



Dear Customers,

Thank you for the confidence you have placed in us. You have chosen a hose line that has been manufactured according to specified guidelines, norms and standards.

To ensure that hose lines are handled safely, please let our customer service advise you and take note of the following operating instructions.

General information

This operating manual specifies how to use, store and test hose lines, in particular to avoid any danger to people, machines and the environment.

It applies for hose lines that are subject to the Pressure Equipment Directive (97/23/EC), the Pressure Equipment Regulation (14th Equipment and Product Safety Act), the Inflammable Substances Act or the Water Framework Directive. In addition, it applies for hose lines in accordance with EN 12115, EN 13765, EN 6134 und DIN 2827. DIN 2827 applies for hose lines made of rust-resistant types of steel for a working pressure > 16 bar as well as for steam and hot water.

The hose lines are not suitable for

either instable fluids or, in general, for gases. These instructions may be used for hose lines that cannot be classified in a regulation or norm (e.g. plastic hoses), taking into account any operator's experience and the potential safety hazard. Further information can be obtained from the well-known Accident Prevention Regulations and the data sheets T002 BGI 572 (ZH1/134) and T024 BGI 822 (ZH 407) published by the German trade association of the chemical industry.

Fitting and safe handling

Ensure that only hose lines suitable for the respective use (in particular with regard to medium, pressure, connections, place of installation and temperature) are used. To ensure suitability, use resistance lists, operating experience or material tests.

Assemble and, if necessary, furnish hose lines with safety equipment (dry break coupling, dry disconnect coupling, back pressure valves). The assembly of the hose line must not affect its normal position and movement. Allow only trained staff to handle the hose line. Do not pull the hose line over sharp edges. Ensure that the hose line does not continuously rub anywhere and that the minimum bending radius is

always met. Do not twist the hose lines lengthwise (torsion) and avoid tensile strain. Do not kink hoses, especially behind the couplings. Do not let medium to be carried come into contact with the outer rubber or cut surfaces. Seal hose lines after emptying them.

Refer to the catalogue for operating information. To handle the hose line, we also refer you to the relevant regulations, in particular: data sheet T002 BG (German trade organisation chemical industry 9/95 (ZH 1/134)), DIN 2827 (in particular Item 8) DIN 20066 DIN 6134 Part 1 (in particular Items 9 and 11), DIN 20066 Fitting (notes on fitting, installation).

Attached please find some examples for correct handling.

Storage

Storage conditions are very important for the service life of a hose line. Under adverse storage conditions the quality can deteriorate ahead of time to such a degree that the original performance characteristics cannot be achieved or not with the necessary degree of safety.

The following points should be taken into consideration regarding storage:

- Always clean used hose lines thoroughly.
- Keep the storage room closed, dark and dry (especially for rubber hose lines).
- Keep the temperature in the storage room between 15°C and 25°C; under all circumstances, avoid temperatures below -30°C and above 30°C (especially for rubber hose lines).
- Store hose lines in a stress-relieved, kink-free manner.
- Ensure that the minimum bending radius is met when rolling up or bending the hose line.
- Under all circumstances, seal hose line endings to protect the hose tube from dirt and ozone influence.
- To avoid the risk of embrittlement (of the hose) or corrosion (of the couplings) do not let chemicals touch the hose line.
- If the storage period exceeds three years from the date of construction for product hose lines or two years for steam hose lines, repeat testing in accordance with the paragraph on initial operation.

Initial operation

The operator specifies the data required for the documentation (e.g. registration number, usage, required safety equipment if applicable, test intervals for repeat testing) of all hose lines. This data can be recorded on data sheets or in product life files. From acquisition to discharging or scrapping, all available data regarding the hose line is thus recorded, possibly electronically. The product life file can be used to record performance characteristics of the hose line, costs, service life, results of repeat testing, and area of application.

The following points must be checked or completed before initial operation:

- Check for transport damage and damage to the bending region.
- If necessary, check the electrical resistance between couplings.
- Check the water pressure (only when using self-built constructions, if the manufacturer's certificate is unavailable or the storage period from the date of construction has been longer than three years for product hose lines and two years for steam hose lines. The hose line must

be fully vented and the pressure should rise by < 5 bar / sec. When checking this, take careful note of sweating, leaky parts or couplings, bumps, bubbles and deformations.


- Markings on the hose line (e.g. material, test date, manufacturer's markings, bursting pressure, batch number).

In addition, the operator has to carry out an independent risk assessment in compliance with Section 3 of the Ordinance on Industrial Safety and Health, Sections 4 and 5 of the Labour Protection Act, and Section 16 of the Ordinance on Hazardous Substances, take measures regarding the required safety precautions and the necessary training and instruction of personnel. Further information on individual hose types can be found in the appendix of the operating instructions.





Safety first

Markert offers carefully coordinated components that are continuously tested for consistent quality. Only use  **marsoflex** components to achieve the highest possible safety. Markert does not give any guarantee on other assembled components.

Should any questions remain unanswered by our operating instructions, let our customer service advise you.

Special Notes

Steam hoses

- To avoid building up a vacuum which can destroy the hose, seal steam and bitumen hoses only after they have completely cooled.
- Do not use steam hose lines for other substances.
- Take ageing into consideration when using rubber hoses.
- Ensure that condensation is completely emptied to avoid damage to the structure (popcorn) in plastic or rubber linings. This is caused by water permeating into the inner layer and evaporating when steam is again sent through the hose.
- Avoid a vacuum caused by sealing the hose line at both ends.
- Adopt safety precautions against surface temperature (danger of burning).
- Connect rubber steam hoses only with standardised couplings.
- If possible, use hose lines in saturated steam.
- Maximum pressure rise: 5 bar /sec.

Metal hoses

- Metal hose lines cause a higher danger of burning due to their high heat conductivity (provide for a heat-insulated outer layer!).
- Metal hoses are electrically conductive; no additional measures are required. Please perform potential equalisation before use.
- During storage, avoid embrittlement caused by chloride, bromide or iodide, extraneous or surface rust.
- Pay attention to damages to and deformation of the hose line, especially in the area around the welding seam (e.g. kinks).

Composite hoses

- Do not turn the swage fitting when assembling the composite line; use the spanner flat of the coupling.
- Do not mount and deform the swage fittings.
- Do not cut the hose with a knife.
- Do not position over sharp edges.
- Do not kink the hose line behind the swage fitting.

PTFE hoses

- Very aggressive media may cause corrosion of the reinforcement.
- Do not use PTFE hoses in radioactive locations; radiation causes the mechanical and electrical properties of PTFE to deteriorate.
- Avoid puncturing the PTFE lining with wire ends.

Tank truck hoses

- Disconnect before continuing your journey or provide safety couplings.
- Correct coupling of hose lines is important. Bars or hammers can cause damage.

Hose lines with thermoplastic linings

- Protect the outside of linings against damage caused by kinking and deformation of the hose.
- Protect lining against damage caused during assembly or when cleaning by the sharp edges of adaptor pieces or parts.
- Use only suitable hose lines for highly insulating media (pinhole).

Maintenance

Test intervals for repeat tests are included in the following regulations:

- DIN 6134 for hose lines made of elastomers for steam and hot water: General Requirements for Hose Lines Made of Elastomers for Steam and Hot Water – Tests
- DIN 2827 for hose lines made of rust-resistant steels for chemical substances
- EN 12115 for rubber and plastic hoses and hose lines for liquid or gaseous chemicals
- EN 13765 for thermoplastic, multiple layer hoses and hose lines
- DGRL 97/23/EG EU Pressure Equipment Directive
- BGI 572 Hose lines, safe operations
- WHG Water Framework Directive
- German Ordinance on Industrial Safety and Health

We recommend a minimum test interval of one year for all hose lines. Steam hose lines should be tested at least every six months.

During repeat tests, the following points must be tested or carried out:

- Checking data in accordance with product life file.
- Visual testing for mechanical/chemical damage or embrittlement of the hose cover, visual damage to the hose tube, faulty couplings, damage to fittings, flaws in the weld seam (heat tinting, corrosion) and other flaws.
- If necessary, replace sealing gaskets.
- If necessary, check the electrical resistance between couplings.
- Pressure test with water in accordance with the paragraph on initial operation.
- Marking with test date and date of next testing.

Discontinue using, repair or scrap hose lines that do not comply with test requirements. Document the test in a test report or test certificate. Allow only qualified staff or a specialised company to do repairs. Repaired hose lines have a higher risk potential. Run a pressure test before reusing.

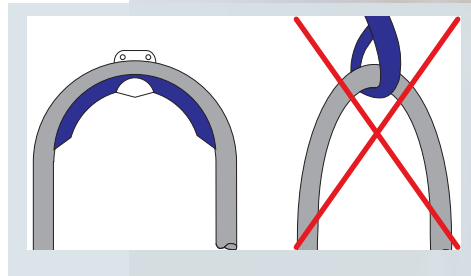


Future is built on safety

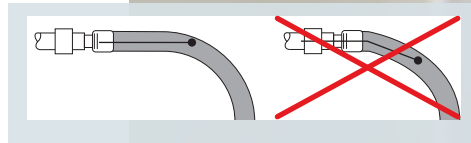
Due to the natural ageing of elastomers, fatigue of wire or textile linings as well as chemical, thermal and mechanical strain, the service life of an active or stored hose line is limited.

Our sales staff and technicians will advise you. They are at your service for replacements at any time.

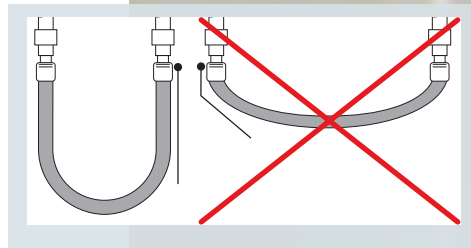
Do not overbend when hanging; instead, use mountings such as hose gauges or rollers.



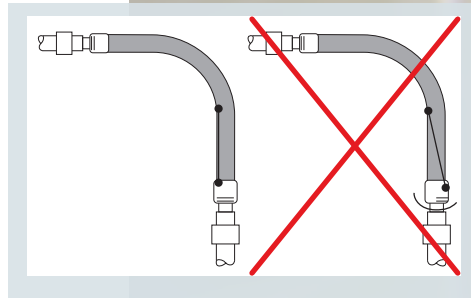
Do not kink hose lines in the bonding region. Avoid slant tensile forces.



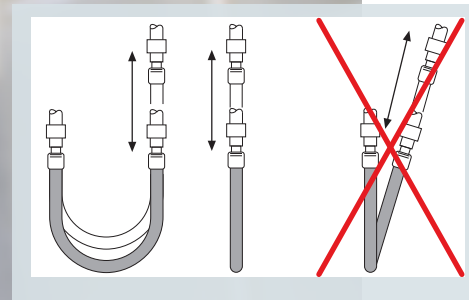
Hose lines should be laid with a sufficient length. Avoid slant tensile forces in the bonding.



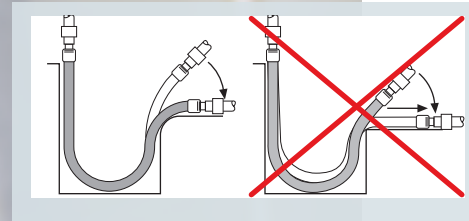
Please do not twist the hose line when installing it and avoid tensional forces.



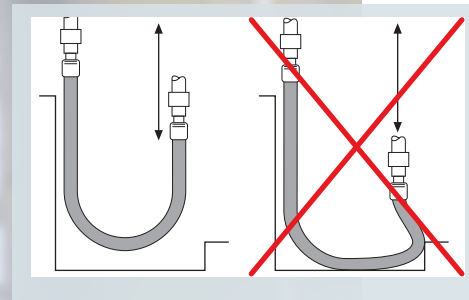
Lay moving directions at hose level.



To avoid damage or kinking, please do not position or pull hose lines over sharp edges.



Allow ample space for hoses in motion. Please avoid kinking or contact with floors or walls.



Avoid fluctuations in bending stress.

