

# **ULTRA-FINE FILTRATION WITH WATER REMOVAL HELPING ALL TYPES OF HYDRAULIC INDUSTRIES**



## **HP-Series** **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
- ✓ 1 Micron Filtration



**GENERATION 2**  
**FILTRATION™**

**The Next Generation of Oil Filtration**



# OIL DOES NOT WEAR OUT... IT BECOMES CONTAMINATED



You change your oil, not because you want to, but because you have to. High pressure systems, such as hydraulics, operate in a range of different environments and are subjected to different work loads. This creates equally diverse rates of contamination so manufacturers only provide 'recommended' oil change intervals.

This philosophy of changing the oil has changed substantially in recent years with the availability of affordable oil analysis with ISO particle counts. Oil sample analysis is playing a large role in 'proactive maintenance' programs. It enables you to monitor the health of the additive package, contamination levels, acidity levels (TAN) and wear trends within the system. This can aid in identifying problems before they get out of hand. With improved filtration, you are able to safely maximize oil change intervals while achieving reduced component wear, helping to reduce costs and environmental impact.

Oil does not wear out, it just gets contaminated. Over 80% of hydraulic failures are the result of dirty oil. Four major causes of hydraulic oil deterioration are moisture, particulate matter, acid build-up and oxidation - all commonly found in other high pressure systems. By efficiently removing water and ultra-fine wear particles missed by the standard oil filters, contamination levels are dramatically reduced. This immediately lowers the risk of malfunctioning control valves, downtime, and the need to change the oil. The cleaner you can keep oil, the longer you can go between changes. If the concentration of ultra-fine particles and acidity levels in oil remain low, you can prolong the oil and increase productivity, resulting in savings that go directly to the Bottom Line.

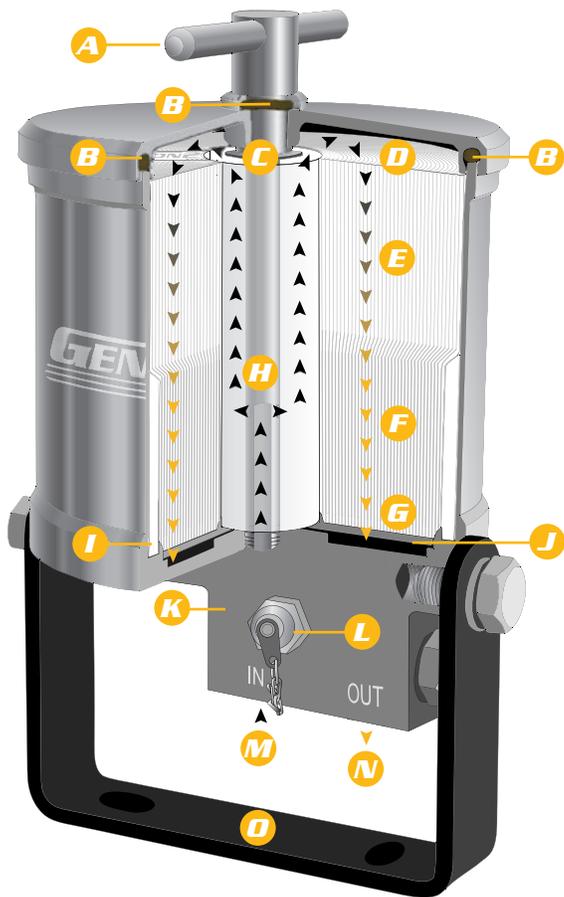
## The Next Generation of Filtration

You need more than a good quality oil and standard filter to extend component life and time between oil changes. **External** contamination arises from many sources including contaminated 'new unused oil', airborne particles (dust) and moisture laden air which enters through the breather, cylinder seals, shaft seals, or during maintenance activities. **Internal** contamination arises when a system 'self-contaminates' over time. The main high pressure oil filters are generally rated at 10  $\mu\text{m}$  (human hair = 50  $\mu\text{m}$ , bacteria cells = 2  $\mu\text{m}$ ) and have a limited ability to remove water and high volumes of 'ultra-fine' particles and wear metals. Over time these particles accumulate to create a sandblasting effect through the system. Compounded with the presence of water, and the formation of acids, the system is subjected to accelerated erosion, abrasive wear, adhesive wear, cavitation, fatigue, oxidation, varnishing, gum and sludge formation, decreasing the life and efficiency of the component, creating a catastrophic failure in time. Without the removal of water and ultra-fine contamination, full-flow filters alone cannot keep oil consistently clean.

Generation 2 Filtration™ (G2F) bypass filtration has the ability to polish small volumes of oil at low flow rates, down to 1 micron, through the precision wound multi-ply 'axial-flow' cellulose element, removing the ultra-fine contamination and water normally missed by standard filters. With 4 stages of filtration, Generation 2™ elements ( $\beta_2 = 200$ ) are designed to meet and exceed 'Servo Control Valve' requirements associated with high accuracy and stability, precise positioning, fine velocity and acceleration controls, found in hydraulics and other high pressure applications.



# HOW TO REMOVE CONTAMINANTS AND KEEP OIL CLEAN



## How It Works

The oil under high pressure (up to 4,569 PSI/315 Bar) enters the inlet at the bottom of the unit, travels up into the 'Integrated Pressure Reduction Valve', moves up the centre core of the G2F element at 43.5 PSI/3 Bar, before passing down through the 4-stages of micro-depth filtration. The oil is filtered down to 1 micron then discharged from the outlet of the unit, the polished oil is then returned to the oil reservoir at atmospheric pressure. The G2F element is to be changed at regular intervals, determined by the rate of contamination produced by the system, and the environment it is operating in. Oil analysis with a ISO particle count is recommended to monitor oil contamination levels, allowing one to meet and exceed targeted oil cleanliness levels.

- A 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 Universal Mounting Bracket**



G2F Eliminates Water Contamination

## The G2F Element - The Secret to our Success

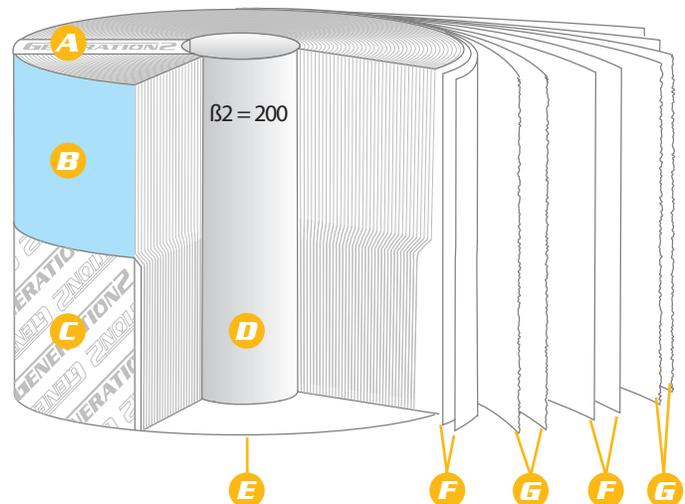
G2F elements remove virtually everything from the oil with the exception of the additive package. By passing oil through the dense precision wound multi-ply 'axial-flow' cellulose element, the housing and the element are designed to exceed the demands of today's technologically advanced high pressure systems. Elements are vacuum sealed and come with a plastic disposal bag ensuring clean and easy element replacement.

- 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**

## Healthy Oil - No Problem

Generation 2™ elements remove water at 99.97% from oil, significantly decreasing the formation of acids, keeping the Total Acid Number (TAN) low, diminishing the accelerated depletion of additives and formation of oxidation, varnish, sludge and gum deposits within the component, dramatically extending the life of the equipment and time between oil changes.

### The element is vacuum packed



# PROLONGING OIL WITH OPERATIONAL SAFETY

## 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 G2F.

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

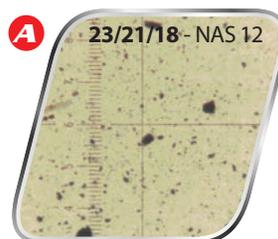
Oil operating in this category will shorten the life of hydraulic components & oil, causing premature wear and continuous breakdowns.

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

## Fluid Cleanliness Levels

Manufacturers of hydraulic systems and transmissions establish fluid ISO cleanliness levels to provide maximum life extension of the component. Once cleanliness target values for any given component are exceeded, the equipment will suffer increased wear and 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



New Unused Oil



Generation 2 Filtration™

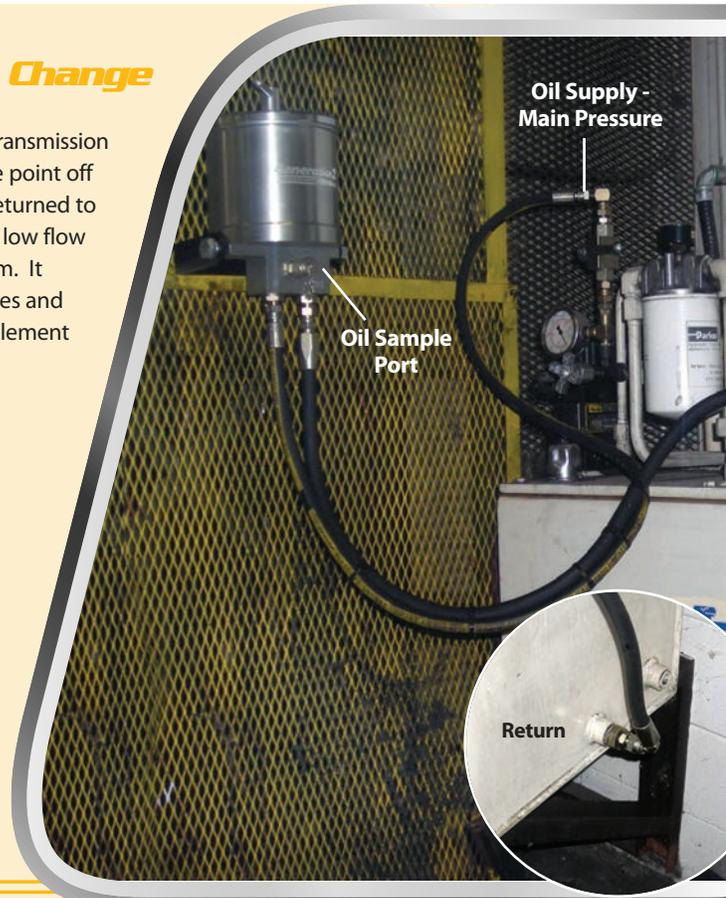
## Simple to Install, Convenient to Change

Being a bypass filter, G2F can be installed on virtually any hydraulic, transmission or high pressure system. Oil supply can be obtained from a pressure point off the pump or main manifold block. Once filtered, the polished oil is returned to the reservoir at atmospheric pressure. Since G2F polishes oil at a very low flow rate, installation of the filter will not impede the operation of the system. It does not replace the conventional standard filtration system - it enhances and works in conjunction with it. As long as the system is running, the G2F element will remove contamination and water missed by standard filters.



Before

After



Oil Supply - Main Pressure

Oil Sample Port

Return

# REDUCE CONTAMINATION, IMPROVE RELIABILITY AND ASSET MANAGEMENT

## A Proactive Approach to Maintenance

G2F is a low cost 'Proactive' maintenance asset management tool reducing long-term maintenance costs, while providing short-term savings on oil, standard filter, downtime, waste oil and offering quick return on the capital investment. Common problems can be identified by the condition of the G2F element.

- 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.



## Benefits

There are many benefits associated with using G2F that helps improve your bottom line and lessen your environmental impact.

- ◆ Consistently maintains oil quality up to 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
- ◆ Increases equipment performance and reduces downtime
- ◆ Reduces replacement part costs, maintenance costs, and associated downtime
- ◆ Dramatic reduction in waste oil and disposal costs

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



## Helping the Environment

The earth has a limited supply of non-renewable resources that are depleting at alarming rates. With added pressure on industry to reduce environmental impact and the implementation of ISO 14001, G2F helps industry do their part to reduce waste oil and protect the environment for future generations.

# FOR A RANGE OF HYDRAULIC APPLICATIONS...AND MORE



Hydraulics, transmissions, and high pressure systems play a vital role in the safe and smooth operation of equipment in a variety of industries. These include manufacturing, mining, construction, fishery, transportation, agriculture, forestry, oil and gas, and waste management to name a few. Some direct applications would include:

- ◆ Mining
- ◆ Forestry
- ◆ Engines
- ◆ Turbines
- ◆ Gear Boxes
- ◆ Compactors
- ◆ Pulp & Paper
- ◆ Compressors
- ◆ Railway Equipment
- ◆ Thermal Oil Systems
- ◆ Industrial Equipment
- ◆ Industrial Oil Systems
- ◆ Industrial Lube Systems
- ◆ Water Glycol Oil Systems
- ◆ Earth Moving Equipment
- ◆ Industrial Presses, Bailers
- ◆ Road Building Equipment
- ◆ Ships, Ferries, Fishing Vessels
- ◆ Military Vehicles & Equipment



## Model

	G2F-HP150	G2F-HP250	G2F-HP350
<b>Oil Reservoir Capacity</b>	250 ℓ	800 ℓ	1800 ℓ
	*66 gal	211 gal	475 gal
<b>Flow Rates</b>	1.5 ℓ /min	2.2 ℓ /min	3.8 ℓ /min
	*0.40 gal/min	0.58 gal/min	1 gal/min

\* gal = US gallon

G2F 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 Generation 2 Filtration™ system does not affect original manufacture warranty. As technical advancements take place, product specifications may be subject to change. L.B.S. Lubrication Units Inc. has been established since 1995.



G2F-HP150

G2F-HP350

G2F-HP250

## GENERATION 2 FILTRATION™



ISO 9001  
QMI-SAI Global

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