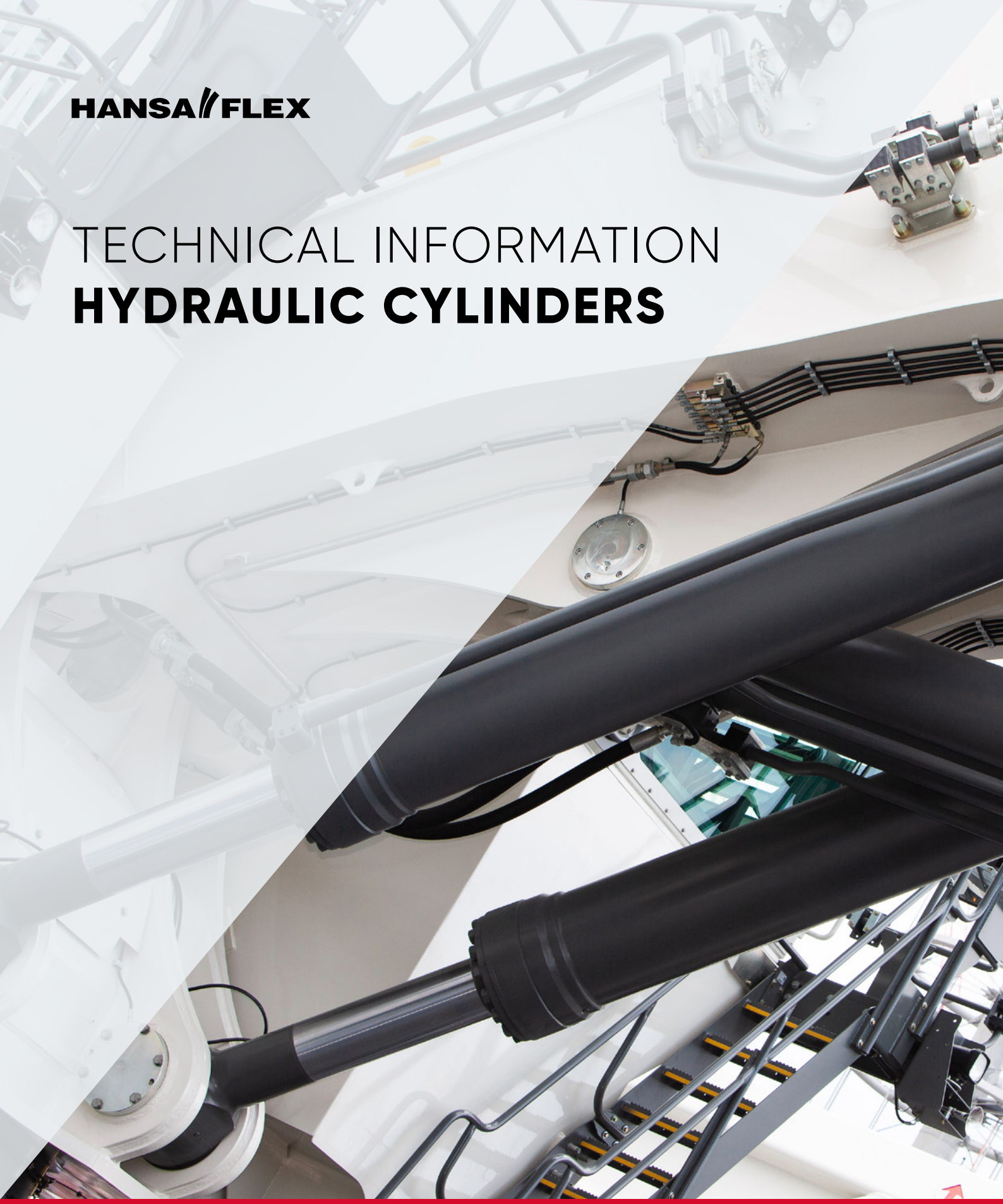
HANSA-FLEX

# TECHNICAL INFORMATION
# HYDRAULIC CYLINDERS



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# Technical information Hydraulic cylinders

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# 1. General information

The installation, commissioning and maintenance of hydraulic systems or their components may be carried out only by suitably qualified personnel and in strict observance of the safety regulations.

Please observe the provisions of DIN EN ISO 4413 (2011) “Hydraulic fluid power - General rules and safety requirements for systems and their components” as well as specifications and safety requirements based on statutory regulations when selecting, installing and operating cylinders.

# 2. Safety instructions

The maximum loads (pressures, forces, temperatures) given in the product documentation must not be exceeded.

Throttling the oil draining out of the piston rod side port will increase the pressure on the piston rod side, because the area of the piston head side is bigger than the area on piston rod side. This pressure can be further increased by a load pulling on the piston rod, and this combination can easily lead to failure of the cylinder on the piston rod side.

Loosening of a consumer port on the cylinder can result in a free fall or uncontrolled lowering of loads.

# 3. Technical information

## 3.1. Installation instructions

Hydraulic cylinders are linear drives. Hydraulic cylinders must be installed such that lateral loads are avoided during operation. The installation position can be freely selected as long as buckling safety is observed.

The stroke end must not be used as an end stop. Where driving loads are involved, external end stops and load-holding or counterbalancing valves must be installed.

When connecting to the pressure supply, pay attention to the correct identification of the connecting lines (refer to markings, if present). Furthermore, the permissible pressure values for screw fittings, pipes and hose lines must be observed.

When using double-acting cylinders as single-acting cylinders, the second oil port must be connected to the hydraulic oil tank so that oil can be replenished without resistance.

The piston rod should be protected against foreseeable damage and corrosion, e.g. by fully retracting it with the system at rest.

Pipelines, screw fittings etc. must be cleaned of dirt, chips, scale etc. before installation and then securely fitted.

Before connecting the hydraulic cylinder to the drive unit, flush the power unit and the supply lines. The consumer lines must be connected together in order to do this. The flushing process is intended to remove dirt and air from the consumer lines.

Hydraulic cylinders must be bled of air before commissioning. To do this, slightly loosen the oil ports or the bleed screw on the cylinders and place a suitable vessel underneath to collect the oil. Then move the cylinder unpressurised between the two end positions until the oil runs out bubble-free and without foaming. Move the oil ports into the highest possible position for quicker bleeding.

## 3.2. Notes on welding on fasteners and painting

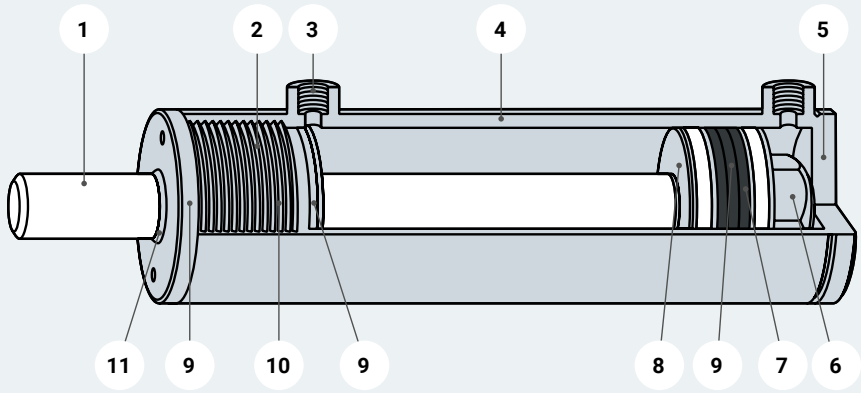
The piston rod must be completely extended. In the case of cylinders with a stroke <400 mm, it must be

removed before welding (to protect the seals from the heat). The piston rod must be protected from weld spatter. The ground cable must always be connected to the component to be welded on, never to the piston rod or cylinder barrel. Otherwise the cylinder seals are damaged by arcing between the piston and the cylinder barrel. The temperature of the piston rod at the piston rod seal must not exceed 80 °C during this operation. Do not retract the piston rod until after the cylinder has cooled.

During painting, the chrome-plated surface of the piston rod and the oil ports must be protected from paint spray mist. When drying in a drying cabinet after painting, the temperature must not exceed 80 °C.

## 3.3. Technical parameters

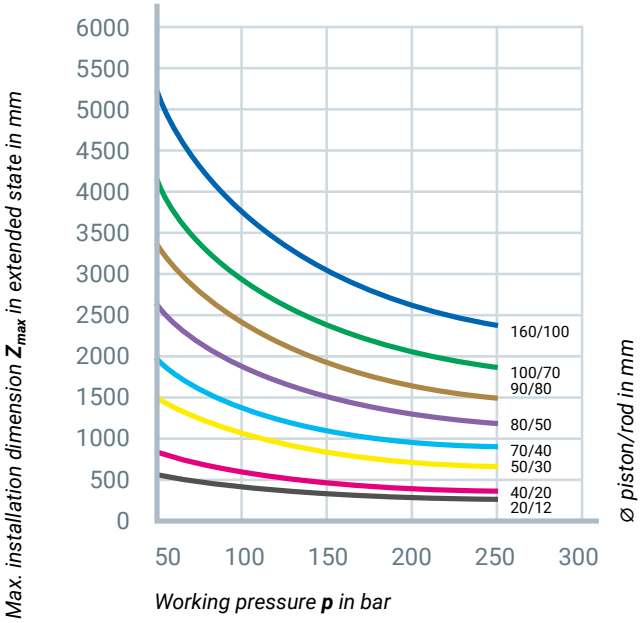
**Standard cylinders up to 200 bar**

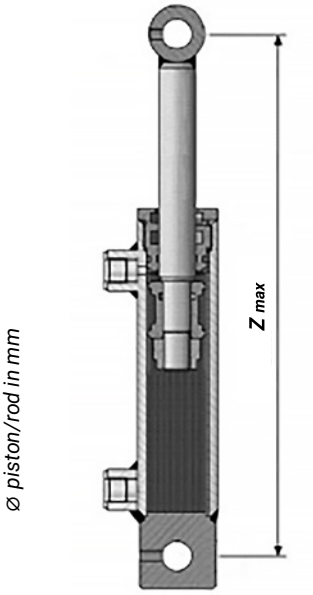



| | |
|---|---|
| **1 Piston rod** | **Steel 20MnV6<br>Chrome 25 µm ± 5<br>(120 hour salt spray test to<br>ISO 3768 - rating in accordance with ISO 4540 Class 9)** |
| **2 Piston rod guide** | **Hydraulic casting UNI 5007 G25** |
| **3 Oil port** | **Steel 9SMn28** |
| **4 Polished cylinder barrel** | **St 52.3 DIN 2393-ISO H9** |
| **5 Cylinder base** | **FE 510-A105** |
| **6 Nut** | **Steel 8UNI EN20898/2** |
| **7 Seal** | **TPM NBR** |
| **8 Piston** | **Steel 9SMn28** |
| **9 Seal** | **OR NBR Fluorosil Viton** |
| **10 Seal TSE-TTS-TTI/L** | **NBR + fabric / polyurethane** |
| **11 Seal GHM-GHK** | **NBR / polyurethane** |
| **Piston speed based on standard seals** | **Max. 25 m/min - 0.42 m/sec** |
| **Piston speed moving into the end positions** | **Max. 6 m/min - 0.10 m/sec** |
| **Temperature range** | **-25 °C to +80 °C** |
| **Max. working pressure (to DIN EN 982)** | **200 bar** |
| **Test pressure (to DIN EN 982)** | **240 bar** |
| **Medium** | **HLP fluids** |

## Buckling chart for single and double-acting cylinders

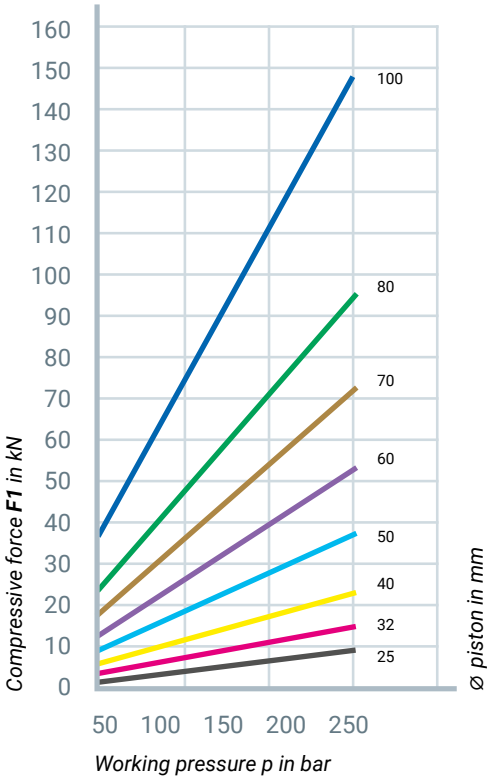
(Buckling safety factor 3.5) (valid for Euler buckling case 2, pinned bearing at each end of cylinder)



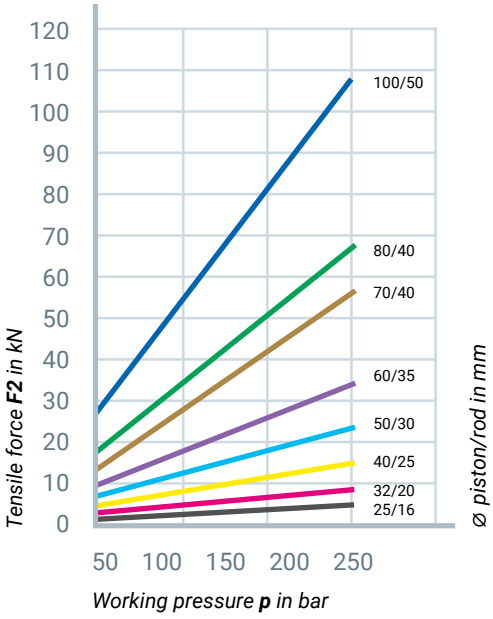

## Compressive force chart for single and double-acting cylinders

(efficiency 95%)




## Tensile force chart for double-acting cylinders

(efficiency 92%)



## 4. Seals, maintenance, care, storage

Seals in hydraulic cylinders are wear parts. If the permissible values for external or internal leakage are exceeded, the seals must be replaced. Complete seal kits should always be replaced together.

In general, hydraulic cylinders require no special maintenance. Where heavy-duty operation is involved, ensure proper lubrication of the bearing points (pivot bearings, swivel bearings etc.). After commissioning, pay particular attention to leak tightness and functional safety.

The maintenance intervals for the system (oil and filter changes) in the system manufacturer's specifications must be observed.

The chrome coating of the piston rod and external components on the cylinder must be protected during transport. Hydraulic cylinders must be stored dry and at an ambient temperature kept as constant as possible in order to avoid the formation of condensation inside the cylinder. The storage locations must be free of vapours and corrosive substances. The oil ports must be sealed with protective caps.

If hydraulic cylinders are not required for longer than 2 months, they must be stored upright with the piston rod fully retracted. There is otherwise a risk of permanent deformation of the seals. The cylinders must be filled with a suitable hydraulic fluid in order to avoid corrosion.

## 5. Disposal information

Hydraulic oil, hydraulic hose lines and hydraulic components may not be thoughtlessly placed in the ordinary refuse; they must be collected and disposed of in accordance with the applicable waste disposal regulations. The national requirements of the country and, if appropriate, information given in the safety data sheets must be observed.