

Technical Information (Definitions)

ABRASION

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

AMBIENT/ATMOSPHERIC CONDITIONS

The surrounding conditions, such as temperature, pressure, and corrosion, to which a hose assembly is exposed.

AMPLITUDE OF VIBRATIONS AND/OR LATERAL MOVEMENT

The distance a hose assembly deflects laterally to one side from its normal position, or when this deflection occurs on both sides of the normal hose centerline.

ANCHOR

A restraint applied to eliminate motion and restrain forces.

ANGULAR DISPLACEMENT

Displacement of two parts defined by an angle.

ANNULAR

Refers to the convolutions on a hose that are a series of complete circles or rings located at right angles 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 or squarelocked 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, i.e., welding, brazing, soldering, swaging, bonding, or mechanical.

AXIAL MOVEMENT

Compression or elongation along the longitudinal axis.

BASKET WEAVE

A braid pattern in which the strands of wire alternately cross over and under two strands (two over-two under).

BEND RADIUS

The radius of a bend measured to the hose centerline, as recommended by the manufacturer.

BEND RADIUS, DYNAMIC

The radius at which constant or continuous flexing occurs.

BEND RADIUS, INTERMITTENT

The radius used for non-continuous operation.

BEND RADIUS, MINIMUM

The smallest radius at which a hose can be used.

BEND RADIUS, STATIC

The smallest fixed radius at which a hose can be subjected.

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 MAKE UP

Term applies to description of braid, e.g. 32-12-.015, T321 SS, where: 32 is the number of carriers; 12 is the number of wires on each carrier; .015 is the wire diameter in inches; and T321 SS is the material, Type 321 stainless steel.

BRAID SLEEVE/RING/FERRULE/COLLAR

A ring made from tube or metal strip placed over the ends of a braided hose to contain the braid wires for attachment of fitting and ferrule, and to immobilize heat affected corrugations.

BRAID WEAR

Motion between the braid and corrugated hose which normally causes wear on the outside diameter of the corrugation and the inside diameter of the braid.

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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 having a melting point that is lower than 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 ARMOR)

CONTROLLED FLEXING

Occurs when the hose is being flexed regularly, as in the case of connections to moving components. Examples: platen presses and thermal growth in pipe work.

CONVOLUTION/CORRUGATION

The annular or helical flexing member in corrugated or stripwound hose/corrugation.

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/OVERALL LENGTH

The length of a hose plus fittings 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/TEST

A non-destructive inspection method for detecting surface defects.

DISPLACEMENT

The amount of motion applied to a hose defined in inches for parallel offset and degrees for angular 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. Also known as "jacketed assemblies."

EFFECTIVE THRUST AREA HOSE

The cross-sectional area described by the mean diameter of the hose.

ELASTIC/INTERMITTENT FLEXURE

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

EROSION

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

FATIGUE FAILURE

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

FERRULE (See BRAID SLEEVE)

FITTING/COUPLING

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

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.

FLUID

A gas or liquid medium.

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).

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GALVANIC-CORROSION

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

GMAW

Gas Metal Arc Weld.

GTAW (See TIG WELD/GTAW)

GUIDE (For PIPING)

A device that supports a pipe radially in all directions, but directs movement.

HELICAL

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

HELICAL WIRE ARMOR/SPRING GUARD

To provide additional protection against abrasion. Metal hoses can be supplied with an external round or oval section wire spiral.

INSIDE DIAMETER (I.D.)

The diameter inside of the hose corrugation.

INSTALLATION

The installed geometry of a hose assembly.

INTERLOCKED/SQUARELOCKED 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.

LAP WELD (LW)

Type of weld in which the ends or edges of the metal overlap each other.

LINER

Flexible sleeve used to line the inside diameter of hose when conveying a high velocity media, also prevents erosion.

LIVE LENGTH

The amount of active (flexible) length of hose in an assembly. Does not include the length of fittings and ferrules.

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.

MEAN DIAMETER

The midpoint between the inside diameter and the outside diameter of a corrugated hose.

MECHANICAL FITTING/REUSABLE FITTING

A fitting attached to a hose which can be disassembled and used again.

MEDIUM, MEDIA

The substance(s) being conveyed through a system.

MISALIGNMENT

A condition where two parts do not meet true.

NOMINAL DIAMETER

Indicates the approximate inside diameter.

OFFSET-LATERAL, PARALLEL

The distance that the ends of a hose assembly are displaced in relation to each other as a result of connecting two misaligned terminations in a system, or intermittent flexure required in a hose application.

OPERATING CONDITIONS

The pressure, temperature, motion, and environment to which a hose assembly is subjected.

OUTSIDE DIAMETER (O.D.)

The external diameter of a metal hose, measured at 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.

PERCENT OF BRAID COVERAGE

The percent of the surface area of a hose that is covered by braid.

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PITCH

The distance between the two peaks of adjacent corrugations or convolutions.

PLY, PLIES

The number of individual thicknesses of metal used in the construction of a wall of the convoluted hose.

PRESSURE

Usually expressed in pounds per square inch (psi).

PRESSURE, ABSOLUTE (PSIA)

A total pressure measurement system in which atmospheric pressure at sea level is added to the gauge pressure.

PRESSURE, ATMOSPHERIC

The pressure of the atmosphere at sea level which is 14.7 psi, or 29.92 inches of mercury.

PRESSURE, BURST (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.

PRESSURE, BURST (RATED)

A burst value which may be theoretical, or a percentage of the actual burst pressure developed by a 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.

PRESSURE, DEFORMATION

The pressure at which the convolutions of a hose become permanently deformed.

PRESSURE, FEET OF WATER OR HEAD

Often used to express system pressure in terms of water column height. A column of water 1 foot high exerts a .434 psi pressure at its base.

PRESSURE, MAXIMUM ALLOWABLE WORKING

The maximum pressure at which a hose or hose assembly is designed to be used.

PRESSURE, MAXIMUM TEST

The maximum internal pressure which a hose can be subjected to without permanently deforming the corrugations.

PRESSURE, PULSATING

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 convolutions.

PRESSURE, SHOCK

A sudden increase of pressure in a hydraulic or pneumatic system which produces a shock wave. This shock can cause severe permanent deformation of the hose corrugations, as well as rapid failure due to metal fatigue.

PRESSURE, STATIC

A non-changing, constant pressure.

PRESSURE, WORKING

The pressure, usually internal but sometimes external, imposed on a hose during operating conditions.

PROFILE

Used in reference to the contour rolled into the strip during the process of manufacturing stripwound hose, or the finished shape of a corrugation/convolution.

PSIA

Pounds per square inch absolute.

PSIG

Pounds per square inch gauge.

RANDOM MOTION

The uncontrolled motion of a metal hose, such as occurs in manual handling.

REUSABLE FITTING (See MECHANICAL FITTING)

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SAFETY FACTOR

The relationship of working pressure to burst pressure.

SCALE

The oxide in a hose assembly brought about by surface conditions or welding.

SEAMLESS

Used in reference to corrugated metal hose which is made from a base tube that does not have a longitudinal seam.

SPLICE

A method of joining two sections of hose.

SQUARELOCKED (See INTERLOCKED)

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 to unbraided corrugated hose while its ends are restrained, or in a braided corrugated hose which has been axially compressed.

STRESS CORROSION

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

STRIPWOUND (See INTERLOCKED)

TIG WELD/GTAW

The gas tungsten arc welding process sometimes referred to as a "shielded arc" or "heliarc."

TRAVELING LOOP

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

TRAVELING LOOP, CLASS A LOOP

An application wherein the radius remains constant and one end of the hose moves parallel to the other end.

TRAVELING LOOP, 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 about the longitudinal axis of a hose assembly while the other end is fixed.

VACUUM

Negative pressure or suction.

VELOCITY

The speed at which the medium flows through the hose.

VELOCITY RESONANCE

The vibration of convolutions due to the buffeting of a high velocity gas or liquid flow.

VIBRATION

Low amplitude motion occurring at high frequency.

WELDING

The process of localized joining of two or more metallic components by means of heating their surfaces to a state of fusion, or by fusion with the use of additional filler material.