SPECTRONICS CORPORATION
956 Brush Hollow Road, P.O. Box 483
Westbury, New York 11590
Tel: 800-274-8888 • Fax: 800-491-6868
Outside U.S. and Canada
Tel: 516-333-4840 • Fax: 516-333-4859
www.spectroline.com

TECHNICAL BULLETIN #190

TREATING ACID BUILDUP IN AC&R SYSTEMS

Acid buildup is an age-old problem for air conditioning and refrigeration systems. Acids can form from a myriad of conditions. Two prominent ones are elevated system temperatures or when moisture accumulates in a system and chemically reacts with the lubricant and various metals. Acid formation is cumulative. Without taking the necessary steps, it builds up in a system, leading to insulation breakdown, arcing and eventual burnout of the compressor windings.

Addressing Acid Problems

One of the ways to address acid buildup is through adsorption. Adsorption is a process whereby acid molecules are held on the surface of a solid by electro-chemical attraction. A system's filter-dryer is an example of the adsorption process at work. Adsorption is very safe to an AC&R system because there is no chemical reaction that can lead to the formation of harmful or caustic by-products. One important drawback to adsorption, however, is that it takes time before it can completely purge the system of acid.

Another method used in the war on acid buildup is the chemical neutralizer. Most neutralizers rely on special base chemicals that react with the acid in a system to produce supposedly harmless by-products of salts and water. However, using chemical neutralizers in AC&R systems isn't without controversy because some base chemicals used to neutralize the acid can, in and of themselves, be corrosive to system components. The same problem applies to the solid salt precipitate that results from the combining of the base chemical with the acid in the system.

To be effective, chemical neutralizers require precise dosing. If not enough is used, the acid won't be totally eliminated. If too much is used, a caustic residue remains behind that can do damage to components. Without knowing the precise amount of acid in a system, it's virtually impossible to determine the right dose of neutralizer to add.

ACID-BUSTER™: A Different Approach to Acid Buildup

Spectroline® ACID-BUSTER™ acid scavenging solution works much differently than common chemical neutralizers. In fact, it doesn't neutralize acids at all. Rather, it chemically bonds with the acid in a system and keeps it in suspension until it can be adsorbed by the filter-dryer. This "scavenging" effect is very efficient and leaves behind no harmful residues that can cause component damage.

Advantages of ACID-BUSTER™

ACID-BUSTER™ is highly concentrated—a little goes a long way. It's also extremely versatile, working with all common refrigerants and lubricants, including mineral oil, polyol ester and alkyl benzene. It's easily and cleanly dosed into a system using prefilled, graduated cartridges and cost-effective injectors. Perhaps most importantly, ACID-BUSTER™ is benign to metal components and can remain safely in the system indefinitely.

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