Oil filtration for the 21st century!
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CONTACT INFORMATION

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Dirty oil is a thing of the past.

Completely eliminate costly oil replacement.

Refresh your lubrication to "better than new" specifications.

- 20 Gallons to 20,000+ gallons - We have a unit to fit your needs.
- Improves machine efficiency.
- Ultra-fine filtration (0.1 micron!)
- Also removes oxides, moisture, varnish, and sludge!
- Will prevent the formation of varnish in ALL hydraulic and lubrication systems.
- Easy set-up and Maintenance.
- Oil test port located on front panel.
- Many options available including many different color and power supply configurations.
- In electrical transformer application, Miracle Boy can be run “hot” without interrupting transformer operation.
Most people are familiar with the process of absorption, less are familiar with adsorption. There is a distinction, and it can mean the difference between clean oil and machinery breakdowns.

**Absorption**
The penetration of a substance (e.g., gas or thin film of liquid) into the surface layer of a solid with which it is in contact (e.g., process by which pesticides are taken into plant tissues by roots or foliage (stomata, cuticle, etc.).

**Adsorption**
The chemical and/or physical attraction of one substance at the surface of another. Refers to gases, dissolved substances or liquids on the surface of solids or liquids. (e.g., the tendency of clay and high organic soils to absorb pesticides.)

Most in-line hydraulic oil filters used today are of the “pleated media” or “wire mesh” type. These types of filter are very efficient in reducing particulate matter that is larger than 25 microns. Anything smaller passes directly through the media and is therefore not affected by the filter at all. At the same time, it also does not allow for water, or oxide removal.

### Test Data

<table>
<thead>
<tr>
<th></th>
<th>Before</th>
<th>After</th>
<th>Efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viscosity mm2/S</td>
<td>146.6</td>
<td>141.2</td>
<td>~</td>
</tr>
<tr>
<td>Oxide Level mg KOH/g</td>
<td>0.14</td>
<td>0.06</td>
<td>~</td>
</tr>
<tr>
<td>Water Contamination ppm</td>
<td>142</td>
<td>36</td>
<td>~</td>
</tr>
<tr>
<td>mg/100ml</td>
<td>6.3</td>
<td>0.4</td>
<td>~</td>
</tr>
<tr>
<td>NOS/100ml</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5–15 micron</td>
<td>765,968</td>
<td>4,009</td>
<td>99.48%</td>
</tr>
<tr>
<td>15–25 micron</td>
<td>135,691</td>
<td>1,214</td>
<td>99.11%</td>
</tr>
<tr>
<td>25–50 micron</td>
<td>86,615</td>
<td>300</td>
<td>99.65%</td>
</tr>
<tr>
<td>50–100 micron</td>
<td>28,893</td>
<td>72</td>
<td>99.75%</td>
</tr>
<tr>
<td>&gt;100 micron</td>
<td>6,478</td>
<td>16</td>
<td>99.75%</td>
</tr>
</tbody>
</table>

This is the result after an oil sample that was passed through the Miracle Boy filter just ONE time.

The Miracle Boy utilizes adsorption strategies and a “deep filtration” media. This type of filter allows for higher performance due to the attractive nature of the filter media. This attractive nature allows for much finer filtration all the way down to the 0.1 micron range. This in turn allows for reduced maintenance schedules, and even eliminates the need to change your lube oil, all while improving the oil’s viscosity.
The Miracle Boy is an off-line, circulating hydraulic oil refresher capable of removing sub-micron particulate (down to 0.1 micron!), water, sludge, and oxides found contaminating most hydraulic oil systems. The Miracle Boy utilizes a treated-cellulose fiber “deep” filter cartridge. It can also handle almost any viscosity oil.

**RECOMMENDED “KIDNEY LOOP” INSTALLATION**

![Oil Tank Diagram](image)

As the picture illustrates, this system is attached directly to your existing oil tank and circulates oil continuously. It is even possible to filter your oil system 24 hours a day, even if the machinery is not being used. This allows for the highest degree of filtration possible. Because this system connects to the oil tank, all of the oil in the system is eventually circulated through the Miracle Boy.

Installation of the Miracle Boy is simple and can be performed quickly, without needing to interrupt the machine (in most cases). The connections to and from the Miracle Boy can be had in many popular PT or NPT style fittings to ease installation and allow trouble-free adaptation to existing equipment. Also included are 1/4 turn ball valves allowing ease of maintenance and cartridge replacement.
**Denyo Power Source Company**

**Case Study**

**Background:**

Denyo Power Source Company is Japan’s leading manufacturer and supplier of engine-driven generators, welders and compressors.

Denyo is committed to providing solutions to power needs no matter where that need is located. From construction sites to remote service areas, Denyo is able to react quickly and provide the needed power where the customer needs it.

**Miracle Boy Details:**

Denyo Power Source Company was looking for a way to reduce the amount of oil maintenance needed for an especially remote location where they were installing power generation equipment.

The five generators are diesel-driven given the fact that no natural gas resource is close enough to supply a gas-fired engine. They are mounted to two structures at two locations, and each has its own Miracle Boy.

The Miracle Boy was chosen for its ability to not only keep the oil as clean as possible, but also for the added benefits of moisture and acid removal which greatly impact the service life of any engine. Miracle Boy has also proven itself in reducing the amount of soot in the oil by a large factor. Here’s what Denyo found after using Miracle Boy for 3 years.

- Particulate matter is kept to lower numbers than new oil
- Moisture almost non-existent at single-digit ppm levels
- TAN (acid number) never reaches higher than new oil
- Soot levels are kept below 2%
- Oil life is prolonged, and make-up oil added to refresh additives between long change intervals
- Oil disposal fees are cut by 70%
- Costly trips to remote location are reduced
- Service Interval of engines is more than doubled
- Miracle Boy has alarm function which notifies if abnormal pressures (high or low) are detected.
- Miracle Boy cartridges are changed annually, as soot buildup dictates.
- Estimated $15,300 saved annually per MB filter unit

**Model: URC-8110-162VG (high temp)**
You have probably thought of many different applications where a Miracle Boy would benefit your business. Miracle Boy has already proven itself in these applications:

**Proven Technology**

**Toyota Automobile Sheetmetal Stamping Facility**
*NC Die press & Cushion (Built 1991)*

Toyota was dissatisfied with the electrostatic filter in use.

Miracle Boy reduced particulate matter by over 99% and reduced filter replacement from 3-4 times a year to just once a year!

Since Miracle boy was installed on their first press, Toyota has installed 18 more units throughout various parts of the production facility.

Oil changes are no longer necessary due to the high purity level achieved using Miracle Boy.

Toyota has begun a program to institute the Miracle Boy filtration system in all of their manufacturing facilities.

**Korea Electric Power Company’s**
*Korea Electric Power Company’s*  
**Wolsong Nuclear Power Plant;**  
*Wolsong, Korea (Built 1983)*

Heavy Water moderated reactor which allows for fuel rod replacement without power interruption.

- Miracle Boy was installed in the lubricant circuit of the Turbine Output Adjusters.
- Miracle Boy has eliminated the need for costly EHC oil replacement.  
  (¥500,000/200L—$10,000/G)
In this application, Miracle Boy is used to filter oil for turbine and gear lubrication.

Osaka Gas International’s — NIPPON YUSEN K.K.

Vessel is owned by Osaka Gas who is under a 25 year contract to have this vessel deliver 660,000 metric tons of LNG to Japan.

This carrier is driven by a large turbine engine and has many various hydraulic systems aboard.

Miracle boy provides a constant supply of clean, fresh oil to the turbine as well as the transmission gears. This not only greatly reduces maintenance times and procedures, but also provides a peace of mind during long-distance oceanic voyages.

Miracle boy can provide you with the same peace of mind!

Traditionally, carrier oil maintenance has required the use of complicated and costly vacuum cars and tank cars, as well as a highly trained specialized staff to perform oil changes on the carriers turbine and gears.

With the high purity of the oil following the continued use of Miracle Boy, oil changes have been eliminated! Osaka Gas Intl. has seen cost savings not only in oil purchase and disposal prices, but also have been able to eliminate the specialized equipment needed.

Safety aboard the carrier has been improved and environmental issues are also reduced.

Overall, this implementation has been viewed as a great success, in increased value brought to Osaka Gas, but also in the continued “value added” benefits that the Miracle Boy offers.
The filtration qualities of the Miracle Boy are surpassed by no other filter. It has been proven that well over 99% of particulate, water and oxides are no match for the powerful filtration utilized in every Miracle Boy filter cartridge.

All oil circulated through the Miracle Boy cartridge must pass through all stages of the filter before being returned to the oil storage tank.

This allows for very low amounts of contamination to be permitted to pass through.

Each cartridge can hold approximately 640cc (over 1 pint dry) of particulate, and .5L (17 fluid oz) of moisture and in models where multiple cartridges are utilized, the capacity is greatly increased.

As a great environmental benefit, used cartridges may be incinerated with no release of dioxins. The EPA has recently released a study showing the potential hazards of dioxin release.

Filter replacement is a simple and time friendly operation.

Cartridge replacement can be performed in minutes, and technical expertise is not required as with other filter manufacturers.

Cartridges are removed by:

(a) Removing power supply from Miracle Boy unit
(b) Closing oil supply and return valves
(c) Unscrewing (by hand) the cartridge top
(d) Lifting cartridge stack out of unit
(e) Removing cartridges from stack
(f) Cleaning stack rod and inside chamber
(g) Installing new seals provided with cartridges
(h) Replacing cartridges on stack
(i) Returning stack to unit and tightening (by hand)
(j) Reconnecting oil supply
(k) Turning power to “ON” position
Standard pleated paper filtration can only remove particulate down to 25 microns.

More than 85% of wear induced to mechanical parts is due to particulate that is smaller than 20 microns.

Reducing particulate to less than 5 microns only reduces this wear to 75%.

If particulate can be filtered less than one micron, wear is reduced to less than 5%.

Miracle Boy provides you with a steady stream of “better than new” oil, which will significantly reduce or even eliminate the wear caused by particulate contamination.

<table>
<thead>
<tr>
<th></th>
<th>Particle</th>
<th>Oxide</th>
<th>Water</th>
<th>High-viscosity oil</th>
<th>Life</th>
<th>Running cost</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Miracle Boy</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>Catch polluted particles of 0.1 micron and less. Removes three types of oil deterioration.</td>
</tr>
<tr>
<td>Net. Film</td>
<td>○</td>
<td>×</td>
<td>×</td>
<td>×</td>
<td>×</td>
<td>×</td>
<td>High efficiency or long life. Catch particles only.</td>
</tr>
<tr>
<td>Centrifugal</td>
<td>×</td>
<td>×</td>
<td>○</td>
<td>×</td>
<td>○</td>
<td>○</td>
<td>Complicated operation.</td>
</tr>
<tr>
<td>Static electricity</td>
<td>○</td>
<td>×</td>
<td>×</td>
<td>△</td>
<td>×</td>
<td>△</td>
<td>Short-circuit with water. Frequent element change.</td>
</tr>
<tr>
<td>Magnetic separator</td>
<td>×</td>
<td>×</td>
<td>×</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>Catch magnetic bodies only. Metal can’t be removed.</td>
</tr>
<tr>
<td>Other depth systems</td>
<td>○</td>
<td>×</td>
<td>△</td>
<td>○</td>
<td>○</td>
<td>△</td>
<td>Limited water removal. Frequent element change.</td>
</tr>
</tbody>
</table>

○ Excellent
○ Good
△ Poor
× Very Poor
The chart below illustrates how Miracle Boy can affect your business. When the testing began, an oil sample was taken and sent to a third party laboratory for analysis. The particulate level was measured at 33.3mg/L. This level of contamination can and will destroy precision machinery. The moisture level was also within the “critical” range at the time of the first analysis.

Once the Miracle Boy was installed (5/23/90) the particulate and moisture levels began to drop immediately. The peaks shown are the scheduled annual filter cartridge replacements. The large spike on 11/22/92 occurred due to the addition of brand new oil. As you can see, even the highest spike on the chart was still well below the particulate measured in “new” oil directly from the oil manufacturer.

The hydraulic oil in this machine has not been changed since the Miracle Boy was installed, yet every time the oil is analyzed, it retains it’s “better than new” qualities. Machine breakage due to oil related failures has been eliminated, and the customer saw a return on investment in only 10 months!
In November of 1965, P.E. Pfeifer and F.T. Finnigan of Pure Oil Co., submitted SAE paper #650865. This paper explains findings on lifter wear in an 8 cylinder gasoline engine using either a full flow oil filter, or a bypass oil filter. The paper goes on to state that “Standard full-flow filters do not remove 1 micron particles (or 5, 10 or 15 micron for that matter) and thus do not prevent against wear causing particles.” Also “Filtration media must be able to reduce particulate that is less than 1 micron to control wear.”

In January of 1966, J.E. Den Besteu, E.G. Leverenze, and C.M. Bloom of International Harvester Company submitted SAE paper #650316. The paper describes a scientific test conducted using a 6 cylinder diesel engine and comparing new oil, used oil, and used oil filtered through a 5 micron filter. This test showed that there was no difference in the wear rate of the engine when any of the oils were used.

Mobil Oil Australia issued Limited Technical Bulletin #863 which states that “Oil does not wear-out, break-down, or otherwise deteriorate to the point that it needs to be replaced.” “It does become contaminated with water, acids, carbon and sludge so that it can no longer provide the protection needed for precision engine components.”

A filter can only filter particles larger than it’s largest opening. Most filters cannot remove particles smaller than 15-25 microns. The Miracle Boy on the other hand removes all particles down to the 0.1 micron range.

In the picture featured at left, you see the comparison of Transformer oil used by Tokyo Electric Power Co., LTD.

On the left is oil taken directly from Transformer in substation 1-C then passed through competitors filter 5 times.

On the right is the same oil, but passed through the Miracle Boy oil refresher only 1 time.

As you can see the difference is astonishing. Particulate count was reduced by 99.55% and you can see the difference in color.

Since this test was performed, Tokyo Electric Power Co., LTD has instituted a mandate for all substations to begin using Miracle Boy.

Multiple ways of saving you money!

Not only does Miracle Boy reduce costly Machine repairs, reduce machine failure downtime, and eliminate the need to change your lubrication oil, it also saves you money on your electric bill!

Customers have typically seen 6.6% reduction in electricity usage (avg. per machine) due to reduced friction. One U.S. customer has reported an annual savings of $4,300, after installation on their 200HP compressor!
### Comparison

<table>
<thead>
<tr>
<th>Filter Type</th>
<th>5-15 µ</th>
<th>15-25 µ</th>
<th>25-50 µ</th>
<th>50-100 µ</th>
<th>Over 100 µ</th>
<th>Filtration Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contaminated Oil (Original Oil)</td>
<td>443,655</td>
<td>19,372</td>
<td>3,339</td>
<td>674</td>
<td>78</td>
<td></td>
</tr>
<tr>
<td></td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Notch Wire 150 µ</td>
<td>443,524</td>
<td>19,348</td>
<td>3,417</td>
<td>682</td>
<td>81</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.03%</td>
<td>0.01%</td>
<td>23.4</td>
<td>1.20%</td>
<td>3.80%</td>
<td></td>
</tr>
<tr>
<td>Pleated Metal Mesh 20 µ</td>
<td>415,299</td>
<td>18,771</td>
<td>3,112</td>
<td>591</td>
<td>53</td>
<td>6.30%</td>
</tr>
<tr>
<td></td>
<td>6.40%</td>
<td>3.10%</td>
<td>6.80%</td>
<td>12.30%</td>
<td>32.10%</td>
<td></td>
</tr>
<tr>
<td>Pleated Paper 20 µ</td>
<td>388,774</td>
<td>19,115</td>
<td>2,686</td>
<td>576</td>
<td>48</td>
<td>12.00%</td>
</tr>
<tr>
<td></td>
<td>12.40%</td>
<td>1.30%</td>
<td>19.60%</td>
<td>14.50%</td>
<td>38.50%</td>
<td></td>
</tr>
<tr>
<td>Filtration Solid 20 µ</td>
<td>257,630</td>
<td>13,725</td>
<td>968</td>
<td>127</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>41.90%</td>
<td>29.20%</td>
<td>71.70%</td>
<td>81.20%</td>
<td>89.70%</td>
<td></td>
</tr>
<tr>
<td>Filtration Wide 20 µ</td>
<td>401,822</td>
<td>137,250</td>
<td>463</td>
<td>34</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>9.40%</td>
<td>29.20%</td>
<td>86.10%</td>
<td>93.6</td>
<td>100%</td>
<td>10.40%</td>
</tr>
<tr>
<td>DIPS, Cellulose 20 µ</td>
<td>216,932</td>
<td>11,251</td>
<td>804</td>
<td>163</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>51.10%</td>
<td>41.90%</td>
<td>75.90%</td>
<td>75.80%</td>
<td>96.20%</td>
<td>50.90%</td>
</tr>
<tr>
<td>Thick Layer Filtration, Multi-layer Paper 20 µ</td>
<td>218,688</td>
<td>9,650</td>
<td>1,080</td>
<td>120</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>50.70%</td>
<td>50.20%</td>
<td>67.70%</td>
<td>82.20%</td>
<td>100%</td>
<td>50.80%</td>
</tr>
<tr>
<td>Thick Layer Filtration, Loaded Paper 20 µ</td>
<td>214,180</td>
<td>4,130</td>
<td>720</td>
<td>90</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>51.70%</td>
<td>79.70%</td>
<td>78.40%</td>
<td>86.70%</td>
<td>100%</td>
<td>53.1%*</td>
</tr>
</tbody>
</table>

#### Filtration Rate of Standard Filters

<table>
<thead>
<tr>
<th>Miracle Boy</th>
<th>4,009</th>
<th>1,214</th>
<th>300</th>
<th>72</th>
<th>16</th>
<th>99.9%*</th>
</tr>
</thead>
</table>

Filtration rate of Miracle Boy!
Operating Suggestions

- Before installing, plumbing, wiring, or operating the device, read through the operator’s manual for proper installation and operating procedures to ensure full effectiveness.
- Install stop valves on suction and delivery pipes (required for inspection and maintenance of the filtration device).
- Do not place flammable solutions and other potentially hazardous items around the filtration device. Keep device away from open flames.
- Install a circuit breaker on the power source for electrically powered models.
- Should the safety device on the filtration device be activated, check for the cause and take appropriate countermeasures.
- Before performing any maintenance work or element replacement, be sure to stop the device, remove oil from the drain, and make sure there is no internal pressure. Device assembly should only be performed by a certified service personnel.
- Do not set the device where it may be exposed to water, steam, or dust. It can lead to breakdown or electrocution.

Product Warranty

Miracle Boy filtration systems are warranted for one full year from the date of delivery against defects in workmanship. This warranty does not cover products not properly installed or used according to handling suggestions as indicated in the operator’s manual. This warranty applies to products that have been acknowledged in our factory to be defective, and covers the repair or replacement of the defective unit, and the shipment of the repaired or replaced unit. This warranty does not cover any consequential or incidental damages. Customer will be responsible for shipping, handling, as well as replacement of supplies associated with product usage. Repairs required after the end of the warranty period, repairs not covered under the warranty, or repairs required outside of our factories may be performed by request for a fee.
**FREQUENTLY ASKED QUESTIONS**

**Q:** I haven’t changed my oil in 10 years. Why do I need a Miracle Boy?

**MB Solution:** If you haven’t changed your oil in 10 years, chances are that it has caused damage to other components and you may not even realize it! Leaders in the lubrication industry are claiming that over 80% of machine failures (in machines using hydraulic oil) are related to oil contamination! Miracle boy can reduce or even eliminate these failures!

**Q:** I have varnish issues in my machine(s), can Miracle Boy remove it?

**MB Solution:** Miracle Boy has been shown to reduce existing varnish by marginal levels. However, it has been shown that the installation of a Miracle Boy either from new or immediately following a varnish removal and oil change will prevent varnish from ever forming.

**Q:** How exactly can Miracle Boy save my company money?

**MB Solution:** Because of the finite filtration offered by Miracle Boy, the cost-savings can be realized in 4 areas.

1.) Reduced wear: Miracle Boy removes particulate, moisture, sludge and oxides to levels so low that wear is reduced and machine failure due to oil contamination is reduced or eliminated.

2.) Less Maintenance: Cartridges only need to be replaced once a year and due to reduced wear, overall machine maintenance is reduced (This also lengthens the full-flow filters replacement interval).

3.) Less Oil: Since the oil is constantly being refreshed to levels far better than new oil, oil changes are virtually eliminated (topping-off may be needed after cartridge replacement).

4.) Electric Bills: Miracle Boy has proven in many cases to reduce the power consumption of the machines to which it is attached. Also, power generation equipment is more efficient and therefore can produce more electricity!

**Q:** What other benefits will I notice?

**MB Solution:** Miracle Boy is committed to being environmentally friendly so by allowing a machine to reuse it’s lubrication indefinitely, oil disposal is no longer necessary. Used Filter cartridges may be incinerated without fear of releasing deadly dioxins. Return on Investment has been shown is as little as 10 months! Maintenance can be performed without machine interruption. And last but not least, the Miracle Boy unit usually occupies less floor space than other types of filtering devices.