



technical aspects corrugated metal hose

bend radius and hose flexibility

The bend radius is measured from the center line of the hose to the mid point of the bend circle when flexed under nominal conditions (i.e. at ambient temperature)

When flexing a corrugated hose, the corrugations on the outside of the radius are expended whilst those on the inside are compressed. The theoretical minimum bend radius is reached when the corrugations on the inside of the radius are touching, but this point may not be reached due to other factors such as the restriction of the external wire braiding or other protection devices.

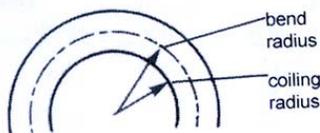
Static bend radius is the bend radius when the hose is stationary under nominal conditions. Dynamic bend radius is the bend radius when the hose is in motion or flexing under nominal conditions.

Note: The bend radius is not necessarily related to the suppleness (pliancy) or flexibility of the hose. Flexibility increases with higher corrugations and closer pitches (i.e. distance between the crown or top of each corrugation). A reduction in wall thickness will also increase flexibility but normally at the expense of a reduced pressure capability. A further factor is the shape of the corrugation, a tear drop shape providing more flexibility than the u-shape corrugation.

International Standard ISO 10380 nominates two types of hose flexibility:

- Type 1 - corrugated hose of high flexibility
- Type 2 – corrugated hose if moderate flexibility

The hose bend radius specifications in the data sheets are the recommended minimum bend radii, and have been tested and listed in accordance with ISO 10380 nominated measurements – in general SITCOFLEX hoses perform better than listed.



pressure loss

When planning piping systems, the pressure loss of the medium conveyed is an important consideration, in addition to the hose's pressure capability and flexibility. At equal flow rates the pressure loss in metal hoses is higher than in rigid piping. This is caused by the corrugations in the wall of the hose, which create increased wall friction, and eddies within the corrugations.

As a rough estimate, it can be assumed that the pressure loss in corrugated hoses is 100% higher than in new welded steel pipe. This means that in the case of corrugated hoses an increase in the hose diameter of 15% is sufficient to reduce the pressure loss to the same value as new welded steel pipe.

service life

The service life of a metal hose is the number of load cycles achieved by the hose until the first leak occurs. A load cycle is the single movement of the hose and its return to its initial position.

The service life depends upon many factors including the operating pressure, operating temperature, bend radius, correct installation, rapid movements, corrosive medium or atmosphere.

Fatigue tests carried out have shown that a direct Relationship exists between the operating pressure, the bend radius and the service life achieved. For example, a reduction in service life due to an increasing operating pressure can be compensated for by a corresponding increase in the bend radius the hose is asked to perform.

International Standard ISO 10380 requires that for hoses up to 100mm nominal bore, the assemblies shall have an average service life of not less than 10 cycles at its nominal static bend radius and not less than 50,000 cycles at its nominal dynamic bend radius, under nominal conditions (i.e. nominal pressure, ambient temperature, correct selection and installation).