MATERION

CASE STUDY

IMPROVING CLARITY OF MEDICAL IMAGING WITH PURE BERYLLIUM

Materion's Pure Beryllium Products are Advancing Medical Imaging Equipment

PROFILE

Varex Imaging Corporation is the world's largest independent supplier of medical X-ray tubes and image processing solutions.

CHALLENGE

Over the course of more than three decades, Varex Imaging Corp. has worked with its customers to create x-ray imaging machines that have helped doctors detect and treat early forms of cancer and other diseases in hundreds of thousands of people. The Salt Lake City-based company's contributions have been so significant to the cause, in fact, that in 2015 it was recognized by one of its largest customers for supplying x-ray tubes for more than 30,000 imaging machines. It's a statistic that Gary Okamoto, Varex's senior sales and marketing manager, South Asia, says the entire company is very proud of.

At the same time, Okamoto explains that the millions of imaging scans for so many cancer patients wouldn't have happened if not for one, highly pure metal incorporated into the x-ray tubes Varex supplies – beryllium.

One of the world's premier independent suppliers of x-ray tubes and digital image detectors, Varex provides original equipment and replacement components to imaging system manufacturers such as GE, Hitachi, Philips, Shimadzu, Siemens and Toshiba. In all, it produces more than 400 different types of medical and industrial x-ray tubes, each designed to meet highly specialized imaging needs.

Founded in 1948, Varex first began manufacturing x-ray tubes in 1970. At the time, x-ray tubes were manufactured using glass and copper. Copper was a useful material because of the high power that it facilitated, Okamoto said, but it also attenuated, or reduced the effectiveness of, the x-ray and resulted in relatively poor image quality.

"If you had a large patient, the image contrast would be especially poor because the copper material was absorbing too much of the x-ray," Okamoto said.

Varex needed to find a material durable enough to stand up to the high temperatures of x-ray tubes while producing clear images.

SOLUTION

In 1985, Varex switched from copper to beryllium for its x-ray tubes. Ultimately, Okamoto said, it was beryllium's many qualities – high transmissivity to x-rays, a high melting point, high thermal conductivity and low electrical resistivity – that made the switch happen.

But choosing the right metal solved only some of the issues. Varex still needed a beryllium supplier that could ensure uniform and pure levels of beryllium, especially as its clients worked to build increasingly more powerful imaging equipment.

"If you have any occlusion in the beryllium, it can show up in the x-ray and give off a false image," Okamoto said. "The radiologist could then tell a patient that they have a tumor when they don't."

High grade, 99.8 percent pure beryllium is necessary for ensuring that x-rays penetrating a beryllium port window are not attenuated in a manner that could cause artificial imaging during patient scans, Okamoto said.

To solve the problem, Varex turned to Materion, for its supply of beryllium and x-ray window assemblies. The two companies worked together to design and build components critical to the CT scan machines, Okamoto said.

"Varex engineers would design the x-ray windows and Materion would make it happen," Okamoto said.

To ensure high quality, Varex tests all of its materials, including beryllium, to ensure that it meets the standards set by its customers. Year-in and year-out, Okamoto said Materion Electrofusion has always met Varex's stringent requirements, from 98.5 percent pure PS-200® beryllium, to 99 percent pure PF- 60® beryllium to 99.8 percent pure IF-1® beryllium.

As imaging equipment evolves and the demands for higher power scans in a shorter amount of time increase, Okamoto said Varex will continue to look to Materion to help it meet the demands of the market.

To learn more about how Materion can help you advance your company's imaging products, talk with our team about ways to improve your imaging components.

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