Safeguarding your future: tiny drier, major potential (continued)

In the second part of this article, Brad Bray of Evomart looks at how POEs are made, their mix ratios, the impact additives have on systems, what purpose desiccants have and how a humble filter drier can now offer significantly more value to the technician, driving profitability and efficiencies on site.


Bradley Bray

POE manufacturing process

When POE lubricants are produced, great lengths are taken to ensure the mix is kept away from being exposed to moist environments. Some examples include:

Metal cans are non-porous, preventing moisture from permeating through material into the lubricant. These cans are sealed with an airtight seal. Plastic containers are avoided, as moisture may permeate through the bottle into the oil.

Nitrogen blankets: during the mixing and filling process, nitrogen is used to blanket the lubricant protecting it from any moisture that may be present.

Desiccants are used to remove acids and moisture. (See desiccant section below)

POE lubricant producers, work off circa 95:5 mix ratio. This means 95% of the total mix comprises of moisture-free ester product. The producer has only 5% of the total mix to introduce the appropriate inhibitors, stabilisers and additives to ensure oil stability. This 5% is to last the life of the oil.

Following a compressor burnout or system retrofit, existing pipe work may contain residues of lubricants, carbon, acids, metal shards as well as other contaminates. There are flushing systems available to clean out a system in preparation for a retro or new compressor installation. Two common flushing methods include: 1. A glycol-based fluid, circulated via with a pump or 2. A solvent 'slug' forced through the pipe run via oxygen free nitrogen.

The remaining lubricant should not exceed more the 5% of the new oil charge. The reason here is anything above the 5% threshold will begin to interfere with the 5% ratio manufacturers have to ensure oil stability.

What are desiccants?

Desiccants are hygroscopic substances that are used to absorb moisture and other particulates, to sustain a dry (moisture free) environment. A common example of a desiccant can be found in every box of new shoes - A small pouch containing Silica Gel beads is usually located within the box, which absorbs moisture keeping the shoes dry and free from mould. Within air conditioning, heat pumps and commercial refrigeration other types of desiccants are used, see below:

Molecular sieve is a material used to adsorb moisture out of a system. The beads contain small pores, which allow small molecules to be absorbed.

Activated alumina is manufactured from aluminium hydroxide. This makes for a highly porous material. These are used as a desiccant for drying out gases and liquids by removing acids and moisture.

Filter driers contain desiccants, normally a mixture of both activated alumina and molecular sieves. Many filters drier producers glue desiccant beads into a cylindrical core shape, these are known as solid cores. Depending on the manufacture of the drier, may determine the ratio of the desiccant mix. Many use an 80:20 ratio, whereas the optimum mixture is 70:30.

System additives

There are some system additive producers, such as UV-dye or sealant products, that use POE lubricants as a means on carrying their additive into the refrigeration cycle, which ensures complete miscibility with the host lubricant.

UV-Dye additives are generally highly concentrated, the amount introduced in with the host oil is a small fraction against the volume of oil. Many UV-dye products have dilution ratios ranging between 1:400-1:1000. As we discussed earlier, manufacturers recommend no more than 5% of the original base fluid

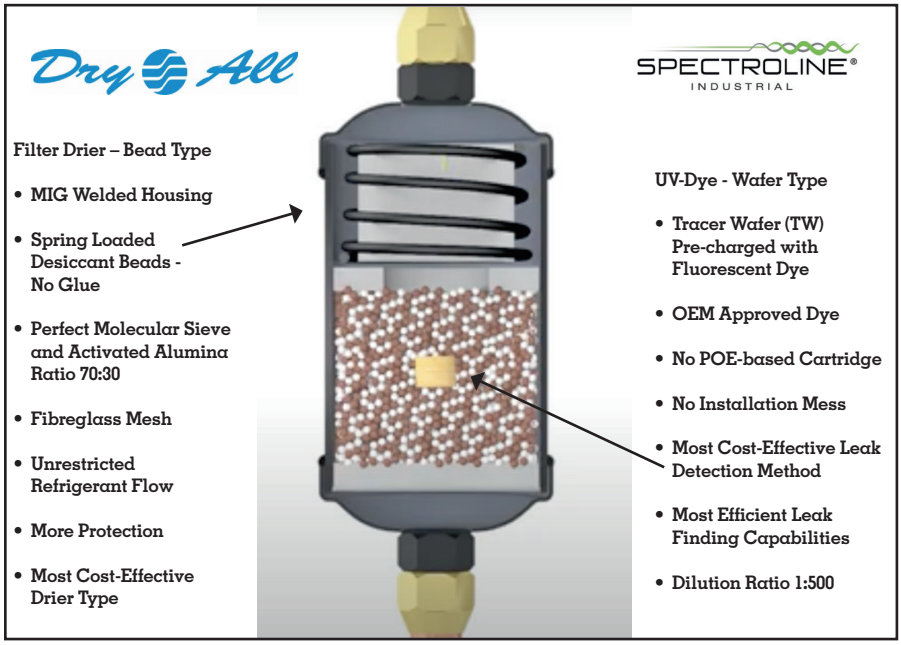
What makes a good filter drier?

Component manufacturer Dry All aims to offer the most value possible within its high-quality mig-welded filter driers. This company works with companies including Emerson, Carrier, Bosch, Daikin, LG, Schneider and more. These companies approve Dry All HVAC&R line components.

Dry All has gone to great lengths to ensure quality throughout its product and offer new innovative ways to offer exceptional value, in product performance and service support. One of its latest innovations includes Spectroline UV-Dye wafers being built into their filter driers. This is a world-first filter drier with leak detection technology built-in.

Filter driers are MiG-welded and sealed with nitrogen, ensuring a moisture-free desiccant. Moisture also ensures the drier housing remains free from possible rust and corrosion.

The 'DMH-TW' Drier Series have installed Spectroline UV-Dye Wafers in with its desiccant mix. This wafer is pre-charged with highly concentrated UV-dye, requiring no need for oil-based capsule to carry the dye into the system. This is the cleanest and most efficient means on introducing



dyes without compromising on moisture introduction...it is also clean and mess free from the operator installing the dye.

The newly launched DMH Filter Drier Series contains a fibreglass mesh, to safely stop swarf and particulates from circulating around the system, damaging, or blocking components.

The DMH solder variants are manufacturer with 20% more copper, offering more space for the engineer to braze without damaging the drier casing or surrounding copper tubing.

Many solid cores require glue to stick the desiccants together. DMH filters do away with this by installing larger beads which are held in place with a spring. This maximises the desiccants' ability to remove moisture and acid and allows refrigerant to flow freely with our limitation.

The DMH series is available with or without UV-Dye... the choice is up to the user. For those readers interested in how the UV-dye versions work, read below:

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How does it work?

As the free-flowing refrigerant and oil passes over the wafer through the filter drier, the dye is released and is transported by the refrigerant and oil. As the dye circulates around the system it mixes with the host oil, in this example POE-oil. This method on introducing the dye offers the least amount of impact on the oil and reduces moisture from entering the system. Once installed the drier will begin absorb and uptake in moisture. See diagram below.

Dry All components including the new TW filter driers are available from the following stockists:

No stockists listed

Proof is in the testing

We have a limited number of FREE samples on offer across 032S, 032F, 053S, 053F and Replaceable Drier Types. To trial your FREE sample or schedule a FREE onsite consultation. Register by visiting: **https://www.dryall.co.uk**