

2019

# OEI EQUIPMENT REPORT

## SHOVELS



OEI's Patented Radial Magnetic Field  
Technology Defies the Force of Gravity



SOLVING TOMORROW'S CHALLENGES TODAY.

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# ONE EYE INDUSTRIES

## GLOBAL SUCCESS ACROSS DIVERSE INDUSTRIES

OEI magnetic filtration is employed internationally by leaders in the oil and gas, mining, commercial and residential building, manufacturing, transportation, food, pharmaceutical, defense, petrochemical, and marine industries. OEI magnetic filtration systems apply to engines, gearboxes, hydraulics and pneumatics, processed products, cooling systems, and water systems. Each filter employs a magnetic filter element with a patented radial field configuration for high holding strength. These systems operate with minimal flow restriction and are proven to capture both ferrous and non-ferrous contamination in rotating equipment applications. The first OEI filtration system was installed in 2001, and has been proven successful in over 40 countries.

## SHOVEL APPLICATIONS

P&H has been installing OEI Magnetic Filters on their shovels for over 13 years. OEI supplies Magnetic Filter Scrubbers and ADD-Vantage 9000 Filters to replace the OEM filters through our Canadian distributor WAJAX for Hitachi. OEI Kidney Loops can be designed in compact format. OEI Scrubbers and Magnetic Filter Elements are available for all gearbox applications.



## ALL PRODUCTS: OVERVIEW

One Eye Industries offers a series of products designed to help organizations achieve rapid payback with the lowest risk by extending the life of rotating equipment:

- 1 ADD-VANTAGE 9000 SERIES**  
The ADD-Vantage 9000 magnetic filtration system employs a magnetic element and a stainless steel cloth element in its design for high efficiency filtration and replaces conventional spin-on cartridge filters.
- 2 SCRUBBER SERIES**  
OEI Magnetic Filter Scrubbers employ an OEI Magnetic Filter Element in a special housing that ensures maximum dwell time for high efficiency filtration. These systems install on both suction and return lines of low and high pressure applications.
- 3 Y-STRAINER SERIES**  
OEI Magnetic Y-Strainers employ a magnetic filter element as a replacement of conventional Y-strainers. Designs with and without a screen are available.
- 4 FILTER PLUGS**  
OEI Magnetic Filter Plugs employ rare-earth magnets and are the high quality replacement for OEM magnetic drain plugs. These filters are effective predictive maintenance tools when contamination is analyzed to determine component wear.
- 5 BEAR TRAP MAGNETIC FILTER PADS**  
OEI Magnetic Filter Pads enhance all spin-on filters by capturing the wear contamination (sludge) < 10 microns that disposable filters fail to remove. These filters extend fluid life by 2 - 3.
- 6 EMERGENCY MAGNETIC PATCH**  
The OEI Emergency Magnetic Patch provides an immediate, temporary solution to pipe wear or rupture by magnetically adhering to surfaces and preventing leakage. This patch helps to prevent unscheduled production.



- 7 SPECIALTY EQUIPMENT DESIGNS**  
OEI offers custom filters for OEM equipment applications such as chain cases, sump filters, transmission plates, pump jacks, and mud tanks. Other OEI specialty designs replace or enhance OEM conventional filters such as CAT, Komatsu, Parker, Schroeder or PALL.
- 8 KIDNEY LOOP SYSTEMS**  
OEI Kidney Loop Systems are self-contained filtration units for offline filtration, fluid transfer of mobile or stationary equipment, and flushing of storage reservoirs. These systems employ multiple magnetic filters for filtration of wear contamination down to 4 microns and below.



# CORE TECHNOLOGY

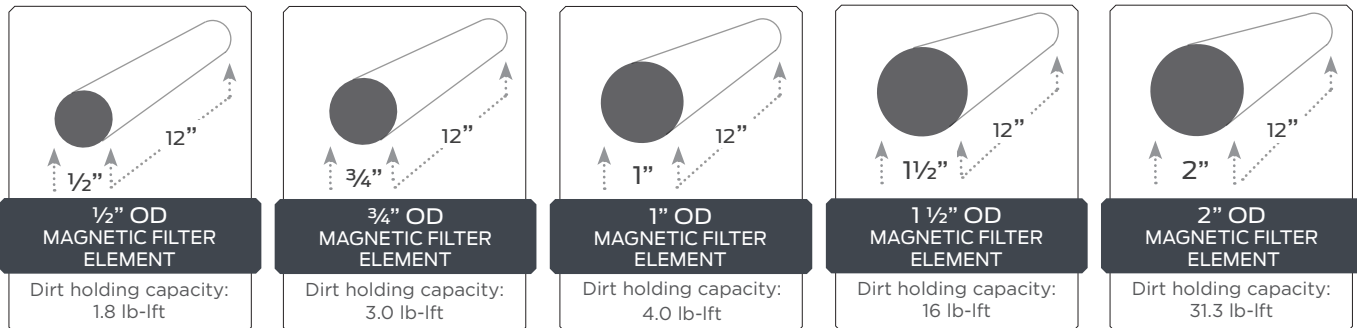
## DESCRIPTION

The patented magnetic filter element attracts ferrous wear particles down to 4 microns and below with up to 95+% efficiency. The magnetic filter element attracts both ferrous and non-ferrous particles. The radial magnetic field design offers incredible holding strength and a high dirt holding capacity.

OEI magnetic filter elements are employed in various housings designed with calculated dwell times for optimal filtration. Magnetic filter elements come in five sizes from 1/2" to 2" outer diameter (OD) (shown below).



1" magnetic filter elements with varying loads of contamination. Dirt holding capacity\*: 3.97 lb-ft.



\*Dirt holding capacity is the quantity of contaminant mass a filter element can trap and hold before the maximum allowable back pressure, or delta P level, is reached.

# CORE TECHNOLOGY BENEFITS

## CLEAN AND REUSE

OEI products are reusable for 18+ years, and require minimal consumables. Conventional filters require frequent, costly changeouts, and disposal.

## PREDICTIVE MAINTENANCE

OEI Magnetic Filter Elements are effective predictive maintenance tools when used for condition monitoring. When removed for inspection, magnetic filter elements will have varying quantities of contamination. Abnormally high quantities of contamination indicate component failure. The composition of contamination will identify which components are stressed, worn, or failing.

Visual analysis of the quantities of wear contamination collected on magnetic filter plugs can determine component failure. Analysis of wear particle compositions and sizes will determine early component wear.

## GOES WHERE NO CONVENTIONAL FILTER HAS GONE BEFORE

OEI magnetic filters can be installed on suction lines to protect pumps without risk of cavitation. Unlike conventional filters, they accommodate space restrictions and unique applications such as splash oil gearboxes, reservoirs, and small coolant lines.

## CAPTURES NON-FERROUS CONTAMINATION

Non-ferrous particles are magnetically captured because of cross-contamination. Particles become statically charged from flow velocity. This charge is a principal force of particle adhesion; iron particles contaminate non-ferrous particles by adhering to their statically charged surface. Another form of cross-contamination occurs when sub-micron iron particles embed in softer non-ferrous particles after abrasive impact.

## PREVENT OXIDIZATION AND VARNISH

OEI effectively removes iron and steel particles under 10 microns that are known to promote oil oxidation because of their catalytic properties. Oxidation can deplete additives that protect against wear, corrosion, sludge, varnish, and viscosity changes that affect the thickness of films between bearing surfaces, friction, control of temperature, and energy consumption.

## NO WORMHOLING OR CHANNELING

OEI filters eliminate the opportunity for wormholing and channeling that conventional paper, fiberglass, and polymer media filter elements are subject to.

Wormholing: when wear contamination punctures the filter media.

Channeling: when fluid flows through punctured holes because it takes the path of least resistance.



## RECOMMENDED INSTALLATIONS

APPLICATION	PRODUCT	PRODUCT NUMBER	DESCRIPTION		
Pre-existing kidney loop system	Magnetic Filter Scrubber	5SC12SCLNPT#	Operating Parameters	Pressure	150 psi
				Flow Rate	20 gpm (single pass) 40-45 gpm (multi-pass)
			Features	Housing (304/316 SS)	4" L x 4" W x 16" H
				Magnetic Filter Element with Camlock	1" OD x 12" L
Ports	¾" – 2" NPT Ports (offset)				
Pre-existing kidney loop system	Magnetic Filter Scrubber	5SC24SCLNPT#	Operating Parameters	Pressure	150 psi
				Flow Rate	45 gpm (single-pass) 90-95 gpm (multi-pass)
			Features	Housing (304/316 SS)	4" L x 4" W x 28" H
				Magnetic Filter Element with Camlock	1" OD x 24" L
Ports	¾" – 2" NPT Ports (offset)				
Kidney Loop Replacement	OEI Kidney Loop System	8KLM-51-91-40-1000-E-220-50-1-JIC-16-DPG-CVR	Operating Parameters	Viscosity	1000 cSt
				Flow Rate	3 gpm (single-pass)
			Features	Motor	3 phase electric
				Magnetic Filter Scrubber	Magnetic Filter Element Suction for pump protection
ADD-Vantage 9000	Magnetic Filter Element Stainless Steel Cloth Element				
Kidney Loop Replacement	OEI Kidney Loop System	8KLM-51-91-40-1000-E-220-50-1-JIC-16-CVR	Operating Parameters	Viscosity	1000 cSt
				8KLM-51-91-40-1000-E-220-50-1-JIC-16-CVR	3 gpm (single-pass)
			Features	Motor	3 phase electric
				Magnetic Filter Scrubber	Magnetic Filter Element Suction for pump protection
ADD-Vantage 9000	Magnetic Filter Element Stainless Steel Cloth Element				
Crowd Case	Magnetic Filter Element	3RCL12HD	FEATURES	Magnetic Filter Element	1" OD x 12" L
				Fitting	Camlock

# CASE STUDY

## KOMATSU SHOVEL

### BMA OPEN CUT COAL MINE AUSTRALIA

Application	550 Komatsu Shovel
Fluid	6000L of hydraulic fluid at 4500 PSI, with an ISO rating of 25/24/16.
Problem	HClean the 5500 Komatsu Shovel's hydraulic fluid to meet ISO fluid cleanliness standard 18/16/13 with a limited kidney loop filtration interval of 3 hours.
Solution	Deploy a high-flow magnetic filtration skid with 6000 L of hydraulic fluid because OEI guarantee an ISO cleanliness of 18/16/13 with 3 hours of kidney loop circulation.
Results	<ul style="list-style-type: none"> <li>» On its trial run, fluid samples were taken before and after the unit, and sent to three independent labs. Common results showed that OEI exceeded the challenge.</li> <li>» by obtaining a cleanliness level of 17/14/10 within the 3 hour kidney loop interval.</li> </ul>



#### GEARBOX OPERATING COSTS OVER 6 YEARS

	COST/HOUR	COST/YEAR	TOTAL COST
STAND-ALONE	\$5.87	\$8,722.25	\$52,333.53
RELIABILITY PACKAGE	\$2.03	\$3,125.00	<b>\$18,750.00</b>

**RELIABILITY PACKAGE SAVINGS: \$33,583.53**



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