

## **A NEW TECHNOLOGY To Remove Moisture from the Atmosphere of Oil Reservoirs**

The oil reservoir (conservator tank) found on industrial and commercial hydraulic, lubricating and electrical transformer systems all suffer the common ailment of water. It is well known that water can accumulate in these conservator tanks to contaminate the oil and whether this happens in a short period or gradually over time the end result is the same, the equipment suffers from rust, corrosion and reduced lubrication. Transformers have even been known to explode from the loss of dielectric strength in their insulating oil. To a great degree this problem is caused by the water being condensed from the humidity in the atmosphere around the conservator tank that then accumulates in the oil.

In an attempt to solve this problem and maintain "dry" oil in lubricating and hydraulic oil systems, water-removing oil filters were developed that can remove water from the oil via a flow stream through the filter. However, filtering does not solve the overall moisture problem but only addresses the water after it is in the oil of transformer systems. In addition, it is difficult to filter oil in transformers as for the most part they are designed as static reservoirs and do not have oil flow streams to connect to. What is needed is an affordable method of preventing the water condensing from the atmosphere.

The cutting edge technology of spin-on air filters solves the problem of water condensing from conservator tank atmospheres. These unique filters have been designed to remove water from an air stream as it passes through the filter and when used as a conservator breather system it will not only remove particulate from air, but will also remove any water vapor. This new technology positions negative valence chemistry within the filter in such a manner as to cause a co-valent bond to form with any positive valence H<sub>2</sub>O molecules that may be passing through with the air and trapping any water vapor within the filter. These breather systems have demonstrated the ability to lower moisture levels in hydraulic oil reservoirs to below condensate dew points and offer a replacement for various static-functioning silica-gel breathers. These water-removing air filters perform in a superior manner, as silica-gel breather's efficiencies are limited to approximately 40% relative humidity environments due to silica-gel being a ridged structure incapable of expansion. Silica-gel only holds water as a permeating vapor that enters under the principal of vapor pressure differentials that may exist between the granule and its proximate atmosphere. Whereas a spin-on air filter's superior performance is due to its unique water-absorbing structures that are able to expand as they accommodate and hold incoming water under hydrogen bonding principals. I have seen numerous examples of spin-on air filters being installed and used to lengthen the life of existing silica-gel breathers by as much as 6 months. Hopefully many power generation companies will take notice of this new technology and see the cost advantages of spin-on air filters. As a result of their water retention ability these filters will be found much more efficient in static-air desiccation of transformer oil conservator tanks.