

# Ultra-fine Filtration with Water Removal

For all types of hydraulic applications



## Hydraulic Applications

### Oil Bypass Filtration for High Pressure Applications

- ✓ Cleans oil 5 ISO grades cleaner than new unused oil
- ✓ Reduces water concentration to less than 100 ppm
- ✓ Maintains oil viscosity and acidity (TAN)
- ✓ Prevents 'fine-tolerance valves' from sticking
- ✓ Dramatically extends oil and hydraulic component life

 **OIL RECYCLING**  
**TECHNOLOGIES™**



# Oil does not wear out... it becomes contaminated

Oil changes are not by choice—they are a necessity. High-pressure hydraulic systems operate in diverse environments under varying loads, leading to different rates of contamination. Because of this, manufacturers provide only recommended oil change intervals. Oil life should be determined by oil sample analysis.

Advancements in oil condition monitoring, such as ISO particle count analysis, have transformed maintenance strategies. Regular oil analysis enables tracking of additive depletion, contamination levels, acidity (TAN), and wear debris, helping identify issues before they escalate.

High-efficiency filtration further extends oil life, minimizes component wear, and reduces oil change frequency. This improves equipment reliability, lowers maintenance costs, and decreases waste oil disposal, supporting a more sustainable approach.

Oil does not wear out—it gets contaminated. Over 80% of hydraulic failures stem from dirty oil. The four main causes of oil degradation are moisture, particulate matter, acid buildup, and oxidation—issues common to all high-pressure systems.

By removing water and ultra-fine particles missed by conventional oil filters, contamination levels drop significantly. This reduces the risk of control valve failures, downtime, and frequent oil changes. Keeping oil clean extends service life, improves efficiency, and enhances performance. Maintaining low levels of fine particulates and acidity helps maximize productivity, cut maintenance costs, and drive direct financial savings.



## Contamination Management



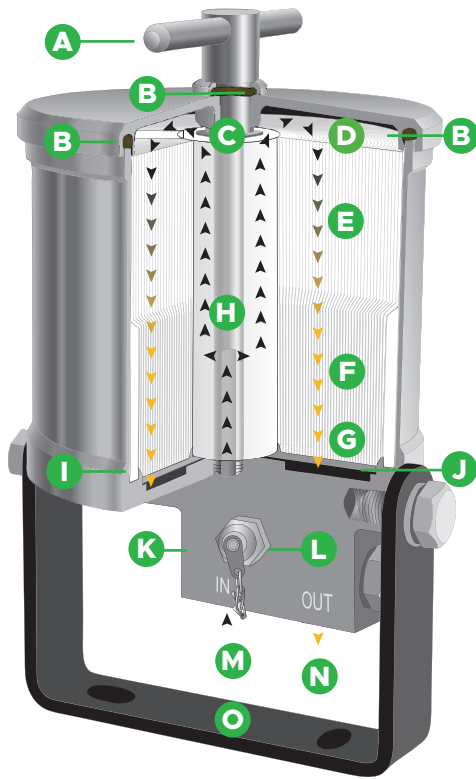
A high-quality oil and standard filter alone will not maximize component life or oil change intervals. Contaminants enter hydraulic systems through various sources. External contamination includes pre-contaminated new oil, airborne dust, and moisture ingress via breathers, cylinder seals, shaft seals, or maintenance procedures. Internal contamination arises as the system wears, generating debris and byproducts over time.

Standard high-pressure filters, typically rated at 10  $\mu\text{m}$  (for reference, human hair is 75  $\mu\text{m}$ , and bacteria are 2  $\mu\text{m}$ ), struggle to remove water, fine particulate, varnish and metal wear debris. As these ultra-fine contaminants build up, they create a sandblasting effect accelerating erosion, abrasive and adhesive wear, cavitation, fatigue, oxidation, varnish, and sludge formation. When combined with moisture and acid formation, contamination speeds up component degradation, increasing the risk of catastrophic failure. Without effective water and ultra-fine particulate removal, full-flow filters alone cannot maintain optimal oil cleanliness, jeopardizing system reliability.

Oil Recycling Technologies™ (ORT) is designed to polish small oil volumes at low flow rates, down to 1 micron, using a precision-wound, multi-ply axial-flow cellulose element that removes ultra-fine contaminants and water missed by conventional filters. Featuring a four-stage filtration process, ORT's advanced replacement elements (rated at  $\beta_2 = 200$ ) are engineered to meet and exceed Servo Control Valve demands for high accuracy, stability, precise positioning, and fine velocity and acceleration control, making them ideal for hydraulic and high-pressure applications where fluid cleanliness is essential for performance and longevity.



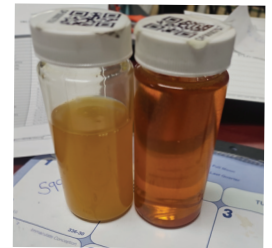
# Prolonging oil with operational safety



## How does it work?

Under high pressure (up to 4,569 PSI / 315 Bar), oil enters the unit through the inlet at the bottom and flows into the Integrated Pressure Reduction Valve. It then moves up the center core of the ORT element at 43.5 PSI / 3 Bar, passing through a four-stage micro-depth filtration system. The oil is filtered down to 1 micron and exits through the outlet, returning to the reservoir at atmospheric pressure. The ORT element requires replacement at regular intervals, based on system contamination rates and operating conditions. Regular oil analysis, including ISO particle count testing, is recommended to monitor contamination and ensure optimal cleanliness.

- A Stainless Steel T-handle** - permits easy lid removal and element replacement
- B O-Ring**
- C Lid Ejection System** - automatically separates the lid from the canister
- D Stage 1 - Surface Filtration**
- E Stage 2 - Depth Filtration**
- F Stage 3 - Pressured Micro-Depth Filtration**
- G Stage 4 - Migrating Particle Filtration**
- H Oil Spike Suppressor**
- I Machine Sealed Edges**
- J Element Support Grill**
- K Integrated Pressure Reduction Valve**
- L Oil Sample Test Point (optional)**
- M Inlet Pressure Port**
- N Outlet Drain Port**
- O Stainless Steel Universal Mounting Bracket**

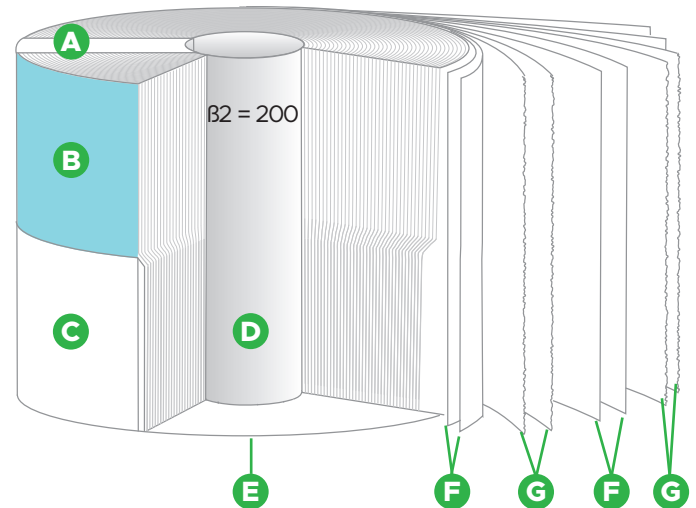


OFS Eliminates Water Contamination

## The Secret - Our Element

ORT replacement elements remove contaminants and moisture while preserving oil additives. With a precision-wound, multi-ply axial-flow cellulose element, these filters exceed high-pressure system demands. Vacuum-sealed for clean storage, they include a plastic disposal bag for easy replacement. ORT offers solutions for various oil viscosities and fluid types (cSt).

- A Fabric Band** - element extraction strap, for easy removal
- B Course Sleeve** - protects upper stage of element
- C Crimped Outer Shell** - creates a dense micro filter media
- D Inner Core**
- E Non-Woven Filter Disc**
- F Standard Crepe Filter Paper**
- G Cross Crepe Filter Paper**



The element is vacuum packed

## Healthy Oil - No Problem

ORT replacement elements remove 99.97% of water from oil, reducing acid formation and slowing the depletion of critical additives, while maintaining a high Total Base Number (TBN). By capturing particles down to 1 micron, they reduce additive load, minimize dirt suspension, and decrease mechanical wear. This extends oil change intervals, optimizes equipment longevity, and lowers maintenance costs.



# A Simple Concept with Proven Results

## ISO and NAS Cleanliness Codes

Internationally recognized standards are used to quantify the number and size of particles in oil. This chart illustrates both standards, the condition of a typical system, and oil cleanliness levels obtained using Oil Recycling Technologies.

ISO Code	Particles/ml 4406:1999			NAS 1638(1964)
	>4 MIC	>6 MIC	>14 MIC	
<b>A</b> 23/21/18	80000	20000	2500	12
22/20/18	40000	10000	2500	-
22/20/17	40000	10000	1300	11
22/20/16	40000	10000	640	-
21/19/16	20000	5000	640	10
20/18/15	10000	2500	320	9
<b>B</b> 19/17/14	5000	1300	160	8
19/16/13	5000	640	80	7
18/15/12	2500	320	40	6
17/14/12	1300	160	40	-
17/14/11	1300	160	20	5
16/14/11	640	160	20	5
<b>C</b> 15/13/10	320	80	10	4
14/12/09	160	40	5	3

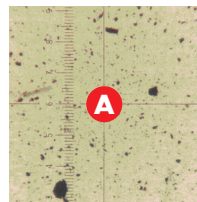
**A** Oil operating in this category will shorten the life of hydraulic components & oil, causing premature wear and continuous breakdowns.

**C** Oil operating in this category will extend oil & component life, reducing hydraulic system breakdowns.

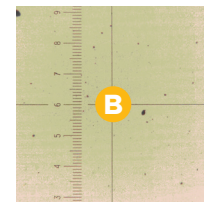
## Fluid Cleanliness Levels

Hydraulic system manufacturers set ISO cleanliness levels to extend component life. Exceeding these cleanliness targets leads to increased wear, reduced performance, and higher failure rates.

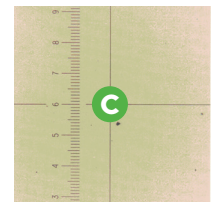
Component	ISO cleanliness level	NAS
Servo control valves	16/14/11	5
Proportional valves	17/14/12	6
Vane and piston pumps/motors	19/16/13	7
Directional and pressure control valves	19/16/13	7
Gear pumps/motors	19/17/14	8
Flow control valves cylinders	20/18/15	9
New unused oil	19/17/14	8



Contaminated Oil  
23/21/18 - NAS 12



New Unused Oil  
19/17/14 - NAS 8



Oil Filtration Solutions 2  
Filtration

## Easy to Install & Maintain

As a bypass filtration system, the ORT is engineered for seamless integration into virtually any hydraulic, transmission, or high-pressure system. Oil can be sourced from a pressure tap on the hydraulic pump or main manifold block, ensuring continuous filtration without interfering with system performance. The polished oil is returned to the reservoir at atmospheric pressure, free of dirt and water, maintaining optimal fluid cleanliness.

Operating at a low flow rate, ORT functions independently of the primary filtration system, enhancing rather than replacing standard filters. As long as the system remains operational, the ORT element continuously removes ultra-fine contaminants and water, effectively addressing the limitations of conventional filtration and extending both oil service life and component longevity.

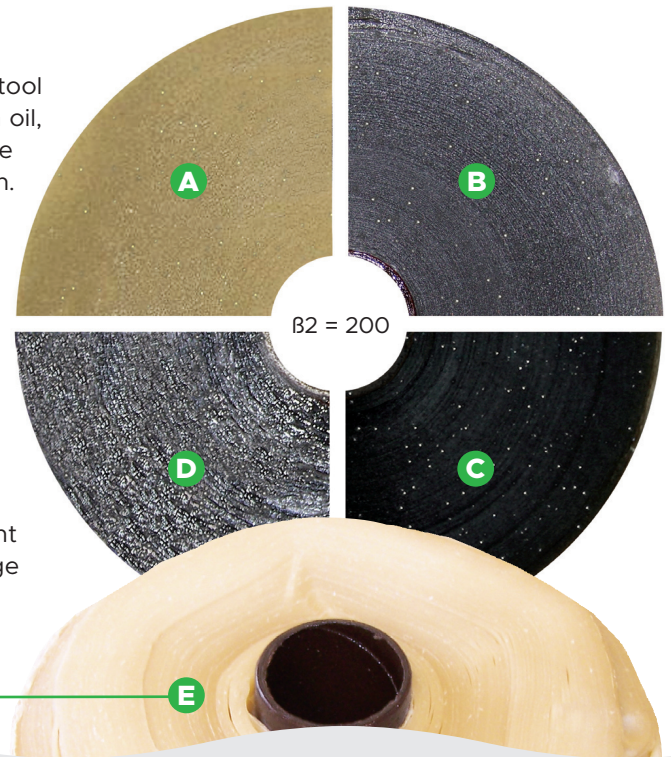


# Identify equipment issues before they become costly and untimely repair ventures

## A Proactive Approach to Maintenance

Oil Recycling Technologies (ORT) is a cost-effective maintenance tool that lowers long-term costs while delivering immediate savings on oil, filtration, downtime, and waste disposal. It ensures quick ROI, while spent ORT elements offer diagnostic insights for early issue detection.

- A Normal Element** - Changed at proper intervals, preventing contamination build-up, obtaining good system hygiene.
- B Contaminated Oil** - Element is light black in color indicating a 'higher than normal' concentration of ultra-fine contamination is present in the oil.
- C Metal Dust Particles Present** - High concentration of metal dust - abnormal abrasion among sliding parts. Change element and sample oil to investigate source of wear.
- D Overdue Element Change** - Element is completely saturated with contamination, the media implodes, indicating the element is overdue for changing. Increase frequency of element change and monitor.
- E Excessive Water Contamination** - Element is spongy and shrunken, indicating water is present in the oil.



## Mechanical, Economic and Environmental Benefits of Use

There are many benefits associated with using ORT's in addition to improving your bottom line and reducing your carbon footprint:

- ◆ Maintains oil up to 5 ISO grades cleaner than new.
- ◆ Lowers water concentration below 100 PPM.
- ◆ Stabilizes viscosity and acidity (TAN).
- ◆ Prevents fine-tolerance valves from sticking.
- ◆ Extends oil and component lifespan.
- ◆ Improves system efficiency and uptime.
- ◆ Reduces maintenance, parts, and downtime costs.
- ◆ Cuts oil use and waste disposal by 66%.
- ◆ Lowers waste production, cost, and carbon footprint.

"We do not inherit the earth from our parents, we borrow it from our children" - Aldo Leopold



## Helping the Environment

The Earth's limited non-renewable resources are depleting rapidly. With rising environmental regulations and ISO 14001 implementation, industries must minimize their impact. ORT's helps reduce waste oil, extend oil life, and support sustainability for future generations.



# Designed for a wide range of hydraulic applications

Hydraulic and high-pressure systems are essential for the safe, efficient, and reliable operation of industrial equipment across multiple sectors. Their functionality supports heavy-duty applications, ensuring optimal performance and longevity in demanding environments. Industries benefiting from advanced hydraulic filtration and maintenance solutions include:



- ◆ **Manufacturing**
- ◆ **Agriculture & Forestry**
- ◆ **Mining**
- ◆ **Oil & Gas**
- ◆ **Construction**
- ◆ **Waste Management**
- ◆ **Fishery & Marine Transportation**

### Key Applications:

- ◆ **Mining & Forestry Equipment** – Ensuring durability in extreme conditions.
- ◆ **Power Generation Turbines** – Maintaining optimal lubrication and efficiency.
- ◆ **Compactors & Industrial Presses** – Enhancing hydraulic stability.
- ◆ **Pulp & Paper Equipment** – Reducing contamination and wear.
- ◆ **Compressors & Thermal Oil Systems** – Preventing moisture ingress and oxidation.
- ◆ **Railway & Road-Building Equipment** – Extending service life and reducing downtime.
- ◆ **Earth-Moving & Construction Equipment** – Protecting critical hydraulic components.
- ◆ **Marine Vessels** – Supporting container ships, ferries, and fishing fleets.

By optimizing oil cleanliness and reducing contamination, advanced filtration systems enhance equipment performance, extend component life, and reduce environmental impact, ensuring smoother operations and greater efficiency across industries.

Model	ORT-FUHP-100	ORT-FUHP-200	ORT-FUHP-300
<b>Oil Reservoir Capacity</b>	250 l *66 gal	800 l *211 gal	1800 l *475gal
<b>Flow Rates</b>	1.5 l/min *0.40 gal/min	2.2 l/min *0.58 gal/min	3.8 l/min *1 gal/min

Oil Recycling Technologies provides a Limited Life time warranty to the original purchaser for defects in workmanship and materials of the Filter canister only. Warranty is not transferable. Hose, adapters, and reusable ends are warranted by the original manufacturer. The use of a Oil Recycling Technologies does not affect original manufacture warranty. As technical advancements take place, product specifications may be subject to change.



FUHP-100    FUHP-300    FUHP-200



### Address

P.O. Box 16125  
Conception Bay South, NL, Canada  
A1X 2E2

**Telephone:** +1 (709) 834-8433 **Fax:** +1 (709) 834-8435

**Email:** info@oilrecyclingtechnologies.com **Web:** www.oilrecyclingtechnologies.com

