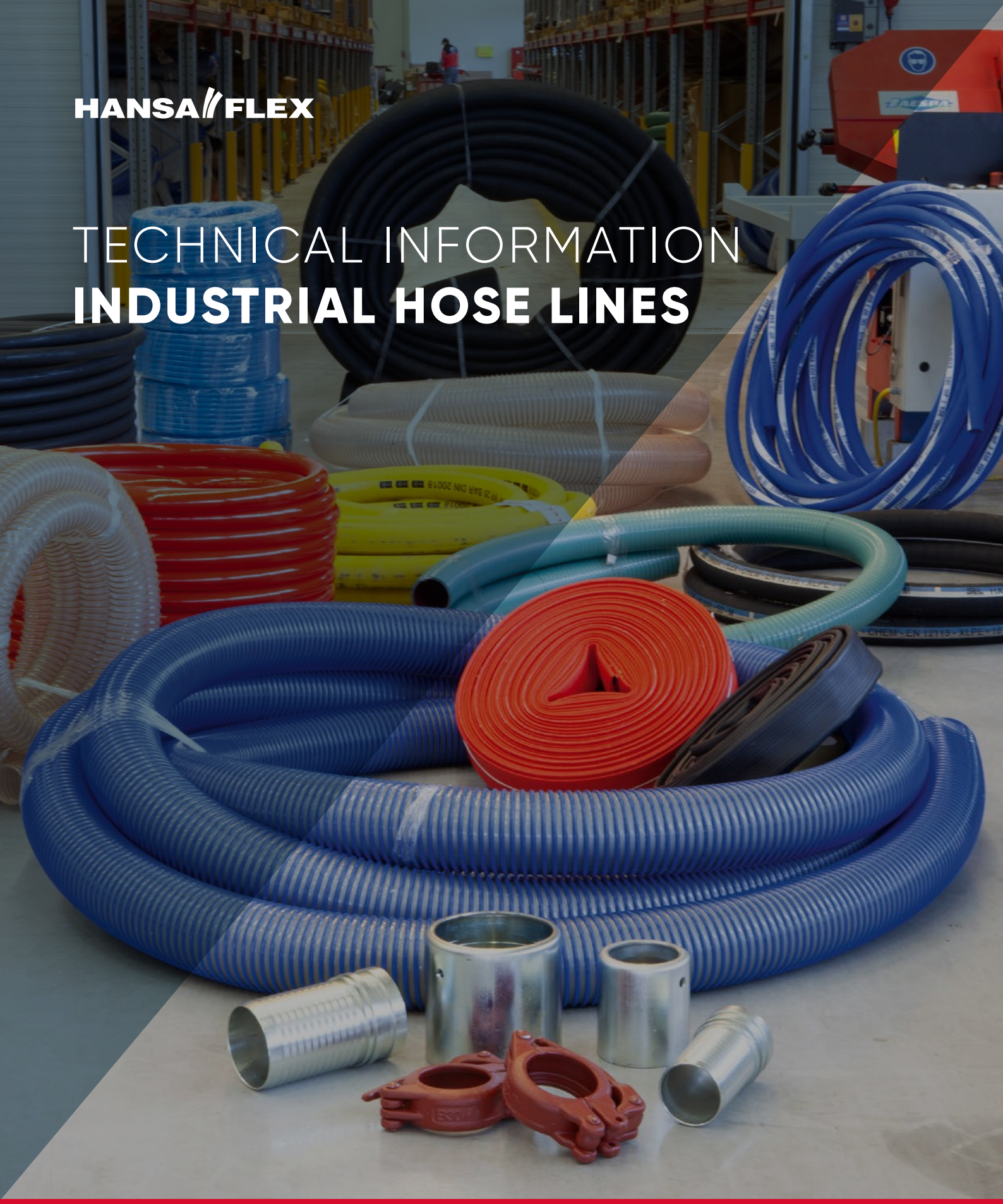
HANSA FLEX

TECHNICAL INFORMATION
INDUSTRIAL HOSE LINES



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1. General information

Note: As well as being work equipment, hose lines may also be system components subject to monitoring requirements in accordance with the ordinance on the protection of health and safety during the use of work equipment (German Industrial Health and Safety Act - BetrSichV). The provisions of BetrSichV must be observed by the operator and employer and a risk assessment must be performed for the hose line used.

2. Proper use

- **Pressure:** Do not allow the pressure to exceed the maximum permissible positive operating pressure of the hose line.
- **Vacuum:** Do not allow the pressure to fall below the maximum permissible negative operating pressure of the hose line.
- **Temperature:** Do not exceed the maximum permissible operating temperature based on the medium used. This must be checked for all hose line components based on the available material resistance lists.
- **Resistance:** Hose line materials must be resistant to the substances flowing through them under operating conditions. This must be checked based on the available material resistance lists. Changes to the medium concentration, duration of operation and temperatures affect the safe operation of the hose line and this must always be taken into account during operation.
- In the case of possible **abrasion** (friction/rubbing), an allowance must be made for wear of the hose line and regular wear checks carried out.
- If the ordering party has not provided any specific operating parameters that the manufacturer can use to perform a conformity assessment in accordance with the Pressure Equipment Directive (2014/68/EU), then the manufacturer's classification applies.
- Technical, organisational and personal protective measures must be implemented in order to be able to operate hose lines safely. Technical and organisational measures always have priority. If such measures are not sufficient to ensure adequate protection from all hazards, effective personal protective equipment must be provided and used.

3. Responsibility of the employer (operator)

Hose lines are work equipment and their inspection requirements and schedules must be specified by the employer (operator) in a risk assessment (see BetrSichV).

Hoses and fittings must function properly when fitted together, and their functional safety must be proven using recognised test procedures (e.g. hydrostatic requirements in accordance with DIN EN ISO 1402).

Observe the German Social Accident Insurance Code of Practice T002 (= DGUV Information 213-053) issued by the German Social Accident Insurance Institution for the Raw Materials and Chemical Industry (BG RCI), issue 9/2014.

4. Transport and storage

Hose lines must not be damaged during transport or storage. It is particularly important to make sure that:

- They are stored in cool, dry and low-dust conditions; out of direct sunlight or UV radiation, and shielded from nearby sources of heat. Hoses and hose lines must not come into contact with materials that could damage them.
- Hose lines are always stored horizontally in a stress- and kink-free condition. When stored as rings, the radius must not be smaller than the minimum recommended by the hose manufacturer.
- Hose ends are sealed with protective caps to protect the inside of the hose from contamination, the effects of ozone and corrosion (after completely draining or cleaning and after the hose line has cooled down).
- Influencing factors that could damage hose lines (e.g. effects of halides, extraneous or flash rust, mechanical loads) are eliminated.
- Appropriate transport packaging is used.

Regulations to be observed include DIN 7716, T002 (DGUV Information 213-053) and DGUV Rule 113-015 (formerly BGR 237).

5. Installation and commissioning

In order to ensure the proper functioning of hose lines and to avoid shortening their service lives by exposure to additional loads, the following requirements must be satisfied:

- Perform the “inspection before commissioning” (in accordance with T002, §§ 14 and 15 BetrSichV).
- Do not put a hose line into operation if it shows signs of visible damage.
- Do not put a hose line into operation if it has exceeded its inspection interval.
- Hose lines must be installed in such a way that they can adopt their natural position and move without obstruction.
- Hose lines must never be subjected to tension, torsion or compression unless they are specifically designed for such use.
- The radius of the hose must not be less than the smallest permissible bending radius stipulated by the manufacturer.
- Hose lines must be protected against damage caused by mechanical, thermal or chemical effects.
- All separable connections must be checked to ensure they are firmly seated.
- If necessary, clean the hose line in a suitable manner before commissioning.
- With respect to electrostatic hazards, TRBS 2153 “Avoidance of dangers of ignition resulting from electrostatic charges” must be observed and followed.

6. Maintenance, repair, inspection

Cleaning: After use and before every inspection, the hose line is to be properly cleaned. If cleaned with steam or chemical additives, the resistances of the materials of the hose line components must be taken into account. Note: The use of steam lances is prohibited.

Inspection intervals: The inspection intervals for hose lines subject to mandatory inspection are to be set by the employer (operator) in accordance with the provisions of BetrSichV within the scope of the risk assessment in accordance with § 3 BetrSichV. The safe operational condition of hose lines subject to mandatory inspection must be regularly checked by an authorised person qualified to conduct inspections within the meaning of § 2 paragraph 6 BetrSichV:

- At regular intervals after the initial commissioning: The inspection interval is determined by the risk assessment performed by the employer – e.g. for thermoplastic and elastomer hose lines at least 1 x per year, for steam hoses at least every six months. More severe loads (e.g. mechanical, dynamic, thermal or chemical) require shorter inspection intervals.
- Irrespective of recurring inspection intervals, a hose line is always to be inspected after a repair.

Test pressures for the strength test (medium: cold water):

- Hose lines (excluding steam hose lines): max. permissible pressure (PS) x 1.5
- Steam hose lines made from elastomer: max. permissible pressure (PS) x 5

In the case of metal hose lines, the chlorine content of the test water given in DIN EN ISO 10380 must not be exceeded.

Scope of inspection: The type and scope of inspection (strength test, visual inspection, test of electrical conductivity etc.) are regulated in BetrSichV, TRBS 1201 and T002 (DGUV Information 213-053). The inspection is to be performed in accordance with § 14 Para. 2 BetrSichV by an authorised person qualified to conduct inspections in accordance with TRBS 1203. The result of the inspection is to be documented.

Repairs: In the event of damage (leaks, cracks in the cover, kinks and abrasion marks etc.), the hose line must be immediately taken out of operation and its further use prevented. Repairs to hose lines must be performed using only original replacement parts from the manufacturer and by the manufacturer’s specialist personnel, and must be followed by an inspection by an authorised person qualified to conduct inspections within the meaning of BetrSichV. The result of the inspection is to be documented.

7. Service life

Hose lines are wear parts with a limited life. The service life is affected by the storage conditions, the loads on the hose line and operational factors. For these reasons, no generally applicable statement about the service life can be made. Depending on the hazard potential, loading and economic significance, we urgently recommend that a schedule of fixed inspection and replacement intervals is established.

The extent to which a hose line remains usable under a given set of operating conditions is determined as part of the recurring inspections by an authorised person qualified to conduct inspections. If damage is detected on a hose line between inspection intervals, the hose line must be immediately taken out of operation and its further use prevented.

8. Damage prevention

- Hose lines may be used only in accordance with their intended purpose and must not be used for other purposes (e.g. for pulling or lifting or as a climbing aid etc.).
- Hose lines must not be disconnected under pressure (exception: coupling systems designed for this use, e.g. dry disconnect couplings).
- Heat sources must be kept away from hose lines.
- To avoid cross-contamination, hose lines must be properly cleaned before a change of medium.
- Do not place hose lines in the path of vehicles (protect them from being run over).
- Mobile loading and tank containers etc. must be fixed and secured for the loading process (e.g. tank cars, ships, tanker trucks or trailers).
- Only approved fittings in accordance with DIN EN 14423 are to be used for steam hose lines made from elastomer.
- Confusion of hose lines must be eliminated by assignment systems (e.g. lock-and-key principle, coding, colour markings, engraving).
- Hose lines must be subjected to recurrent inspection at regular intervals in accordance with their risk assessment.

9. Disposal

Hose materials and fittings that are no longer usable must be disposed of properly in accordance with the local regulations.

10. Special requirements apply to the following hose line types (among others):

Steam hose lines

- Ensure complete emptying of condensation in order to avoid structural damage of the elastomer hose (popcorning), which is caused by water penetrating into the inner layer and evaporating when the hose line is charged with steam again.
- Do not use steam hose lines for other media.
- Avoid the negative pressure that occurs due to cooling of a hose line when both ends are closed off.
- Take protective measures against surface temperatures (risk of skin burns).
- Constrictions of cross sections are to be avoided (risk of overheated steam).

Metal hose lines

- Due to their thermal conductivity, there is an increased risk of injury at high temperatures with metal hose lines that do not have a thermally insulating external cover.
- Metal hose lines are sufficiently electrically conductive without additional measures.
- Pay particular attention to damage of the wire braid and deformation of the hose, e.g. kinks.
- Metal hose lines must never be exposed to the effects of halides, extraneous rust or flash rust.

Food hose lines

- Food hose lines must always be properly cleaned before being brought into use.
- Only cleaning agents suitable for the inside and outside of the hose lines may be used (pay attention to the hose line material resistance, temperature and duration of cleaning). The stipulations of the hose line component manufacturer must be observed.
- Food hose lines must be steamed exclusively in an open system.

For the proper use of hose lines, the comprehensive guidance contained in the German Social Accident Insurance Code of Practice T002 (= DGUV-Information 213-053), the Pressure Equipment Directive (PED), the German Industrial Health and Safety Act (BetrSichV) and TRBS 1201 "Testing of work equipment and systems requiring monitoring" must be observed.

For hose lines of special construction or for intended uses that are not covered here, the separate provisions stipulated by the manufacturer must be observed (e.g. sandblasting, liquefied petroleum gas (LPG), heated hose lines).