

ASSIWELL® Metal hoses

Operating manual for metal hose assemblies

GENERAL



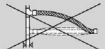



















The hose assemblies have been designed according to the available order indications for medium, pressure and produced according to this layout. It is the responsibility of the installation designer and operator to identify and analyze the relevant hazards and define and implement the necessary measures.

The hose assemblies are to be installed and operated in an adequate manner.























The laws, standards and directives applicable in the country in which the hose assembly is used must be taken into account.

Depending on the installation and operating conditions (relevant parameters: medium, min. & max. operating pressure, min. & max. operating temperature, prevailing flowing conditions of the medium inside the hose during all operating states, outside influences, e.g. mechanical, corrosive, oscillation-related, or thermal), serviceability of the hoses is to be examined by an outside and inside visual inspection, depending on the level of hazard, within adequate time intervals. Especially in case of aggressive, poisonous and highly inflammable media, these inspections are to be carried out within short distances of time.

INSTALLATION INSTRUCTIONS METAL HOSES

Wrong installation		Correct installation
	Don't absorb vibrations from several directions by one single hose – install several hoses in a 90° angle line	
	Don't allow the hose to move in one direction only – centre it to permit absorption of half of the movement in both directions	
	Don't permit axial movements – install the hose vertically to the direction of movement	
	Avoid large lateral movement – install the hose in a 90° bend	
	Avoid torsion – the hose bend and the direction of movements must be in the same plane	
	Avoid excessive bending of the hoses at their ends – use pipe bends	
	Don't use any length – dimension the exact length	
	Take care that the flexible length is not too long – dimension the exact length	
	Avoid torsion due to angular movements – all movements in hose axis only	
	Keep the welding torch away from the hose – cool the connecting seam between the hose and the fittings – don't overheat it	
	Don't drag the hose on the floor without any protection – avoid damage by using an outer protection cover.	

INSTALLATION INSTRUCTIONS METAL HOSES

Wrong installation		Correct installation
	Don't pull the hose off – uncoil it	
	Don't twist the hose – install it torsion-free	
	Dimension the hose adequately – take care that the flexible length is not too short	
	Avoid excessive bending of the hose – use pipe bends	
	Don't move the hose obliquely to the installation plane - move it in hose axis only	
	Avoid sagging of the hose – use a support	
	If larger axial movement has to be absorbed: Don't install the hose in a straight line – install it in a U-shaped bend	
	Avoid torsional twist when fittings are not in line – install in one plane only	
	Avoid overbending when suspending the hose - use a support roll	
	Avoid excessive bending of the hoses at their ends – use pipe bends	
	Don't absorb vibrations in the axial direction – install the hose vertically to the direction of movement	

INSTALLATION

Observe the installation instructions contained in this operating manual and the DIN 20066:2017-11 (Hose assemblies) Installation (installation instructions) and DGUV R 133-015 and TÜV 002 (03.2017). To ensure the serviceability of hose assemblies and in order to avoid a shortening of their service time by additional strains, the following is to be observed:

- The hose assemblies are to be installed in a way that their natural position and movement are not impeded
- Hose assemblies must not be strained during operation by outside influences like tension, torsion, and upsetting, unless they are specially designed and constructed to serve such an application
- The min. bending radius must not fall below the figure indicated by the manufacturer (figures can be taken from the catalogue)
- Hose assemblies must be protected from damages by outside mechanical, thermal, or chemical influences
- The removable joints must be checked to fit tightly before putting in operation
- Do not put the hose assembly in operation in case outside damages are visible
- If necessary, the hoses are to be cleaned appropriately before initial operation
- In case of hose assemblies requiring an equipotential bonding, bonding has to be checked and if necessary, provided afterwards

CORRECT APPLICATION

Hose assemblies are only to be used for applications they are designed and determined for. Please take all relevant parameters like permissible pressure, tolerable bending radius, temperature range, and all media to get in contact with the hose, from the enclosed documentation, i.e. the manufacturers declaration, declaration of conformity, or the marking applied on the hose.

Relevant parameters are:

- Pressure (max. permissible excess pressure in service must not be exceeded)
- Temperature (max. admissible temperature depending on the medium must not be exceeded. If necessary, this has to be verified along resistance lists of the hose assembly components)
- Bending radius (min. tolerable bending radius must be observed)
- Movement (in case of a likely abrasion, a possible wearing-off effect must be taken into account and be monitored) and
- Resistance (materials of the hose assembly have to be resistant against the flowing substances. If necessary, this has to be verified by resistance lists)

In case that hoses are marked acc. to the following norms, the below-mentioned regulations are valid:

- ISO 10380: Corrugated metal hoses and hose assemblies.
- DIN 3384: Hose assemblies of stainless steel for gas acc. to DVGW Sheet G 260
- DIN EN 14585-1: Corrugated metal hose assemblies for pressure applications acc. To PED 2014/68/EU
- EC 1935/2004: Materials and articles intended to come into contact with food.
- EN 12434: Cryogenic flexible hose assemblies. Permissible for the use of cryogenic fluids
- DIN 2827: Hose assemblies of stainless steel for chemical applications. For hose lines to DIN 2827, material 1.4571 is prescribed. These hose assemblies are marked with the material number. As the hoses are ordered standardized according to this norm, the manufacturer cannot carry out a hazard analysis on the chemical resistance. Within the framework of the hazard, the operator has to verify whether resistance of the material for the relevant medium is provided. Depending on the medium level of hazard, repeated tests have to be carried out within appropriate time intervals.

If Angst+Pfister does not get the full information about the application, medium and working pressure, the warranty and responsibility or liability no longer apply for PED 2014/68/EU.

In order to operate the hose assembly safely, technical, organisational and personal protection measures are to be carried out. Priority has always to be given to technical and organisational measures. In case not all dangers can be excluded by this, effective personal protection gear is to be provided and used.

TRANSPORT & STORAGE

- For transport, the hose and hose assemblies have to be packed/fixed in such a manner, that damages should be excluded. Special provision shall be applied for consequences of motion during transportation
- Transport and store in cool, dry, and low-dust ambient; avoid direct sun or UV light; protect from near heat sources; hoses and hose assemblies must not get in contact with substances and surfaces which can cause damages
- Hoses and hose assemblies have to be transported/stored lying, tension-free, and buckling-free. If transported/stored in rings, the min. bending radius must not fall below the figure indicated by the manufacturer
- Close the hose ends with protection caps to protect the inside from soiling, against ozone influence and corrosion (after residual evacuation resp. cleaning)

MAINTENANCE & INSPECTION

Cleaning

The hose assembly is to be cleaned and rinsed after each operation, and prior to each inspection. If cleaned with steam or with chemical additives, the resistance of the hose assembly components are to be observed. If used with food contact, special cleaning must apply.

Inspection periods

The safe operating condition of hose assemblies subject to compulsory inspection is to be verified and documented by a "qualified person":

- Prior to initial starting (hose assemblies purchased ready for service: random quality checks)
- In regular intervals after initial starting (each single hose assembly). (Inspection period e.g. for thermoplastic and elastomer hose assemblies min. 1 x per year, steam hoses twice a year. A higher strain requires shorter inspection periods, e.g. in case of higher mechanical, dynamic, or chemical strains)
- Examine each hose assembly after a repair

Scope of inspection

Kind and scope of inspection (e.g. pressure test, visual examination, electrical conductivity test etc.) for example are controlled by the "qualified persons" acc. to operating safety regulation TRBS 1203 or TUV 002 (03.2017). The result is to be documented.

Repairs

Repairs of hose assemblies are to be carried out by a "qualified person" only, according to the valid operating safety regulation with following inspection, marking, and documentation.

EXCEPTIONAL FEATURES FOR EXAMPLE ARE VALID FOR THE FOLLOWING HOSE ASSEMBLY TYPES:

Metal hose assemblies

In case of metal hoses, which are not equipped with an outside heat insulation, a higher danger of scorching occurs in case of an application with steam, due to their high heat conductivity.

- Metal hoses are conductive enough without further measures
- Pay special attention to damages of the wire braid (if applied) and on deformation of the hose, e.g. kinking
- No influences by chlorides, bromides or iodides, extraneous rust or rust film during storage must occur

REMARK

For the appropriate application of hose assemblies, the comprehensive notices of leaflet TÜV 002 (03.2017) and the relevant rules for accident prevention are to be observed.

METAL HOSE DESIGN

Influence of the service conditions on the metal hose design
In view of the variety of the different applications the working pressures and bending radius stated in the technical tables can only be used as a guideline. They are valid for predominantly static stress and room temperature (20 °C). The pressure values provide a minimum of three times (If ISO 10380: four times) the safety factor to the burst pressure. The usual test pressure is at 1.5 times the working pressure, unless the user specifies a higher pressure for testing or acc. to PED. The existing service conditions (i.e. pulsating and discontinuous demand, type and frequency of motion, higher working temperature etc.) exert additional demands on the hose material. These influences can be taken into account in favour of the working safety and working life by the information in the datasheet.

Angst + Pfister AG
Thurgauerstrasse 66
Postfach
CH-8052 Zürich
Switzerland
Tel. +41 (0)44 306 61 00
Fax +41 (0)44 306 61 00
www.angst-pfister.com
ch@angst-pfister.com