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# ASG Launches MROpen EVO $MgB_2$ MRI Scanner

ASG Superconductors USA, Inc., recently showcased its new magnesium diboride ($MgB_2$) MRI scanner, MROpen EVO, the latest version of the company's cryogen free MRI system. While ASG has offered an $MgB_2$ MRI system over the last decade, this new system offers a number of enhancements, including improved operating software, a new digital spectrometer, new coils and new sequences, plus the latest version of the company's helium free MRI system.

ASG's $MgB_2$ MRI is the only such system on the market. According to ASG Superconductors USA general manager Marco Belardinelli, ASG's scanner sells at a similar price point as the more common superconducting niobium scanners, but thanks to its 'cryogen-free' technology, the operation is safer and the end user does not have to worry about shortages and the increasing cost of liquid helium.

## Superconductivity Reached at 20 K Instead of 4 K.

With ASG's system, the two magnet coils are isolated in two vacuum chambers and connected to two cold heads that take the heat out of the magnet, transferring it to the compressors installed in the electronic room. With $MgB_2$ technology superconductivity is reached at 20 K, compared to 4 K for conventional systems.

This difference in temperature not only increases stability, almost eliminating the risk of magnet quenching, but also reduces the amount of energy needed to keep the magnet cool. Furthermore, in contrast to traditional superconducting scanners, ASG's technology allows the magnetic field to be turned on and off in less than an hour. This allows for better patient safety, and increased flexibility for magnet maintenance and daily operations.

Unlike conventional MRIs, ASG's system is open on top, in front and behind, so that a patient is not confined within a tight space. ASG claims that, since its MRI scans can be performed in a variety of positions - such as standing, sitting, bending or lying down - the system is better able to diagnose certain pathologies.

## Market Acceptance Higher as Helium Prices Rise

Belardinelli noted that the market acceptance of an $MgB_2$ MRI scanner has evolved in recent years. Four to five years ago, there was much greater stickiness with traditional niobium MRIs.

Nowadays, Belardinelli said, there is a much greater awareness of helium shortages and rising

prices, which are pushing the whole MRI industry to look for alternative solutions to this strategic natural resource. This is a trend worldwide and in particular in the U.S., where it was confirmed at the 2019 meeting of the Radiological Society of North America (RSNA).

ASG completed three new installations of its scanners in the U.S. and Canada in 2019 and already has an additional installation scheduled in 2020. Two of these sales were at American Health Imaging (AHI) facilities in Georgia and Texas while the third-one was in Edmonton at the Cross Cancer Institute of the University of Alberta where ASG technology has been combined with a linear accelerator to provide radiotherapy guided by magnetic resonance. The company has also installed its MRI scanners in Italy, the UK, Kuwait and Dubai.

ASG introduced its first cryogen-free superconducting $MgB_2$ system in the U.S. in 2012 via the company's U.S. subsidiary Paramed Medical Systems Inc., which had been active in North America since 2007. In December, Paramed was rebranded as ASG Superconductors USA in an effort to strengthen the link between the U.S. market and the Italian parent company. ❍

## CFS and Brookhaven Awarded INFUSE Grant for Quench Detection

Fusion development start-up Commonwealth Fusion Systems (CFS) and the Brookhaven National Lab have been awarded a $200,000 grant through the U.S. Department of Energy's (USDOE) new Innovation Network for Fusion Energy (INFUSE) program to develop superconducting power cables and test their ability to withstand quenches in a project, entitled "Superconducting Cable Quench Detection". CFS is using HTS cables to create high-strength magnetic fields in its SPARC tokamak-based power reactor. If successful, SPARC, which is being built in collaboration with the MIT Plasma Science and Fusion Center, would be the first controlled device to achieve a net energy gain from fusion, thereby validating the potential of high-field devices built with superconducting technology.

Quench detection and remediation technologies are crucial for protecting HTS power cables from overheating. Quenching occurs when a superconductor suddenly stops conducting electricity without any resistance or enenergy loss.

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Publisher: Douglas Neumann

Executive Editor: Douglas Neumann
Contributing Writer: Klaus Neumann

Editorial Contact: editor@superconductorweek.com

Customer Service: service@superconductorweek.com
tel +1-302-245-1815

*Superconductor Week*
1606 44th St. NW
Washington, DC 20007 USA

www.superconductorweek.com/cms