

Operating Instructions for hose lines and formed hose parts

Installation

For installation please note DIN 20066 section 4 Hose lines - DGUV Regel 113-015 – hydraulic-hose lines - rules for safe use rulebook: BG-rules hydraulic-hose lines – rules for safe use BGR 237 e.g. February 2008 – Hose lines safe use leaflet T 002 (e.g. edition 12/2008 formerly e.g. edition 7/2005) (BGI 572)

To ensure operability of hose lines and prevent shortening their service life through additional stresses, following principle should be taken into account:

- Hose lines must be installed in such a way that they are accessible at any time and are not hindered in their natural position and motion
- In operation hose lines must never be subjected to stresses from external influences in terms of traction, torsion and compression, unless specifically designed for such loads
- The minimum bend radius of the hose specified by the manufacturer must be observed
- Hose lines must be protected from damage caused by mechanical, thermal or chemical influences from outside
- Prior to start-up detachable connections must be checked for secure positioning
- In case of visible external damage, hose lines must not be put into operation
- Prior to start-up, the hose line should be cleaned as necessary and in an appropriate manner
- In the case of hose lines, where potential equalization is required in accordance with TRBS 2153 formerly BGR 132 (rules for avoidance of risks of ignition caused by electrostatic charges), this must be checked and retrofitted if necessary

Intended use

- **Pressure and vacuum:** Maximum permissible excess / low operating pressures of the hose lines must not be exceeded
- **Temperature:** Maximum permissible operating temperature depending on the medium must not be exceeded. This should be checked using the available resistance lists of the hose line components
- **Resistance:** Hose line materials must be resistant to flow-through media under operating conditions. This should be checked using the available resistance lists
- With possible abrasion (wear) of the hose line, wear must be taken into account and controlled
- Where the customer has no specific operating parameters that can be used by the manufacturer to evaluate conformity, the classification of the manufacturer shall apply
- Measures protecting from external fire or flame were not taken into account during design
- To ensure the safe operation of hose lines, technical, organisational and personal protection measures should be undertaken. Here priority is always given to technical and organizational measures.
If this does not allow all hazards to be avoided, effective personal protection equipment must be provided and utilised

Storage

For storage of elastomeric and thermoplastic hoses and hose lines in accordance with DIN 7716 / T002 (BGI 572) / BGR, 237 please note the following requirements:

- Store in a cool, dry location with low dust levels; avoid direct exposure to sun or UV rays; shield in the vicinity of sources of heat; hoses and hose lines must not come in contact with substances which might cause damage
- Hoses and hose lines must always be stored stress-free, without kinks and laid horizontally. When stored in rings, the minimum bend radius specified by the manufacturer must be observed
- Close ends of hoses with caps to protect inside of the hose from soiling, effects of ozone and corrosion (after emptying out any residue and/or cleaning)

Maintenance, servicing, inspection

Cleaning: Hose lines should be cleaned and rinsed out after use and prior to every check. When cleaning with steam or chemical additives, the resistance of the hose line components must be taken into account. (Attention: the use of steam distributors is not permitted.)

Testing intervals: The intervals of repeated inspection are to be determined by the operating company regarding their respective risk assessment and in accordance with the directives of the Operational Safety Ordinance § 3. The operationally safe condition of hose lines shall be inspected by a competent person as defined by the Operational Safety Ordinance § 2 paragraph 7:

- Prior to the start-up of bought, ready for use hose lines: quality control via spot checks
- At regular intervals after the initial start-up, each individual hose line must be tested (testing interval e.g. for thermoplastic and elastomeric hose lines at least once a year, steam hoses at least twice a year). Higher stresses require shorter testing intervals with increased mechanical, dynamic, thermal and chemical loads.
- After any type of repair (every single hose line).

Testing pressures (medium: cold water):

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| - Hose lines (except steam hose lines): | Max. permissible pressure (PS) x 1.5 |
| - Steam hose lines: | Max. permissible pressure (PS) x 5 |

Scope of testing: Type and scope of testing (pressure testing, visual inspection, testing of electrical conductivity etc.) shall be the responsibility of the "competent persons" according to industrial health and safety regulations or T002 (BGI 572). The result must be documented.

Repairs: Repairs to hose lines may only be carried out using genuine spare parts by the manufacturer and his specialist staff with subsequent testing by a "competent person" according to industrial health and safety regulations. The results of the test must be documented.

Special provisions apply e.g. to the following hose line types:

Steam hoses

- Steam hoses should not be used for other material; take the fast aging of elastomeric hose lines into account
- Ensure complete drainage of condensate to prevent structural damage ("pop corning"), which is caused by the ingress of water into the inside layer and evaporation with the renewed application of steam
- Avoid partial vacuum through cooling of hose assembly closed off on both sides
- Take measures to protect against surface temperatures (risk of burns)

Metal hose lines

- In the case of metal hose lines that are not equipped with a heat insulating thermal jacket there is an increased risk of burns when using steam due to the high thermal conductivity.
- Metal hose lines offer sufficient conductivity without additional measures.
- Pay special attention to possible damage of wire braiding and deformation of the hose, e.g. kinking
- During storage and operation lines must not be subjected to influences caused by chlorides, bromides or iodides, extraneous rust or rust film.

Hose lines with thermoplastic inner liners

- Protect inner liners from damage by kinking and deformation of the hose from outside
- In the case of media with no or a relatively low conductivity ohm-conductive hoses should preferably be used.

General information

Attention: Hose lines may be used as work equipment and as equipment part requiring monitoring as defined in the industrial health and safety regulations. The operator must take appropriate testing requirements as defined in the industrial health and safety regulations into account. These operating instructions exclude the right to legal liability and completeness.