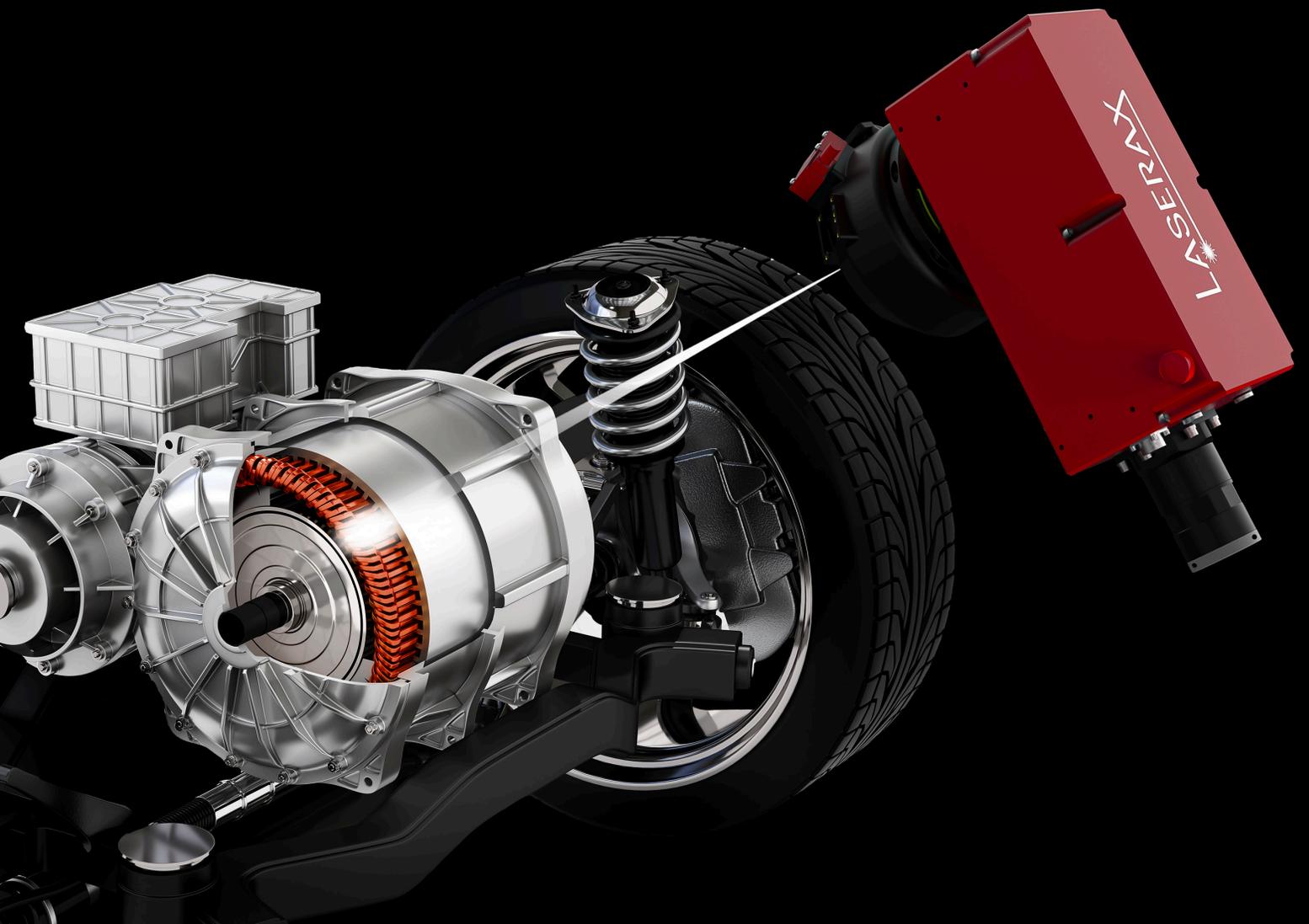




# INDUSTRIAL LASER SOLUTIONS

FOR ELECTRIC MOTOR MANUFACTURING



Laser technology is quickly becoming a standard in the EV industry, as electric motor manufacturers need to scale up production, lower their environmental impact, and consistently produce high-quality parts.

Parts like stators, hairpins, rotors, and a range of castings are already manufactured using lasers. Whether it's for laser cleaning, texturing or marking, Laserax has developed a range of laser solutions specifically for electric motor manufacturers.

## LASER PROCESSES FOR ELECTRIC MOTOR MANUFACTURING

### GASKETING/BONDING SURFACE PREPARATION

Laser surface preparation allows manufacturers to achieve optimal surface conditions before applying adhesives, sealants, or coatings.

Laserax's cleaning and texturing technology removes contaminants and modifies the part's surface roughness if required for a stronger and more durable bonding process. Laser surface preparation also introduces a layer of oxides that is beneficial for bonding in addition to the surface roughness that promotes adhesion.



### EPOXY REMOVAL OF STATOR CONNECTOR TABS

Once EV stator are coated with epoxy, laser cleaning can be used to remove the coating from the connector tabs to get clean copper surfaces prior to welding the connectors to other parts of the e-motor. Using laser for this task eliminates the need for manual masking operations.

This process is often performed with the laser head mounted on an industrial robot arm. An extraction nozzle is installed on the robot arm to capture dust and fumes at the source. It is essential to prevent contaminating surfaces or damaging connections and electronic components.



### ROTOR SURFACE PREPARATION AND MARKING

The rotor's shaft can be cleaned with a laser before it is press fitted into the rotor's core. This process removes oil, dust, or any contaminants remaining from its manufacturing.

Laser marking can be used to mark rotor laminations and squirrel cages while their surface temperature is extremely high, such as after the casting process or a heat treatment. At high temperatures, the laser marking of metals like steel and aluminum is faster than usual, as lower energy levels are needed to etch the preheated surface.



## HIGH SPEED MARKING OF CRITICAL PARTS

When laser marking is integrated directly in the production line, the laser process and automation features need to be fast to prevent bottlenecks.

Laserax offers the fastest marking solutions in the industry. Our laser markers also outperform competitor's lasers by their ability to mark parts while the surface temperature is extremely high.

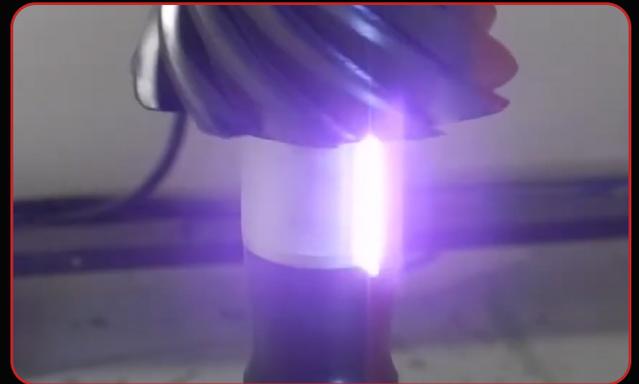
Laserax has also developed a unique laser process to mark 2D codes that remain readable after processes such as shotblasting and e-coating.



## PINIONS PHOSPHATE & E-COATING REMOVAL

E-coating needs to be removed from several areas of a driveshaft before assembly. Instead of masking the assembly areas prior to e-coating, a fiber laser is used to remove the coating from localized areas. The laser process is precise and consistent, and the resulting cleaning quality is perfect.

Phosphate coating needs to be removed from pinions and ring gears to improve mechanical properties before the assembly. The process leaves the metal underneath unaffected and helps create a stronger assembly.

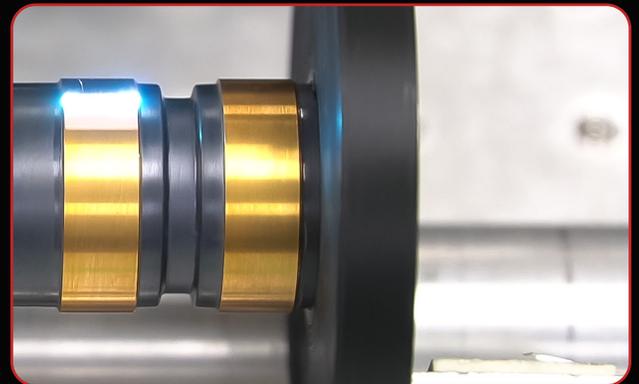


## SLIP RING OXIDE REMOVAL

Laser can remove oxides from slip rings. It ensures that no contaminants remain on the surface.

Since most slip rings are made of copper, laser cleaning is typically used to remove copper oxides, but other types of oxides can be removed as well if a different type of metal is used.

As a result of laser oxide removal, current transfer is optimal between slip rings and brushes. This increases the performance and lifespan of the Electrically Excited Synchronous Motor (EESM).



## OUR CUSTOMERS



BORGWARNER

STELLANTIS

LASER MARKING

LASER CLEANING

LASER TEXTURING

LASER WELDING

## LASER SERVICES



### FEASIBILITY STUDIES

Laserax perform preliminary tests to validate feasibility and demonstrate the laser's capabilities before developing a laser process. We then send a full report with our recommendations.



### LASER PROCESS DEVELOPMENT

Laserax develops the laser configuration to meet your process requirements. This includes choosing the right laser, optical components, parameters, part handling systems and fume management.



### BATCH PROCESSING & PROTOTYPING

Manufacturers looking to explore the benefits of laser and validate whether it works in their manufacturing process can use our batch processing service for prototyping, preproduction or while waiting for a laser machine order.

## RECOMMENDED LASER SOLUTIONS



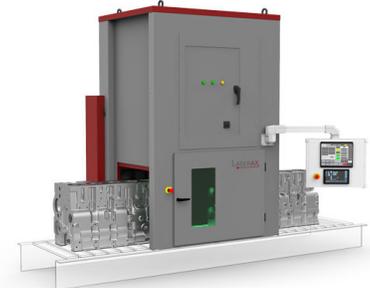
### ROTARY WORKSTATION

The rotary workstation is the most efficient of all manual loading laser solutions. It is the ideal choice when only a short cycle time is available for laser treatments. It achieves high production throughput with a dual-position indexer, enabling simultaneous processing and part loading.



### ROBOT CELL

The robot cell combines the precision of laser technology with the dexterity of robotics. It can be used to clean, texture, and even mark surfaces. With its long reach and multi-axis movement, the robot arm moves the laser head and adjusts the angle as needed for the application.



### CONVEYOR MACHINE

The conveyor machine is designed to process parts and apply permanent, high-definition labels on them. Parts can either be treated as they move on the conveyor (on-the-fly) or while another process such as weighting or quality control is being conducted.



laserax.com

**INDUSTRIAL LASER  
SOLUTIONS FOR ELECTRIC  
MOTOR MANUFACTURING**

#### LASERAX HEADQUARTERS

101-2811 Watt Ave  
Quebec, QC G1X 4S8  
Canada  
+1 418 780-7324

#### LASERAX USA

41210 Bridge St  
Novi MI 48375  
United States  
Phone: +1 330 331-6607  
Toll-Free: +1 888 427-2024

#### LASERAX GmbH

Im Kleinfeld 17  
79189 Bad Krozingen  
Germany  
+49 (0)7633-836-4935



ISO 9001:2015 & ISO 14 001:2015