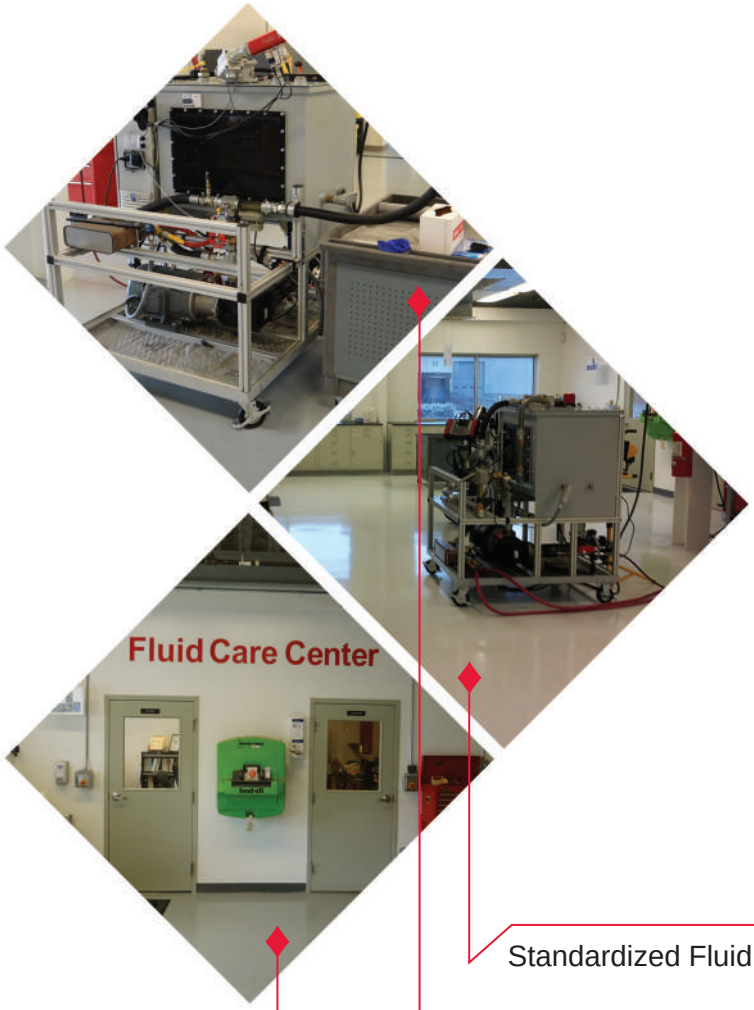
Schroeder INDUSTRIES
Advanced Fluid Conditioning Solutions®

FLUID CARE CENTER | FCC



Standardized Fluid Testing

Fluid Quality Optimization

Filtration Optimization

Advanced Fluid Conditioning Solutions® Using the Fluid Care Center

As both customer requirements and government regulations continue to drive more efficient filtration, developing new products requires a state-of-the-art testing laboratory. Schroeder has leveraged 65 years of filtration knowledge and brought well known standard tests and custom engineered testing capabilities in a single location to form what we are now proud to call the Fluid Care Center or FCC.

Standard Housing Testing

Schroeder tests the performance of its housings to the recognized, but more stringent, NFPA standards for pressure performance, giving our customers peace of mind. Static burst pressure and cyclic rated fatigue pressure (RFP) testing per NFPA/T2.6.1 conservatively determines rated pressures for filter housings.

Schroeder publishes pressure drop vs. flow testing as specified in ISO 3968. Lower pressure drop reduces power requirements, which means energy savings and reduced fuel costs. Schroeder also uses the same equipment to verify cracking and full flow pressure settings of filter bypass valves and indicators.

Flow Bench

Cyclic Testing

Standard Element Testing

Schroeder tests to industry standards for element performance so our customers can compare our element to our competition.

Multi-Pass Test Stand

The most common and important test for filters is the multi-pass testing (MPT) per ISO 16889. This test provides critical performance data for filter elements: filter efficiency(ß), beta stability, and dirt holding capacity(DHC). In addition to testing the performance of elements, Schroeder also tests filter integrity. Filter element collapse/burst testing per ISO 2941 tests the strength of the element construction itself, including the media, support layers, tube, and end caps and provides assurance that an element will hold up in high differential pressure. Schroeder uses a pull tester to check the bond strength of the epoxy/end cap adhesion. Additionally, SI has a bubble point tester which provides a non-destructive filter element integrity test.

Fluid Quality Testing

- **Oil and Additive Elemental Analysis**
- **Automatic Particle Counter** Automatic particle counting for oil analysis, generates 4µm(c), 6µm(c) and 14µm(c) cleanliness codes per ISO 4406. For water or water-based fluids, when automatic particle counters cannot be used accurately, gravimetric analysis can also provide contamination level information
- **Karl Fisher Titration System** Water Content Determination
- **Analyses of Oil, Additive Degradation**
- **Viscometer** Kinematic Viscosity Testing
- **Photomicroscope** Subjective identification and sizing of particulate contamination, used element and used oil analysis
- **Surface Tensiometer Measurement** Interfacial tension between oil/diesel and water

Technical Cleanliness

The contamination test unit is ideal for determining component cleanliness of small hydraulic components such as hoses, camshafts, and hydraulic manifolds. It can be used to drive cost-reduction through lower production failure rates by identifying weak process steps, optimizing both internal and external handling processes, establishing cleanliness standards and documenting component cleanliness. Schroeder's equipment will determine the type, size and quantity of contaminants, which can be used to verify quality standards and system optimization.

Contamination Test Unit (CTU) in the FCC clean room

Rapid Prototyping with 3-D Printed Components

Schroeder uses the latest technology to advance product development using additive manufacturing to decrease development times and product costs. Schroeder delivers novel solutions for our customers in the shortest time possible.

Filter component made using a 3-D Printer

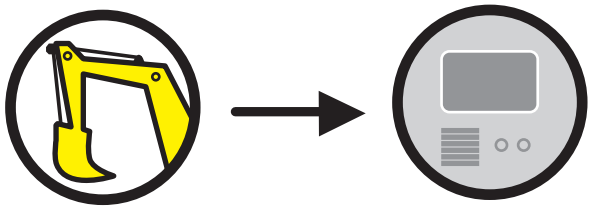
FLUID QUALITY EXPERTISE

Application Specific Testing - Unique to Schroeder

Schroeder has developed purpose-built equipment and tests to reconstruct customers' operating environments while measuring performance. Using the data from these tests when designing hydraulic systems reduces cavitation, size, cost, and increases system longevity.

Application Specific

Hydraulic Test Stand



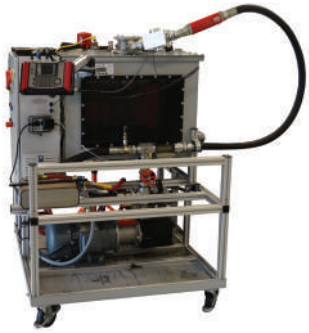
Hydraulic Load Cycle Test (HLCT)

As tolerances get tighter, performance standards more stringent, and operational requirements higher, understanding the impact of the flow of the filter housing and element becomes even more critical in preventing machine down time. Ensuring that filter elements are constructed correctly (have the right beta stability, efficiency, and ΔP) for this application is of paramount importance especially for mobile customers.

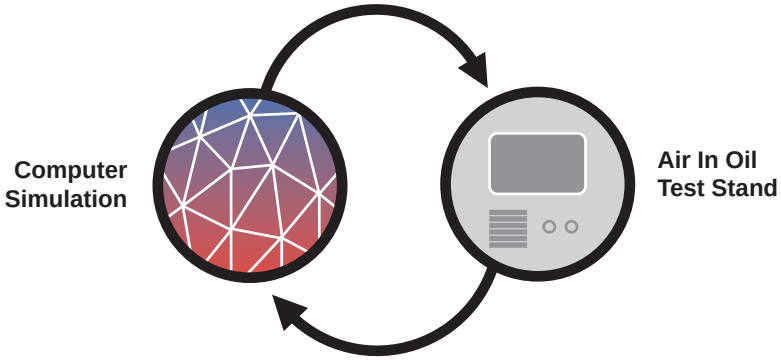
The HLCT recreates the field hydraulic loads using recorded flow profile from the customer's machines and then records the element performance in a laboratory-grade dynamic multi-pass test. Schroeder's test measures and records continuously throughout the cyclic variation. This data provides incredible insight into the design of both the hydraulic circuit and the filtration used on the machine.

With the Hydraulic Load Cycle Test, Schroeder defines the real world performance of its products and our competitors. Like the standard ISO multi-pass test, outputs are filter efficiency, and beta stability, but the results relate to a customer's specific duty cycle.

Application Specific



Air In Oil Test Stand



Air Release Technology

Hydraulic oil tanks, including peripherals, have to occupy the minimum space in order to meet modern mobile equipment requirements. Smaller tank volumes, more complex tank geometry, and shorter dwell times increase the risk of problems from the accumulation of air in the hydraulic oil. Gas in oil causes many problems like pump efficiency loss, cavitation damage, accelerated oil aging, noise generation, and increased temperature. Schroeder has developed an air in oil test stand to measure the amount of air in the fluid allowing optimization of both filtration performance and reservoir design. Tests can be run using the customer's reservoir to examine how changes to configuration such as baffling or filter setup affect deaeration of the fluid.

Schroeder also has expertise in computer simulation of stress and fluid dynamics to examine dynamic reservoir conditions. By iteratively pairing computer simulation and physical testing using the air in oil stand, reservoir geometry and configuration can be quickly and efficiently optimized. Though still useful at the end of a design cycle, the biggest benefit is realized when this technology is brought to bear early in the design process.

Multi-Purpose Test Stand

Diesel Fuel/Water Seperation Diesel fuel/water separation testing (single-pass efficiency and tank draw-down), Hydraulic oil/water separation testing (tank draw-down) and custom testing.

FLUID CARE CENTER | FCC

L-4271 | 2015

Filter Systems Demo Area

Schroeder Industries is expanding the Fluid Care Center (FCC) to include a new dedicated filter systems demonstration area. This section of the FCC will display many of our advanced filter systems products and allow for real time operation. Each product will be fully operational for demonstration and training purposes.

Products available for demonstration in the FCC:

- Triton-A Dehydration Station
- Triton-E Dehydration Station
- SVD10 Vacuum Dehydrator
- Asset Management Filtration Station® (AMFS)
- Filtration Station® (FS)
- HTB 100 Test Bench
- Testmate® Monitoring Unit (TMU)
- MFD and MFDBC Filter Carts
- HY-TRAX® Fluid Sampling System
- SVD01 Vacuum Dehydrator
- HMG 3010 Data Recorder
- Testmate® Monitoring Unit (TMU)
- Bulk Diesel Fuel Filtration Carts (BDFC and BDC)

Other products are on display and available for viewing in the FCC.

For more information, please contact filtrationproductsmanager@schroederindustries.com

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