



INDUSTRIAL  
LUBRICANTS &  
SERVICES LIMITED

# Air Sentry<sup>®</sup>

DESSICANT BREATHERS

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# Why Use Air Sentry® Breathers?

## Protect Your Equipment

### Two Main Threats To Productivity

#### Particulates

More than 75% of all machine wear related failures were due to particulate contaminants. Frequently the greatest cost of equipment failure is not the component replacement cost, but the labor production downtime. Most particles start off as dirt that becomes airborne, which then finds its way into lubricant and fuel reservoirs, and is later transported to bearings, bushings, seals, valves, and other machine components. There they become key ingredients in abrasion, erosion, and fatigue failures. The contaminants also cause lubricant degradation, shortening the life of the lubricant and decreasing its ability to lubricate.



With machine clearances measured in thousandths of an inch, it doesn't take much contamination to affect bearings and other sensitive components. Even particles of 10 micron or smaller can disrupt the lubricant film and cause a great amount of wear.

#### Moisture

Moisture is a continuous threat. Its presence in lubricants and hydraulic fluids creates a host of problems including rust, lubricant additive depletion, viscosity changes, oxidation and sludge formation.

Air Sentry® Breathers neutralises contamination and stops moisture from entering your equipment while still allowing clean air to pass through.

With an Air Sentry® Breather installed you can rest easy knowing that your investments are protected from humidity and the ill effects associated with moisture getting into your systems.

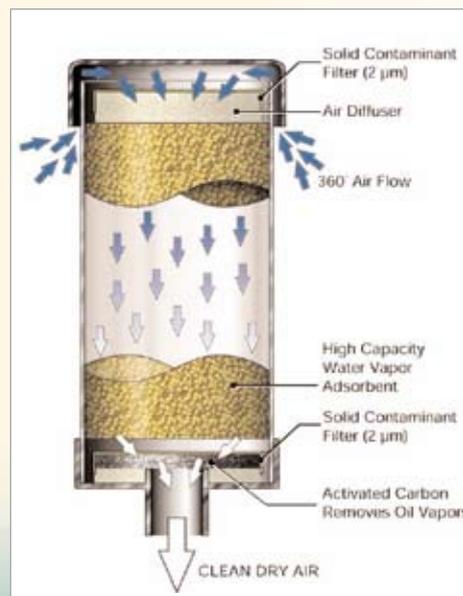


## How Air Sentry® Breathers Work

Air Sentry® Contamination Control Breathers replace existing breather caps or air vents on fluid holding tanks, reservoirs and gearboxes. Most older style air venting methods provide minimal if any contamination control. AirSentry® breathers provide the first line of defence in contamination control methodology utilising patented designs and featuring colour indicating silica gel and self cleaning 2-micron filtration.

When contaminated air enters the top of the breather, it passes through a three stage filter process, firstly a self cleaning solid particle filter that traps solid particles greater than 2 microns, then a bed of silica gel that adsorbs 95% of moisture in the air and finally through an additional 2 micron filter in the bottom of the breather to ensure that no harmful particles will enter the tank or reservoir.

When air is expelled back through the desiccant breather from the equipment water vapours are adsorbed by the silica gel which turns to dark green at the bottom of the breather rather than the top indicating excessive moisture inside the reservoir. As the exhausted air passes back through the self cleaning 2-micron filter, located in the top cap of the breather; any particles that were trapped as air entered the system are now back flushed from the filter.



# Water and Dirt – The Most Destructive Lubricant Contaminants

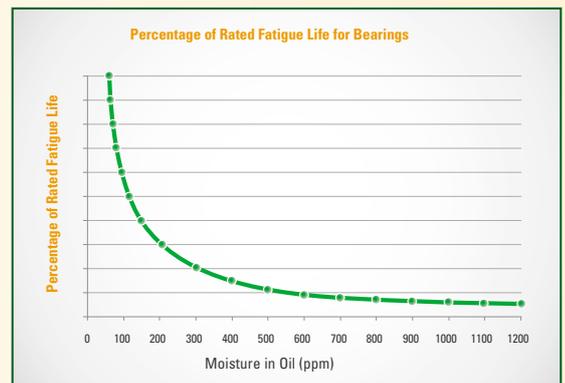
## Moisture and dirt are known to enter lubricant areas through several areas:

- › Condensation from humid air entering oil compartments causing condensation on the walls above the oil level
- › Airborne particulates such as dust and dirt
- › Moisture absorbed directly from the air due to the hygroscopic nature of oil
- › Oxidation and combustion processes that create water as a chemical reaction
- › Free water and particulates entering through faulty equipment, seals or faulty breathers

This results in dissolved, suspended or free water and/or particulates that can promote rapid oxidation of the lubricant's additives and base stock resulting in diminished lubricant performance and equipment failures.

The best defence against dirt and moisture contamination is a three-step proactive maintenance strategy, firstly understanding what levels of contaminants are acceptable in your equipment, having strategies to exclude or limit water and dirt ingress and then measuring performance against your target levels.

Bearing companies recognise that bearing life is significantly reduced due to hydrogen embrittlement caused by water penetrated bearing surfaces. As shown in the adjacent chart low moisture levels significantly improve bearing fatigue life.



Air Sentry® breathers in conjunction with an ILS Oil Analysis Programme will help you manage any water and dirt ingress in your lubricant tanks and reservoirs. We recommend you benchmark the current condition of your new or used oil before fitting your Air Sentry Breathers and follow up with an oil analysis programme using the target levels and frequencies below.

## Target Levels and Oil Analysis Frequencies

### WATER LEVELS Chart

Water Levels (ppm)	Industrial Gearboxes	Hydraulic Systems	Compressor Fluids	Transformer Fluids	Engine Oils	Transmission Fluids
<b>Optimum Level</b>	< 200	<200	<200	<50	<500	<200
<b>Satisfactory Level</b>	200 - 2000	200-2000	200-2000	50-100	500 - 2000	200-2000
<b>Remedial Actions Required</b>	2000 - 3000	2000-3000	2000-3000	100-150	2000 - 5000	2000-3000
<b>Condemning Level</b>	> 3000	>3000	>3000	>150	>5000	>3000

### CLEANLINESS Charts (2)

Cleanliness Levels ISO 4406:99	Hydraulic Systems	Testing Frequency	Hyd Systems with Servo Valves	Testing Frequency
<1500 psi	19/17/14	6 months	16/14/12	4 months
1500 to 2500 psi	18/16/14	4 months	15/13/11	3 months
>2500 psi	18/16/14	4 months	15/13/11	3 months

	Industrial Gearboxes	Rotary Compressor Oils	Reciprocating Compressor Oils	Engine Oils	Transmission Fluids
<b>Cleanliness Levels ISO 4406:99</b>	17/16/13	16/14/11	18/15/13	18/16/14	17/16/13
<b>Testing Frequency</b>	6 months	3 months	4 months	4 months	6 months

**Note:** For major rebuilds or new commissioning we recommend sampling day one, one week after operation and one month after operation then reverting to the above levels.

# D-Series

## Disposable Stationary Applications

The D-Series are designed to satisfy the requirements of most stationary fluid management applications. The breathers use 100% silica gel for moisture adsorption and feature 2-micron solid particle filtration with airflow ratings of 35 cfm to 100 cfm.

The D-Series is constructed of industrial grade raw materials, tested to ensure a wide range of chemical compatibilities, and features high impact resistant ABS top and bottom caps. The clear acrylic tube makes it easy to inspect the condition of the color-changing silica gel from a distance. The silica gel turns from gold to dark green to visually indicate the adsorption of moisture and confirm the breather is getting the job done!



## Typical Applications: Storage Tanks, Fluid Reserves, Transformers, Pumps, Gearboxes

Model	Height	Diameter	Mounting Connection	Silica Gel	Maximum Adsorption Capacity	Maximum Air Flow	Maximum Reservoir Fluid Flow	Type of Medium
D-102	20.3 cm	12.7 cm	1" slip fit	1.2 kg	489 mL	990 l/m	262 gpm	100% Silica Gel
D-103	20.3 cm	12.7 cm	1" MNPT	1.2 kg	489 mL	990 l/m	262 gpm	100% Silica Gel
D-108	25.4 cm	12.7 cm	2" MNPT	1.6 kg	634 mL	2830 l/m	750 gpm	100% Silica Gel

# Z-Series

## Limited Space Applications

Air Sentry® Z-Series breathers are designed for applications where space is limited or air flow requirements are below 10 cubic feet per minute (cfm). The Z-Series is typically used on gearboxes and low fluid volume applications where mounting space is limited or where a larger breather won't fit without remote mounting.



## Typical Applications: Gearboxes, Drums, Small Oil Containers

Model	Height	Diameter	Mounting Connection	Silica Gel	Maximum Adsorption Capacity	Maximum Air Flow	Maximum Reservoir Fluid Flow	Type of Medium
Z-134	8.3 cm	8.3 cm	1/2" FNPT	0.2 kg	90 mL	283 l/m	75 gpm	100% Silica Gel

# X-Series



## High Humidity / High Dust Applications

X-Series Breathers are the perfect solution for high humidity and high dust environments. To extend the desiccant's life, the X-Series incorporates 2 check valves and a reusable top cap. The check valves provide a closed system until airflow is required, extending the service life of the desiccant. Specifically, the intake check valve allows airflow into the breather only when differential pressure between the atmosphere and fluid reservoir exceeds a 0.3 psi threshold, while the exhaust check valve permits air to exit the reservoir when the differential pressure exceeds a 2.1 psi threshold. A 0.3 psi check valve is also available for exhaust.

When the gold silica gel has turned dark green, remove the reusable top cap from the bottom desiccant cartridge, dispose of the spent dark green desiccant cartridge, then use the same top cap with a replacement cartridge.

**Typical Applications:** Paper Mills, Wash-Down Areas, Steam Cleaning Rooms, Quarries, Timber Processing

Model	Height	Diameter	Mounting Connection	Silica Gel	Maximum Adsorption Capacity	Maximum Air Flow	Maximum Reservoir Fluid Flow	Type of Medium	Replacement Cartridge	Check Valves PSI In / Out
X-100	15.9 cm	8.3 cm	1/2" FNPT	0.4 kg	145 mL	283 l/m	75 gpm	100% Silica Gel	L-143	0.3 / 0.3
X-503	17.8 cm	12.7 cm	1" MNPT	0.6 kg	254 mL	990 l/m	262 gpm	100% Silica Gel	A-345	0.3 / 0.3

# XR-Series



## Extreme Environment Applications

Air Sentry® XR-Series breathers are designed to perform in any extreme environment where protection from dust, moisture and vibration are critical.

XR-Series breathers include a metal reinforced base available with male NPT threads to adapt to your equipment. The base is designed to handle the rigors of high vibration applications. The top cap uses two check valves to prevent outside moisture and solid contaminants from entering the breather until there is a need for airflow. The rebuildable design allows for economical replacement of the desiccant cartridge.

**Typical Applications:** Windmills and Wind Power Generation, Mining Equipment, Mobile Equipment, Timber Processing, Steel Mills

Model	Height	Diameter	Mounting Connection	Silica Gel	Maximum Adsorption Capacity	Maximum Air Flow	Maximum Reservoir Fluid Flow	Type of Medium	Replacement Cartridge	Check Valves PSI In / Out
XR-101	21.6 cm	13.2 cm	1" MNPT	0.6 kg	254 mL	990 l/m	262 gpm	100% Silica Gel	A-351	
XR-102	29.2 cm	13.2 cm	1" MNPT	1.2 kg	489 mL	990 l/m	262 gpm	100% Silica Gel	A-352	0.3 / 2.1
XR-108	35.6 cm	13.2 cm	2" MNPT	1.6 kg	634 mL	990 l/m	262 gpm	100% Silica Gel	A-358	0.3 / 2.1

# R-Series

## High Vibration Applications

Air Sentry® R-Series suit most heavy equipmen with hydraulic fluid tanks or reservoirs

They are ideal for these high vibration, mobile applications, including off-road, construction and farm vehicles. R-Series desiccant breathers are easily mounted in place of standard breather caps via rugged steel pipe threads and a reusable metal base.

When the gold silica gel cartridge turns dark green, simply install a new replacement cartridge to keep things moving!

**Typical Applications:** Cranes, Off Road Equipment, Farm Implements, Construction Vehicles



Model	Height	Diameter	Mounting Connection	Silica Gel	Maximum Adsorption Capacity	Maximum Air Flow	Maximum Reservoir Fluid Flow	Type of Medium	Replacement Cartridge
R-102	24.1 cm	13.2 cm	1" MNPT	1.2 kg	489 mL	990 l/m	262 gpm	100% Silica Gel	A-302

# M-Series

## Heavy Duty Applications

M-Series breathers are designed from heavy-duty materials capable of handling the requirements of the most severe environments. They replace the standard breather cap or vent tube on fuel tanks and fluid reservoirs. Pipe threads on the bottom standpipe make the units easy to install in moments.

All M-Series designs have 2 micron pleated filters and silica gel bags that are easily replaced. They also feature the proprietary Splash Sentry®, which prevents foaming or splashing fluids from entering the breather during normal operating conditions.

**Typical Applications:** Heavy Duty Off-Road Equipment, Mobile Heavy Equipment, High Temperatures



Model	Height	Diameter	Mounting Connection	Silica Gel	Maximum Adsorption Capacity	Maximum Air Flow	Maximum Reservoir Fluid Flow	Type of Medium	Replacement Silica Gel Bag	Replacement Polyester Pleated Filter	Filter Weight
M-103	16.8 cm	25.4 cm	1" MNPT	1.0 kg	380 mL	990 l/m	262 gpm	100% Silica Gel	095A201	095A204	0.9 kg



## Industrial Lubricants and Services Limited

Industrial Lubricants and Services Limited ( ILS ) is a specialist lubricant company importing and distributing quality brands of lubricants and associated products throughout New Zealand.

Holding the exclusive agencies for **Castrol**, **BP** and **Whitmore's** lubricants, **Pulsarlube** single point lubricators, **KATS Coatings**, and **Air Sentry** breathers gives ILS a unique product offer for the New Zealand market. Direct factory access allows ILS to offer a superb value proposition that meets the specialised needs of our customers.

With a portfolio of over 900 different products, ILS offers the right package required for your industry.

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