



Corrugated metal hose lines Technical, medical and food gases

MN
20000-7.1

Printed documents are not subject to the change service.

1 Scope

The purpose of these operating instructions is to provide competent persons with the hose manufacturer's information required for the assembly, operation, maintenance and testing of corrugated metal hose lines.

It is only valid in direct connection with the further instructions of the system manufacturer, taking into account the intended use specified by the system manufacturer in consultation with the hose line manufacturer.

2 Intended use

The corrugated metal hose lines are used exclusively for dry, **non-corrosive/aggressive** technical, medical and food gases.

The hose lines may only be used for the following applications:

- Connecting bottles and bundles for filling
- Connecting removal bundles and bottles
- Connecting buffer bundles and bottles

Any other use beyond the specified one is considered incorrect. The manufacturer is not liable for any damage resulting from this; the risk for this is borne solely by the operator.

3 Basis

- The hose lines may only be installed, tested and maintained by competent persons – for technical, medical and food gases/systems. Special reference is made here to the regulations on the safe handling of oxygen / oxygen equipment.
- The hose lines may only be operated and used as intended and when in perfect condition.
- Specified application limits such as minimum bend radius (single bend, frequent movement), max. operating pressure as well as min./max. operating temperature must not be violated. See the manufacturer's specifications. If one or more of these values have been disregarded, the hose line must be removed immediately and inspected by a competent person.
- The manufacturer guarantees the suitability of the corrugated metal hose line only for the fluids approved by it.
- The corrugated metal hose line can be protected against external mechanical influences by a metal strip-wound hose (interlocked profile) or shrink tubing or spiral springs.
- The corrugated metal hose line can be equipped with various components. Catch rope to protect against whipping of a torn hose line, a heat protector, a kink protector, a wear protector, etc.
- The hose lines are intended for use in potentially explosive atmospheres. The component is not subject to the stipulations of Directive 2014/34/EU (ATEX), since it does not fulfil an autonomous function and does not have any intrinsic potential source of ignition. It is neither a device, nor a protection system, nor a component in the sense of Directive 2014/34/EU (ATEX).
- When used in a potentially explosive zone, the system manufacturer and/or operator must ensure that:
 - the hose line is electrically conductively connected to the surrounding components.
 - there is no increase in surface temperature as a result of, for example, exothermic chemical reaction, inside and/or outside, or as a result of adiabatic compression of the fluid.
- When using a hose line covered with non-conductive heat shrink tubing or other coating in a potentially explosive zone, it must be ensured that no ignition hazard can occur due to static charging of the heat shrink tubing (e.g. by pulling the hose line across the floor or unrolling it over a roller or hose reel).

4 Before commissioning

- Before each commissioning, the hose line must be subjected to a thorough visual inspection.
- Corrugated metal hose lines are very sensitive to kinking, static or dynamic torsional stress, and bending below the minimum bend radius. Failure to observe this can lead to immediate failure or a drastic reduction in service life.
- Torsion and kink protection during assembly/disassembly, connecting/disconnecting:
 - To tighten and loosen the nut on the hose fittings, use a spanner to hold against the flat side (if present) of the tube (behind the nut).
 - Before connecting the corrugated metal hose lines, the system components to be connected to the hose line must be in their positions. The subsequent adjustment of, for example, gas bottles or bottle bundles leads to inadmissible torsional stresses.
- The hose line must be checked for leaks after installation and before commissioning using a suitable leak detection agent, e.g. foam-forming according to EN 14291.
- The hose lines may only be put into operation after complete and technically flawless assembly.
- For protection against electrostatic charge, especially in potentially explosive zones, the hose line must be mounted in an electrically conductive manner and earthed to the installation.
- The hose lines may not be covered with insulating layers, not even paint, before use in potentially explosive zones.



Corrugated metal hose lines Technical, medical and food gases

MN
20000-7.1

Printed documents are not subject to the change service.

5 During operation

- The hose line may not be subjected to tensile or torsional stress due to external influences during operation.
- The hose line must be installed in such a way that its movement is not impeded.
- The hose line must always be protected against external thermal overload and chemical attack.
- Pressure surges caused by media must be avoided because the resulting temperature increase (adiabatic compression) can lead to critical operating conditions.
- When changing media, the hose lines may need to be flushed.
- Caution: When changing media, there may be a slight mixing of media due to the incorporated gas.
- Frequent and/or large pressure load changes, temperature fluctuations and bending movements can have a negative effect on the hose line's service life.

6 Maintenance/repair/replacement

- The residual grease content in the hose line (on delivery) is less than 50 mg/m². In this condition it is suitable for the use of oxygen as well as for the use of technical, medical and food gases.
- An oxygen hose line may not be operated after contamination and must be taken out of service immediately. Store and label contaminated hose lines so that they can no longer be used. For assessment of contamination and cleaning, return the hose line to the manufacturer.
- The hose line must be subjected to a pressure test and a leak test at least once a year in accordance with the applicable regulations, unless otherwise specified by the system manufacturer or the competent person responsible for the test. A record of the test must be kept.
- In case of high mechanical, dynamic, thermal or chemical stresses, it may be necessary to shorten the inspection intervals.
- There is no provision for repairing the hose lines. Defective hose lines must be taken out of service and disposed of.
- Typical external signs of damage to the hose line include: damage to the braid or protective hose, permanent deformation or kink in the hose, corrosion, discolouration (thermal tempering colours) or unacceptable leakage.

7 Disconnecting

- Only disconnect the hose line when it is completely depressurised (in line with the environment).
- Caution: After disconnecting the hose line, residual gases may escape. Depending on the medium, there may be a risk of poisoning and deflagration (potentially explosive zone around the orifice area).
- Beware of trapped media! Hose lines closed on one or both sides may still be pressurised.
- Depending on the process requirements (cleanliness, ignition hazard), the hose line must be protected against the ingress of contaminants after disconnection, e.g. by using dust caps or immediately connecting to a new bottle / bundle.
- Corrugated metal hose lines are very sensitive to kinking, static or dynamic torsional stress, and bending below the minimum bend radius. Failure to observe this can lead to immediate failure or a drastic reduction in service life.
- Torsion and kink protection during assembly/disassembly, connecting/disconnecting:
 - To tighten and loosen the nut on the hose fittings, use a spanner to hold against the flat side (if present) of the tube (behind the nut).
 - Before connecting the corrugated metal hose lines, the system components to be connected to the hose line must be in their positions. The subsequent adjustment of, for example, gas bottles or bottle bundles leads to inadmissible torsional stresses.

8 Service

- Only use original replacement seals.
- Before installation on the food and medical gas systems, it must be checked whether FDA approval has been granted for the installed seals as delivered. If approval has not been granted, such seal sets must be ordered from the manufacturer.
- A defective hose line may only be replaced with an original hose line.

9 Storage and transportation

- If the hose lines are delivered packed in a protective cover, these hose lines must be transported and stored in their protective cover and sealed with dust caps until direct assembly.
- The hose lines must be transported and stored free of tension (not below minimum static bend radius), without superimposed loads, preferably lying down.
- Do not store solvents, fuels, lubricants, chemicals, acids, disinfectants or similar in storage areas for corrugated metal hose lines.
- After a longer storage period of 1 year or more until first use, the hose line must be subjected to a thorough visual inspection.