Testing and flushing machines for hydraulic cylinder MPC family

New generation machines for testing and flushing of hydraulic cylinders according to CE safety rules. The machines are the result of intensive research and development work and can operate manually or automatically.

Software TOTAL TEST:

- **The machine software can be PLC based Siemens with touch screen and report printer, it may alternatively consist in PC based system to be interfaced with the company network;**
- **Optional bar code recording and management;**
- **Customized software available on request;**
- **Machine pressure drop reset to state lone cylinder data;**
- **Possible web monitoring, update and trouble shooting.**

Testing:

- **Cylinder test procedure based on ISO 10100:2001 standard. by comparison of measured pressure loss inside the cylinder chambers with a validated sample stored in the test program taking into account parameters, time and other company data;**
- **The machine do perform the test at a controlled and stabilized fluid temperature between 38°C and 42°C.**

The TOTAL TEST system goes over the standard by performing following tests:

- **Sliding pressure monitoring during the full stroke of the cylinder; unexpected pressure deviations put in evidence by pressure Vs. time graph.**
- **Sealing test performed in any intermediate position of the piston (non only at stroke ends).**
- **Braking chamber pressure monitoring (with optional graph and statistics).**
- **Control valves integrated into the cylinder.**
- **Stroke and position measure (by instrument up to mm cent precision).**
- **Possibility of tests under load.**

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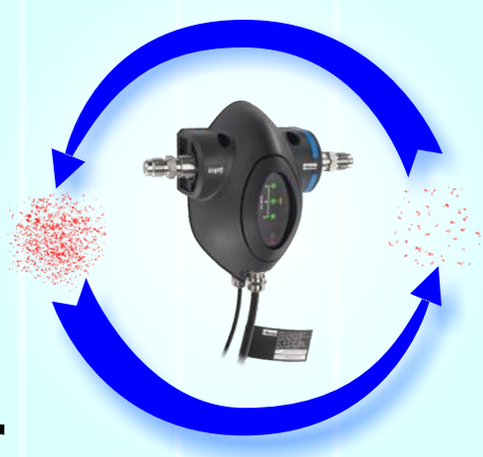


Flushing:

- **The machine is equipped with a well sized filtration system that works on the oil pressure and return lines; a special controlled (Patented) off-line filtration system is also provided in order to further clean the fluid and to ensure the desired fluid contamination level;**
- **The operator can input the max allowed contamination in the test program; a laser scan particle counter is placed in line with the circuit and it is used to control the oil contamination level;**
- **The system can manage different contamination level per ISO 4406, NAS or GHOST standards.**

CE

FLUSHING SET

How the MPC testing and flushing machines monitor and control the oil cleanliness conditions

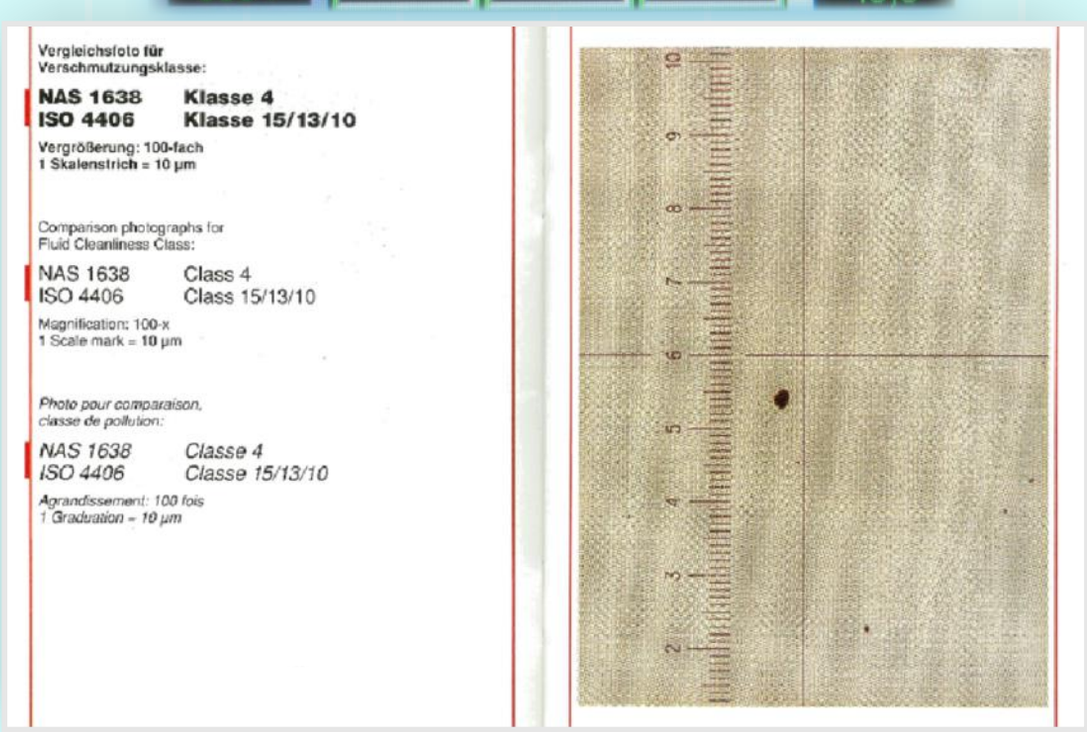
The controlled contamination level is the one of the oil inside machine tank. The MPC machine is set to operate in accordance with ISO 4406 standard but may alternatively be set to NAS or GHOST standards by internal conversion system. The machine is predisposed to evidence best achieved contamination values.

Machine tank fill up from oil drums is made by mean of the off line pump and filters. Tank venting is fitted with 10 µ filters. The pressure and return line to and from the cylinder are also equipped with 10 µ filters to protect the valves. The off line system is further equipped with a dialysis membrane system operating under a (Patented) PLC based control method.

The actual class of contamination is constantly measured by a laser scan particle counter, visualised on the screen and printed on the test report. Filter clogging condition is also constantly checked and reported by machine PLC.

TOTAL TEST can also provide a (patented) optional sampling system based on filtering membranes (Millipore system) directly connected to the A and B cylinder chambers allowing the check of the contamination inside the cylinder during first fill up and washing phases.

The cylinder contamination from A and B ports can also be checked electronically. This optional system do however require constant fluid flows of at least 5 seconds not always compatible with cylinder size.



Safety:

- **All machines do comply with the applicable CE safety regulations;**
- **Machine frame is fully closed and designed to reduce the noise level and to prevent risks of fluid splash. The cylinder holding unit is equipped with transparent and interlocked protective devices of sliding type;**
- **The flexible hoses are secured against whiplash by special steel bonds and run under a protection grid below the cylinder;**
- **Gratings or platforms may be supplied on request for operator safety;**

In order to ensure the best operator safety during all the testing operations, TOTAL TEST have developed a wide range of protection system for the cylinder support device; this in order to reduce specific risk level and to fulfill customer needs and local safety requirements:

• telescopic protection barrier

Do protect the operator against cylinder blow, pipe blow or whiplash along full rod stroke.

• single tunnel barrier

Single piece sliding tunnel in way of cylinder and ports area segregating cylinder operation inside a protective barrier.

• double tunnel barrier

Improved safety system against cylinder end cup blow with double movable section. Available cylinder fitting space limited to 3.500 mm.

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INSTALLATION LAYOUT

The allocation and the design of the workshop area dedicated to cylinder testing is important to ease operations and safety. It is recommended to install the cylinder testing machine in a "white area" served by lifting devices and accessible by transport equipment. TOTAL TEST can recommend on request best test area layout.

AIR/OIL separation technology.

In addition to mentioned oil condition and contamination monitoring, the MPC machine is equipped with a special technology for air-oil separation.

TOTAL TEST consequently developed a special mechanical plus software controlled separation system against oil contamination by air inside machine and tank which do collect the separated air to the atmosphere.

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