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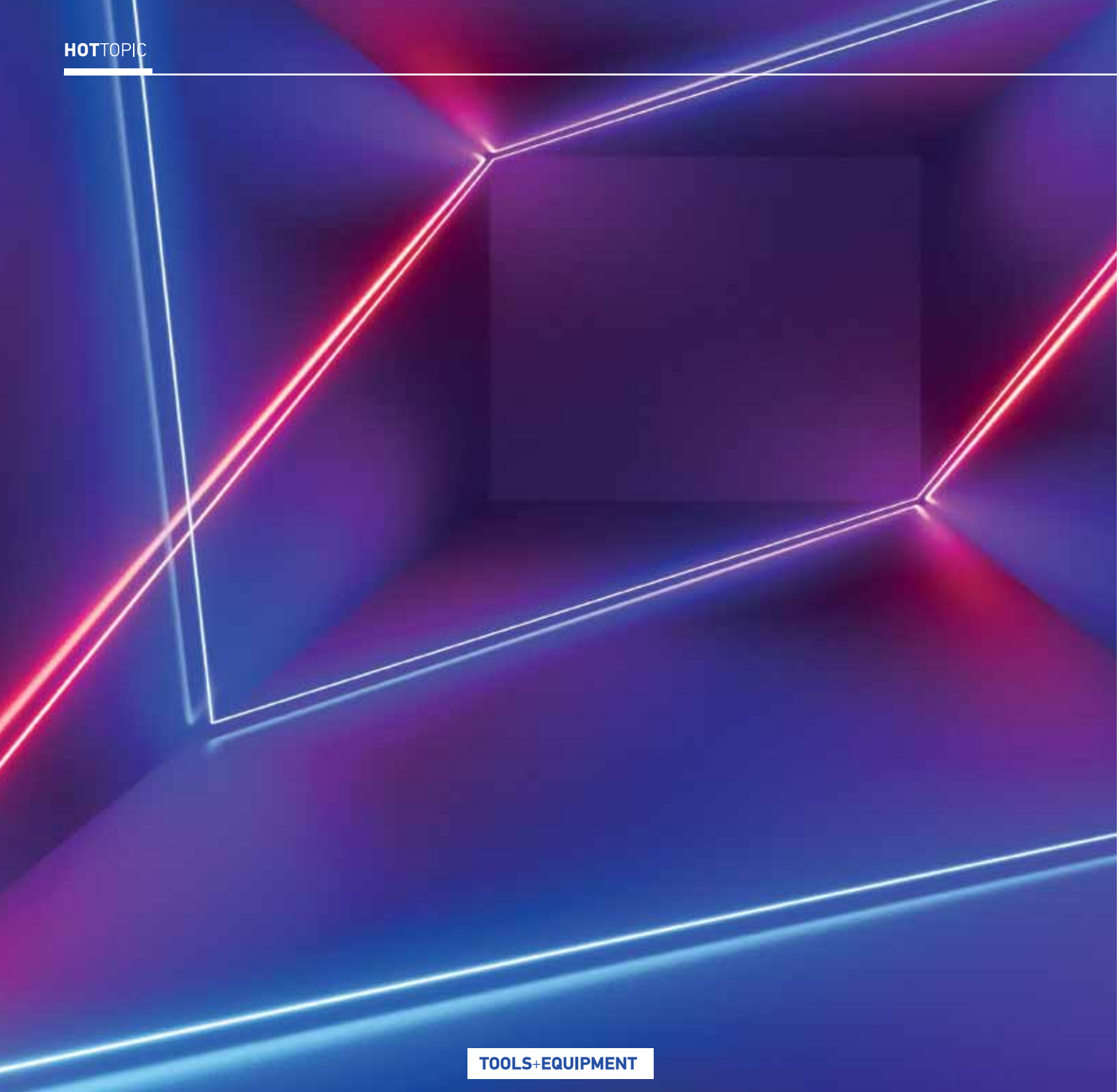

TOOLS+EQUIPMENT

Clean laser tech

the latest hot topic

Laser systems remove grease, residue, contaminants, corrosion, and existing coatings from metal surfaces quickly, with less preparation and mess than traditional processes.

> “Laser cleaning is as fast at removing old coatings as other methods, but without the mess”

In vehicle remanufacturing, core products such as engines must be returned to essentially new condition in both quality and performance through a controlled, reproducible, sustainable process. The process typically involves disassembly, inspection, and replacing unsalvageable parts. In the remanufacturing process, removing grease, residue, contaminants, corrosion, and old coatings before applying a new coating is often important to assure proper adhesion. By ensuring the items are cleaned down to bare metal, remanufacturers and repair shops can avoid costly warranty issues that otherwise result when corrosion and contaminants cause performance issues and coatings peel, flake, bubble, or fail prematurely.

Unfortunately, the traditional processes used for this purpose – such as sandblasting, dry ice blasting, and chemical stripping – are messy and require expensive consumables, as well as substantial time for preparation and clean-up.

A more effective alternative coming to the fore in the US market utilises industrial-grade, precision laser-based systems that can remove residues, contaminants, paint, and rust with a high-energy laser beam that leaves the substrate unaffected. Preparation and clean-up time are minimal, and the low-maintenance equipment can last decades.

According to Vincent Galiardi, owner of Galiardi Laser Clean, a surface cleaning operator based in Missouri, many people are surprised to learn that clean technology lasers are a cost-effective, efficient, and safe method of vehicle part surface preparation.

“Many people are unfamiliar with the use of lasers to pre-treat metal surfaces,” said Galiardi. “When I do a demonstration, at first the people in attendance are sceptical, but after I use the laser to treat a small area, everyone starts getting excited. By the end, when I let them try the equipment, everyone is saying how great the laser works.”

Laser systems can be integrated into automated inline processing lines, or salvage and bodyshop technicians can use mobile handheld units. With significant advantages in safety and efficiency, laser cleaning could be poised to disrupt the surface pre-treatment market, especially for vehicle remanufacturers.

Resolving cleaning limitations

In vehicle remanufacturing and body repair, sandblasting, dry-ice blasting, or chemical stripping are traditionally used as industrial cleaning processes to pre-treat metal surfaces, but they have various limitations.

- **Sandblasting** – Abrasive sandblasting involves forcefully projecting a stream of abrasive particles on to a surface, usually with compressed air or steam. The silica sand used in abrasive blasting typically fractures into fine particles and becomes airborne, which can cause serious respiratory disease. Sandblasting is also time-consuming to clean up since the sand essentially scatters everywhere, even though it is usually considered a “fast” cleaning method.
- **Dry-ice blasting** – With dry-ice blasting, dry-ice pellets are used as the abrasive. The challenge is that dry-ice blasting is often not abrasive enough to sufficiently remove paint or corrosion from the surface of metals. Since dry ice is an expensive consumable, the costs can escalate when cleaning metal surfaces in higher volumes.
- **Chemical stripping** – With chemical stripping, harsh, even toxic chemicals are used to strip metal-based objects of paint and other coatings, rust, and other contaminants to bare metal. However, for operators, exposure to corrosive acids and noxious chemical fumes can be dangerous. The process can also be time-consuming to prepare the proper chemical bath, achieve the required level of cleaning, and dispose of the waste.

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Laser Photonics provides systems which function as mobile standalone units or can be integrated into vehicle remanufacturing production lines.

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Effective laser cleaning

Laser-based systems have significant advantages over these traditional methods, including ease-of-use in which an operator simply points and clicks a high-energy laser beam at the surface. The substrate is not affected by the laser, and the systems do not create any mess or by-products. The approach is eco-friendly, energy-efficient, and completes the job in half the time of traditional methods when preparation and clean-up are considered.

"In our experience, laser cleaning is as fast at removing rust or old coatings as other methods, but without the same amount of clean-up," said Galiardi. "When we treat a surface with lasers, any fumes or dislodged particulate is extracted into a HEPA filter and the job is done. There is no media [sand, dry ice, chemicals] to replenish or clean up."

Galiardi uses laser systems made by Florida-based Laser Photonics, a leading provider of patented industrial grade CleanTech laser systems for cleaning and surface conditioning. The American-made systems function either as mobile standalone units or can be integrated into production lines.

The laser systems are available in portable and stationary models ranging from 0.05 kW to 3 kW (a 4 kW version is in development) with chamber sizes from 90cm x 90cm in size to 180cm x 360cm. The systems can also be installed in remanufacturing lines in cabinets or operated by a robotic arm.

Galiardi said that with clean laser technology there is now an environmentally friendly alternative to abrasive blasting and chemical stripping for surface pre-treatment. The approach is safer for operators and highly adaptable to a wide range of vehicle remanufacturing and part and body repair applications.

"As people become more aware of laser-based systems and compare them to traditional methods, they need to factor in prep and clean-up time, which can significantly impact project cost. When the improved operator safety, equipment longevity, and lower maintenance of laser systems are also considered, the clean laser technology has a much higher ROI," he said.

"CleanTech laser systems can last for 50,000 to 100,000 hours. That's many decades working eight-hour days. After purchase, there's virtually no maintenance necessary," Galiardi added.

Laser cleaning systems remove corrosion, grease, residue and existing coatings from automotive metal surfaces.