

Filter Driers & Strainers

Introduction

New refrigerants and synthetic oils (such as POE/PAG) demand a more precise operating environment than ever before. Excessive moisture and contamination levels can quickly lead to a loss of refrigeration capacity, system efficiency or even breakdown.

The Solution?

Trust time-tested Henry Tech Filter Driers & Drier Cores to offer reliable, long lasting protection, for both food service and air conditioning applications, whether it's a new installation, field replacement or retrofit.

The First Line of System Protection

The Filter Drier & Drier Core in a refrigeration or air conditioning system is often referred to as the system protector. It removes harmful elements from the circulating refrigerants and lubricants before serious damage results.

1. Moisture

Moisture or water can come from many sources:

- Improper dehydration of new equipment
- Improper field assembly or poor service procedures
- Refrigerant leaks
- Wet refrigerant
- Wet oil, Poly-ol Ester (POE) which is much more "moisture loving" (Hygroscopic) than mineral oils

Note: If the moisture content of the POE oil is greater than 75 PPM (parts per million), the POE reverts back to its original chemical – an alcohol and an organic acid. Alcohol reduces the Filter Drier's effectiveness with water and acid attacks the refrigeration system's internals.

A leading international compressor manufacturer's experience with Poly-ol Ester Oil is presented in Fig. 1.

The seriousness of POE's hygroscopic nature is depicted as the compressor with its oil, moves its way from manufacture, to rack fabrication, to field installation and finally commissioning.

For the most cost effective method of removing the harmful effects of moisture, simply choose a Henry Tech Filter Drier/Drier Core.

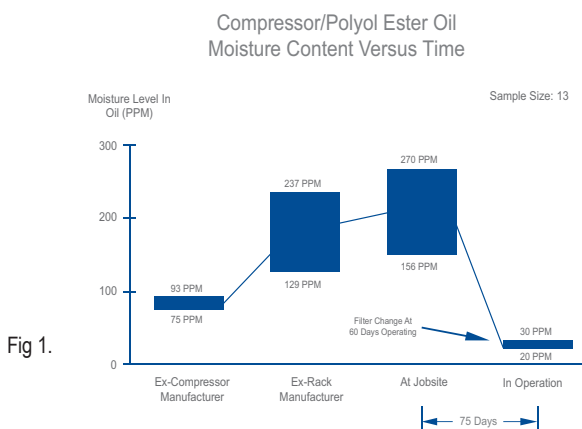


Fig 1.



The Filter Driers & Drier Cores Function

The primary contaminants which Filter Driers & Drier Cores are expected to remove are:

- Moisture
- Acids
- Solid contaminants such as metal filings, flux, dirt, oxides and wax
- Sludges and Varnish

2. Acids

Acids are formed by a combination of refrigerants being heated to elevated temperatures and the presence of high moisture content in the system. This Hydrolysis forms both Hydrochloric and Hydrofluoric (inorganic) acids. Organic acids are also created from the lubricant's breakdown in the presence of moisture. Since acids attack and corrode the metals in a refrigeration system, it is crucial that they be removed as quickly as possible to minimise damage.

It is crucial to be aware of the harmful effects of high discharge or condensing temperatures on refrigeration systems, as they act as the major catalyst in the production of acids. It is good trade practice to replace the Filter Drier or Core whenever a system has operated for extended periods under high operating temperatures.

Henry Tech Filter Driers/Cores have a critical mission, to remove this acid, prolonging the life of compressors and refrigerants.

3. Solid Contaminants

These include dirt, copper oxide scale, sludges, flux, metallic particles etc... Such contaminants can be introduced during manufacture, field assembly or service. They can damage compressor cylinder walls, bearings and cause blockages of capillary tubes or TX Valve strainers. These contaminants create the conditions necessary for the decomposition of the refrigerant/lubricant mixture at high temperatures.

The effective removal of contaminants is difficult due to the wide range of particle sizes that can be encountered in a system.

A refrigeration system demands:

- Thorough flow micron filtration to capture these particles.
- Guaranteed uniform porosity through the entire Filter Drier Core.
- A core shaped to give maximum surface area with negligible pressure drop.
- Improved filtration and long lasting results.

Henry Tech Filter Driers/Cores offer thorough flow filtration with less chance of total core blockage.

4. Sludges and Varnish

Even the cleanest system when subjected to unusually high discharge temperatures will suffer from lubricant breakdown. Sludge, varnish and carbon deposits are some of the by-products of this occurrence. A refrigeration system can feature certain catalytic metals (iron & copper) that can further contribute to the refrigerant/lubricant mixture's breakdown.

Total Filtration Management Solutions

Henry Tech's range of Filter Driers/Drier Cores are manufactured from the desiccants 3A Molecular Sieve, Activated Alumina and Activated Carbon. The most suitable desiccant is chosen for the Filter Drier's intended application and its location within the refrigeration system. Henry Tech's vast experience has resulted in the creation of proprietary mixtures to target the removal of system contaminants before they can do damage and cause breakdowns to the refrigeration system. Designed in conjunction with the Suction Filter Element, Henry Tech delivers total filtration management solutions for the benefit of customers.

3A Molecular Sieve (MS)

Used for maximum moisture removal, the 3A Molecular Sieve traps and removes water molecules from the circulating refrigerant and oil. Tested in accord with ARI 710-86, when installed in the Liquid Line these Filter Driers provide the drying capacity necessary to keep the moisture content of the circulating fluids below 75 parts per million (ppm). This therefore avoids the creation of acids in POE oils.

Henry Tech's 3A Molecular Sieve Filter Driers/Drier Cores are suitable for the traditional refrigerants (including R717) as well as the modern refrigerants including high pressure R410A and CO₂. 3A MS Filter Driers/Drier Cores deliver the most cost effective means of removing the harmful effects of moisture from the refrigeration system.

3A MS and Activated Alumina (AL) mixtures

For high performance moisture, acid and contaminant removal, Henry Tech provides its customers with Filter Drier Cores that contain a mixture of both 3A MS and Activated Alumina. The Activated Alumina chemically attracts acids that may be present in the refrigeration system, locking them away so as to prolong the life of compressors, refrigerants and oils.

Note: High percentage mixes of AL are not recommended for long term use with POE oils, as they can strip the compressor manufacturer's oil additives from the systems lubricant.

3A MS, AL and Activated Carbon (AC) mixtures

Best suited for clean up after burnout and for severely contaminated systems plagued with moisture, acids, sludge/varnish and other contaminant issues. Working in conjunction with the other desiccants present in this type of Filter Drier, the Activated Carbon cleans the operating system of the deposits that contribute to the breakdown of refrigerant and lubricants. When fitted, these Filter Driers/Drier Cores provide the best insurance policy available for any compressor replaced in the field.

Suction Core – 100% Molecular Sieve

Targets moisture & particulate removal from the suction line before these contaminants can reach the compressor. Ideal for commissioning purposes, these replaceable Cores feature a unique design that delivers both low pressure drop, in conjunction with high refrigerant flow rates.

Compressor manufacturers know that motor burnouts can be caused by system contaminants returning down the suction line. Foreign particles including copper oxides, metal and copper pieces enter the compressor and become embedded in the motor windings themselves. As the compressor starts and stops, these windings flex and move. The particles present scrape the insulation of the motor windings leading to motor burnout, system downtime and possible stock losses.

To extend the life span of the compressor, adequate filtration is required before the suction service valve.

Specially designed for such an application, the Suction Filter Element removes returning contaminants down to 10 microns (Filter Beta rating = 10: ISO 4548-12). Its fluted design keeps the collected debris safely embedded in the filter whilst its large surface area keeps pressure drop to a minimum.

Henry Tech Suction Filter Element provides the compressor with the particulate protection it needs to prevent breakdowns caused by a contaminated system.

Note: Good trade practice dictates that the Maximum recommended pressure drop in the Suction Line Filter for commercial refrigeration (R134a) is 10.3 kPa.

