

# Plasma-In-A-Bag Offers New Sterilization Approach

The practice of sterilizing medical tools and devices, and the resulting reduction in surgery-related infections, helped revolutionize health care in the 19th century. Through the years, numerous sterilization techniques have been developed, but the old mainstay remains the 130-year-old autoclave.

However, Norbert Koster and his colleagues at TNO Science and Industry, an independent research organization in the Netherlands, are developing a new way to sterilize medical devices by sealing them inside plastic bags and then using electromagnetic fields to create plasmas -- partially ionized gasses that contain free electrons and reactive ions.

Scientists have known for a long time that plasmas have the ability to kill bacteria and sterilize objects, but the major problem has always been that plasma-sterilized objects still had to be packed into a sealed container afterwards. There was no way to sterilize them inside sealed containers.

Now, Koster and his colleagues have developed a way to sterilize medical tools by sealing them inside vacuum bags and then placing them in chambers that are at even lower pressure. This causes the vacuum pack around the tools to puff out. Then they use an electromagnetic field to remotely ignite a plasma inside the bag, killing any bacteria and viruses. When the process is finished and the bag is removed from the chamber, the outside pressure causes it to shrink down again to closely wrap the now sterilized objects, keeping them sealed.

At the moment, Koster and his colleagues are investigating how long the discharge needs to be to destroy all the bacteria and viruses. This technique is not likely to replace the traditional autoclave any time soon, but it opens up the possibility of sterilizing new types of instruments, including devices like detectors and other fancy electronics that would otherwise be damaged by traditional steam and heat methods.

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