styles and selection rubber hose

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flexible solutions

construction
Rubber hose is generally constructed of an inner layer which is reinforced and then covered with an outer layer.

The inner layer is to contain the substance being conveyed, and evenly transmit internal pressure forces to the reinforcing element.

The reinforcement is the material that provides the overall strength and pressure resistance to the hose. The reinforcement used can vary from polyester yarn, rayon, nylon, cotton or metal wire. It is the reinforcement that gives the hose its pressure rating. The overall wall thickness of a hose is not necessarily an indicator of its pressure capability.

The outer cover is the layer placed over the reinforcement and serves to keep elements such as the weather, abrasion and/or chemicals from weakening it.

rubber materials
The rubber materials used are selected to suit the hose application. NBR rubber for example is used predominantly on petrol and oil hoses due to its excellent oil resistance and moderate resistance to aromatics. EPDM is used on water and air hoses due to its excellent ozone and aging characteristics, and steam resistance. Whilst UHMWPE is used on chemical hoses due to its excellent resistance to chemicals and acids.

Data Sheet RH002 provides further information on rubber types.

A copy of a Rubber Compatability Table is available from Radcoflex upon request.

pressure capabilities
The attached Data Sheets show for each hose a Pressure Rating (WP) – this is the Working Pressure, which is the maximum pressure to which the hose can be subjected including pressure surges (a rapid rise or fall in internal pressure). This pressure is determined by testing the hose until it ruptures (called the Burst Pressure) and then dividing the pressure achieved at that point by a safety factor.

Note: care must be taken that the end fitting to be attached to the hose has as high a pressure rating as that of the hose. The applicable pressure rating of a complete assembly will be the lower of the hose or the end fitting.

safety factor
The Safety Factor applicable for each hose is shown on its Data Sheet. It varies depending upon the application and pressure requirements for the hose. In more hazardous critical applications, higher safety margins are used. For example for Steam, a safety factor of 10:1 is used, however for low pressure water delivery a safety factor of 3:1 may be used.

delivery and suction hose reinforcement
The reinforcement used in delivery and suction hoses vary. Suction hoses will collapse when negative pressure is applied so to resist this, these hoses are fitted with a single or double internal wire helix wrapped along the length of the hose.

Most rubber suction hoses have a medium positive working pressure capability so can be used both as a suction and a delivery hose.

common terms used rubber hose

Chloroprene Rubber
also known as Neoprene or Poly-Chloroprene, a family of synthetic rubbers that are produced by the polymerization of chloroprene

Delivery Hose
hoses for the purpose of transferring a particular conveyant at a positive pressure

Elastomer
an elastic substance resembling rubber

EPDM Rubber
stands for ethylene propylene diene Monomer (M-Class), an elastomer, is a synthetic rubber

Extruded Hose
is manufactured whereby raw compound is fed into an extrusion head and formed into the circular shape of a hose by means of a steel die - the hose is cured in a steam autoclave or a hot silica bath

FDA
stands for Food and Drug Administration (USA) and generally indicates that the rubber used meets the FDA requirements for food grade

FRAS Rubber
is a Neoprene rubber specially formulated to be Fire Resistant Anti-Static

Mandrel Built Hose
is manufactured on a long steel pipe (mandrel) – layers of rubber are applied to the revolving mandrel with each layer applied in the reverse direction to the previous one, providing strength and maximum adhesion for the hose, which is then cured in a steam autoclave

NBR Rubber
is Nitrile Butadiene Rubber (also known as Buna-N), a synthetic rubber copolymer of acrylonitrile and butadiene

Neoprene Rubber
see Chloroprene above, Neoprene is a trade name of DuPont Dow Elastomers

Polymer
a macromolecular material formed by the chemical combination of monomers

SBR Rubber
is Styrene Butadiene Rubber (also known as Buna-S), a synthetic rubber copolymer of styrene and butadiene

Suction Hose
suction occurs when a conveyant is being pulled through a hose, creating a vacuum (also known as negative pressure) – generally occurs on the suction end of a pipe or line

UHMWPE
stands for ultra high molecular weight polyethylene, a thermoplastic polyethylene with a better abrasion resistance than PTFE