



Operation Manual

Of

Rubber Hose Assembly





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1. FOREWORD

The setting up of hoses on an industrial site or any application site is among the operator's obligations and is done under his responsibility.

The following recommendations are provided in order :

- to keep the operators informed about the dangerous actions having a possible impact on safety and on hose integrity or performances.
- to adjust the various operations to the type of hoses about :
 - the transportation, storage and handling before use
 - the hose assembly with its couplings
 - the installation and use
 - the maintenance and repair

Requested facilities for operations, either concerning staff or material depend upon :

- the type and size of the industrial application site,
- the tonnage of available cranes and lifting equipment,
- the on-site environmental conditions,
- the various regulations.....

Recommendations provided below are an indication of a current installation : they have to be adjusted according to specific conditions of the site.

2. GENERAL SAFETY



Read all instruction, warnings, and cautions carefully. Follow all safety precautions to avoid personal injury or property damage during system operation. TRELLEBORG INDUSTRIE SAS cannot be held responsible for damage, injury or pollution resulting from unsafe use, lack of maintenance or incorrect product and/or system operation.

Contact TRELLEBORG INDUSTRIE SAS if in doubt as to the safety precautions and operations. Failure to comply with the following cautions and warnings could result in equipment damage, personal injury and environmental impact.



Wear appropriate Personal and Protective Equipment when assembling, operating, repairing or maintaining the system.



Do not exceed the maximum working pressure specified for the hoses.



3. TRANSPORTATION, STORAGE AND HANDLING BEFORE USE

3.1. Transportation

Hoses can be transported by truck, by train, by ship or by plane on wooden pallet, into wooden crate or directly into container according to the hose type and as agreed with customer.

Hoses are secured in their packing, and then packing has to be secured whatever the transportation way chosen. More generally hose integrity must be guaranteed by avoiding any external way of injury like blade, nail, screw, sharp edges, etc...

Hoses must keep their original packing for preservation as long as possible till the final destination.

Staking on several levels must follow the usual recommendation for road/rail/air transportation and/or marine shipment under forwarder's responsibility.

3.2. Storage

The following guidelines are in accordance with the ISO 8331:2011 standard *Hoses and Rubber and Plastic Guidelines for Selection Storage, Use and Maintenance*.

Local storage : We recommend storing hoses in a warehouse or at least under a covered and a well-ventilated area (roof).

The hoses storage area should be dedicated for that purpose, free from traffic, work in progress and offering an efficient protection against infrared and ultraviolet rays, excessive temperature (40 °C max), sunlight, insect and rodents, oil, solvents, corrosive vapours and away from any ozone source, that may accelerate the rubber aging and performances.

Temperature : Ambient temperature should be as stable as possible and preferably between -10 °C and +25 °C. Caution should be taken below -10 °C for handling the product because it can become very rigid and more fragile.

Heating : pipes and hoses must be located at least 2 meters far away from any heat source.

Humidity : the relative humidity should be less than 70 %.

Light : Products should be stored in a dark place and protected from sunlight or any permanent bright artificial light (UV and IR). Some products are packed with a plastic anti-UV film and protective caps at both ends.

Ozone : the storage does not contain ozone-producing facilities such lamps or tubes, mercury vapour, high-voltage electrical equipment, electric motors, etc...

Environment : solvents, fuels, lubricants, chemicals should not be stored in the same room or in the vicinity of hoses.

Storage time : it should be minimized. Therefore, stock management in FIFO process (First In, First Out) is highly recommended. For preservation the original packing must be kept as long as possible till the final use.

3.3. Handling

Due to overall dimensions, weight and flexibility of hoses, some elementary precautions must be permanently kept in mind during handling operations :

- Know the load weight with accuracy.
- Balance the load.
- Control the load movements with guiding ropes if necessary.

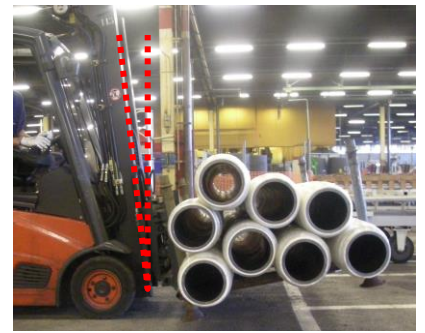
The use of a forklift is generally recommended.



Use specific location for forks



Engage forks thoroughly



Tilt the forks to ride



Do not unbalance the load



Do not raise too high when useless

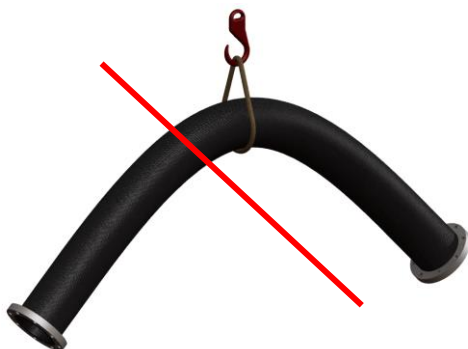


Do not raise hoses through ID

Do not drag the hose across abrasive surfaces or sharp parts.

Long hoses must be raised in different lifting points with nylon straps (150 mm wide minimum) or adapted devices, in order to avoid a too excessive bending radius that may cause a permanent hose deformation (obstruction) and a damage of the hose structure.

Slings steel cables might injure the coating and are generally prohibited.



Prohibited



Recommended

A spreader bar and the use of flat nylon strap (150 mm wide minimum) must be used imperatively for handling in a straight length.

The gripping points must be at least :

- 2 for hose length < 6 m
- 3 to 6 for hose length up to 8 m
- 4 for hose length > to 8 m



4. INSTALLATION AND USE

The installation and use have to be performed by experimented and qualified operators.

4.1. Unpacking before final use

Hoses must keep their original packing for preservation as long as possible till the final use or the hose couplings assembly.



Remove the protective film (if any) with a pair of scissor.



Do not cut it with a cutter that may cut the rubber cover

Never use staple on the protective film or directly on the hose body to fix a temporary marking.

4.2. Hose assembly with its couplings

The product can be provided by TRELLEBORG INDUSTRIE SAS in accordance with the purchase order :

- Either equipped with the appropriate couplings. The couplings assembly is directly made in TRELLEBORG INDUSTRIE SAS' plant.
- Either without any couplings. The couplings assembly is made by a local TRELLEBORG INDUSTRIE SAS' subsidiary, a local distributor or directly by the end user.

4.2.1. Hose initially equipped with couplings

The initial responsibility and warranty of TRELLEBORG INDUSTRIE SAS is automatically cancelled due to any modification, like the repair or the partial or total replacement of the hose couplings.

4.2.2. Hose initially equipped without couplings

Operator has to use only couplings adapted to the hose (dimensions) and the application (national regulation, standard, company rules...).

The mounting has to be performed by experimented and qualified operators according to the recommendations of the couplings manufacturer.

In case of doubt, it is highly recommended to contact a TRELLEBORG representative for advice.

4.3. Connection

An inventory of the materials to be used for the installation will be carried out before starting the work in order to make the operation easier and to prevent any risk of accident.

The end user is kindly advised to record the identification numbers of the hose assembly (hose + couplings) engraved on the identification plate or on each component for Quality traceability reasons.

The end user has to check that the conveyed fluid conforms to the fluid group noted on the identification plate (if any) and the allowed fluids mentioned on the Hose Data Sheet.

During this operation of connection, use a gasket (generally not provided by TRELLEBORG) adapted to the hose flanges, and make sure not to exceed the acceptable bending radius recommended by TRELLEBORG on the Hose Data Sheet.

Be sure that the line is not twisted permanently after connection.

When the system is under hydraulic pressure, do not stand in line with the bolting direction. Keep this area free of stall at all times.



4.4. Disconnection

Before disconnecting the hose, make sure to depressurize the installation, to empty the line and to know the dangerousness of the conveyed fluid within the hose (composition, temperature...). A retention tank could be added to restrain the remaining fluid if any.

The disconnection procedure will be generally carried out in the inverse order to the connection.

4.5. Use on service

Hoses must not be used for applications other than those specified in its data sheet or clearly notified in written agreement from TRELLEBORG INDUSTRIE SAS.

In order to increase the service life and to limit the fatigue of the hose, we highly recommend :

- To limit any impact or contact on flexible like to drive over the hose with a forklift for instance
- To prevent the hose from any risk of friction : chafing, abrasion....
- Not to convey permanently or temporarily a fluid that might not be compatible with the rubber liner as noted in the data sheet
- Not to expose the hose close to a flame or a source of high temperature
- Not to expose the outer surface of the hose to corrosive substances
- Not to have a permanent bending radius close to the minimal bending radius noted in the hose data sheet, due to the installation configuration
- To plan a survey routine and a periodic maintenance program

5. MAINTENANCE RECOMMENDATION

5.1. Hose identification and routine survey

Hoses are clearly identified on their rubber body, on a identification plate and/or on their couplings with different mentions according to the applied standard. The hose assembly date is clearly noted on the coupling and must be updated when the coupling is replaced or modified (with a pressure test performance) by the company in charge of the assembly.



The frequency of routine survey and the description of tests to be performed are detailed in the corresponding standard for which the hose is in conformance with.

A visual inspection is recommended to detect

- an abnormal storage condition at warehouse
- an abnormal installation configuration on site
- the loss of bolting or other accessories

and to check if the hose and its couplings seem not damaged.

The routine survey must be performed as often as necessary. The first survey should be performed six months after the commissioning date of the hose, and then every 6 months. The frequency can be extended to 1 year in case of successful consecutive surveys.



We also recommend performing a visual inspection further to an abnormal event/incident of the installation.

Survey should include the following controls :

Externally :

- Traces of leakage
- Loosening bolts
- Couplings in good condition for service (no visible sign of defective assembly on hose, rust or any other injuries)
- Permanent or significant local deformations such as : depression, crash, knocked elbows
- Collapse, twisting, tearing or tea siding throughout its thickness
- Abrasion and notch revealing the structure

Internally (with endoscopic camera if necessary)

- Blisters, swelling or suspect change of rubber appearance
- Cuts

In case of any doubt, a hydraulic test is recommended before reusing in service, and to contact a TRELLEBORG INDUSTRIE SAS representative if necessary.

Warning: before disconnecting a hose, be sure of the absence of residual pressure and respect the disconnection procedure of the site.

5.2. Repair

The repair of the rubber hose is generally impossible. Only minor injuries can be temporarily accepted with the written agreement of TRELLEBORG INDUSTRIE SAS

Couplings can be partially or totally replaced in conformance with the couplings manufacturer's procedures under the responsibility of the company in charge of the couplings assembly.

The performance of conformity tests, like a hydraulic pressure test as a minimum, and the update of the hose identification tag are necessary before reusing the hose in service.



6. WARRANTY

TRELLEBORG INDUSTRIE SAS warrants that its products meet the specifications stated in the offer.

The products are guaranteed against materials or workmanship for a period of 12 months from delivery EXW Plant of production or TRELLEBORG INDUSTRIE SAS warehouse as per agreement.

The warranty is limited to repair or replacement of defective products recognized by the technical services of TRELLEBORG INDUSTRIE SAS, to the exclusion of all other costs. Statements made under the guarantee cannot have the effect of extending the length thereof.

Are excluded from the warranty defects resulting from non-compliance with the recommendations of TRELLEBORG INDUSTRIE SAS, especially in case of improper storage, improper installation, use and/or abnormal external aggression, poor maintenance, etc..., or alterations made without the written consent of TRELLEBORG INDUSTRIE SAS.