical or electro-chemical attack of a media upon a hose assembly.

Cycle-Motion: The movement from normal to extreme position and return.

Developed Length: The length of a hose plus fitting (overall) required to meet the conditions of a specific application.

Diamond Weave: A braid pattern in which the strands alternately cross over one and under one of the strands (one over – one under). Also known as plain weave.

Dye Penetrant Inspection or Test: A method for detecting surface irregularities, such as cracks, voids, porosity, etc. The surface to be checked is coated with a red dye that will penetrate existing defects. Dye is removed from surface and a white developer is applied. If there is a defect in the surface being checked, the red dye remaining in it causes the white developer to be stained, thereby locating the defective area.

Displacement: The amount of motion applied to a hose defined as inches for parallel offset and degrees for radial misalignment.

Dog-Leg Assembly: Two hose assemblies joined by a common elbow.

Duplex Assembly: An assembly consisting of two hose assemblies – one inside the other – and connected at the ends.

Effective Thrust Area – Hose and Bellows: The cross-sectional area described by the outside diameter (at the tops of the convolutions) less two times the metal thickness of the hose or bellows.

Elastic (Intermittent Flexure): The smallest radius that a given hose can be bent to without permanent deformation of the metal in its flexing members (convolutions or corrugations).

Erosion: The wearing away of the inside convolutions of a hose caused by the flow of the media conveyed, such as wet steam, abrasive particles, etc.

Exposed Length: The amount of active (exposed) hose in an assembly. Does not include the length of fittings and ferrules.

Fatigue: Failure of the metal structure associated with, or due to, the flexing of metal hose or bellows.

Ferrule: (See definition for Braid Sleeve)

Fitting: A loose term applied to the nipple, flange, union, etc., attached to the end of a metal hose.

Flat Braid: Has a braid angle greater than 45° (See Braid Angle).

Flow Rate: Pertains to a volume of media being conveyed in a given time period, e.g., cubic feet per hour, pounds per second, gallons per minute, etc.

Frequency: The rate of vibration or flexure of a hose in a given time period, e.g., cycles per second (CPS), cycles per minute (CPM), cycles per day (CPD), etc.

Galvanic Corrosion: Corrosion that occurs on the less noble of two dissimilar metals in direct contact with each other in an electrolyte, e.g., water, sodium chloride in solution, sulfuric acid, etc.

Guide (For Piping): A device that supports a pipe radially in all directions, but allows free longitudinal movement.

Hardware: A loose term used to describe parts of a hose assembly other than the hose and braid, e.g., fittings, collars, valves, etc.

Helical: Used to describe a type of corrugated hose having one continuous convolution resembling a screw thread.

Helical Wire Armor: To provide additional protection against abrasion under rough operating conditions, metal hoses can be supplied with an external round or oval section wire spiral.

Inside Diameter: This refers to the free cross section of the hose and (in most cases) is identical to the nominal diameter.

Installation: Referring to the installed geometry of a hose assembly.

Interlocked Hose: Formed from profiled strip and wound into flexible metal tubing with no subsequent welding, brazing, or soldering. May be made pressure-tight by winding in strands of packing.

Intermittent Bend Radius: The designation for a radius used for non-continuous operation. Usually an elastic radius.

Lap Weld (LW): Type of weld in which the ends or edges of the metal overlap each other and are welded together.

Liner: Flexible sleeve used to line the I.D. of hose when the velocity of gaseous media is in excess of 180 ft. per second.

Loop Installation: The assembly is installed in a loop or “U” shape, and is most often used when frequent and/or large amounts of motion are involved.

Mechanical Fitting or Reusable Fitting: A fitting not permanently attached to a hose which can be disassembled and used again.

Medium (Singular)/Media (Plural): The substance(s) being conveyed through a piping system.

Minimum Bend Radius: The smallest radius to which a hose can be bent without suffering permanent deformation of its convolutions.

Misalignment: A condition in which two points, intended to be connected, will not mate due to their being laterally out of line with each other.

Nominal Diameter: A term used to define the dimensions of a component. It indicates the approximate inside diameter.

Offset – Lateral, Parallel, & Shear: The amount that the ends of a hose assembly are displaced laterally in relation to each other as the result of connecting two misaligned terminations in a piping system, or intermittent flexure required in a hose application.

Operating Conditions: The pressure, temperature, motion, media, and environment that a hose assembly is subjected to.

Outside Diameter: This refers to the external diameter of a metal hose, measured from the top of the corrugation or braiding.

Penetration (Weld): The percentage of wall thickness of the two parts to be joined that is fused into the weld pool in making a joint. Our standard for penetration of the weld is 100 percent, in which the weld goes completely through the parent metal of the parts to be joined and is visible on the opposite side from which the weld was made.

Percent Of Braid Coverage: The percent of the surface area of a hose that is covered by braid.

Permanent Bend: A short radius bend in a hose assembly used to compensate for misalignment of rigid piping, or where the hose is used as an elbow. Hose so installed may be subjected to minor and/or infrequent vibration or movement.

Pipe Gap: The open space between adjacent ends of two pipes in which a hose assembly may be installed.

Pitch: The distance between the two peaks of adjacent corrugation.

Ply, Plies: The number of individual thicknesses of metal used in the construction of the wall of a corrugated hose.

Pressure: Usually expressed in pounds per square inch (PSI) and, depending on service conditions, may be applied internally or externally to a hose.

- a. Absolute Pressure – A total pressure measurement system in which atmospheric pressure (at sea level) is added to the gage pressure, and is expressed as PSIA.
- b. Atmospheric Pressure – The pressure of the atmosphere at sea level which is 14.7 PSI, or 29.92 inches of mercury.
- c. Burst Pressure (Actual And Rated)
 1. Actual – Failure of the hose determined by the laboratory test in which the braid fails in tensile, or the hose ruptures, or both, due to the internal pressure applied. This test is usually conducted at room temperature with the assembly in a straight line, but for special applications, can be conducted at elevated temperatures and various configurations.
 2. Rated – A burst value which may be theoretical, or a percentage of the actual burst pressure developed by laboratory test. It is expected that, infrequently, due

to manufacturing limitations, an assembly may burst at this pressure, but would most often burst at a pressure greater than this.

- d. Deformation Pressure (Collapse) – The pressure at which the corrugations of a hose are permanently deformed due to fluid pressure applied internally, or, in special applications, externally.
- e. Feet of Water or Head Pressure – Often used to express system pressure in terms of water column height. A column of water 1 ft. high exerts a .434 PSI pressure at its base.
- f. Proof Pressure or Test Pressure – The maximum internal pressure which a hose can be subjected to without either deforming the corrugations, or exceeding 50 percent of the burst pressure. When a hose assembly is tested above 50 percent of its burst pressure, there often is a permanent change in the overall length of the assembly, which may be undesirable for certain applications.
- g. PSIA – Pounds per square inch absolute.
- h. PSIG – Pounds per square inch gauge.
- i. Pulsating Pressure – A rapid change in pressure above and below the normal base pressure, usually associated with reciprocating type pumps. This pulsating pressure can cause excessive wear between the braid and the tops of the hose corrugations.
- j. Shock Pressure – A sudden increase of pressure in hydraulic or pneumatic system, which produces a shock wave. This shock can cause severe permanent deformation of the corrugations in a hose as well as rapid failure of the assembly due to metal fatigue.
- k. Static Pressure – A non-changing constant pressure.
- l. Working Pressure – The pressure, usually internal, but sometimes external, imposed on a hose during operating conditions.

Profile: Used in reference to the contour rolled into strip during the process of manufacturing stripwound hose, or the finished shape of a corrugation; formed from a tube by either the “bump-out”, “sink” or roll forming processes, used in making corrugated hose.

Random Motion: The non-cyclic uncontrolled motion of a metal hose, such as occurs in manual handling.

Reusable Fitting: (See Mechanical Fitting)

Safety Factor: The relationship of working pressure to burst pressure.

Scale: Generally refers to the oxide in a hose assembly brought about by surface conditions or welding. An oxide.

Seamless: Used in reference to a corrugated metal hose made from a base tube that does not have a longitudinal seam as in the case of a butt welded or lap welded tube.

Squirm: A form of failure in which the hose is deformed into an “S” or “U” bend as the result of excessive internal pressure being applied or unbraided corrugated hose which has been axially compressed, loosening the braid, while the hose is pressurized. This is

particularly true with long lengths of braided hose subjected to manual or mechanical handling.

Strand(s): Individual groups of wires in a braid. Each group is supplied from a separate carrier in the braiding machine.

Stress Corrosion: A form of corrosion in stainless steel normally associated with chlorides.

Tig Weld: The tungsten insert gas welding process sometimes referred to as shielded arc. The common trade name is Heliarc.

Traveling Loop: A general classification of bending, wherein the hose is installed to a U-shaped configuration.

1. Class A Loop – An application wherein the radius remains constant and one end of the hose moves parallel to the other end of the hose.
2. Class B Loop – A condition wherein a hose is installed in a U-shaped configuration and the ends move perpendicular to each other so as to enlarge or decrease the width of the loop.

Torque (Torsion): A force that produces, or tends to produce, rotation of or torsion through one end of a hose assembly while the other end is fixed.

Velocity: The speed at which the medium flows through the hose, usually specified in feet per second.

Velocity Resonance: The sympathetic vibration of convolutions due to buffeting of high velocity gas or air flow.

Vibration: Low amplitude motion occurring at high frequency.

Paragon Performance

If you have any questions please give us a call @ 1-800-270-0333