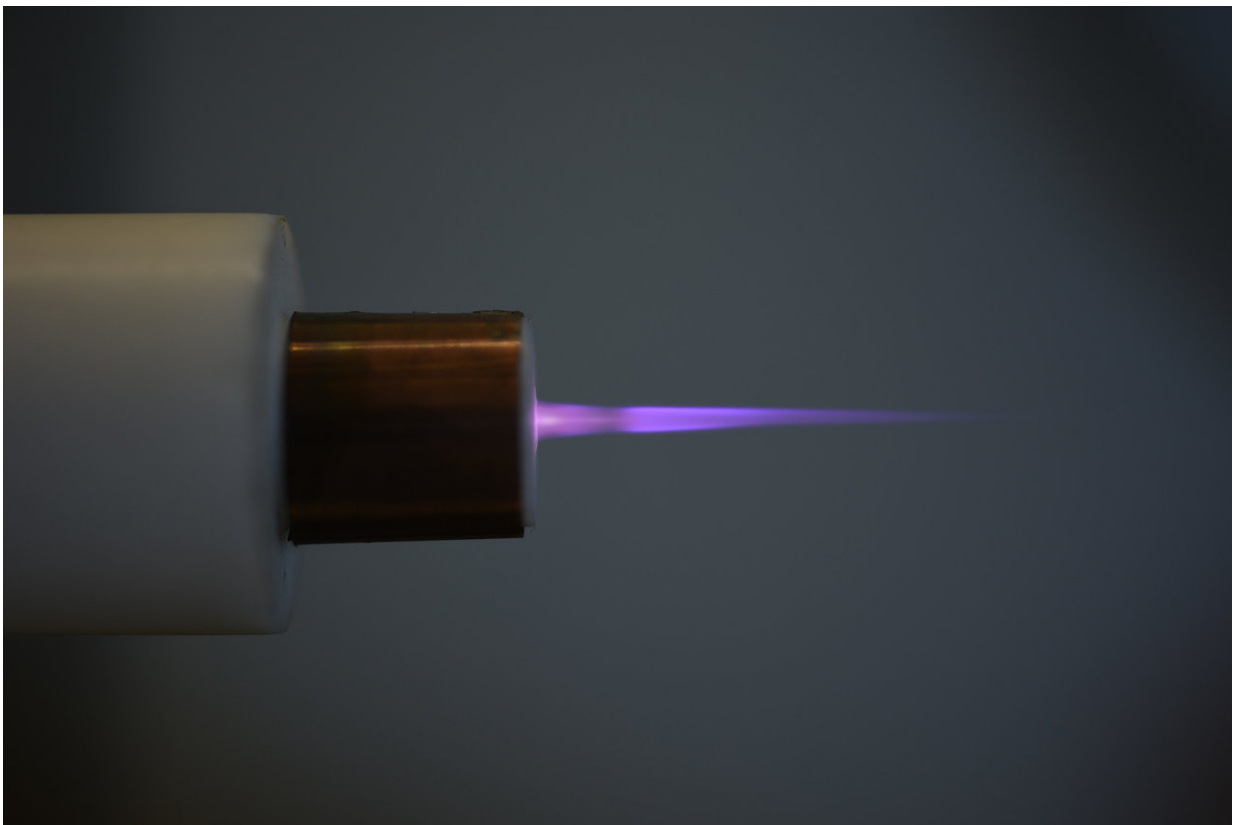


DC voltage cold plasma technology for a safer, more cost-effective approach to sterilize medical tools

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Purdue researchers have developed a new device that generates cold plasma and could transform how medical tools are sterilized. Credit: Purdue University

Purdue University researchers have developed a new device that uses

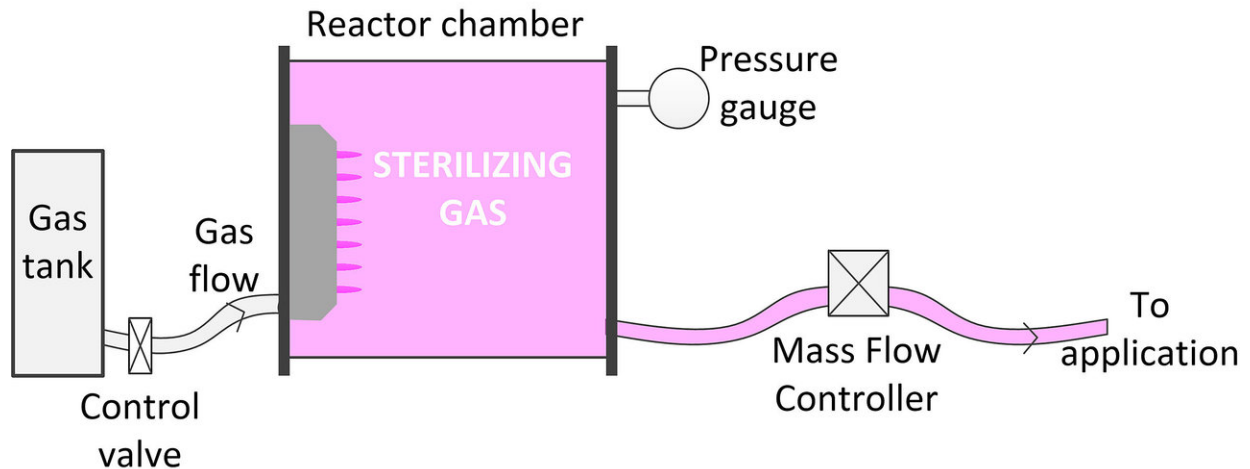
cold plasma technology that could transform how medical tools are sterilized.

The device generates cold [plasma](#), which has high potential to be used in the fields of sterilization and disinfection, through pure direct current high [voltage](#) instead of the conventional radio frequency or pulsed DC power.

"We use high-voltage DC [technology](#) to create bursts of plasma to sterilize medical tools or devices," said Alexey Shashurin, an assistant professor in Purdue's School of Aeronautics and Astronautics, who developed the device along with his graduate student, Xingxing Wang. "This interesting and unique approach is much safer and more cost-effective than radio frequency voltage or pulsed DC power methods to generate cold plasmas."

The RF voltage or pulsed DC power methods cause electromagnetic interference (EMI), which leads to problems with some medical monitors and devices, and puts patients at risk. Conversely, the DC voltage cold plasma device simplifies creation of electrically safe system.

"Our cold plasma technology offers a much simpler and cost-effective system compared to e-beams or gamma radiation sterilization systems," Wang said. "We are also using room temperature sterilization instead of the traditional high-temperature approach, which requires more equipment and setup. Some medical tools, such as those involving plastic pieces, cannot go through high-temperature sterilization processes. Also, DC cold plasma technology provides a more economic approach by using air as a sterilization agent instead of chemicals."



Purdue researchers have developed a method to use DC voltage cold plasma technology to produce a sterilizing gas for medical device packaging. Credit: Purdue University

In addition to creating a cold plasma reactor, the researchers have developed a method to use the DC voltage [cold plasma](#) technology to produce a sterilizing gas. The gas could then be used in creating less expensive sterile packaging for medical devices, a \$21 billion industry in 2016.

"This [device](#) is a disruptive technology and may cause a paradigm shift in the field of sterilization," Shashurin said. "The combination of being chemical-free, low temperature, simple and safe makes this a game changer in the medical tool [sterilization](#) community."

The Purdue team is also looking at other potential applications for the technology, including the germination power of plants in the agricultural industry; preventing bacteria in the food packaging industry; and cleaning surfaces in the manufacturing industry.

Provided by Purdue University

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