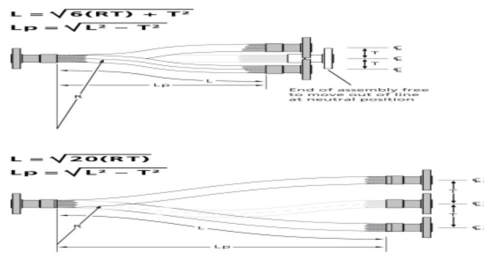
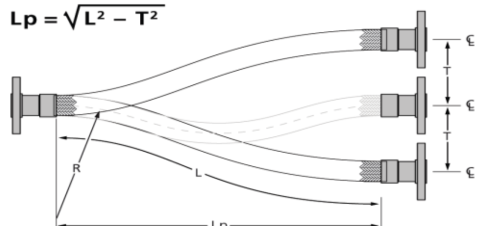
Pressure Loss and Flow Velocity Information	
Pressure Loss	**Flow Velocity Consideration**
For the same flow characteristics, the pressure loss is higher in metal hoses than rigid piping, due to the profile of the corrugations. As a rough estimation, expect the pressure loss in corrugated hoses to be 150 percent higher than in new, smooth steel pipes.	The flow velocity in corrugated metal hose should never exceed 150 ft./sec. for gas or 75 ft./sec. for liquids. When a hose is installed in a bent condition, the flow values should be reduced proportionally to the degree of the bend. Where the flow velocity exceeds these rates, an interlocked metal hose liner or larger hose I.D. is recommended.
Classification of Motion	
Random Motion	
Such motion is non-predictable and occurs from the manual handling of a hose assembly. Care must be taken to prevent over-bending of the hose and to avoid external abrasion of the wire braid. An armor covering of interlocked hose provides protection against these abuses.	
Minimum Bend Radius Occurs at Offset Position	
Moving end is free to move “out of line” at neutral position. To find the live hose length:	
Axial Motion	
This type of motion occurs when there is extension or compression of the hose along its longitudinal axis. This class of motion is restricted to unbraided corrugated hose only and is accommodated by traveling loops (see pg. 18) or bellows specifically designed for this purpose.	
Angular Motion	**To find the live hose length:**
This type of motion occurs when one end of a hose assembly is deflected in a simple bend with the ends not remaining parallel.	$L = \pi RO/180 + 2(s)$ L = Live Hose Length (inches) $\pi = 3.1416$ R = Minimum Centerline Bend Radius — Dynamic (in.) O = Angular Deflection (degrees S = Outside Diameter of Hose
Offset Motion	
Offset motion occurs when one end of the hose assembly is deflected in a plane perpendicular to the longitudinal axis with the ends remaining parallel. This movement can be due to a one-time (static)bend or movement which repeatedly occurs slowly over time (such as thermal expansion). • The appropriate formula to use to calculate Live Hose Length depends on the condition of the moving end. • When the offset motion occurs to both sides of the hose centerline, use total travel in the formula; i.e., 2 x “T.” • The offset distance “T” for constant flexing should	

never exceed 25 percent of the centerline bend radius "R." • If the difference between "L" and "Lp" is significant, exercise care at installation to avoid stress on hose and braid at the maximum offset distance.	
Minimum Bend Radius Occurs at Crowded Position	
Moving end of hose is restricted to move only up and down as hose crosses neutral position. To find the live hose length: $L = \sqrt{20(RT)}$ $Lp = \sqrt{L^2 - T^2}$	$L = \sqrt{20(RT)}$ $Lp = \sqrt{L^2 - T^2}$ 
Traveling Loops	
In a piping system where axial movement must be accommodated or where the magnitude of the motion is in excess of the limits of an offset movement, the traveling loop configuration offers an ideal solution. In traveling loops, the centerline of a hose assembly is bent in a circular arc. Traveling loops accommodate movement in one of two ways. A constant radius traveling loop accommodates motion by varying the length of the arms of the assembly while the radius remains constant. A variable radius traveling loop accommodates motion by varying the bend radius of the hose assembly. Both types of traveling loops can be installed to absorb either horizontal or vertical movement. The constant radius traveling loop provides for greater movement while the variable radius traveling loop requires less installation space.	L = Live Hose Length (inches) R = Minimum Centerline Bend Radius for Constant Flexing (inches) T = Total Travel (inches) H = Hang Length of the Loop (inches)