

## **FOR IMMEDIATE RELEASE**

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## **Mainstream's QwikShot® Acid Flush The Only One Approved for the Army Medical Cryocooler**

*Rockledge, FL* (May 2003) – Liquefaction of medical oxygen requires cooling to more than 300° F below zero and this has proven quite a challenge for forward-deployed medical bases. However, Mainstream Engineering Corporation has successfully demonstrated an innovative multi-stage autocascade refrigeration system that interfaces with a unique oxygen production system, to liquefy gaseous oxygen. The liquid oxygen is used aboard medical air transports, where there is insufficient room to store cylinders of compressed oxygen. This unique Army Medical Cryocooler is designed for maintenance-free cryogenic cooling even in some of the warmest parts of the world. However, because it is a high-pressure-ratio autocascade vapor compression system operating with a blend of HFC refrigerants and using POE oil, it is an ideal candidate for acid formation and compressor burn-out. Further complicating the problem is that the typical operating location is a desert of very fine powdery sand, which can easily clog a condenser coil. A preventative maintenance program designed to keep these units running needed to be developed, with acid treatment as a critical component.

QwikShot® Acid Flush™ was selected as the only approved acid treatment for the removal of unwanted acid from operating units, and the only acid treatment to be used after a compressor change-out. According to chemical engineer Larry Grzyll; “The choice was easy, QwikShot Acid Flush is the only acid treatment that does not neutralizes the acid.... That means no residues, no contaminates, and no dosage problems... it's a no brainer.”

QwikShot Acid Flush is guaranteed not to void any compressor warrantee. Complete details about QwikShot Acid Flush, including performance test results and the Limited Warrantee, are available on the QwikProducts web site at [www.qwik.com](http://www.qwik.com).

Test data reported on the web site includes a comparison of two identical new R-22 systems with new filter-driers. Both systems were purposely charged with an initial acidity value of 133 Parts Per Million Acid (PPM) and QwikShot Acid Flush was introduced into only one system.

The system without QwikShot was operated continuously for 32 hours and the acidity dropped 45% to 73 PPM. While this may sound great, since the filter-drier is clearly removing the acid, the bad news is that the compressor burned out after 32 hours. However, if we could speed the acid removal, we could avoid compressor burn out.

The second system containing the QwikShot Acid Flush was operated for more than 32 hours without a failure. After 20 minutes of operating, the compressor oil (containing QwikShot) was tested for acid and it was determined that 100% of the acid was removed from the oil. (Without the addition of QwikShot, the acid level only dropped 45% in 32 hours.) Tests on this second system have also shown that more than 60% of the QwikShot was removed from the oil in less than six minutes. Of course, the exact rate at which QwikShot is adsorbed in the filter-drier depends on the system flow rate and drier type. In general, however all of the QwikShot is normally removed in less than 20 minutes of operation in a typical system. Experiment discussed on the Web site using HFC's, like R-134a, displayed similar results

The patented QwikShot® Acid Flush™ removes the acid without any of the problems associated with neutralization. Conversely, neutralization acid treatments leave a residue of some kind--a basic law of chemical reactions--and can therefore cause serious problems in an A/C or refrigeration system. The Army Medical Cryocooler designers look to minimize risk and improve reliability whenever possible, choosing QwikShot Acid Flush, and only QwikShot, for this application was a simple decision.

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