



CASE STUDY FL1000 filtration – Wood Veneer Plant

Immediate Results; reducing costly equipment rebuilds and downtime

FL1000 Machine Setup

A FL1000 – Wall mounted unit was purchased by a Wood Veneer plant/customer. The target equipment for filtering was an Actuator Pendulum Assembly on a log peeling machine. The Actuator Assembly has a tube with screw and cycles approximately 8,000 times per day when the plant is running. Current rebuild cycle on the Actuator is about every 6 months.

The gearbox has approximately 3 gals of gear oil in the unit, with oil temperatures running approximately 110-120° F (43-40°C). Enclosed pressure in the actuator is less than 10 psi.

Lubrication oil used in this application: *Mobil SHC 629 Synthetic, ISO-150*, with a Viscosity Index of 166

Customers goals:

- Add filtration to the gear oil; thereby reducing rebuilds on the actuator unit.
- Low-flow filtration capability since the gear oil reservoir is small.
- Using the Noria Oil Target Cleanliness Calculator, and the customers preference – an Oil Target Cleanliness of **18-16-14** was set.
- “Tank-Turn” of 1-2 per hour

FL1000 Factory setup:

FL1000 setup as wall mount unit for fixed installation.

Filter installed; Short Depth Filter with particulate removal down to 1 Micron.

Pressure relief factory set at 60 psi.

Installation procedures:

FL1000 attached with the included wall-mount bracket to a location near the inlet/outlet ports of the actuator. Factory provided hoses were cut to the correct length, with adequate allowance for actuator movement.

Fittings were crimped & attached to the hoses, customer provided fittings with the thread size for the inlet/outlet ports on the target machine. The hoses w/fittings, were connected to both the FL1000 inlet/outlet, and the Actuator in/out ports.

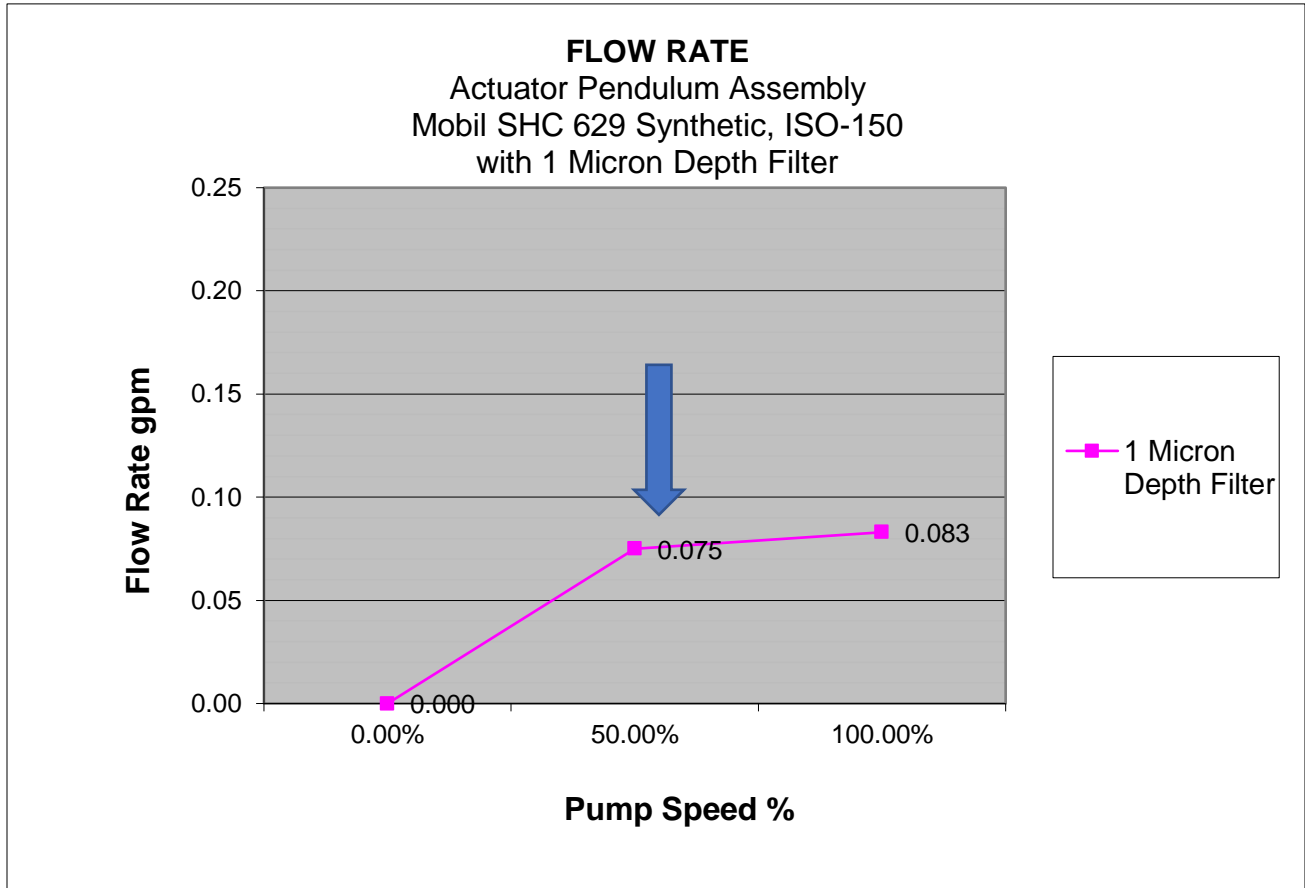
Power was provided by a 120v nearby receptacle.

Filter was pre-filled with Mobil SHC 629 gear oil, attached to the FL1000 and tightened. Unit was switched on and adjusted to full speed to assist priming the unit.

Total install time was about 1 hour.

Pump Speed and Pressure Adjustment

Once primed, the Pump speed was adjusted, using the manual potentiometer knob, to approximately 50% to reduce the flow, with the pump pressure set at approximately 20 psi. Resultant flow rate was approximately **0.075/gpm (4.5/gph)**. See chart below.



The “tank turn” at the flow rate above equals approximately 1.5 “tank turns” per hour. In a 24-hr period, the FL1000 completes 36 “tank turns”, or 108 gals. Note: the FL1000 is able to be operated both during machine operation, and during down time.

Results

Fluid sampling was done before/at installation, 1 week, and 5 weeks. Improvements in oil cleanliness were almost immediate. Prior to filtering, ISO Codes were **25-25-24**, at 1-week the ISO Codes improved to **23-20-15**, and at 5-weeks to **18-16-12**.



Oil Samples 0-1 weeks

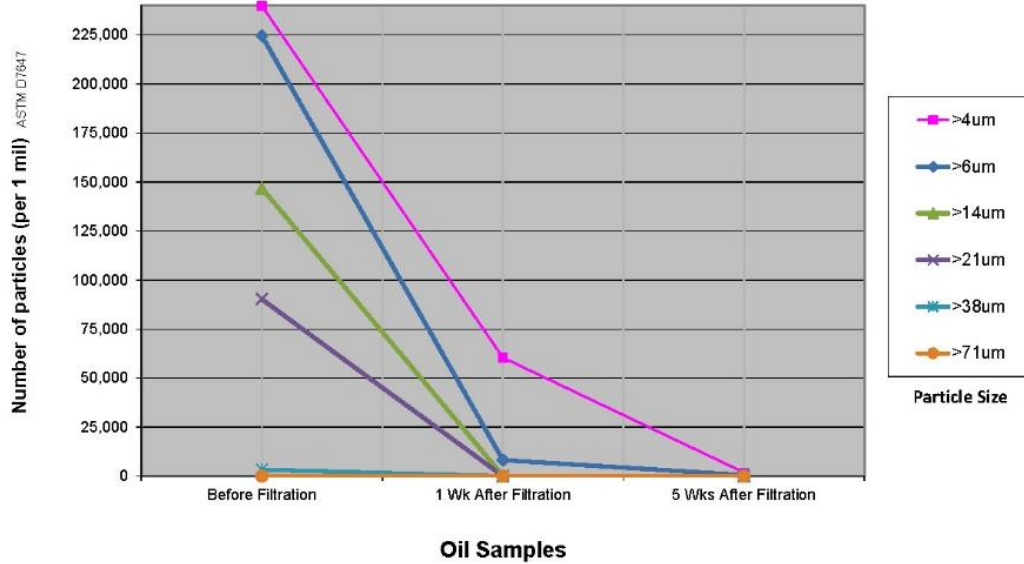


Oil Sample 5-weeks

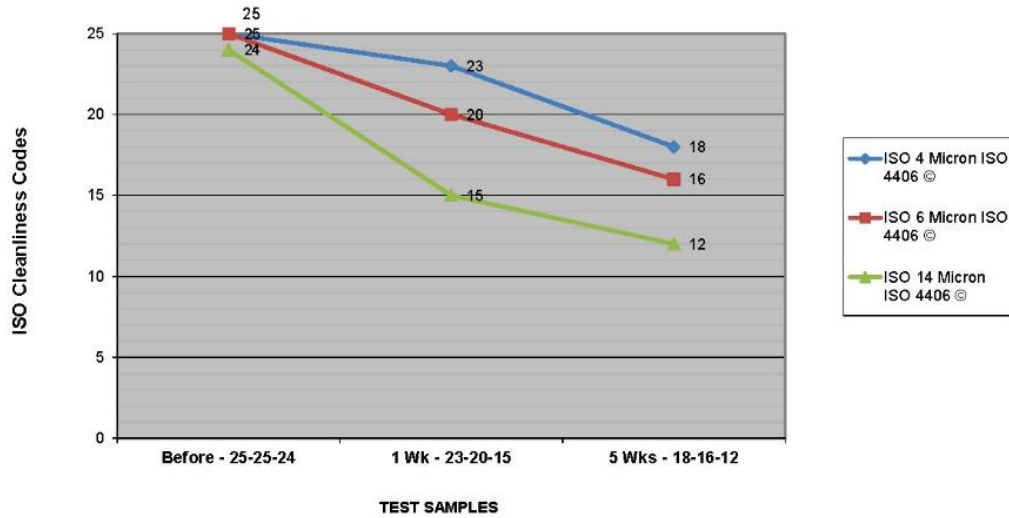
Complete Results in oil contamination and Oil Cleanliness testing are shown below:

Silicon	ppm	ASTM D5185m	>20	<1	2	2
Potassium	ppm	ASTM D5185m	>20	2	0	<1
Particles >4µm		ASTM D7647	>5000	1858	▲ 60448	▲ 239854
Particles >6µm		ASTM D7647	>1300	551	▲ 8207	▲ 224653
Particles >14µm		ASTM D7647	>160	28	▲ 173	▲ 146876
Particles >21µm		ASTM D7647	>40	6	29	▲ 90260
Particles >38µm		ASTM D7647	>10	0	1	▲ 3325
Particles >71µm		ASTM D7647	>3	0	0	1
Oil Cleanliness		ISO 4406 (c)	>19/17/14	18/16/12	▲ 23/20/15	▲ 25/25/24
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
Emulsified Water	scalar	*Visual	>0.1	NEG	NEG	NEG

OIL CONTAMINATION
 Actuator Pendulum
 Gear Oil MOBIL SHC 629



OIL CLEANLINESS - ISO CODES
 Actuator Pendulum
 Gear Oil MOBIL SHC 629



Cost Benefit Analysis

All of the customers goals were reached, including reaching the Oil Cleanliness target of 18-16-14 (actual 18-16-12).

The current rebuild cycle is approximately every 6 months – and rebuild cost every 6 months (not including downtime) is approximately \$14K.

Using the Noria Machine Life Extension Calculator, the **Life Extension Factor** is approximately **3**. If the current Target (18-16-14) can be maintained, we can expect the system to last **3 times longer** than currently being experienced at 25-25-14.