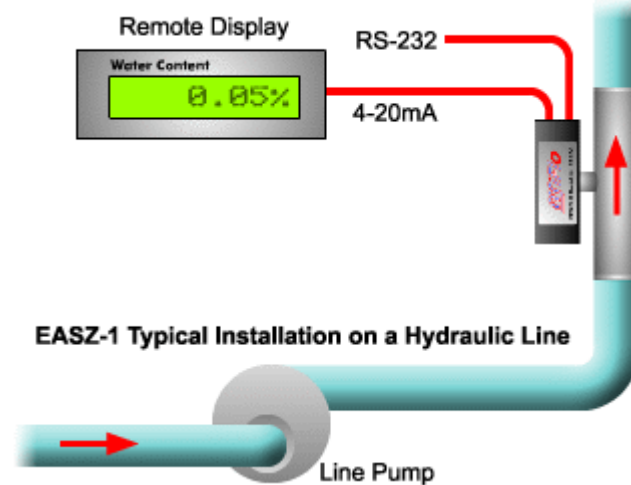




- » Home
- » Flowmeter Products
- » Water in Oil Sensors
- » Rental/Flow Surveys
- » Measuring Principle
- » Applications
- » Distributors
- » Company Profile
- » **Contact Us**
- » Links
- » Flow Calculator
- » Reynolds number Calculator
- » Site Map
- » News
- » Research and Development

## The EASZ-1 transmitter can prove Water Removal systems are actually working



In every moving oil process, water contamination is almost unavoidable. Water can be seen at the bottom of sumps, tanks and reservoirs. It is a well-known fact that water can be a big problem for fuels, hydraulic oil and lubrication systems. Traditionally, companies have sought to determine the extent of water in oil contamination through sampling using either crude methods such as crackle tests or more sophisticated laboratory methods using Karl Fischer instruments and other devices. EESIFLO has developed a non-intrusive, non-powered device that fits in almost any size pipe and will accurately report moisture or free water immediately. The device was named to be easy to pronounce (Easy One).

### What water can do?

Why is it so important to manage water contamination? Water can affect the oil's base stock, encourage oxidation, viscosity increase and foaming. Water can also affect the additive package through water-catalyzed hydrolysis, leading to acids and additive depletion. Water causes rust and corrosion which in turn increases wear as a result of aeration, changes in viscosity resulting in film strength failure, hydrogen blistering and embrittlement. Water can also be a contributor to other contaminants in the oil such as micro-organism suspensions and even waxes. Water must be avoided at all costs. If moisture is building up or if free water is present, the EASZ-1 will alert the user immediately so that preventative action can be taken.

### How to handle water in oil problems?

Oil contaminated with water can come from surrounding humidity or immediately as in water jet washing or seal failure. In the case of the latter, the EASZ-1 is the only reliable tool to immediately inform the user that a problem has occurred. The response time is 1 second. Immediate knowledge of a problem can save thousands of dollars on equipment cost and downtime.

Whatever the source the root cause needs to be known for corrective measures. Without knowing the cause it will be pointless to simply replace the oil with newer oil. It may be difficult to know what the cause may be, but the EASZ-1 is a device that can monitor moisture build up or water contamination online. The device needs to have a fast response time as well as an ability to measure low ppm ranges and higher percent ranges of contamination. The EASZ-1 can measure below 100ppm with a resolution of +/- 35ppm. It can also measure up to 25% water in oil. This places the instrument above former instruments simply used for "screening" purposes. The measurement of ppm values are meaningful to oil suppliers and clients, since oil is supplied to a specification based on its ppm level of water. Laboratory results are reported in ppm as well. Correlations can be made between the EASZ-1 online instrument and laboratory reports. Having said this, the EASZ-1 will give more meaningful results than a laboratory sample, simply because a lab sample is a small volume of the oil drawn off at a particular time, it has to be handled carefully and transport and handling can be a problem affecting the accuracy of the sample. The EASZ-1 samples 24 hours a day, once every second and it samples the total volume of oil so that any changes whether small or large can be monitored.

There are a number of ways to remove water online. Some methods uses are gravity separation and dehydration. Each client has to decide which technology is most beneficial to his process. The final d depend on the ultimate dryness level required, the volume of water that must be removed, the base o required flow and processing rate.

#### **Removing water in oil using absorption methods**

Some types of filter cartridges have an additional wrap consisting of polymer and desiccants or simila These filters are specifically designed to remove water by absorption and remove both emulsified anc as well as solids. However, the elements typically have a limited volume capacity and are best fitted t filter cart for minor water ingressio problems. In fact, when a small gearbox is being fitted with an ex chamber type breather, it is worthwhile to filter the gearbox with a water-removing element to remove elements of moisture that may condense out on surfaces within the unit when it cools. This method is effective method although knowing when to perform a filter change can be a problem. This can be sol installing an online EASZ-1 water in oil monitor that will alarm the operator when moisture or water lev could poise a threat to oil contamination

A known disadvantage of absorption removal is that it has a limited capability for water removal which the element's capacity. A positive aspect is its ability to trap solids.

#### **Removing water in oil using Gravity Separation**

Free water in the system will usually settle to the bottom of the tank . Some oils are designed to hold suspension rather than to allow it to separate out, making gravity separation a less-than-effective stra effectiveness of the gravity separation process can be ascertained by placing and EASZ-1 water in oi prior to separation and after separation. Currently, it is difficult to tell the immediate effectiveness of a separator while it is online. Clients currently have to rely on manufacturer's promises or specifications but cost effective , accurate water in oil monitor will certainly test the effectiveness of the separator ar indication on the reliability of the system in actual working conditions. Since the temperature of the oil ability to hold water, the EASZ-1 is temperature compensated so that measurements are not affected cooler oil. In most of these systems ,the major downside to this method is that it removes only free w elements of emulsified and dissolved water will remain. The upside is the low cost of water removal. I level of remaining moisture can be directly monitored by the EASZ-1.

#### **Removing water in oil using Centrifuge systems**

Basically , this technology removes water by spinning the oil at very fast rates. The greater the differe gravity between the contaminant and the oil, the more effective the process. For this reason, centrifug better on low specific gravity and low viscosity oils, like turbine oils, rather than heavier gear type oils. advantage of the EASZ-1 water in oil transmitter is that it is able to measure moisture or water contan both these types of oils. In a centrifuge, both free and emulsified water will be removed; this will depe extent on the type of additive package, as some water will be held in suspension in the oil. The EASZ principle of dielectric measurement, so it can still measure both free and emulsified water in oil even v packages. A possible setback to centrifuges is that only emulsified and free water will be removed - a can be partially overcome by keeping temperatures low.

#### **Removing water in oil using Vacuum dehydrators**

By heating the oil, typically to approximately 65 degC the water is vaporized inside the dehydrator, wi excessive oil degradation due to thermal and oxidative stress. In most dehydrators, the air is warmed prior to being passed over the oil, encouraging the water to transfer from the oil into the air. The real t process is its ability to remove dissolved water. Dissolved water in oil will normally be in lower ppm ra EASZ-1 will be able to measure the effectiveness of this process since the EASZ-1 can measure wat 100ppm. In reality, turbines and paper mills would like to keep water levels as low as possible but in r levels can sometimes exceed wished for results. In this case, the water in oil transmitter must also be higher levels of contamination, so that as processes are being adjusted to meet contamination require instrument will reflect the affects of these changes i.e. if they problem has occurred, the EASZ-1 will k The EASZ-1 will also know when the problem has been solved.

A known fact regarding vacuum dehydrators is their cost. Since the cost can be high, many companie to rent dehydrators on an "as-needed" basis rather than purchase them. Since the EASZ-1 online wat monitor is relatively a low cost item, the clients can benefit from purchasing their own water in oil tran: ascertain the effectiveness of different vacuum dehydrator systems and make sure that their investme

covered.

### **Removing water in oil using Dehydration /Air Stripping**

Air stripping can remove free and emulsified water as well as dissolved water down to less than 100 µg/l. The EASZ-1 water in oil monitor can measure values of water less than 100ppm with a resolution of +/- 3%. It can measure free water, emulsified water or dissolved water by direct measurements of dielectric. The sensor is not destroyed by free water. There is also no need for continual re-calibration. The instrument can be tested now and again in the client's laboratory against dry oil.

The air strippers have an ability to degas. Air stripping works by drawing air or nitrogen gas into a stream of oil, which mixes in and absorbs the water and gasses within the oil. The oil/air is then expanded to release the nitrogen, which takes the impurities with it. Just like vacuum dehydrators, cost can be an issue with air stripping. However, its advantage is that it costs less to maintain than a typical vacuum dehydrator because it has fewer moving parts. Air stripping can also remove gaseous impurities, as well as dissolved water and can be an effective alternative to vacuum dehydration.

### **Choosing a water in oil removal system.**

The decision about which main water removal technology is best will predominantly be based on the oil and the water to be treated. The decision will be further impacted by the need to reach a target water level.

EESIFLO is an instrumentation manufacturer. We do not assist clients in these decision making processes. It is up to the experts in each particular field. The EASZ-1 can in many cases prove to clients and manufacturers how effective the water removal system is, if there be need for modification or rethinking.

The EASZ-1 can be delivered almost anywhere in the world within 24- 48 hours. Call your nearest EE or log onto [www.eesiflo.com](http://www.eesiflo.com) for more information