Operating Instructions Metal Hose Assemblies

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General information

The hose assemblies are designed and manufactured in accordance with the customer's specifications regarding medium, pressure and temperature. All finished hose assemblies are finally tested, including a leak or strength test, in accordance with the relevant regulations or as instructed by the customer.
Before installation, the hose assemblies must be checked for damage and contamination and cleaned if it is necessary.
Damaged hose assemblies must not be used. The hose lines must be protected against corrosive and mechanical external influences.
The operator must organise this inspection at appropriate intervals depending on the operating conditions. It is essential to replace damaged lines.
The relevant accident prevention regulations and the BG Chemical Association's information sheet T002 (BGI 572) apply to the proper use of hose lines.

Assembly

During the installation of the hose lines, the following must be observed:

- The specified bending radii must be observed.
- The hose assemblies must be installed free of tension and torsion and are not allowed to be subjected to tensile stress or compression.
- Before installation, the hose assembly must be checked for damage. Damaged hoses are not permitted to be used.
- It is important to ensure that the hose lines are not exposed to corrosive media or harmful mechanical influences.
- Disconnectable connections must be checked for secure seating before using.

During Operation

During start-up and in operation, the parameters used in the design (e.g. pressure, temperature, bending radii) must be strictly observed.
Suitable protective equipment must be provided against external harmful influences.
The resistance of the media wetted materials is monitored with regard to the specified flow media. A clear statement on the resistance of the hose lines can, however, only be made with absolute certainty based on operational and practical experience

Incrustations in the hose lines as a result of the media passing through them can lead to signs of corrosion and affect the flexibility of the hose line's specified bending radii and can lead to an early failure.
To minimise the risk of getting burnt at high operating temperatures, appropriate protective safety regulations must be followed (contact protection, warning notices, shut-off devices).
Hose assemblies must be secured against swinging around freely if there is a corresponding risk. However, the movement of the hose assemblies must not be restricted, as there is a risk of friction wear or overloading.
If there is a risk of electrostatic charge, appropriate steps must be taken, e.g. by discharging the voltage correctly.

Maintenance

The operator must define inspection periods for hose assemblies in accordance with the applicable regulations. Damaged hose lines must be replaced. Attention must also be taken to any deformation due to kinking of the line or damage to the wires of the braiding. Damaged hose lines are not allowed to be repaired.
Contaminated hoses must be cleaned with suitable substances and replaced if necessary.

Storage Instructions

Please note the following when storing hose assemblies:

- Hose assemblies should be stored in a cool, dry place and, if possible, in a stretched condition.
- When storing in coils, the specified bending radii must not be exceeded.
- Hose assemblies must be stored free of tension, torsion and kinks.
- Hose assemblies must be stored cleaned and dried; to protect the inside from dirt and corrosion, it is recommended to seal the ends with caps.

Gas hoses according to DIN 3384:2007-08

Hose Selection Guide

Type Name	Design	Nominal Diameter	Materials	Allowable operating pressure acc. to DIN 3384
FI-0	UNBRAIDED corrugated stainless steel hose	DN 6, DN 8, DN 10, DN 12, DN 16	Hose Material: 1.4541/ 1.4571/ 1.4404	MOP 5
FI-0	UNBRAIDED corrugated stainless steel hose	DN 20, DN 25, DN 32 DN 40, DN 50, DN 65 DN 80, DN 100	Hose Material: 1.4541/ 1.4571/ 1.4404	MOP 1

FI-1	SINGLE BRAIDED corrugated stainless steel hose	DN 6, DN 8, DN 10 DN 12 DN 16, DN 20, DN 25 DN 32 DN 40, DN 50 DN 65, DN 80, DN 100	Hose Material: 1.4541/ 1.4571/ 1.4404 Braiding Material : 1.4301	Welded Fittings MOP 16 Soldered Fittings: MOP 5
FI-1	SINGLE BRAIDED corrugated stainless steel hose	DN 125, DN 150, DN 200, DN 250	Hose Material: 1.4541/ 1.4571/ 1.4404 Braiding Material : 1.4301	Welded Fittings MOP 16
FN-1	SINGLE BRAIDED corrugated stainless steel hose	DN 16, DN 20, DN 25, DN 32, DN 40, DN 50	Hose Material: 1.4541/ 1.4571/ 1.4404 Braiding Material : 1.4301	Welded Fittings MOP 16

Fitting types for gas hoses according to DIN 3384:2007-08

Nr.	Fittings Type	Materials	Pressure Ratinng
1	Male thread/ Hexagon Nipple according to DIN EN 10226-1/ DIN 2999-1 (to be provided on one side only)	b, c, d	Up to DN 25 - MOP 16 Up to DN 50 – MOP 5 Greater than DN 50 – MOP 1 (for soldered fittings max. MOP 5)
2	Female thread/ socket according to DIN EN 10226-1/ DIN 2999-1 (to be provided on one side only)	b, c, d	Up to DN 25 - MOP 16 Up to DN 50 – MOP 5 Greater than DN 50 – MOP 1 (for soldered fittings max. MOP 5
3	Fixed Flange, sizes according to DIN EN 1092-1/ DIN 2501 (to be provided on one side only)	a, b, c	MOP 16 Plate thickness depending on the nominal pressure (min. PN 6)
4	Welding ends according to DIN EN ISO 9692-1	a, b, c	MOP 16 Welded type only
5a	Pipe sockets for sleeves without soldering according to DIN 2353	a, c	MOP 16
5b	Pipe sockets for straight pipe connectors to DIN 3387-1	e	MOP 5
6a	Threaded nipple for solderless screw connection to DIN 2353	a, b, c	MOP 16
6b	Welding nipple with 24° sealing cone and O-ring for threaded connection according to 6a	a, b, c, d	MOP 16 (gelötete for soldered fittings max. MOP 5)
7	Loose flange with welding neck/ collar according to DIN EN 1092-1 / DIN 2501	a, b, c	MOP 16 Plate thickness depending on the nominal pressure (min. PN 6)
8 und 11	3-part union, conical sealing, with female thread DIN EN 10226-1/ DIN 2999-1	b, c, d	Up to DN 25 - MOP 16 Up to DN 50 – MOP 5 Greater than DN 50 – MOP 1 (for soldered fittings max. MOP 5

9 und 12	3-part union, conical sealing, with external thread DIN EN 10226-1/ DIN 2999-1	b, c, d	Up to DN 25 - MOP 16 Up to DN 50 – MOP 5 Greater than DN 50 – MOP 1 (for soldered fittings max. MOP 5
10 und 13	3-part union, conical sealing, with external thread DIN EN 10226-1/ DIN 2999-1	b, c, d	Up to DN 25 - MOP 16 Up to DN 50 – MOP 5 Greater than DN 50 – MOP 1 (for soldered fittings max. MOP 5)
15	3-part union, with flat sealing, with internal thread DIN EN 10226-1/ DIN 2999-1	b, c, d	Up to DN 25 - MOP 16 Up to DN 50 – MOP 5 Greater than DN 50 – MOP 1 (for soldered fittings max. MOP 5)
16	3-tlg. Verschraubung, konisch dichtend, mit Außengewinde DIN EN 10226-1/ DIN 2999-1	b, c, d	Bis DN 25 - MOP 16 Bis DN 50 – MOP 5 Über DN 50 – MOP 1 (gelötete Anschlüsse max. MOP 5)
17	3-tlg. Verschraubung, konisch dichtend, mit Anschweißende nach DIN EN ISO 9692-1	b, c, d	MOP 16 (gelötete Anschlüsse max. MOP 5 / Schweißende nur aus Werkst. b oder c)
18	Flachdichtender Bund mit Überwurfmutter mit Gewinde DIN EN ISO 228-1	b, c, d	MOP 5 Bis DN 50
19	Pressverbinder nach DVGW VP 614	b, c, d	MOP 5
20	Anschluss für Geräte/ Regler für Flüssiggase nach DIN EN 560	b, c, d	MOP 1

Material specifications for fittings

a)

- Pipes made of P235GH (1.0345) DIN EN 10216-2 or DIN EN 10217-2
- Unfinished steel made of UZSt 37-2 (1.0161) in accordance with DIN EN 10087 / dimensions in accordance with DIN EN 10278

b)

- S235JRG2 (1.0038) in accordance with DIN EN 10025-2

c)

- Austenitic stainless steels according to DIN EN 1.0088-3

d) Other materials

- Malleable cast iron (threaded fittings to DIN EN 10242)
  - EN-GJMW-400-5 (EN-JM 1030) in accordance with DIN EN 1562

- Machining steel
  - 1.0715 according to DIN EN 10087
  - 1.0718 according to DIN EN 10087

- Brass (copper-zinc casting alloy)
  - CuZn39Pb2 (CW612N/ old 2.0380) according to DIN CEN/TS 13388
  - CuZn39Pb3 (CW614N/ old 2.0401) according to DIN CEN/TS 13388
  - CuZn40Pb2 (CW617N/ old 2.0402) according to DIN CEN/TS 13388

- Gunmetal (copper-tin-zinc casting alloy)
  - CuSn5Zn5Pb5-C (CC491/ old 2.1096.01) according to DIN EN 1982

e)

- Copper
  - CuDHP (old SF-Cu) (CW024A/ old 2.0090) according to DIN CEN/TS 13388

Other materials are only permitted to be used if they are at minimum of the same quality as the respective material used and if this is certified.

Marking and identification

The hose assemblies are permanently marked on an end sleeve and contain at minimum the following information:

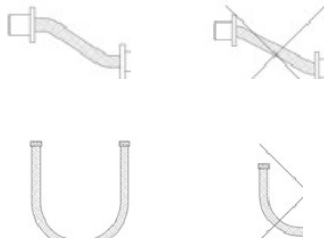
- Manufacturer's identification code
- Date of manufacture
- Type name
- Nominal diameter
- Pressure rating
- DIN-DVGW registration number

Connection of hose, braiding and connecting parts

- Welded connections
  - The requirements of DIN EN ISO 10380:2003 apply
- Soldered connections
  - The requirements of DIN EN ISO 10380:2003 apply
- Soldered connections for gas hoses are permitted up to max. MOP 5
  - No cadmium-containing solders are allowed to be used
- Form-fit connections
  - For threaded connections, the connection can also be made using form-fit connections. Holding rings or equivalent must be non-detachably mounted at the factory

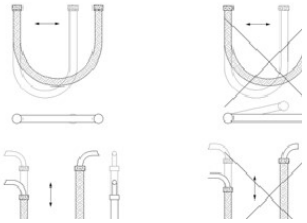
Installation and handling of metal hoses

- The bending radius must be observed during installation and the hose length must be sufficient to ensure stress-free installation. This applies both when compensating for lateral misalignment with direct connection of the tube axes and for U-shaped installation and absorption of lifting movements.



- Kinking of the hose ends must be avoided by using fittings such as manifold bends

- Movements may only be performed in the hose axis to ensure that there is no damaging torsion.

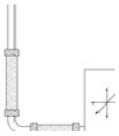


- In U-shaped installation, the hose must be guided properly, e.g. using a reel or similar, so that it does not have a smaller bending radius.

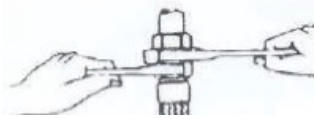
- Axial compression of the hose assembly must be avoided in any situation. Movements in the axial direction must be absorbed by installing the line in a U-shape.

- To absorb vibrations, it is important to ensure that the hose is installed in a right angle to the direction of vibration

- If the vibrations occur in 2 directions, the flexible hose has to be installed in a 90° bend or 2 hose assemblies have to be installed at right angles to each other.



- To avoid torsion on the hose, two keys should always be used when installing metal hose lines with screw connections. For this reason, it is important to ensure that one connection of the hose is rotatable if possible.



- For welding or soldering connections of metal hoses, the hose line must be protected against welding spatters and overheating and cleaned of any flux and other contamination before putting into operation

The Flexotube GmbH team is always available to answer any further questions you may have.

Head Quarter & Production
Lindigtstraße2
D-01683 Nossen

Sales Office
Adlerstraße 77a
D-25462 Rellingen

Tel. 04101 847178-0
Fax. 035242 4394-140
E-Mail: service@flexotube.de