

# User Manual for the Application of Hose Assemblies for High-Pressure Water Jet Machines

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This User Manual has been prepared according to the requirements of EN 1829-2:2008 High-Pressure Water Jet machines – Safety Requirements – Part 2: Hoses, Hose Lines and Connectors. It contains instructions on the proper use of hose assemblies made by Parker Hannifin GmbH, Polyflex Division, for high pressure water-jetting applications. Never use hose assemblies without thoroughly reading and understanding this User Manual. Any additional safety requirements issued by machine manufactures, trade associations etc. must be complied with. We recommend wearing protective clothing.

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## 1. Hazard notice

Hazards due to escaping media

- Media escaping at high pressure can cause personal injury and property damage
- The escape of flammable media can cause fire
- The escape of toxic media can cause intoxication if these are inhaled or ingested

Hazards because of whipping hose assemblies

- If after break of the hose assembly the pressure is not immediately reduced to zero, the hose starts whipping, which may cause personal injury or property damage.

Hazards due to change in length of the hose assembly

- In the event of a sudden pressure change in the hose assembly, its length may change by +2%. This may lead to the operators losing their safe foothold.

Hazards due to incorrect behavior of operator

- Hazards may arise from the use of unsuitable substances or components by the operator, especially in case the application limits defined by the manufacturer are exceeded (e.g. too high pressure, too high tensile loads).

## 2. Description

The hose assemblies are made from high-pressure hose and the corresponding fittings by Parker Polyflex and the company's trained and certified distributors in compliance with Parker assembly instructions and they are pressure tested after completion. Upon customer's request, the hose assemblies can be equipped with protective sleeves or other safety equipment such as containment grips.

## 3. Marking

The hose bears a factory marking specifying the manufacturer, the maximum working pressure, the part number, nominal size, batch number and the date of manufacture (quarter/year). The marking may include additional information. Protective sleeve has no marking as a standard.

On its crimping shell or marking sleeve, the hose assembly bears a marking specifying the manufacturer, the maximum working pressure, the month and year of manufacture and the standard "EN 1829-2".

The working pressures of both hoses and fittings are limited. In rare cases, the fittings may be used at lower working pressures than the hose. In this case the hose assembly bears an additional warning. For the application of the hose assembly, it is not the pressure stated on the hose but the pressure on the crimping shell and/or marking sleeve that is relevant.

## 4. Assembly and installation, proper use

### Assembly and installation

To ensure the proper function of hose assemblies and in order not to shorten their life by additional strain, the following instructions need to be followed:

The maximum working pressure shall not be exceeded.

The hose shall not be bent to less than its minimum bend radius.

Do not kink or twist hose assemblies. Especially when long hose assemblies are routed, loops may form which can lead to kinks in the hose when pulled.

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Parker manufactures special fittings (Polyflex-Lok) which minimize this problem. Under pressure, any hose may become shorter or longer. Change in length of Parker hoses is in the range of approx. 2%. Before installing a hose assembly, make a visual inspection of the following:

- o The working pressure of the hose assembly corresponds to the pressure of the pump.
- o The hose cover does not show any damage.
- o The fittings do not show any signs of corrosion.
- o Threads and sealing faces are not damaged or dirty.
- o O-rings are available and not damaged.

Make sure that the connecting thread of the fitting matches its counter-piece.

Do not remove protective caps until immediately prior to assembly.

When mounting the fitting, slightly grease the threads of the fitting and the adapter to prevent cold welding (seizing).

When putting the hose assembly into operation, slowly build up the pressure and check the assemblies for leaks.

### Proper use

**Operating medium:** Parker hose assemblies are designed for use with water. For information about use with other media, please contact your Parker distributor - Parker's range includes special hoses which are suitable for e.g. corrosive media.

**Temperature:** The hose assemblies are designed for safe operation at temperatures from -10 to +70 °C. If you wish to operate the hose assembly beyond this range, please contact your Parker distributor. Parker's range also includes special hoses suitable for higher temperatures. If hose assemblies are operated at low temperatures, no problems should be expected with the hose assemblies themselves; however, measures should be taken to prevent the operating medium from freezing.

**Trouble-shooting:** Immediately eliminate any leakage on the connectors (refasten connectors, replace O-rings, if necessary, or rework the cone). Caution: Prior to performing any work, always relieve the pressure - never work on hose assemblies while they are under pressure. Should the leakage occur in the hose (blisters in the hose cover, leaks at the relief holes of the fitting) put the hose assembly out of operation immediately. Continued use of a leaky hose assembly exposes the operators to serious hazards.

**Special types of application:** When used in tall buildings, hose assemblies have to be supported to prevent tensile stress. If hose assemblies are used under tensile stress, this will shorten their life.

When using hose assemblies in potentially explosive atmospheres, it needs to be considered that Parker high-pressure hose assemblies are electrically conductive in general (from fitting to fitting). However, neither the protective sleeves nor the hose cover are electrically conductive.

## 5. Storage and utilization time of hose assemblies

### Storage

Even if properly stored and operated at permissible loads, hose assemblies are subject to natural ageing. This limits their storage and utilization time. Improper storage, mechanical damage and excessive stress are the most frequent causes of failure.

For the storage of hose assemblies, the following instructions shall be followed:

Store the hose assemblies in a cool and dry place with low levels of dust. Do not expose the hose assemblies to direct sunlight or UV radiation. Protect the hose assemblies from heat sources.

Do not use any ozone-generating luminaries (fluorescent sources of light, mercury vapor lamps) or electrical devices in the immediate vicinity of hose assemblies.

Store hose assemblies stress-free and in a horizontal position.

When storing hose assemblies in bundles, the hose shall not be bent to less than its minimum bend radius.

Store fittings with protective caps to prevent damage to the thread.

The maximum storage time of bulk hose is 10 years and that of completed hose assemblies is up to 2 years. If possible, storage of hose assemblies should be avoided. The natural properties of the hose materials cause a loss of compression in the fitting, which may lead to premature leakage of the fitting.

### Utilization period and replacement intervals

Parker does not limit the utilization period of a hose assembly, however it should not exceed 6 years.

Hose assemblies are used in a great variety of applications. For this reason Parker Polyflex is unable to guarantee a specific useful life of the hose assembly in a particular application.

The following guidelines may be useful:

- a) Parker Polyflex hose assemblies meet, or in most cases, exceed the requirements of DIN EN 1829-2. This standard prescribes that hose assemblies have to resist at least 20,000 cycles from zero to working pressure. This is relevant for industrial applications (e.g. cleaning of parts in the automotive industry) where hose assemblies are used on a permanent basis. In this case, no periodic pressure tests are required, but periodic visual inspections are recommended. The intervals for visual inspection and replacement must be determined by the manufacturer of the plant.
- b) In the construction industry (e.g. concrete refurbishment) and in flexible guns, hose assemblies are usually exposed to additional stress (e.g. tensile loads, mechanical damage) which may considerably reduce their useful life. This is why the tests according to section 6 are mandatory.

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## 6. Maintenance, repair, inspection, periodic pressure tests

Prior to the first putting into operation and at least every six months:

Check the hose assemblies for their function and as to whether they can be safely used.

This inspection should be done by a skilled person, who due to professional training and experience has sufficient knowledge about hoses.

Scope of tests: visual inspection of the hose assemblies. Check whether the working pressure of the hose assembly corresponds to the actual working pressure of the application and whether the hose assembly shows any visible damage. Visible damage may include:

Damage of the hose cover (e.g. abrasion, cuts or cracks)  
Deformation beyond the natural shape of the hose assembly in depressurized or pressurized state or during bending. This may include separation of layers, blistered, crushed or kinked hose. Damage or deformation of the fitting. Corroded fitting. Hose detaching from the fitting. Maximum storage and utilization times have been exceeded

Daily:

Visual inspection of the hose assemblies by the operator (see above)

Upon discovery of any visible damage, replace the hose assembly or have it approved for further use by a qualified person.

According to EN 1829-2 hose assemblies whose cover is so badly damaged that the wire reinforcement becomes visible have to be withdrawn from service. Repair of the hose cover is not allowed.

Yearly:

In addition to the visual inspection of the hose assembly, a pressure test with 1.2 x the working pressure has to be performed with this pressure being applied for two minutes. This pressure test is not required for hose assemblies in continuous use (industrial plants).

Repair of hose assemblies

Parker Polyflex advises against the repair of hose assemblies as the safety of a hose assembly that has already been in service is always reduced. In general, repair of hose assemblies by authorized Parker Polyflex distributors is permissible with certain restrictions. Please consult your Parker distributor.

## 7. Polyflex-Lok

Polyflex-Lok is a system designed for the fast mounting of hose assemblies and/or for the connection of the hose assemblies to the pump / gun without any tools.

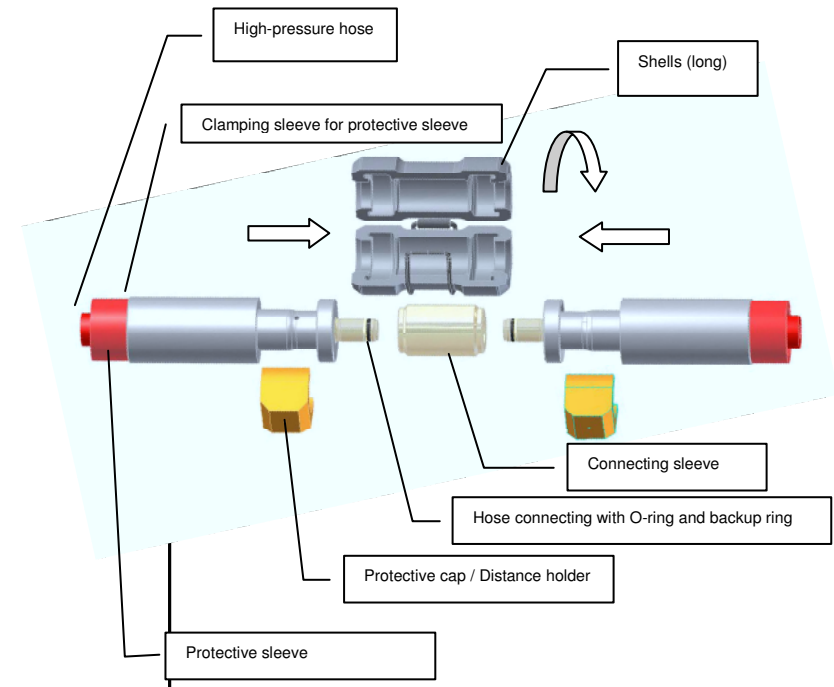
The system for connecting hose assemblies consists of hose assemblies (equipped with protective sleeve as a standard) with special connectors and protective caps, connection sleeves and shells.

Assembly:

Remove the protective caps from the hose connectors.  
Slightly grease the hose connectors or wet them with some water and push them into the connection sleeve up to the stop. CAUTION: Make sure that all parts are perfectly clean and free from dirt and damage or deposits. Otherwise proper tightness and/or easy disassembly cannot be ensured. If necessary, clean the parts prior to assembly.  
Close the shells over the connection sleeve.  
Pull the hose assemblies apart (important, as otherwise the protective caps cannot be mounted) and mount the protective caps between the shells and the clamping sleeves for the protective sleeve.

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Disassembly:

Remove the protective caps.

Push the hose assemblies together up to the stop as otherwise the Shells cannot be opened.

Open the Shells and remove them.

Pull the hose connectors out of the connecting sleeve and immediately place the protective caps on the hose connectors.

The Polyflex-Lok System for the connection of the hose assembly to the pump / gun is designed according to the same principle. An adapter is screwed to the pump; a hose assembly is pushed into the adapter and fixed with Shells and a cap. Here as well cleanliness is mandatory.

