

MIRACLE BOY

- **99% efficiency** for removal of polluted particle
- Catches **sludge** and maintains oil **PH level**
- Removes **suspended moisture** at the **ppm level**

Remarks: We have another type of element, which is applied for water based lubricants

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Why Miracle Boy Now ?

We believe every company has the following goals:

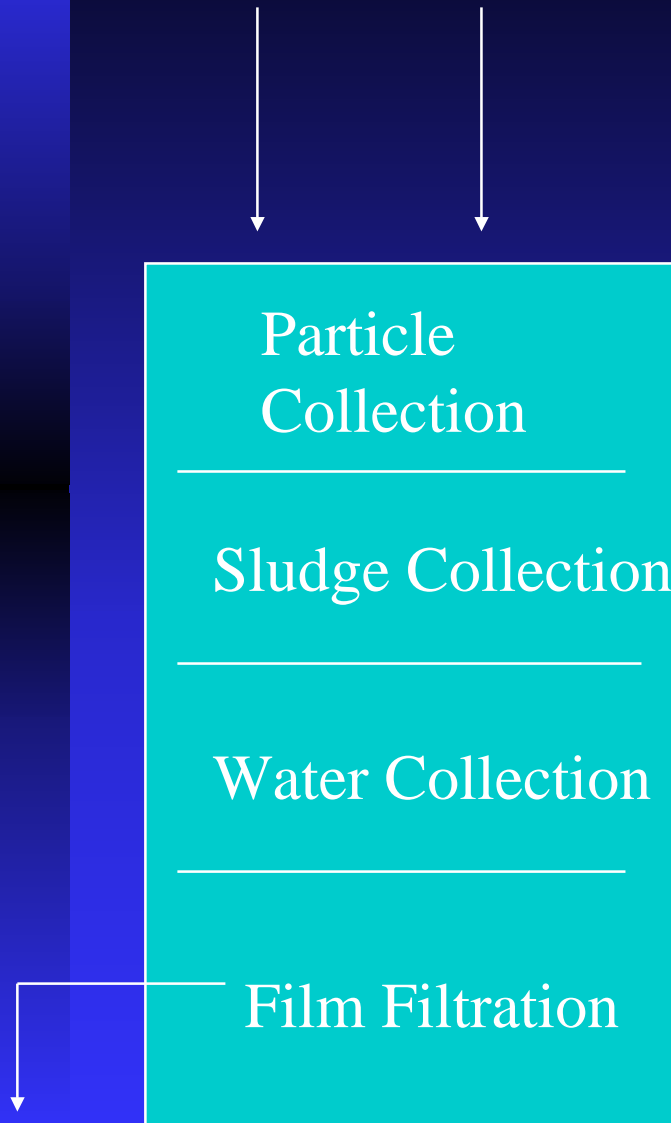
- To reduce the maintenance cost as much as possible after installing the machine
- To improve the productivity by decreasing machine breakdown
- To preserve the environment



Therefore

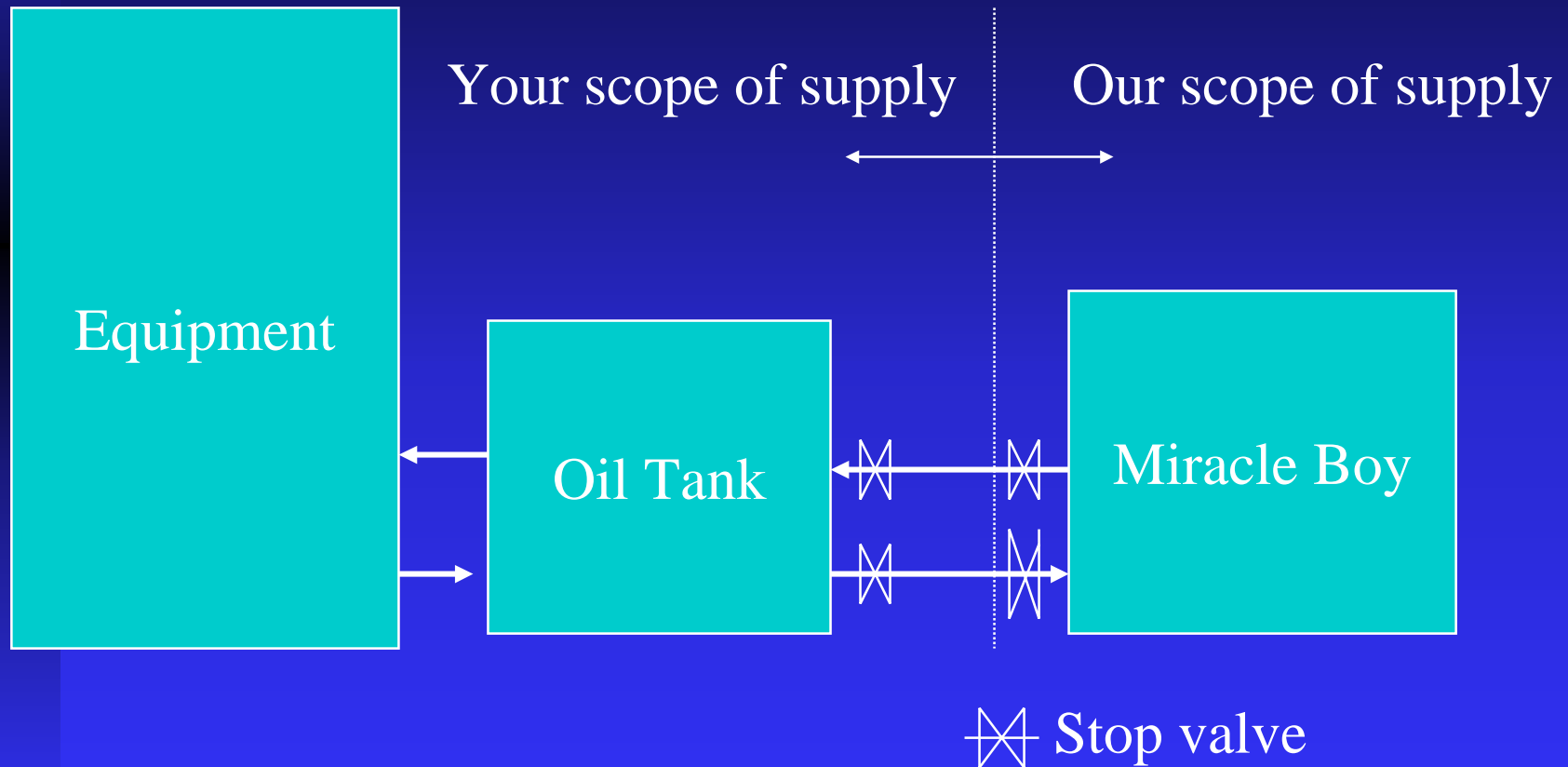
- By keeping the oil condition like new indefinitely, you can meet above proposition.
- “Miracle Boy” is the oil filtering system for 21 century

Multi-Function Element



- The filter element is made of special adsorption layers. Filtrated oil is returned to the tank through the film and center pipe
- Anti-clogging operation due to multi-function element

Installation (Bypass system)



Features of Miracle Boy

- Preserves oil quality indefinitely, keeping it just like new.
- Reduces machine breakdown and maintenance work drastically, which improves overall machine performance.
- Sharp drop in maintenance costs since oil change and oil disposal are no longer required.
- Environmentally friendly
- Prolongs equipment life drastically
- Enhances the precision / quality of products due to cleanliness of oil during operation
- To increase energy-saving

Equipment information

- Size: 30cm x 34cm x 73cm for 600l tank
- Delivery: 2 months
- Delivery method: Air
- Estimated time for Installation: 1 Hour
- 1 year Warranty
- Spare Parts: Filter Element only
- Frequency of filter change: Typically once a year (verify using pressure gauge)
- Estimated Time for Element change: 5 minutes-Easy work

Other information

- Simple design means maintenance work is very easy. Moving parts are only the circulating pump and motor.
- Filter element can be applied to a wide range of viscosities (VG1~VG260), minimizing spare parts.
- Compact design.
- No heater required.
- Anti-clogging operation due to multi-function element.
- Many customers report “No oil change/ No machine breakdown more than 11 years”
- Extensive supply record such as Toyota / Honda / Nissan, many paper companies, etc.

Supply Record

- More than 1,600 units in last 11 years
- Toyota, Nissan, Suzuki, Mitsubishi, Hitachi and other famous manufacturers in Japan are using **MIRACLE BOY** for oil management
- Daimler Chrysler is testing for MB ability currently.
- Japanese TOP5 and 40 other paper manufacturer selected **MIRACLE BOY**
- Applicable to many types of oil such as lubrication oil, mechanical oil, processing oil, compressor oil, engine oil, food processing oil, antirust oil, fuel oil, washing oil, test oil, vacuum pump oil, insulated oil etc

Machining Center

(Spindle Lubrication oil/re-circulated type)

Application: Machining Center

Application: Spindle Lubrication Oil / re-circulated type (Not mist type)

Problem:

1. Coolant oil (water base cutting fluid) is contaminating the spindle oil. Due to that, burning of bearing and/or precision problem of machining center is occurred.
2. Spindle should be replaced every 3 months costing US\$ 20,000 / spindle

Solution:

1. Install MB

Result:

1. Coolant oil(water base) is removed. Preserves spindle oil quality indefinitely, keeping it just like new.
2. Sharp drop in maintenance costs since spindle replacement and oil change / disposal are no longer required after installing MB since 2000
3. Reduce machine breakdown and maintenance work drastically, which improves overall machine performance
4. Frequency of element change: Once a year
5. Environmentally friendly

Machining Center

(Way Lubrication oil)

Application: Machining Center

Application: Way Lubrication

Problem:

Coolant oil(water base) is contaminating the way lubrication oil. Due to that, wear and tear problem and/or precision problem of machining center is occurred.

Solution:

1. Install MB

Result:

1. Coolant oil(water base) is removed. Preserves way lubrication oil quality indefinitely, keeping it just like new.
2. Oil change / disposal are no longer required after installing MB
3. Reduce machine breakdown and maintenance work drastically, which improves overall machine performance
4. To manufacture good quality product with simple maintenance
5. Frequency of element change: Once a year
6. Environmentally friendly

Gear Oil

Application: Gear Oil for heavy cutting/ high loading

Problem:

1. Standard filters cannot remove particulate as viscosity of gear oil is high.
2. Wear and tear of gear is occurred due to oil pollutants, resulting in machine trouble, gear replacement

Solution:

1. Install MB

Result:

1. Preserves gear oil quality indefinitely, keeping it just like new.
2. No oil change is required
3. Frequency of element change: Once a year

Test Oil

Application: Before shipment, final test is needed with test oil

Problem:

1. If test oil has contamination, quality problem may result.

Solution:

1. Install MB

Result:

1. Preserves test oil quality indefinitely, keeping it just like new.
2. No quality problem due to test oil contamination
3. Oil change is not required
4. Frequency of element change: Every 3 months to 6 months

Aluminum Die Casting

Application: Die Casting Machine - Water glycol oil

Problem:

Due to oil contamination, valve trouble, machine trouble is occurred

Solution:

1. Install MB

Result:

1. Preserves water-glycol oil quality indefinitely, keeping it just like new.
2. No oil change is required, but periodical viscosity checking / adjustment is required
4. Frequency of element change: Once a year

Vacuum Pump

Application: Vacuum pump for transmission gear manufacturing line

Problem:

1. Frequent oil change: every 2~3 months
2. Vacuum pump(US\$70,000) breakdowns with frequent oil change
Breakdown-Repair-Breakdown-Repair-Replace cycle represents a significant cost

Solution:

1. Install MB to vacuum pump (Model 411-12V)

Result:

1. Significant reduction in machine downtime and lower repair costs
2. No oil change is needed
3. To increase energy saving
4. Easy maintenance
5. Customer is now installing MB for every vacuum pump

Screw Compressor

(Oil Injection Type)

Application: Screw compressor- Oil injection type

Application: compressor oil

Problem:

1. Cost for periodical overhaul is expensive
2. Compressor breakdown interrupts factory operation

Solution:

1. Install MB-C Series

Result:

1. Theoretically overhaul is eliminated, which is very expensive
2. To reduce electric power consumption (Actual result in Japan: 6.6% reduction. US customer has estimated US\$4,300 of annual cost savings for 200Hp compressor)
3. Oil change / disposal are no longer required - Environmentally friendly
4. To enhance the reliability of compressed air supply with simple maintenance
5. To prolong the life of compressor itself

Pay-Back: Pay-Back is **within 2 years** and thereafter estimated annual cost saving is **US\$ 4,000 /unit** for 200Hp compressor

Frequency of element change: Once a year (2 months only for 1st replacement)

Supply record: More than **250 units**

Screw Compressor

(Oil Free Type)

Application: Screw compressor- Oil free type

Application: compressor oil

Problem:

1. Cost for periodical overhaul is expensive
2. Compressor breakdown interrupts factory operation

Solution:

1. Install MB/ Model 411-12V

Result:

1. Theoretically overhaul is eliminated, which is very expensive
2. Oil change / disposal are no longer required - Environmentally friendly
3. To enhance the reliability of compressed air supply with simple maintenance
4. To prolong the life of compressor itself

Pay-Back: Pay-Back is 0 years and thereafter big annual cost saving will be realized.

Frequency of element change: Once a year (2 months only for 1st replacement)

Supply record: Toyota, Toshiba, NTN etc

Actual Test Data by 3rd party in Japan

(Spindle oil for machining center)

Customer: No.1 Japanese Automobile Company

	<u>Before attaching MB</u>	<u>After attaching MB</u>
Viscosity @40 degree(mm ² /s)	21.72	21.83
Water (ppm)	26	21
Oxide Level(mgKOH/g)	0.47	0.44
Pollution 0.8u(mg/100ml)	4.8	2.6
Number of Pollutants		
5~15u	23,470	8,745
15~25u	2,085	815
25~50u	760	205
50~100u	70	40
100u over	15	5

Actual Test Data by 3rd party in Japan

(Way lubrication oil for machining center)

Customer: No.1 Japanese Automobile Company

	<u>Before attaching MB</u>	<u>After attaching MB</u>
Viscosity @40 degree(mm ² /s)	30.41	29.79
Water (ppm)	4,370	58
Oxide Level(mgKOH/g)	0.38	0.31
Pollution 0.8u(mg/100ml)	75	0.2
Number of Pollutants		
5~15u	immeasurable	3,110
15~25u	immeasurable	235
25~50u	immeasurable	95
50~100u	immeasurable	5
100u over	immeasurable	0

Actual Test Data by 3rd party in Japan (Gear Oil for Press Machine)

Customer: No.1 Japanese Automobile Company
(Transmission)

	<u>Before attaching MB</u>	<u>After attaching MB</u>
Viscosity @40 degree(mm ² /s)	139.6	138
Water (ppm)	1,770	297
Oxide Level(mgKOH/g)	1.1	1.05
Pollution 0.8u(mg/100ml)	18.5	1.2

Actual Test Data by 3rd party in Japan

(Test oil)

Before shipment, final test is needed with test oil

	<u>Before attaching MB</u>	<u>After attaching MB</u>
Viscosity @40 degree(mm ² /s)	69.89	69.30
Water (%)	0.9	0.2
Oxide Level(mgKOH/g)	2.78	3.08
Pollution 0.8u(mg/100ml)	12.2	0.3

Actual Test Data by 3rd party in Japan

(Vacuum pump oil)

	<u>Before attaching MB</u>	<u>After attaching MB</u>
Viscosity @40 degree(mm ² /s)	69.37	70.74
Water (ppm)	680	42
Oxide Level(mgKOH/g)	0.03	0.02
Pollution 0.8u(mg/100ml)	19.8	2.0

Actual Test Data by 3rd party in Japan

(Compressor Oil/Screw oil injection compressor)

	<u>Before attaching MB</u>	<u>After attaching MB</u>
Viscosity @40 degree(mm ² /s)	37.66	36.32
Water (ppm)	5,060	53
Oxide Level(mgKOH/g)	0.14	0.60
Pollution 0.8u(mg/100ml)	2.20	0.60

Oxide Level is going up due to adding oil at the time of element change

Actual Test Data by 3rd party in Japan

(Compressor Oil/Screw oil free compressor)

	<u>Before attaching MB</u>	<u>After attaching MB</u>
Viscosity @40 degree(mm ² /s)	53.50	54.37
Water (ppm)	219,000(21.9%)	32
Oxide Level(mgKOH/g)	0.07	0.22
Pollution 0.8u(mg/100ml)	13	1.1

Oxide Level is going up due to adding oil at the time of element change