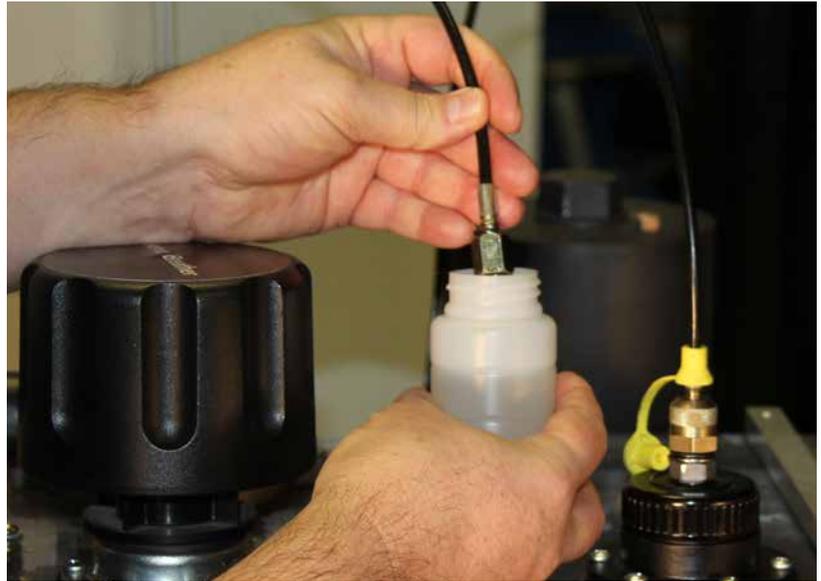




## What Can Fluid Analysis Do For You?

Fluid analysis is a snapshot of what is happening inside your equipment. It summarizes the condition of your oil and identifies component wear and contamination in virtually any application.

- Identify opportunities for optimizing filtration performance
- Safely extend drain intervals
- Minimize downtime by identifying minor problems before they become major failures
- Maximize asset reliability
- Extend equipment life



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## Suggested Sampling Intervals and Methods

Fluid analysis is most effective when samples are representative of typical operating conditions. Always take samples at regularly scheduled intervals and from the same sampling point each time. How critical a piece of equipment is to production should be a major consideration for determining sampling frequency.

<b>Hydraulic</b>	250-500 hours	By vacuum pump through oil fill port of system reservoir at mid-level
<b>Gearboxes</b>	750 hours	By vacuum pump through oil level plug or dipstick retaining tube
<b>Compressors</b>	Monthly or at least every 500 hours	By vacuum pump through oil fill port of system reservoir at mid-level
<b>Turbines</b>	Monthly or at least every 500 hours	By vacuum pump through oil level plug or dipstick retaining tube

Test Kits and Sampling Products Outside of North America: The fluid sampling program featured in this section is used by North American customers. If you're located outside of North America, we recommend you contact your local Donaldson distributor to discuss availability.



## Fluid Analysis Program

The Donaldson Advanced Fluid Analysis Kit is designed to monitor component wear, contamination and fluid condition.

### Benefits

- Partnership with a total filtration solutions provider
- High quality testing by an ISO 17025 A2LA accredited laboratory
- Results available immediately upon sample processing completion
- Innovative data management tools that will help you affect change in daily maintenance practices.

## How Send Samples to the Laboratory

### STEP A | Sample Information

First-time users need to establish a Horizon® account, and new components (sample point) need to be added to your account. Go to this address: [www.eoilreports.com/login](http://www.eoilreports.com/login)

Next, fill out the QR code label  with the corresponding Component ID and Sample Date. Attach the label to the sample jar and retain the other label for your records.

To improve accuracy and ensure faster processing, use the Sample Submission feature in Horizon to send the sample information to the laboratory. Once the information is submitted online, the QR code will contain all required sample information needed for processing.

NOTE: Provide the laboratory with as much detailed equipment and fluid information as possible. More in-depth analysis is possible when the analyst knows the time on both the unit and fluid and whether the fluid and/or filter have been changed since last sampled.

### STEP B | Laboratory Locations

A list of available laboratory locations is included on the form. Label your package with the laboratory address of your choice and ship it using a trackable shipping service, such as UPS or FedEx.

### STEP C | Online Access

If the sample information cannot be submitted online, complete the simple form on the right, detach the form and submit it to the laboratory with the sample.

IMPORTANT: Samples will be placed on hold if the component ID does not match an ID in your account and no component information is included on the paper form. Components can be added to your account online via Horizon or by contacting Customer Service. Samples placed on hold for more than 30 days will be disposed.



Fluid Sampling Products	Part No.
Fluid Analysis Kit	X009330
Sample Extraction Pump	P176431

**ADVANCED INDUSTRIAL**  
1-877-468-3113 | www.donaldson.com  
X009330 | Oil Samples Only

**ONLINE SUBMISSION INSTRUCTIONS**

1. Send an email to [fluidanalysis@donaldson.com](mailto:fluidanalysis@donaldson.com) to establish an online account.

2. Log into your online account to add a new component to your equipment management.

3. Use Sample Submission to add a new sample to the system. The laboratory will receive the sample information and will process the sample.

4. Apply label to samples.

5. Ship samples to laboratory via trackable delivery service per address below.

6. Receive results via email or access Horizon.

**ACCOUNT INFORMATION**  
Distribution Sales Rep (ACCT: DONALD) \_\_\_\_\_  
Company Name \_\_\_\_\_  
Contact \_\_\_\_\_  
Address \_\_\_\_\_  
City / Country \_\_\_\_\_  
Telephone \_\_\_\_\_  
Email \_\_\_\_\_

**SAMPLE INFORMATION**  
Component ID \_\_\_\_\_  
Secondary ID \_\_\_\_\_  
Component Type and Location \_\_\_\_\_  
Transmission  Tr  Turbine  
 Turbine Governor  Box  Hydraulic  
 Other \_\_\_\_\_  
Date Taken \_\_\_\_\_  
Fluid Type \_\_\_\_\_  
Component Time \_\_\_\_\_  
Fluid Changed  Yes  No  Unknown  
Filter Changed  Yes  No  Unknown  
Filter Part# \_\_\_\_\_  
Comments \_\_\_\_\_

**COMPONENT INFORMATION** (to add new samples or manage unit)  
Manufacturer \_\_\_\_\_  
Model \_\_\_\_\_  
Product Mfr \_\_\_\_\_  
Product & Viscosity Grade \_\_\_\_\_

**LABORATORY LOCATIONS**

**A** DONALDSON LABORATORY  
200 BRIDGEMAN BLVD  
INDIANAPOLIS, IN 46205  
USA  
TEL: 317-251-1000  
FAX: 317-251-1001

**B** DONALDSON LABORATORY  
5100 S. STATE ST.  
HOUSTON, TX 77056  
USA  
TEL: 281-251-1000  
FAX: 281-251-1001

**C** DONALDSON LABORATORY  
5100 S. STATE ST.  
HOUSTON, TX 77056  
USA  
TEL: 281-251-1000  
FAX: 281-251-1001

## Test Points, Adapters and Hose Assemblies

If you have filters installed in hard-to-access locations, test points, adapters and hose assemblies can be used to plumb up a bulkhead to read pressure differentials.

See Accessories Section for complete offering!





## Test Results / Reports from Your Sample

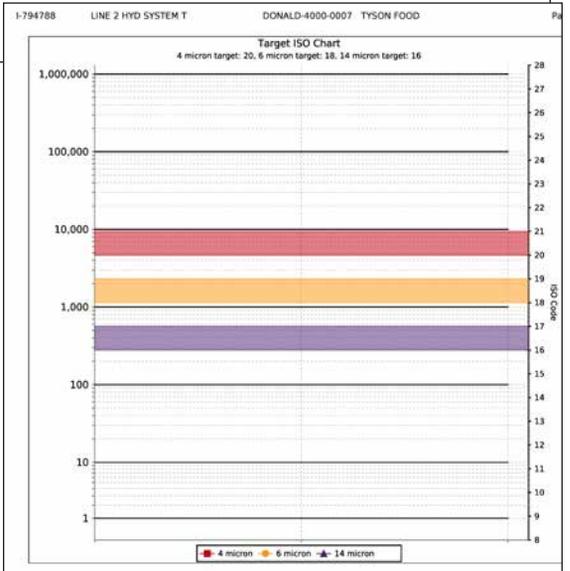
Your Donaldson test report color codes individual results by severity for a better understanding of the overall severity of the report. It also provides a graphical representation of the cleanliness level of the fluid with a photo micropatch accompanied by the Target ISO Chart done on each sample.

With Donaldson, you're also on track for total program management with problem summary reports, sample processing turnaround tracking and data mining capabilities that allow you to affect positive change in your daily maintenance practices.

- Get test results almost immediately – online
- Identify significant trends in fluid cleanliness
- Use management reports to pinpoint problems with critical units
- Identify bottlenecks in sample turnaround time
- Influence equipment purchasing decisions
- Access your information from anywhere there is an internet connection



Information		Component Information		Sample Information	
NALD-4000-0007 TYSON FOOD KREIDER 5 CUSTER AVE W HOLLAND, PA US 15106-5459		Component ID: LINE 2 HYD SYSTEM T Secondary ID: Component Type: HYDROSTATIC TRANSMISSION Manufacturer: Information Requested Model: Information Requested Application: PLANT/INDUSTRIAL Sump Capacity: 0 gal		Tracking Number: 16125E00733 Lab Number: I-794788 Lab Location: Indianapolis Data Analyst: RHM Sampled: 22-Nov-2016 Received: 29-Nov-2016 Completed: 08-Dec-2016	
Filter Type: Information Requested Filter Parts: NOT IDENTIFIED Product Manufacturer: Information Requested Product Name: Information Requested Viscosity Grade: Information Requested		Miscellaneous Information		Product Information	
Comments: Check for source of water contamination (SEALS, BREATHERS, FILL PORTS). Water is at a SEVERE LEVEL. Suggest flushing system. Laser particle count results may be invalid or unable to be tested due to water contamination. IIR (OXIDATION/NITRATION) RESULTS may be skewed due to excess water. Suspect spectrometrical analysis may be skewed due to extreme water contamination. In order to properly compare data to the correct standards, please provide COMPONENT MANUFACTURER and MODEL, and the FLUID MANUFACTURER, PRODUCT NAME, and VISCOSITY GRADE. Please provide filter type and micron rating to allow for proper particle count evaluation.					
Wear Metals (ppm)		Contaminant Metals (ppm)		Multi-Source Metals (ppm)	
Iron	Chromium	Nickel	Aluminum	Copper	Lead
0	0	0	0	0	0
Tin	Cadmium	Silver	Vanadium	Silicon	Sodium
0	0	0	0	0	0
Potassium	Titanium	Molybdenum	Antimony	Manganese	Lithium
0	0	0	0	0	0
Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
0	0	0	0	0	0
Sample Information		Contaminants		Fluid Properties	
Date Sampled	Date Received	Lube Time	Unit Time	Lube Change	Filter Change
22-Nov-2016	30-Nov-2016	h	h	gal	Link
Particle Count (particles/ml)		Additional Testing			
ISO Code	Water by Karl	Photo	Micrograph		
1 WAWAWA	WAT	WAT	WAT	WAT	WAT
4 micron	6 micron	14 micron	ISO Code	Lab Number	
1	22-Nov-2016	WAT	WAT	WAWAWA	I-794788





# How to Read the Donaldson Fluid Analysis Report

Reading a fluid analysis report can be an overwhelming and sometimes seemingly impossible task without an understanding of the basic fundamentals for interpreting laboratory results and recommendations. Referring to the report descriptions and explanations below will help you better understand your results and, ultimately, better manage a productive, cost-saving reliability program.

## Customer, Equipment and Sample Information

The information submitted with a sample is as important to who is reading the report as it is to the analyst interpreting the test results and making recommendations. Know your equipment and share this information with your laboratory. Accurate, thorough and complete lube and equipment information not only allows for in-depth analysis, but can eliminate confusion and the difficulties that can occur when interpreting results.

**Unit, Lube, Turnaround Time and Account** information are listed on the left side of the report emphasizing the data most critical to laboratory processing and data interpretation. Details such as what kind of compressor, gearbox, engine, etc. influences flagging parameters and depth of analysis.

**Second ID** is each customer's opportunity to uniquely identify units being tested and their location.

**Manufacturer and Model** can also identify metallurgies involved as well as the OEM's standard maintenance guidelines and possible wear patterns to expect.

**Filter Types and their Micron Ratings** are important in analyzing particle count—the higher the micron rating, the higher the particle count results.

**Application** identifies in what type of environment the equipment operates and is useful in determining exposure to possible contaminants.

**Sump Capacity** identifies the total volume of oil (in gallons) in which wear metals are suspended and is critical to trending wear metal concentrations.

**Lube Manufacturer, Type and Grade** identifies a lube's properties and its viscosity and is critical in determining if the right lube is being used.

The laboratory at which testing was completed is denoted by an **I** for Indianapolis and an **H** for Houston. The following Lab # is assigned to the sample upon entry for processing and should be the reference number used when notifying the lab with questions or concerns.

### Data Analyst Initials

Make note of the difference between the Date Sampled and the Date Received by the lab. Turnaround issues may point to storing samples too long before shipping or shipping service problems.

Overall report severity based on comments.

Account Information			Component Information			Sample Information																	
Account Number: DONALD-4000-0007 Company Name: TYSON FOOD Contact: JEFF KRIEDER Address: 403 S CUSTER AVE NEW HOLLAND, PA US Phone Number: 717-355-5459			Component ID: LINE 2 HYD SYSTEM T Secondary ID: Component Type: HYDROSTATIC TRANSMISSION Manufacturer: Information Requested Model: Information Requested Application: PLANT/INDUSTRIAL Sump Capacity: 0 gal			Tracking Number: 16125E00733 Lab Number: 1794788 Lab Location: Indianapolis Data Analyst: RNM Sampled: 22-Nov-2016 Received: 30-Nov-2016 Completed: 06-Dec-2016																	
Filter Information			Miscellaneous Information			Product Information																	
Filter Type: Information Requested Micron Rating: 0			Filter Part#: NOT IDENTIFIED			Product Manufacturer: Information Requested Product Name: Information Requested Viscosity Grade: Information Requested																	
Comments: Check for source of water contamination (SEALS, BREATHERS, FILL PORTS). Water is at a SEVERE LEVEL. Suggest flushing system. Laser particle count results may be invalid or unable to be tested due to water contamination. IR (OXIDATION/NITRATION) RESULTS may be skewed due to excess water. Suspect spectrometals analysis may be skewed due to extreme water contamination. In order to properly compare data to the correct standards, please provide COMPONENT MANUFACTURER and MODEL, and the FLUID MANUFACTURER, PRODUCT NAME, and VISCOSITY GRADE. Please provide filter type and micron rating to allow for proper particle count evaluation.																							
Wear Metals (ppm)				Contaminant Metals (ppm)			Multi-Source Metals (ppm)		Additive Metals (ppm)														
Sample #	Iron	Chromium	Nickel	Aluminum	Copper	Lead	Tin	Cadmium	Vanadium	Silicon	Potassium	Titanium	Rubidium	Antimony	Manganese	Lithium	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc	
1	0	0	0	0	0	0	0	0	0	0	60	0	0	1	0	0	12	0	0	0	0	0	0
Sample Information			Contaminants			Fluid Properties																	
Sample #	Date Sampled	Date Received	Lube Time	Unit Time	Lube Change	Fuel Dilution	Soot	Water	Viscosity 40°C	Viscosity 100°C	Acid Number	Alkalinity	Oxidation	Nitration									
1	22-Nov-2016	30-Nov-2016	h	h	gal	% Vol	% Vol	% Vol	64.4	0.02	102	134											
Particle Count (particles/mL)										Additional Testing													
Sample #	ISO Code	> 4	> 6	> 10	> 14	> 21	> 38	> 70	> 100	Test Method	Water by Karl Fischer	Photo Micrograph											
1	4000	0	0	0	0	0	0	0	0	L500	257333	CMPLT											
Comments are advisory only and are based on the assumption that the sample and data submitted are valid. Missing fluid or component information limits the evaluation. No warranty is expressed or implied.																							
#	Date	4 micron	6 micron	14 micron	ISO Code	Lab Number																	
1	22-Nov-2016	WAT	WAT	WAT	WAWAWA	1794788																	



## Recommendations

A data analyst's job is to explain and, if necessary, recommend actions for rectifying significant changes in a unit's condition. Reviewing comments before looking at the actual test results will provide a roadmap to the report's most important information. Any actions that need to be taken are listed first in order of severity. Justifications for recommending those actions immediately follow.

**Comments** Check for source of water contamination (SEALS, BREATHERS, FILL PORTS). Water is at a SEVERE LEVEL. Suggest flushing system; Laser particle count results may be invalid or unable to be tested due to water contamination. IR (OXIDATION/NITRATION) RESULTS may be skewed due to excess water; Suspect spectrometals analysis may be skewed due to extreme water contamination; In order to properly compare data to the correct standards, please provide COMPONENT MANUFACTURER and MODEL, and the FLUID MANUFACTURER, PRODUCT NAME, and VISCOSITY GRADE. Please provide filter type and micron rating to allow for proper particle count evaluation.

Sample #	Wear Metals (ppm)										Contaminant Metals (ppm)			Multi-Source Metals (ppm)					Additive Metals (ppm)					
	Iron	Chromium	Nickel	Aluminum	Copper	Lead	Tin	Cadmium	Silver	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Antimony	Manganese	Lithium	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
1	0	0	0	0	0	0	0	0	0	0	0	0	60	0	0	1	0	0	12	0	0	0	9	0

Sample #	Sample Information							Contaminants			Fluid Properties					
	Date Sampled	Date Received	Lube Time	Unit Time	Lube Change	Lube Added	Filter Change	Fuel Dilution	Soot	Water	Viscosity 40°C	Viscosity 100 °C	Acid Number	Base Number	Oxidation	Nitration
			h	h		gal		% Vol	% Vol	% Vol	cSt	cSt	mg KOH/g	mg KOH/g	abs/cm	abs/0.1 mm
1	22-Nov-2016	30-Nov-2016	0	0	Unk	0	Unk				44.4		0.02		192	134

"Highlighted" numbers denote test results the analyst has flagged because they exceed pre-set warning parameters and warrant closer examination or require action. Individual results are flagged by severity color to better explain the overall severity assigned to the sample.

## Elemental Analysis

Elemental Analysis, or Spectroscopy, identifies the type and amount of wear particles, contamination and additives. Determining metal content can alert you to the type and severity of wear occurring in the unit. Measurements are expressed in parts per million (ppm).

Combinations of these Wear Metals can identify components within the machine that are wearing. Knowing what metals a unit is made of can greatly influence an analyst's recommendations and determine the value of elemental analysis.

Knowledge of the environmental conditions under which a unit operates can explain varying levels of Contaminant Metals. Excessive levels of dust and dirt can be abrasive and accelerate wear.

Additive and Multi-Source Metals may turn up in test results for a variety of reasons. Molybdenum, antimony and boron are additives in some oils. Magnesium, calcium and barium are often used in detergent/dispersant additives. Phosphorous is used as an extreme pressure additive in gear oils. Phosphorous, along with zinc, are used in anti-wear additives (ZDP).

Sample #	Wear Metals (ppm)										Contaminant Metals (ppm)			Multi-Source Metals (ppm)					Additive Metals (ppm)					
	Iron	Chromium	Nickel	Aluminum	Copper	Lead	Tin	Cadmium	Silver	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Antimony	Manganese	Lithium	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
1	0	0	0	0	0	0	0	0	0	0	0	0	60	0	0	1	0	0	12	0	0	0	9	0

**Iron (Fe)**

**Definition**  
 Iron is a wear metal detected with Elemental Analysis by ICP (Inductively-Coupled Plasma), which detects all 60 elements, measuring them from the unit lube. Most of the elements that are not in lube, such as lead, are not in lube. Wear metals include iron, chromium, nickel, aluminum, copper, lead, tin, cadmium, silver, vanadium, and potassium. For reference, wear metals are also used in lube analysis. High levels of wear metals indicate excessive wear, which can be caused by excessive dirt, poor oil quality, or excessive operating hours. Excessive wear can lead to increased downtime and higher maintenance costs. Iron is a common wear metal in most hydraulic systems. It is often found in the form of iron filings or iron particles. Iron is also a common contaminant in hydraulic systems. It is often found in the form of iron filings or iron particles. Iron is also a common contaminant in hydraulic systems. It is often found in the form of iron filings or iron particles.

**Reporting Measurement**  
 ppm

**Amount of Sample Needed**  
 25cc

**Test Location**  
 Fluids Analysis

**Possible Sources**  
 Ring-and-Ring Compressors  
 Shaft, Piston, Crosshead, Piston (Dumb),  
 Crank, Housing, Casting, Piston  
 Rotary Compressors  
 Vane, Shaft, Bearings, Housing  
 Variable / Constant Compressors  
 Shaft, Gears, Bearings, Piston  
 Hydraulic  
 Rod, Cylinder, Piston, Shaft, Piston  
 Ring-and-Ring Compressors  
 Shaft, Piston, Crosshead, Piston (Dumb),  
 Crank, Housing, Casting, Piston

When reviewing your report online, you can click on the metal to see its definition, the ASTM test method used, how the results are reported, the amount of sample needed to perform the test, possible sources as to where the metal is coming from, and an illustration of the test equipment.



## Test Data

Test results are listed according to age of the sample—oldest to most recent, top to bottom—so that trends are apparent. Significant changes are flagged and printed in the gray areas of the report.

Samples\* appear in an oldest to newest **numbered sequence** so that results are easily associated with them throughout the report and depth of analysis.

**Water** in oil decreases lubricity, prevents additives from working and furthers oxidation. Its presence can be determined by crackle or FTIR and is reported in % of volume. Water by Karl Fischer determines the **amount** of water present. These results appear in the Special Testing section of your report.

**Viscosity** measures a lubricant's resistance to flow at temperature and is considered its most important physical property. Depending on lube grade, it is tested at 40 and/or 100 degrees Centigrade and reported in centistokes.

Sample Information								Contaminants			Fluid Properties					
Sample #	Date Sampled	Date Received	Lube Time	Unit Time	Lube Change	Lube Added	Filter Change	Fuel Dilution	Soot	Water	Viscosity 40°C	Viscosity 100 °C	Acid Number	Base Number	Oxidation	Nitration
			h	h		gal		% Vol	% Vol	% Vol	cSt	cSt	mg KOH/g	mg KOH/g	abs/cm	abs/0.1 mm
1	22-Nov-2016	30-Nov-2016	0	0	Unk	0	Unk				44.4		0.02		102	134

Particle Count (particles/mL)										Additional Testing		
Sample #	ISO Code	> 4 µm	> 6 µm	> 10 µm	> 14 µm	> 21 µm	> 38 µm	> 70 µm	> 100 µm	Test Method	Water by Karl Fischer - 6304C	Photo Micrograph
	Based On 4/6/14										ppm	
1	WA/WA/WA	WAT	WAT	WAT	WAT	WAT	WAT	WAT	WAT	Laser	257338	CMPLT

Comments are advisory only and are based on the assumption that the sample and data submitted are valid. Missing fluid or component information limits the evaluation. No warranty is expressed or implied.

#	Date	4 micron	6 micron	14 micron	ISO Code	Lab Number
1	22-Nov-2016	WAT	WAT	WAT	WA/WA/WA	I-794788

The **ISO Code** is an index number that represents a range of particles within a specific micron range, i.e. 4, 6, 14. Each class designates a range of measured particles per one ml of sample. The particle count is a cumulative range between 4 and 6 microns. This test is valuable in determining large particle wear in filtered systems.

**Fuel** and **Soot** results are all reported in % of volume. High fuel dilution decreases unit load capacity. Excessive soot is a sign of reduced combustion efficiency.

**Oxidation** measures the breakdown of a lubricant due to age and operating conditions. Oxidation prevents additives from working and therefore promotes increased acid content, as well as increased viscosity. **Nitration** is an indication of excessive "blow-by" from cylinder walls and/or compression rings and indicates the presence of nitric acid, which speeds up oxidation. Too much disparity between oxidation and nitration can indicate air to fuel ratio problems. As Oxidation/Nitration increases, TAN will also increase and TBN will begin to decrease.

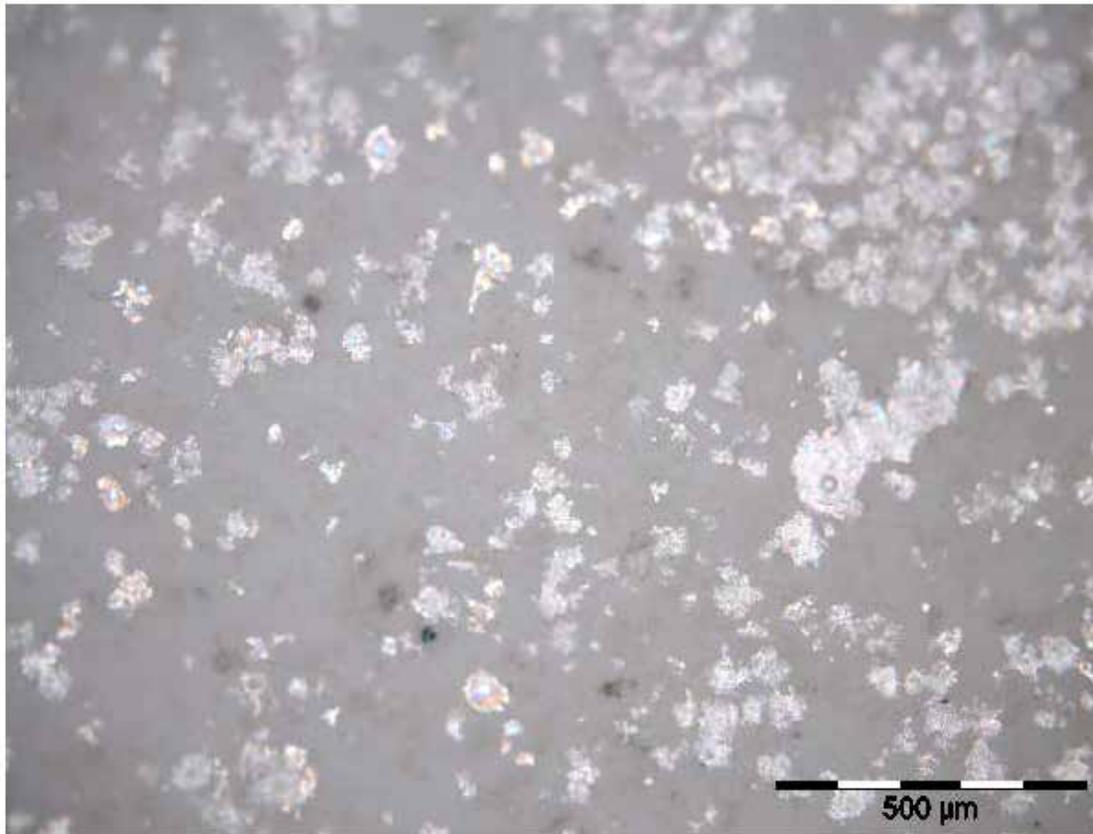
## Special Testing

Special testing is often done when additional, or more specific, information is needed. For example, an Analytical Ferrograph might be requested when a ferrous metal larger than 5 microns has been detected by Direct Read Ferrography. The AF can determine actual size of the particle, its composition—iron, copper, etc.—and the type of wear it's creating—rubbing, sliding, cutting, etc. Additional special testing could include, Water by Karl Fischer and RPVOT (Rotating Pressure Vessel Oxidation Test).

## Photo Micropatch

A photo Micropatch is included with each test report and provides digital imagery of the wear debris, contamination and/or filter media particles found in each fluid sample. It is taken at a 100x magnification and includes the sample's ISO code and a 10 micrometer scale for particle size comparison.

I-794788      LINE 2 HYD SYSTEM T      DONALD-4000-0007      TYSON FOOD      Page 3  
**ISO Code:** WA / WA / WA      **Volume:** 10mL  
**Magnification:** 100x



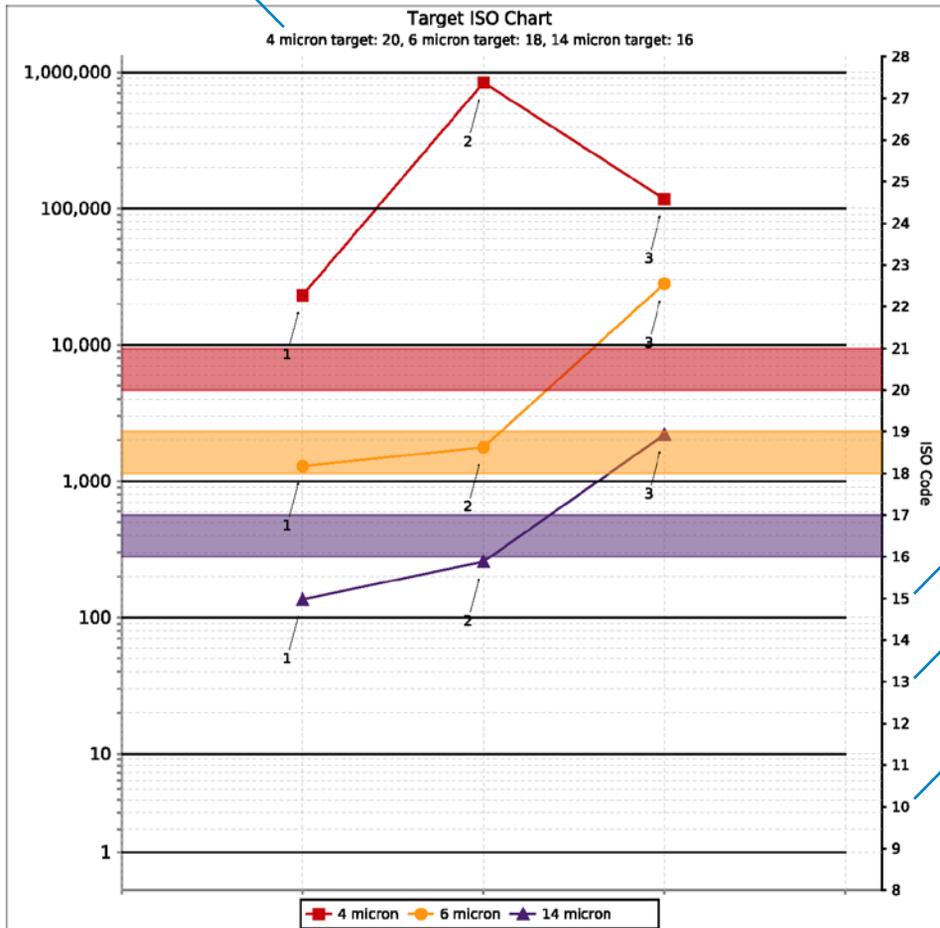
500 micrometer scale



### Target ISO Chart

If target ISO codes are provided on the Component Registration Form, it will appear above the unit ID.

I-782287 64044 NL DONALD-4136-0000 WL GORE (CHERRY HILL) Page 2



Particle count results are reported in particles per milliliter or particles per 100 milliliters at a given size (microns) and ISO Cleanliness Code. When sampling units for the first time, you must include on the Component Registration Form the target ISO Cleanliness Codes specific to each of your applications. These unit-specific codes will then pre-fill on each test report. If target ISO codes are not provided, the target ISO field will be determined by the type of hydraulics and pressure rating listed on the Component Registration Form. The 4, 6 and 14 micron particle ranges are then graphed for each sample tested.

The ISO 4406 standard utilizes a three number system to classify system cleanliness — The first number represents the number of particles present measuring greater than 4 µm. The second represents particles greater than 6 µm and the third represents those greater than 14 µm.

#	Date	4 micron	6 micron	14 micron	ISO Code	Lab Number
1	22-Nov-2016	WAT	WAT	WAT	WA/WA/WA	I-794788

Each of the ISO Code's three numbers represents an ISO range. For example, the ISO Cleanliness Code for the most recent sample in this report is 19/18/15. Because the number of 4µm particles is between 2,500 and 5,000, the corresponding ISO code is 19. Because the number of 6µm particles is between 1,300 and 2,500, the corresponding ISO code is 18. Because the number of 14 µm particles is between 160 and 320, the corresponding ISO code is 15.

## Portable Fluid Analysis Kit

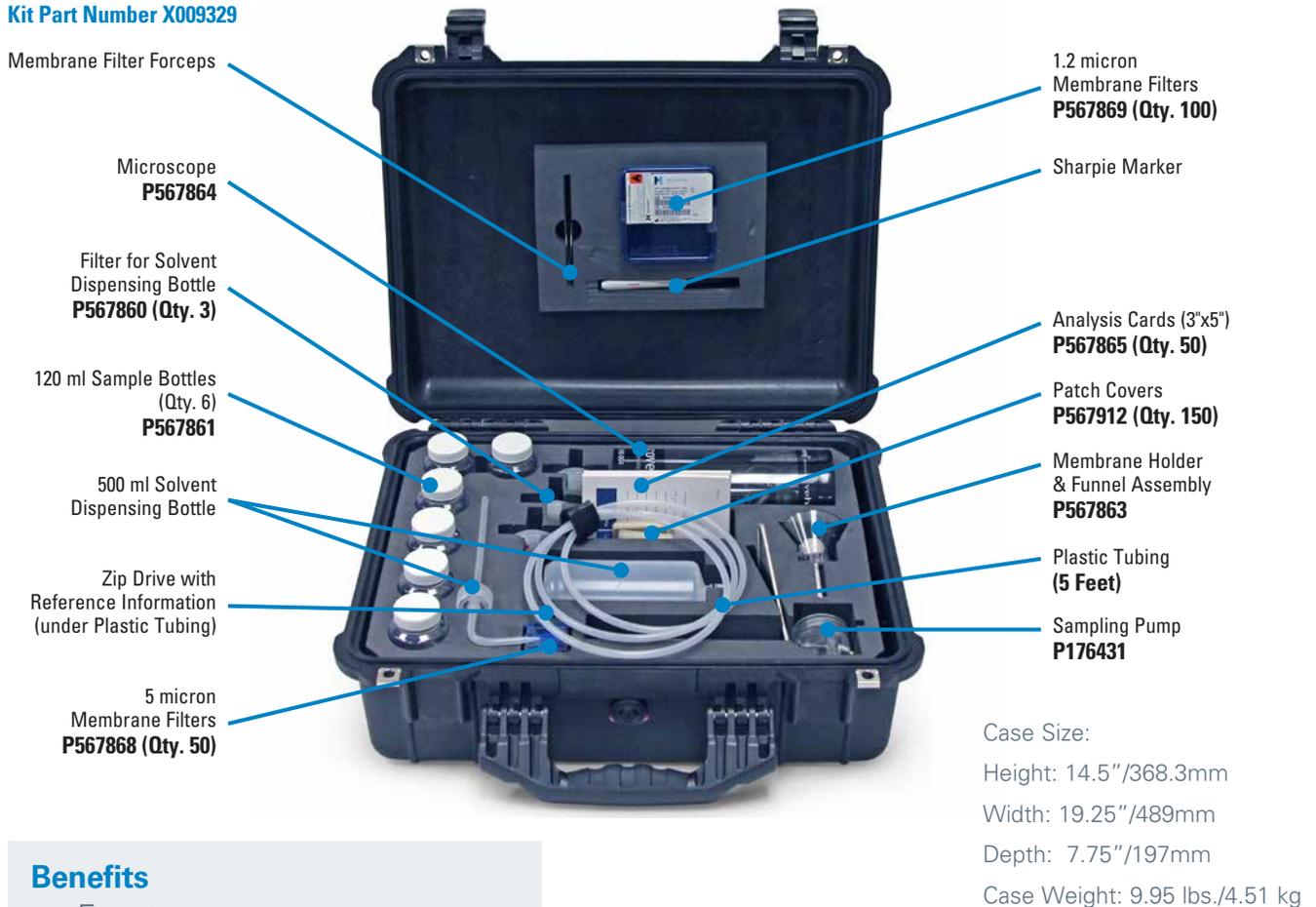
Fluid analysis is a snapshot of what is happening inside your equipment. It tells you the condition of the lubricant and identifies component wear and contamination in virtually any application. The Donaldson Portable Fluid Analysis Kit (**Part No. X009329**) allows you to conduct immediate on-site particulate analysis in as little as ten minutes.

Using the patch test method, you can quickly and reliably assign a three-digit cleanliness code per ISO 4406-1999 to a given fluid sample. Simply pull a 25 ml fluid sample through a patch membrane filter and compare oil sample particle distribution with the Fluid Cleanliness Comparison Guide (included) to assign an ISO Cleanliness Code.

- Use this kit to determine which systems need improved filtration.
- When improvements are made, use it to monitor the cleanliness status of the system.
- A great alternative to expensive, portable electronic devices.

### Kit Contents

**Kit Part Number X009329**



### Benefits

- Easy to use
- Results in as little as 10 minutes
- Measures particulate levels
- Provides reliable results

The **Donaldson Portable Fluid Analysis Kit** includes enough supplies for 200 fluid samples. All apparatus is securely packaged and well-protected with laser-etched foam in a sturdy carrying case.



## Basic Steps for Use

Kit includes detailed operating instructions and visual comparison guide.



1. Assemble waste bottle, funnel-patch assembly, and vacuum pump to form the sample processing assembly. Tighten the vacuum pump o-ring on the funnel-patch assembly tube by turning the aluminum locking device.



7. Draw the sample fluid through the patch by pulling on the vacuum pump handle.



2. Install solvent\* dispensing tube and install solvent filter on end of the dispensing tube.

\*Mineral spirits are the most commonly used solvent



8. Once the entire sample has passed through the patch rinse the funnel with filtered solvent and draw through the patch. Continue to pull air through until the patch starts to dry. Then separate the funnel from the patch supporter and remove the patch with forceps.



3. Rinse the funnel-patch assembly with the filtered solvent to remove background contamination. The patch should not be in place for this process.



9. Place the sample (ink/dirty side up) on a clean index card and cover it immediately with a plastic laminate patch cover.



4. Separate the funnel from the patch supporter and install a filter patch with ink grid up. (If the patch has an ink grid).



10. Analyze the sample with the 100x magnification field microscope.



5. Reattach the funnel to the filter patch base with filter patch. Twist lock the funnel to the base.



11. For best results, stand the microscope (without the lens cap or base) directly over the sample.



6. Agitate the sample fluid bottle and pour 25ml into the funnel. 25ml is denoted by the first line on the funnel (closest to the patch).



12. Use the reference photos at the back of the manual to make approximate ISO code correlation and identify contaminant types.

\* Odorless mineral spirits