The Kiss of Death

The History of Alcohol To Control Moisture

Back in the early fifties a major appliance manufacturer was looking at ways to cut production costs. A newly hired engineer eager to impress, suggested to substitute the installing of the drier with the addition of \( \frac{1}{4} \) ounce of methyl alcohol. This would save the company $2.50 per refrigerator for a projected annual savings of $2.5 million from the current production of 1 million units per year.

Very simple math, very simple concept, a nice savings in deed, quickly approved by the higher ups without question. The concept was tested on three refrigerators.

Unit #1: contained alcohol without a drier

Unit #2: standard silica gel/molecular sieve drier, no alcohol

Unit #3: standard silica gel/molecular sieve drier, with alcohol

The test period lasted two weeks. No problems were noted.

Production of household refrigerators and chest freezers with alcohol in place of a drier were adopted at the company’s three plants which produced appliances under five brand names.

In the meantime, Unit #3 of trial test was moved into the employees lunch room. Units #1 and 2 were display samples and never plugged back into a wall. After 3 months, Unit #3 went down with a restricted cap tube. The diagnosis for failure was traced to an incompatibility between the alcohol and silica gel. Chemical erosion had pulverized the silica gel into a fine powder which migrated into the system to block the cap tube.

No cause for panic, since the production units did not have driers.

Sales were booming. All the cost reductions (drier elimination being one) adopted by the manufacturer helped undercut the competition. The manufacture picked up two more national chains.

Time will Tell

In a period spanning two-four years, the insurance underwriter for a major compressor manufacturer noticed an increase in charge backs for failed compressors. The insurance company paid a visit to the compressor manufacturer for an audit. The auditors found a high incidence of replacement compressors being issued to our cost cutting appliance manufacturer. The appliance manufacturer acknowledged to the insurers that an increase in compressor failures was expected due to their higher volume, therefore, stronger statistical exposure for warranty repairs. The appliance manufacturer boldly inferred that the compressor manufacturers’ quality had been suspect. After all, the appliance manufacturer just assembles 100s’ of components made by someone else.

Insurance companies may not understand the principles of the Refrigeration: they only knew they were losing money. Lawsuits were filed, experts were called in and our eager engineer was axed. All the details were never made public since the parties settled privately out of court.
What we do know about Alcohol in a Refrigeration Cycle

The function is very simple, alcohol lowers the freezing point of water preventing system moisture from forming ice at the expansion device. Alcohol does not remove moisture or convert moisture as some would like you to believe. Alcohol is merely an antifreeze.

The damage caused by alcohol in the system may take some time. I remember reading an advertisement calling the liquid dehydrants "still the quickest fix around". There is a poisonous mushroom when ingested is very tasty but will cause vomiting the next day, the vomiting stops, you feel great for about two weeks, then you just drop dead from liver failure.

This is similar to what happens when you inject alcohol into a system. First, the alcohol acts as an antifreeze stopping moisture blockage. Next, any moisture in the drier is sucked out by the alcohol circulating in the refrigerant-oil stream. The hungry drier slowly starts to trap alcohol and reject all water adsorption. (molecular sieve has a great affinity for alcohol). The interchange of moisture for alcohol in the drier core may take many months. Often, but not always, the system may experience a second bout of moisture blockage. Of course that just means we did not add enough alcohol the first time, so the uninformed technician may dose the system with another shot of gin. With plenty of free water now circulating in the system damage to the compressor is imminent.

**Shake your Money Maker**

I call alcohol "the kiss of death", but I recall one time it made the rent. On one of my first service calls as an apprentice working with a journeyman (the owner), we were on an A/C repair for a new customer. We fix this guys A/C and the customer got pissed at the amount of the bill. My boss offered to do a little maintenance on his three other units for free if the guy would cut a check today. The customer agreed. I went back up on the roof with my boss expecting to do some serious work. Instead he pulled out a bottle of the infamous liquid dehydrant and filled it into two 10-ton systems. It must have been about six months or so later, we were back with a crane pulling out one of the 10-ton compressors. The compressor job came at a good time, business was slow and I really needed the money.

Now don’t get any greedy ideas. Short term profits can turn into long term losses. My ex-boss mislaid customer confidence, and today resides in a pathetic trailer park outside of Tucson.

**Still a Big Seller**

You have to wonder why this trash can still be found on every wholesalers shelf. With the volume of damaging evidence gathered over 40 years, it’s just as difficult to answer as why so many of us still smoke cigarettes.

You will not find alcohol (liquid dehydrants) in the product line of the more reputable chemical manufactures/distributors. It is only bottled by those lower on the food chain. No OEM has every endorsed or approved the use of alcohol. Instead, OEM’s advise against their use and will void any warranty coverage.

The purveyors of the product state they have studies from independent laboratories supporting their claims of “safe and effective”. They have refused to identify the labs or provide copies of any research. The only test results they have shared are those from their own testing departments. In house testing by their very nature, must be taken with a rather large grain of salt.
The Point is Compelling

Our industry has no consumer protection. This is why any crack pot with a wonder chemical or add-on energy saving device can prosper. In a story of this nature, the voice of knowledgeable experts in the field are not easy to find. I invite your responses.