TECHNOLOGY MANUAL

ONE EYE INDUSTRIES

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EXECUTIVE SUMMARY

DESIGN AND TECHNOLOGY

One Eye Industries Inc. (OEI) designs and manufactures patented Magnetic Filtration Systems which apply to all rotating equipment, engines, gearboxes, hydraulics and pneumatics, as well as to other applications such as water and coolant. One Eye employs a radial magnetic filter rod technology in the construction of its Magnetic Filtration Systems which capture ferrous and non-ferrous material to sub -micron levels with minimal flow restriction. OEI Magnetic Filtration extends the life of equipment components and fluids, reducing maintenance and improving reliability.

INDUSTRIES

Leaders in oil and gas, mining, commercial and residential building, manufacturing, transportation, food, pharmaceutical, chemical and marine industries employ OEI Magnetic Filtration in over 40 countries around the world.

ENVIRONMENT

One Eye technology is an environmentally responsible alternative to traditional filtration methods. This technology offers a 16+ year product life. It does not require utilities to operate; the components of OEI filters are cleanable—not throw away. These filters greatly reduce the number of contaminated traditional depth media filters entering landfills. Importantly, OEI Magnetic Filters extend fluid life, extend component life and extend maintenance intervals; these results ensure that a company's environmental footprint is significantly reduced.

SAFETY

OEI Magnetic Filtration Systems offer increased safety to a company's employees by reducing maintenance frequency. This results in a reduction of risk in the following: travel, exposure to the elements, treatment of toxic materials and opportunity of injury during maintenance.

ECONOMICS

The effectiveness of OEI Filters directly impacts a company's fiscal health. The product life of 16+ years with reusable components, the elimination of costs related to the frequency of installation, the transport and disposal/replacement of traditional filtration, the increase of uptime due to component and fluid longevity and the reduction of a company's carbon footprint all positively affect a company's bottom line. The initial cost of an OEI product is quickly realized in the continued savings the product brings to any reliability program.

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UNDERSTANDING EQUIPMENT FAILURE

WEAR CONTAMINATION

1. 80% of rotating, cooling and heating equipment failure is directly attributed to wear contamination.
2. Today's material quality, design and machining capabilities function at a high level, the tolerances for rotating equipment components are precise. Quality bearings have a 1 micron tolerance, as do servo valves for pneumatic and hydraulic systems. Magnetic filtration must be able to accommodate these new tolerances. Radial field rare earth magnetic filtration technology meets this new standard; ceramic magnetic filtration does not.
3. Traditional full flow filtration is challenged to clean wear contamination under 10 microns in size because custom filtration for this capability is expensive and requires frequent change out.
4. The alternative, bypass filtration, is helpful on many applications however is expensive and requires a low flow rate to be effective.
5. Standard analysis programs such as spectrographic and ferrographic analysis do not identify wear contamination under 4 microns.

FINDING THE SOLUTION

Identify the sources.

- Parts manufacturing
- New fluids and lube oils
- Air ingression
- Break-in wear

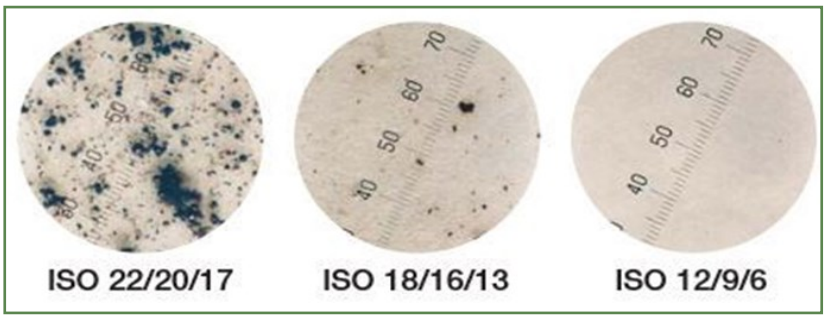
PRIMARY FILTRATION APPLICATIONS

Hydraulics · Pneumatics · Combustion Engines · Compressors · Turbines · Pumps · Transmissions · Gear Boxes · Fuel Systems

EMPLOY PROACTIVE, PREVENTATIVE MAINTENANCE PROGRAMS

1. Employ quality fluids and lube oils designed for the application and environment.
2. Employ quality magnetic filtration on all applications to ensure filtration of particulate below 1 micron in size.
3. Manage equipment with a predictive maintenance program utilizing quality analysis of fluids and lube oils for wear metal contamination. Contamination can identify wear of specific components.

UNDERSTANDING FLUID CLEANLINESS



INDUSTRY STANDARDS

ISO standards were developed in the late 1970's dictating the industry standard for clean fuels, lube oils and fluids is 18/16/13 or 2,500 particles per millilitre. This level of cleanliness does not account for contamination that causes premature wear. Due to increasing operating costs and strict environmental legislations, ensuring optimum performance and reliability is directly dependent on fluid cleanliness.

ISO 4406 Cleanliness Code	22/20/17	20/18/15	18/16/13	12/9/6
Kilograms of particulate contaminant pumped per year	800	200	50	0.4
Water Content (ppm)	5,000	1,000	500	100
Liters of water equivalent pumped per year	250,000	50,000	25,000	5,000

INDUSTRY REALIZATIONS

Over the past 40 years, it has been realized that wear particulate under 4 microns is the most damaging. To improve equipment performance, fluid cleanliness must be the highest priority in maintenance programs. For example, the tolerances on equipment components such as bearings or high pressure nozzles are down to and below 1 micron.

Traditional filtration is not designed to handle high levels of contamination, nor particulate below 1 micron in size.

Inefficiency is no longer acceptable and new technologies are introducing a new mindset to industry.

ONE EYE SURPASSING INDUSTRY STANDARDS - CASE STUDY

5500 KOMATSU SHOVEL, HYDRAULIC FLUID FILTRATION

An OEI Kidney Loop was used to filter the hydraulic system on a 5500 Komatsu Shovel operating at 4500 psi, with 6000 L of hydraulic fluid.

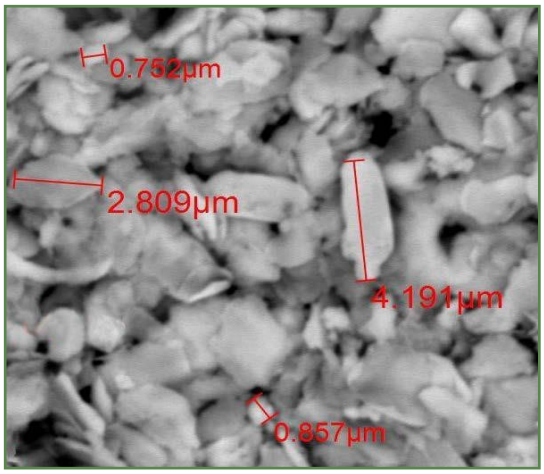
- Hydraulic Fluid: ISO 25/24/16
- ISO Standard: ISO 18/16/13

Traditional filtration was unable to meet minimum ISO fluid cleanliness requirements with a limited kidney loop filtration interval of 3 hours.

- OEI guaranteed an ISO of 18/16/13 or lower.
- On a trial run, fluid samples were taken before and after installation, then sent to three independent labs.
- The common results showed that OEI exceeded the standard at an ISO cleanliness level with 17/14/10.
- 88% ferrous contamination and 12% non-ferrous contamination was captured.

Kidney Loop System

Sub-Micron Sized Contamination Analysis



Magnetic Filter Rod with Captured Contamination

OEI TECHNOLOGY

INTRODUCING OEI MAGNETIC TECHNOLOGY TO MARKET

One Eye Industries introduced an innovation to magnetic filtration 17 years ago with application on all rotating equipment found in oil and gas, mining, construction, wind, food, manufacturing and marine industries.

This is a cleanable, reusable technology that offers an environmental alternative to disposable depth media filtration. OEI filters are engineered for individualized applications to account for flow rate, pressure, temperature, viscosity, space, ports, as well as multi-direction flow. OEI technology is currently installed on water, gas, lube oil, fuel, condensate, LNG, LPG, glycol, coolant, chemical and oil applications.

WHY THIS TECHNOLOGY IS DIFFERENT

OEI filtration technology is unique in that it filters contamination to sub-micron levels with minimal flow restriction, maximizing efficiency. OEI designs magnetic filter rods using the highest-grade **neodymium** and **samarium cobalt** rare earth magnets**.** These magnets are then installed in a stainless steel encased magnetic rod with radial fields for optimized magnetic field strength.

> Ceramic and low-grade rare earth magnets are unable to effectively filter below 4 micron contamination due to loss of field strength when exposed to temperature variance and vibration.

This radial field design allows for a large surface area for capture, therefore a high contamination holding strength. Because of the design and the quality magnets, OEI Magnetic Filter Rods are powerful enough to filter both ferrous and non-ferrous contamination to sub-micron level. Contamination below 4 microns in size is the most damaging because machine components (bearings, servo valves, meters etc.) are subject to failure due to low tolerance of sub-micron wear particulate.

OEI Magnetic Filtration captures non-ferrous contamination through two methods: static adhesion and entrapment. With static adhesion, the flow of liquid induces an electro-magnetic charge to the particulate which is then attracted to the radial magnetic fields. Entrapment occurs from cross contamination of sub-micron iron particulate and non-ferrous particulate. This occurrence is found in all fluids and oils used in rotating equipment.

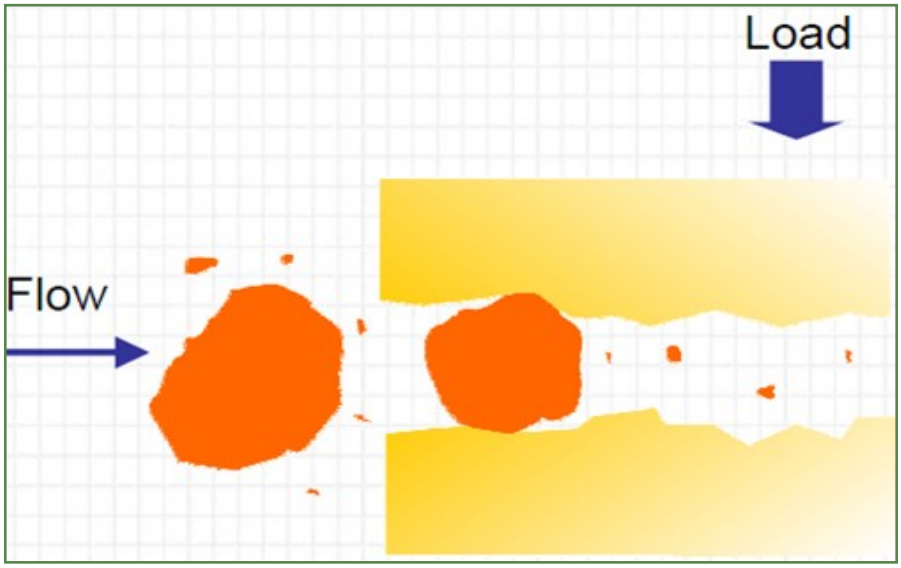
COLLECTING NON-FERROUS CONTAMINATION - ENTRAPMENT

ENTRAPMENT

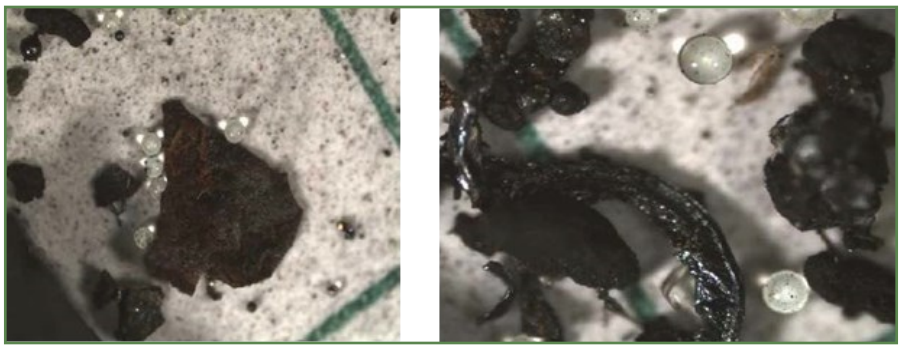
One way non-ferrous material is captured by magnetic filtration is through the process of entrapment. This occurs when sub-micron ferrous metal particles come into contact with larger non-ferrous particles. Non-ferrous contamination marries with ferrous sub-micron particles; these then become a single contaminate. Also, ferrous material wears non-ferrous material (abrasive wear); for example, when oil is flowing through the bearings, micron and sub-micron ferrous particles gouge or score material such as copper or brass. These particles marry up and are trapped by the magnetic filter.

The generation of ferrous contaminants in most hydraulic and lube systems due to both normal and abnormal wear is a fact of life. Christian Bauer, Pall Corporation

ABRASIVE WEAR

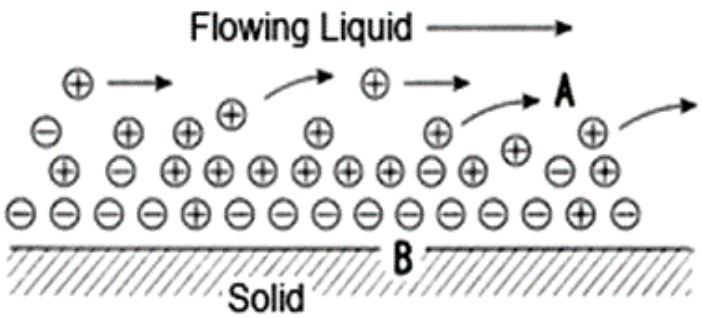


CAPTURED NON-FERROUS CONTAMINATION



COLLECTING NON-FERROUS CONTAMINATION - STATIC ADHESION

Static charge is one of the forces in play which aids OEI Magnetic Filtration technology in capturing non-ferrous material. Firstly, a force directly related to static electricity is friction. Friction can separate positive and negative charges ultimately generating static fields (known as flow electrification). The *triboelectric* effect (also known as *triboelectric* charging) is a type of contact electrification in which certain materials become electrically charged when they frictionally contact a different material. Secondly, if air bubbles are present in the flow matter, they amplify the static electricity. Finally, liquid and gases which flow over a solid (pipelines, holding tanks, etc.) create a static charge as well.



The overshadowing menace of all liquid organics (especially hydrocarbons) is the physical fact that they generate static electricity when in flow.
http://www.machinerylubrication.com/Read/809/electrostatic-charge-hydrauli

OTHER FACTORS THAT INFLUENCE STATIC CHARGE

- High fluid velocities
- Flow through filter elements and other microporous materials
- Turbulence created by pumps, especially centrifugal pumps
- Discharging onto the free surface of a reservoir

THE NON-FERROUS CONTAMINATION TEST

Take an OEI Magnetic Filter Rod outside to the parking lot and rub it around in the dirt. Nano-sized carbon contamination from vehicle exhaust embeds into debris, enabling the capture of dirt, rocks, glass and dust.

CERAMIC MAGNETS

For the past 70 years, ceramic magnetic filtration technology has serviced rotating equipment endeavoring to filter ferrous wear metals. Ceramic magnets are primarily composed of ferrite or alnico. Ceramic magnetic filter elements inherently present several pragmatic issues due to low magnetic field strength:

1. The contaminant holding capability is limited creating inefficiencies in removing wear particles under 10 microns in size.
2. Ceramic magnetics installed in magnetic filters must be exposed to fluids or oils to ensure their full magnetic field strength opportunity.
3. When these ceramic magnets are encased in a protective material like plastic, to prevent degradation, magnetic field strength is reduced by more than 50%.
4. Ceramic magnetic material is brittle; when exposed to high vibration and temperature change, it severely fractures. This leads to the dispersal of sub-micron material above 10 micron fragments into small particles.
5. As ceramic magnets are extremely brittle and easily broken, they cannot be used in machinery that experiences excessive stress or flexing. Ceramic magnet fragments will flow in conjunction with the oil or fluid wearing on bearings and other steel or iron components.

Typical wear on a ceramic magnetic rod.

Rare earth magnets encased in stainless steel.

Standard OEM Ceramic Technology

OEI Rare Earth Magnetic Technology

RARE EARTH MAGNETS

CERAMIC MAGNETS VS RARE EARTH MAGNETS VS QUALITY RARE EARTH MAGNETS

Collect some dirt from outside prior to your presentation. First, use an OEM magnetic plug or filter rod (ceramic or rare earth) to pick up the dirt. Next, use the same size OEI Magnetic Filter Plug or Rod as a comparison. Let the magnetic filters do the talking.

Explain that OEI Magnetic Filters can be used as a predictive maintenance tool. In fluids, small amounts of fine contamination means the system is clean. Alternatively, high levels of contamination means there is a failure in your system causing component wear or failure.

RARE EARTH MAGNETS

In the last 15 years, advances in magnetic technology have resulted in magnetic field strengths significantly stronger than traditional ceramic magnetic technology. Developed in the 1970's and 1980's, rare earth magnets are the strongest type of permanent magnets producing significantly stronger magnetic fields than other types, such as ceramic. There are over 40 variations of rare earth magnets, the quality of magnet depends on the composition of rare earth metals. One Eye utilizes the two highest quality rare earth magnetic compositions in the design of its magnetic filters.

1. Neodymium Magnets

Quality neodymium magnets can lift more than any other magnet type of the same size. These magnets are extremely resistant to demagnetization by external magnetic fields. A neodymium magnet (also known as NdFeB, NIB or Neo magnet) is the most widely used type of rare earth magnet. This is a permanent magnet made from an alloy of neodymium, iron and boron to form the Nd2Fe14B tetragonal crystalline structure. Neodymium magnets are the strongest permanent magnet commercially available.

2. Samarium-Cobalt Magnets

Samarium-cobalt magnets were the first industrialized rare earth magnets with high heat capabilities up to 980 ˚F/530 ˚C. A samarium–cobalt (SmCo) magnet is a strong permanent magnet made of an alloy of samarium and cobalt. These magnets are generally ranked similarly in strength to neodymium magnets, but have higher temperature ratings and higher coercivity.

MAGNETIC PROPERTIES

UNDERSTANDING MAGNETIC PROPERTIES

The most important characteristic of a high-quality magnet is its ability to withstand temperature and vibration. OEI Magnetic Filtration is manufactured with the highest quality rare earth magnetic technology. Neodymium-boron is the standard rare earth metal composition used by One Eye with full strength capability at a temperature of 300 °F/150 °C. In high temperature applications, the rare earth metal composition of samarium-cobalt is used to maintain full strength at 600 °F / 300 °C. Majority of magnetic filtration companies use ceramic magnets or low grade rare earth magnets with low heat tolerances.

GAUSS READING

A common misunderstanding when identifying magnetic field strength is referencing Gauss rating. Gauss readings are the measurement of the magnetic flux field lines – not strength. The Gauss, abbreviated as a G or Gs, is the cgs unit of measurement of magnetic flux density (or "magnetic induction"). One gauss is defined as one maxwell per square centimeter.

IDENTIFYING FIELD STRENGTH

To identify the magnetic field strength of a magnetic filter plug or a magnetic filter rod, the establishment of a pull and of a holding test is required.

The strength of a magnet is often given in terms of its pull force, its ability to move (push/pull) other objects. The magnetic field strength is identified by the applied weight it can hold before the magnetic field loses its influence. This is an absolute measurement of magnetic field strength. A higher holding strength equates to a higher contaminant holding capability, and in turn a greater ability to efficiently filter sub-micron particles. A larger surface area of magnetic flux lines directly corresponds to more efficient filtration capability.

This represents the holding strength of a 2” OD, 1 lft long OEI Magnetic Filter Rod with a holding capacity of 740 lb.

MAGNETIC PROPERTIES

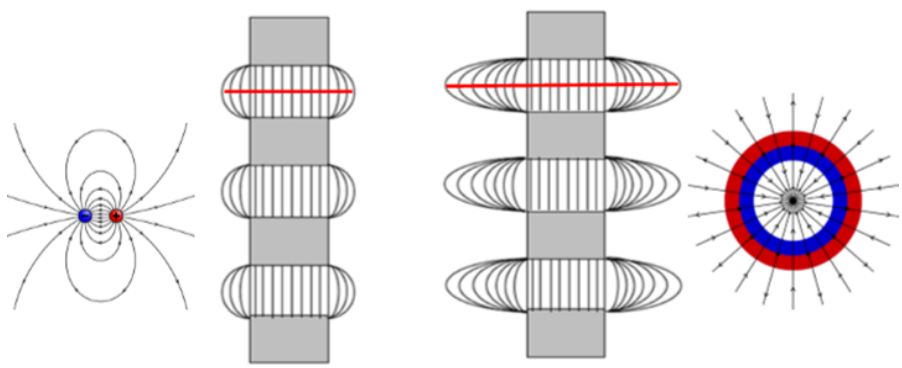
CURIE POINT

To identify a magnetic filter's ability to provide quality filtration, it is necessary to determine the Curie point (T_C). This is the temperature at which certain materials lose their permanent magnetic properties. Only quality rare earth magnets capable of maintaining full field strength at temperatures up to 300 °F/150 °C can provide effective filtration capabilities in rotating equipment applications.

MAGNETIC FIELDS

The typical multi-magnet, north and south magnetic field configuration has a small surface area and limited field strength. In comparison, a rare earth radial magnetic field design has a larger surface area and the strongest field strength to ensure the most efficient filtration capability. This radial magnetic field configuration is up to 5 times stronger.

Standard Magnetic Field Radial Magnetic Field



THE RADIAL FIELD TEST

Take an angle iron and attach it to an OEI Magnetic Filter Rod, try and pull it off to display the strength of the rod.

Proceed to slide the angle iron down the OEI Magnetic Filter Rod to display the radial fields.

Because there are several fields of capture and dead space at the end of the magnetic filter rod, the design allows for ease of cleaning.

KNOW YOUR APPLICATION

FACTORS THAT DETERMINE MAGNETIC FILTER DESIGN

It is critical to understand your application to accurately determine the most effective magnetic filter rod and housing. To ensure the highest level of efficiency, the magnetic filter rod must be installed in a non-ferrous material such as 304-316 Grade Stainless Steel, therefore, not subject to electrolysis. Each application must be properly ascertained, resulting in the correct recommendation of this filtration technology.

- Viscosity
- Pressure
- Flow Rate
- Temperature
- Contamination Levels
- Single/Multi Pass
- Port Size and Type

- Installation of a magnetic filter rod into an existing pipe is not recommended because it results in minimal dwell time and a reduced surface area. This increases flow velocity, ultimately reducing filtration efficiency.
- Installing a magnetic filter rod in existing traditional filters or strainers requires research to ensure maximum efficiency.
- Installing a magnetic filter rod in carbon steel strainers or piping is not recommended because it effects the magnetic fields efficiency and magnetizes the housing. Further, installing it into a typical lube oil or hydraulic reservoir will achieve a filtration efficiency of 20 to 25% because the fluid exposure to the magnetic fields is limited.

THE SHAKER JAR TEST

Ensure your shaker jar has oil and iron shavings in it and that the lid is secure.

1. Place an OEI Magnetic Filter Pad against the jar and shake it so the shavings move through the liquid and attract to the magnetic fields of the pad outside of the jar.
2. Place a competitor OEM plug against the jar and shake it. Show that the plug is unable to hold itself to the jar. Point out the fields of capture as you will see the contamination attracted to the plug.
3. Place the OEI Magnetic Filter Plug of the same size against the jar and demonstrate the fields of capture and that the plug holds itself to the contamination.
4. Place the larger OEI Magnetic Filter Plug against the jar and shake it, show the fields of capture (clearly seen) and that you can hold the jar up by the plug.

FILTER HOLDING CAPACITIES

DIRT HOLDING CAPACITY

The amount of contamination a filter can trap and hold before reaching a maximum allowable pressure drop.

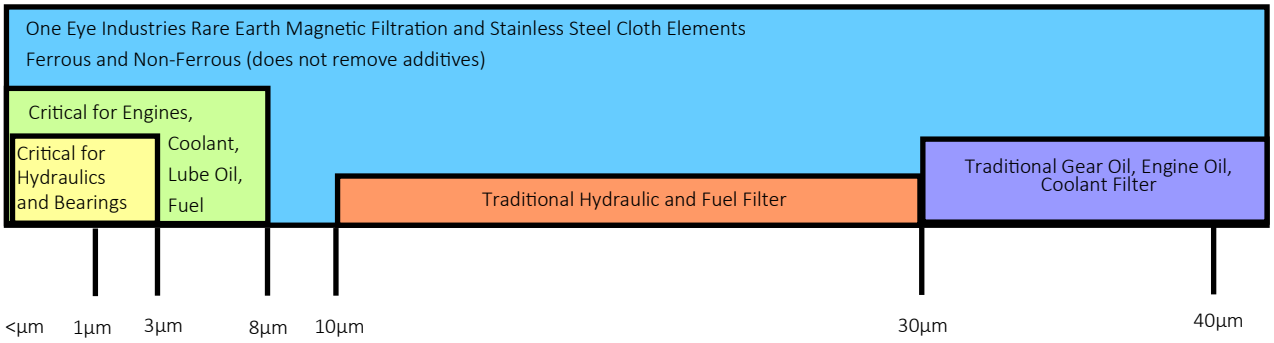
TRADITIONAL FILTRATION METHODS

For traditional spin-on filtration, the dirt holding capacity is used to determine the type of filter required and how often filters should be changed. If traditional filters become oversaturated or clogged from contaminants, those contaminants either return into the fluid or the filter loses complete filtration ability as it goes into bypass. Traditional spin-on filter dirt holding capacities are affected by pore size, pore density, filter depth and the type of filter media.

Dirt holding capacity typically measures filtration capability through the ISO 16889 Multi-Pass Test. This value is obtained by placing a filter into a circuit, adding different sized particles to the fluid, then testing the filter's ability to capture them. To test how many particles and what sizes are captured, a particle counter is placed before and after the filter to measure the outcome. This test allows the user to determine how well the filter performs.

ONE EYE INDUSTRIES METHODS

One Eye measures dirt holding capacity by first weighing the magnetic filter rod without any contaminants, then saturating the rod with contamination in incremental amounts until the magnetic filter rod cannot hold anymore. This peak saturation point of the magnetic filter rod is the magnetic filter's true dirt holding capacity.



OEI MAGNETIC FILTER ROD HOLDING CAPACITY

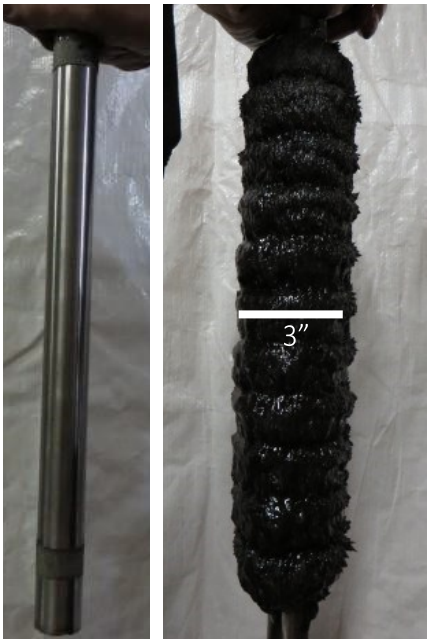
One Eye's unique magnetic field configuration used in our patented magnetic filter rods increases the magnetic field strength over traditional magnetic filters. OEI Magnetic Filter holding capacity testing is conducted using ferrous and non-ferrous wet low density contamination ranging from 100+ microns to sub-micron levels (representative of typical contamination found in rotating equipment).

1/2" OD magnetic filter rod has a dirt holding capacity of 820.55 g (1.81 lb)/lft

Magnetic field holding strength 57 lb_m/ft.

3/4" OD Magnetic Filter Rod has a dirt holding capacity of 1351.25 g (2.98 lb)/lft

Magnetic field holding strength 123 lb_m/ft.



1" OD Magnetic filter rod has a dirt holding capacity of 1800.31 g (3.97 lb)/lft

Magnetic field holding strength 270 lb_m/ft.

2" OD Magnetic filter rod has a dirt holding capacity of 14197.5 g (31.30 lb)/lft

Magnetic field holding strength 740 lb_m/ft.

ADD-VANTAGE 9000

The ADD-Vantage 9000 series utilizes two filtration methods in one design. The **first method** uses a stainless steel element that eliminates any chance of "channelling or wormholing". The element is reusable, and available in 40, 25, or 10 micron B200 rating. The **second method** is the OEI Magnetic Filter Rod patented designed to create multiple radial magnetic fields which produce a large surface area and a strong field presence.

APPLICATIONS
Cooling/Cutting Fluid • Chemicals • Fuel • Oil • Hydraulic Fluid • Lube Oil • Transmission Fluid • Coolant • Water

PART NUMBER: ADV9 -

- Filters ferrous and non-ferrous contaminants to sub-micron levels.
- Extends fluid change intervals by 2 to 4 times supported by fluid analysis.
- Extends cleaning intervals by 6 months to 1 year.
- Flows 40% more fluid than conventional media elements.
- Cleans easily with a parts washer, ultrasonic cleaner, solvent, soap and water, or the OEI Enviro-Wash Station.

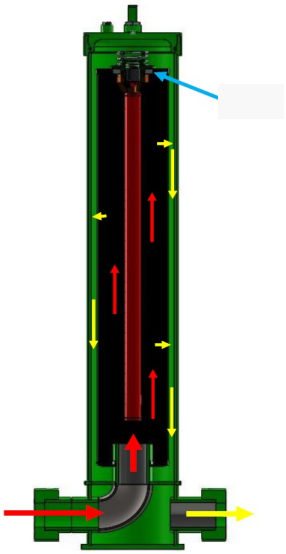
ADD-VANTAGE 9000 - HIGH FLOW

The ADD-Vantage 800 is designed for high flow, light and heavy viscous oils and fuels. This filter is designed for mobile and plant applications, construction, oil and gas, marine, mining, manufacturing and power generation industries.

APPLICATIONS

Bulk Fuel • Engine Lube Oil • Gear Oil • Hydraulic Fluid • Coolant

PART NUMBER: ADV9 -



Flow Rate	300 gpm / 1135 L/min
Max. Operating Pressure	500 psi / 35 bar
Temperature Range	40 °F-225 °F/ -40 °C-107 °C
Bypass Setting	15, 45 or 65 psi
Vessel Construction	Carbon Steel
Cap	Carbon Steel
Weight	110 lb, 140 lb
Seals	Viton, Buna, EDPM
Element	Perf, Eco
Element Change Clearance	16” and 38“

- Filter is designed for inside/out flow, making magnetic filtration as the first line of defence.
- Available with 1” or 1 ½ ” magnetic filter rods to meet the toughest filtration requirements.
- High flow and high dirt holding capacity filters.
- The bypass is located within the filter element allowing magnetic filtration to continue even in bypass.
- Standard One Eye carbon steel design. Consult OEI for special fluid and housing considerations.
- Element change out is from the top to minimize oil spillage.
- Standard cleanable elements Beta 200 in various micron ratings with a 5+ year life. Disposable depth media is available in various micron ratings; these are coreless and crushable for reduced disposal costs.
- Low pressure drop perforated.
- Inlet and outlet ports available in Code 61, SAE, NPT, and BSPP up to 3”.
- Optional inlet and outlet test points.

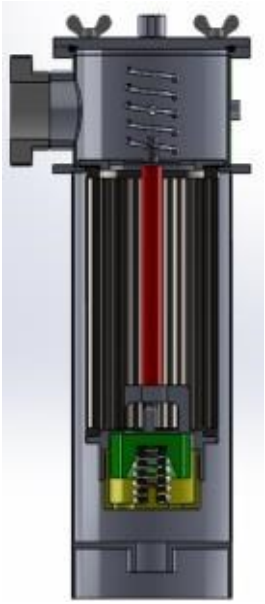
ADD-VANTAGE 9000 - IN-TANK

The OEI MIT Filter Rod is an in-tank filter designed with two cleanable filter mediums (patented magnetic filter rod and stainless steel filter element) to increase filtration capability to sub-micron levels of both ferrous and non-ferrous contamination.

APPLICATIONS

Lube Oil · Gear Lube · Hydraulic Fluid

PART NUMBER: ADV9 - MIT - ###



Max. Operating Pressure	500 psi / 35 bar
Temperature Range	300 °F /158 °C
Element	Stainless Steel
Size	3”, 5”, 8”
Holding Strength	270 lb/lft (401.8 kg/m)
Vibration Resistant	Yes
Port Design	Additional ports can be added for hydraulic top ups or fills
Installation	All standard return lines

ADD-VANTAGE 9000 - LOW PRESSURE

The OEI Low Pressure ADD-Vantage 9000 offers increased reliability for boilers, chillers, heat exchangers, pumps and cooling towers. These filters remove contamination to sub-micron levels, protecting all system components. These magnetic filters install slip stream or inline on both suction and return lines. With no bypass and minimal flow restriction for low and high pressure applications, these filters offer maximum filtration.

APPLICATIONS

Chiller Water · Coolant · Boiler Water · Residential Water · Process Water · Glycol

PART NUMBER: ADV9 - VS116
ADV9 - VS216

Max. Operating Pressure	72 psi at 300 °F/150 °C
Temperature Range	300 °F/150 °C optional 600 °F / 300 °C
Vessel Construction	Stainless Steel
Element	Stainless steel cloth media elements: Beta 200 in various micron
Size	3” 5” 8”
Holding Strength	270 lb/lft (401.8 kg/m)
Vibration Resistant	Yes
Port Design	VS116 - 3/4” NPT VS216 - 1” NPT
Installation	All standard return lines

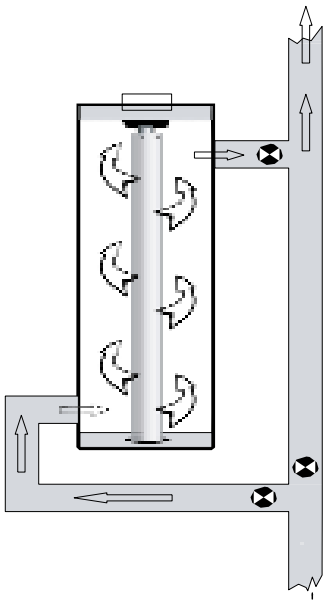
MAGNETIC FILTER SCRUBBERS

The OEI Magnetic Filter Scrubber is installed prior to pumps or on suction and return lines for fuel, lube oil, hydraulics, coolants and water systems. This filter removes ferrous and non-ferrous contaminants prior to entering pumps and fluid lines. One Eye has multiple designs to accommodate all applications and will design custom units.

APPLICATIONS

Cooling/Cutting Fluid • Chemicals • Fuel • Oil • Hydraulic Fluid • Lube Oil • Transmission Fluid • Coolant • Water

PART NUMBER: 5SC -



- Allows for full exposure of ferrous contamination to the OEI Magnetic Filter Rod.
- Removes ferrous and non-ferrous contamination to sub-micron levels which reduces wear on bearings, seals, heads, pistons and pumps.
- Designed with minimal flow restriction.
- Valuable predicative maintenance tool.
- Extends fluid change intervals as supported by fluid analysis.
- Extends cleaning intervals.
- Magnetic filter rod is easily removed, wiped clean and returned to service*.

* When installing, allow clearance for rod removal.

MAGNETIC FILTER SCRUBBER FLOW RATES

Scrubber Model		5SC349S	5SC12S	5SC24S	5SC36S	5SC212S	5SC224S
Viscosity cSt @ 40 °C							
Water, Coolant Diesel Fuel							
(1 - 30 cSt)							
Single Pass Filtration	gpm	8	21	40	60	50	98
Multi Pass Filtration		30	81	95	122	200	400
Engine, Gear and Hydraulic Oil							
(40 - 110 cSt)							
Single Pass Filtration	gpm	7	20	38	55	50	98
Multi Pass Filtration		30	65	80	90	190	380
(220 cSt)							
Single Pass Filtration	gpm	6	15	30	45	40	70
Multi Pass Filtration		15	41	76	75	133	200
(460 cSt)							
Single Pass Filtration	gpm	5	12	20	25	25	40
Multi Pass Filtration		10	25	30	35	65	95
(680 cSt)							
Single Pass Filtration	gpm	3	6	10	12	12	20
Multi Pass Filtration		5	13	16	20	40	65
(1000 cSt)							
Single Pass Filtration	gpm	0	3	5	6	8	15
Multi Pass Filtration		0	5	8	11	22	40
Single Pass: Fluid will pass through the magnetic filter once (ex. Transfer Station).							
Multi-pass: Fluid will pass through the magnetic filter multiple times (ex. Lube System).							

MAGNETIC FILTER SCRUBBERS - INLINE

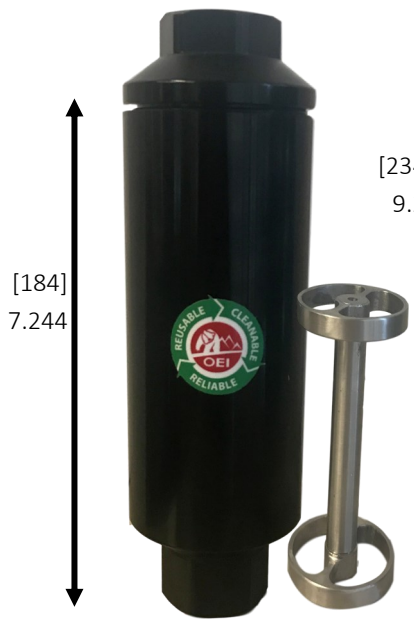
The OEI Magnetic Inline Filter is for low flow, light viscosity applications. The filter housing is made with light weight billet aluminum (6160-T6). The inline design allows for maximum dwell time and high efficiency. Two standard inline designs are offered, each with a removable end cap for access to the magnetic filter rod. The third design has a 90° degree port for access to the magnetic filter rod from the top.

APPLICATIONS

Fuel · Engine Coolant · Hydraulic Fluid · Boiler Water · House Water · Chillers Water · Lube Oil

PART NUMBER: 5IL04

PART NUMBER: 5IL05



PART NUMBER: 5IL90

Flow Rate	4 gpm
Max. Operating Pressure	150 psi
Temperature Range	300 °F/150 °C
Vessel Construction	Billet Aluminum (6160-T6) or Stainless Steel
Weight	5ILO4: 1.0 lb 5IL905: 1.02 lb 5IL05: 2.4 lb
Vibration Resistant	Yes

MAGNETIC Y-STRAINERS

OEI Magnetic Y-Strainers are used to capture ferrous and non-ferrous materials from fluids using magnetic radial fields to capture contamination to submicron level. OEI Magnetic Y-Strainers offer a minimum flow restriction. These y-strainers prevent damaging contaminate to pass through the hydraulic system; contaminates cause premature wear and eventual catastrophic failure resulting in unscheduled maintenance.

APPLICATIONS

Chemicals· Lube Oil · Break Fluid · Grease · Coolant · Fuel · Hydraulic Fluid

PART NUMBER: 5Y###

- No requirement for additional horsepower to function
- Provides significant return on investment with life of 16+ years
- Eliminates the costs of purchasing and disposing of traditional filters
- Reduces the replacement of close tolerance components
- Extends the life of linings and pumps

CRYOGENIC MAGNETIC Y-STRAINER

PART NUMBER: 5YBC - ###

- Flanged access allows for cleaning at –320 °F/ -195 °C.
- If used as a suction strainer, One Eye recommends removing the filter screen.

KIDNEY LOOP SYSTEMS

OEI Kidney Loop Filtration Systems offer customers customized designs to meet application requirements. These efficient systems are designed to clean large reservoirs in a third the time of traditional filtration. OEI recommends installing these filter skids during scheduled maintenance or installing them for 24/7 operation to maintain high cleanliness levels through extended maintenance cycles, resulting in increased productivity.

APPLICATIONS

Chemicals· Lube Oil · Grease · Coolant · Fuel · Hydraulic Fluid

PART NUMBER: 8KL## - ###

- For applications with limited space such as drag lines and shovels
- Optional permanent installation on large gear boxes or reservoirs
- Mobile or stationary
- Lifting lugs and wheels available upon request
- Positive displacement gear pump
- 5 gpm (18.92 lpm) viscosity 500 or 1,000 cSt
- Sample ports on kidney loop system
- Optional kill switch
- Built to meet international electrical standards
- Water absorption elements available
- Cleanable and reusable for 16+ years

3 STAGE DESIGN OFFERING A HIGHLY EFFICIENT AND CLEANABLE LONG-LIFE FILTRATION SYSTEM:

- STAGE 1 - A magnetic filter scrubber capable of sub-micron filtration of ferrous and non-ferrous contamination.
- STAGE 2 - ADD-Vantage 9000 filter containing reusable stainless steel cloth media elements (eliminates worm-holing and channeling) with an absolute rating of 25-40 microns and a nominal rating of 8-10 microns. This media element can be cleaned and reused for 5+ years.
- STAGE 3 - The OEI Magnetic Filter Rod inside the ADD-Vantage 9000 stainless steel element traps ferrous contamination to sub-micron levels.

MAGNETIC FILTER PLUGS

OEI Magnetic Filter Plugs are designed to replace the OEM industry standard ceramic magnetic plugs. These plugs use strong rare earth magnets encased in nickel chromium which eliminates degradation. Standard OEM plugs are manufactured using low grade ceramic magnets which degrade due to heat and vibration, creating even more contaminate.

APPLICATIONS

Final Drives · Rear Ends · Transfer Cases · Transmissions · Gear Boxes · Differentials · Fill Plugs

PART NUMBER: 7 - ###

NPT

Recessed O-Ring

Bonded Seal

Standard O-Ring

- Captures ferrous and non-ferrous contamination.
- A predictive maintenance tool to identify problems before failure occurs in equipment or systems.
- Standard operating temperature of 300 °F/150 °C. Custom operating temperatures available up to 600 °F/300 °C.

PREDICTIVE MAINTENANCE

OEI Magnetic Filter Plugs offer customers a cost effective tool of predictive maintenance reducing downtime and preventing catastrophic failure.

NORMAL WEAR

CAUTION!

IMMINENT FAILURE!!

MAGNETIC FILTER RODS

OEI Magnetic Filter Rods employ powerful magnetic radial fields to capture both ferrous and non-ferrous contamination to sub-micron levels. These filters are designed for a variety of sizes and fasteners. OEI Magnetic Filter Rods compliment or replace OEM filtration. With an operating life of 16+ years, these filters are easily cleaned and returned to operation.

APPLICATIONS

Existing Filtration Systems

PART NUMBER: 2R###
3R###

- Manufactured with 304/316 grade Stainless Steel tubing, (Monel and other Stainless Steel grades available).

PREDICTIVE MAINTENANCE

OEI Magnetic Filter Plugs offer customers a cost effective tool of predictive maintenance reducing downtime and preventing catastrophic failure.

Manage equipment with a predictive maintenance program utilizing quality analysis of fluids and lube oils for wear metal contamination. Contamination can show wear of specific components.

MAGNETIC FILTER PROTECTIVE CAGE

- Designed to aid in the installation and removal of magnetic filter rods.
- Supplied with all 31R and 32R OEI Magnetic Filter Rods as a safety precaution due to filter strength.

CAGE POLICY

- Cages are a standard application for all 2” OD (5.08 cm) and 1 ½“ OD (3.81 cm) Magnetic Filter Rods which are over 12” (30.48 cm) in length.
- Magnetic Filter Rods which are 12” L (30.48 cm) or less, can be purchased with a protective cage upon request.
- Cages can be custom designed for specific applications.

DEMO KITS

One Eye offers three individualized demo kits to aid in everyday sales. The carrying cases are small and easily maneuverable and house several of One Eye Industries Inc. top products. These demo kits efficiently provide customers with knowledge of One Eye's environmentally friendly, cost effective, user friendly products that capture contaminants to sub-micron levels.

1OEIDEMOKIT-W2

ANGLE IRON: Used to test holding strength of OEI Magnetic Filters.

1MPBT500: OEI Magnetic filter pad for disposable filters up to 3" in size.

1MPBT800: OEI Magnetic filter pad for disposable filters 3" - 4" in size.

1MPBT900: OEI Magnetic filter pad for disposable filters 4"+ in size.

7NPT34ES: OEI 3/4" NPT Magnetic Filter Plug for final drives, rear ends, transfer cases and transmissions.

OEM 3/4" Plug: Original equipment manufactured plug for comparison to One Eye technology.

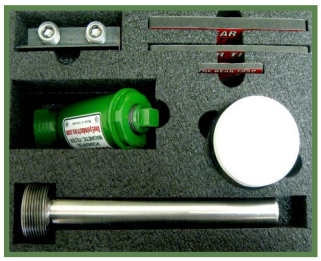
5YB1TA: OEI Magnetic Y-Strainer.

5SC3475CLNPT1: OEI Magnetic Filter Scrubber for installation in low pressure fluid applications.

9ADV9-1000: ADD-Vantage 9000 for installation in fluid applications where pressure exceeds standard spin on filter capabilities.

3RNC5812: OEI Magnetic Filter Rod for reservoirs, gear boxes, filter elements, pipelines and more.

OEI Shaker Jar: Tool to represent oil filter and demonstrate magnetic filter pad and plug capabilities.



1OEIDEMOKIT

1MPBT500: OEI Magnetic Filter Pad for disposable filters up to 3" in size.

1MPBT800: OEI Magnetic filter pad for disposable filters 3" - 4" in size.

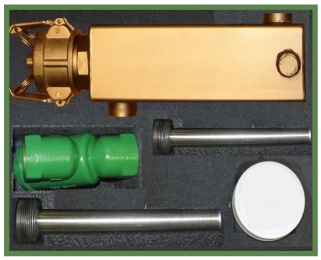
7NPT34ES: OEI 3/4" NPT OEI Magnetic Filter Plug for final drives, rear ends, transfer cases and transmissions.

OEM3/4": Original equipment manufactured magnetic plug for comparison to One Eye technology.

3RNPT1128: OEI Magnetic Filter Rod for reservoirs, gear boxes, filter elements, pipelines and more.

5YB1TA: OEI Magnetic Y-Strainer.

OEI Shaker Jar: Tool to represent oil filter and demonstrate magnetic filter pad and plug capabilities.



1OEIDEMOKIT-5SC

5SC34TSCLNPT34: OEI Magnetic Filter Scrubber for installation in low pressure fluid applications.

1MPBT500: OEI Magnetic Filter Pad for disposable filters up to 3" in size.

4MPBT900: OEI Magnetic filter pad for disposable filters 4"+ in size.

7NPT34ES: OEI 3/4" OEI NPT Magnetic Filter Plug for final drives, rear ends, transfer cases and transmissions.

OEM3/4" Original equipment manufactured magnetic plug for comparison to One Eye technology.

3RNPT1128 OEI Magnetic Filter Rod for reservoirs, gear boxes, filter elements, pipelines and more.

5YB1TA: OEI Magnetic Filter Y-Strainer.

OEI Shaker: Tool to represent oil filter and demonstrate magnetic filter pad and plug capabilities.

MAGNUSSON MOSS WARRANTY ACT

WARRANTY COVERAGE

"Under the Magnuson-Moss Warranty Act and general principles of the Federal Trade Commission Act, a manufacturer may not require the use of any brand of filter (or any other article) unless the manufacturer provides the item free of charge under the terms of the warranty."

ACCORDING TO CATERPILLAR WARRANTY BULLETIN (NO.39):

"When auxiliary devices, accessories and consumables (filters, oil, additives, catalysts, etc.) made by other manufacturers are used on Caterpillar equipment, the Caterpillar warranty is not affected simply because of such use."

Source Note: MB6/01-1 ©2001 Fleetgaurd Inc.

TECHNICAL SERVICE BULLETIN TSE-85-1R

Manufacturers Warranties

Consumer purchasers of automotive filters are sometimes told by an automobile dealer's service writer or mechanics that a brand of replacement filter cannot be used in the consumer's vehicle during the warranty period. The claim is made that use of the brand will "void the warranty", with the statement or implication that only the original equipment brand of filters may be used. This, of course, tends to case doubt on the quality of the replacement filter.

That claim is simply not true. If the consumer asks for the statement in writing, he will not receive it. Nevertheless, the consumer may feel uneasy about using replacement filters that are not original equipment. With the large number of do-it-yourselfers who prefer to install their own filters, this misleading claim should be corrected.

Under the Magnuson-Moss Warranty Act, 15 U.S.C. SS 2301-2312 (1982), and general principles of the Federal Trade Commission Act, a manufacturer may not require the use of any brand of filter (or any other article) unless the manufacturer provides the item free of charge under the terms of warranty.

So if the consumer is told that only the original equipment filter will not void the warranty, he should request that the CE filter be supplied free of charge. If he is charged for the filter, the manufacturer will be violating the Magnuson-Moss Warranty Act or other applicable law.

By providing this information to consumers, the FMC can help to combat the erroneous claim that a brand of replacement filter other than original equipment will "void the warranty".

It should be noted that the Magnuson-Moss Warranty Act is a federal law that applies to consumer products. The Federal Trade Commission has authority to enforce the Magnusson Moss Warranty Act, including obtaining injunctions and orders containing affirmative relief. In addition, a consumer can bring suit under the Magnuson-Moss Warranty Act.

HOW TO CONTACT

QUOTES

Quotes@oneeyeindustries.com

- Quote inquiries and status updates

ADMINISTRATION

Admin@oneeyeindustries.com

- PO notifications
- Direction of inquiries

ACCOUNTING

Accounting@oneeyeindustries.com

- Maintaining all files related to distributors and dealers
- Payment and payment schedules
- Invoicing

OPERATIONS

Operations@oneeyeindustries.com

- Receives and responds to order inquiry form
- Orders
- Delivery times
- Spec sheets
- Customer complaints
- RMA's

SHIPPING

Shop@oneeyeindustries.com

- Weights and dimensions
- Shipping
- Waybills
- Tracking
- Transportation

MARKETING

Marketing@oneeyeindustries.com

- Catalogues
- News releases
- Product information and promotions
- Tradeshows
- Lunch and learns
- Advertising
- Case studies

OEI ORDER INQUIRY FORM

1 PROJECT INFORMATION REQUIREMENTS

	OEI Order Inquiry Form	
ONE EYE INDUSTRIES	Company	
	Contact	
	Phone/Email	
	Date	

2 PROBLEM / FLUID APPLICATION

3 TECHNICAL INFORMATION REQUIREMENTS

Operating Data			Design Data		
Operating Pressure:			Design Pressure:		
Operating Temperature:			Design Temperature:		
Maximum Flow Rate:			Redundancy:	Singlepass[1]	Multipass[2]
Viscosity:			Vessel Connection		
Liquid Density:				Size [in]	Flange Class
Reservoir Size:			Inlet:		
Type of Port:			Outlet:		

Notes:

1. Singlepass: Fluid will pass through the magnetic filter once (ex. Transfer Station)
2. Multipass: Fluid will pass through the magnetic filter multiple times (ex. Lube System, Kidney Loop)

ONE EYE INDUSTRIES

THE LEADER IN INDUSTRIAL MAGNETIC FILTRATION

BE PART OF THE SOLUTION

MANUFACTURING · MINING · MARINE

OIL & GAS FOOD · PHARMACEUTICALS

WIND · FORESTRY · FLEET

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