Press Release

Fraunhofer ILT and Etxetar: expanding industrial applications for LMD and EHLA

Regulatory pressure, high-value repair and the need for scalable industrial solutions are pushing laser-based manufacturing processes into new territory. Fraunhofer ILT and Etxetar are responding by expanding the industrial reach of laser metal deposition (LMD) and extreme high-speed laser material deposition (EHLA). Under a memorandum of understanding, the two partners are combining process expertise, industrial engineering and application know-how to address growing demands in aviation, coating and beyond.

Etxetar brings more to this partnership than machine-building expertise. The Spanish company positions itself as an engineering partner for high-value industrial solutions, combining machine-tool know-how with a strong application focus. This translates into concrete work on turbine blades, blisk repair, railway axles and gear components, alongside proprietary process strategies, software-supported process monitoring and industrial process integration. That depth matters: Etxetar brings the technical understanding needed for a true development partnership, creating a strong basis for jointly exploring how LMD and EHLA can address specific industrial requirements and new market opportunities.

Fraunhofer ILT brings in-depth process expertise in LMD and EHLA, both to advance these technologies in line with industrial requirements and to translate process knowledge into scalable system designs. This includes extensive know-how in digital process optimization, for example in capturing component geometries during coating, detecting deviations from target contours and automatically adjusting process parameters such as feed rate. These capabilities become especially valuable when established processes are adapted for new applications and tighter industrial requirements.

Regulation is creating new momentum

One driver behind the growing momentum for these technologies is regulation. Europe's Euro 7 framework has expanded its scope beyond exhaust emissions to include non-exhaust sources such as brake particle emissions, significantly shifting the market environment for coating and surface technologies. For manufacturers of brake discs and other wear-intensive components, the pressure to find robust and scalable alternatives is mounting, and Etxetar has already positioned EHLA-based solutions in this context.

"Euro 7 is creating a demand for scalable coating solutions – and that pressure will not stay limited to Europe. We expect similar requirements to emerge in other major markets," says Dr. Thomas Schopphoven, Head of department Laser Material Deposition at Fraunhofer ILT.

From Fraunhofer ILT's perspective, once legislation creates a clear technical need, many manufacturers start looking for alternatives, opening the door for broader industrial deployment across other markets, such as China, India and Japan.

Aviation is a particularly promising field for high-value repair

Among the application fields the partnership is targeting, aviation stands out as a particularly strong fit. High-value components such as blisks, turbine blades and other geometrically demanding parts combine exactly the requirements that make LMD-based repair attractive: high material value, demanding service conditions and a clear interest in extending component life rather than replacing parts prematurely.

"Aviation sets the bar for what laser-based repair has to deliver – precision, repeatability and full process control on components where failure is not an option," says Alejandro Bárcena, CEO, Etxetar.

Aviation is not the only field where the partnership can make a difference. Etxetar already documents use cases in gear repair, helicoidal gear repair and certified railway axle repair – applications where wear, localized damage or demanding geometries make replacement costly. Space-related components are also on the radar, particularly where advanced manufacturing and repair strategies can support new propulsion concepts or other highly specialized applications.

Smarter coating: AI is making laser deposition more robust and productive

Artificial intelligence is playing an increasingly practical role in making these processes more robust and productive. Fraunhofer ILT's AI-SLAM project demonstrates how this works in laser metal deposition: the system records component geometries during coating, detects deviations from the target contour and readjusts process parameters such as feed rate in real time.

Based on larger datasets, the software also learns how to improve the process iteratively. For industrial users, that matters because coating and repair tasks often involve uneven wear, changing layer thicknesses and repeated manual correction steps. In a partnership with Etxetar, this kind of digital process intelligence adds another layer of value, supporting the move from good results in individual cases to reliable performance in demanding industrial environments at scale.

From proven processes to new market opportunities

This collaboration is not about introducing immature technologies, but about opening further industrial fields for processes that are already proven. The memorandum of understanding reflects a shared ambition: to further develop and industrialize LMD and EHLA in fields where regulation, durability requirements and cost pressure are creating fresh momentum – from brake disc coating under Euro 7 to the repair of high-value turbine components.

What makes the partnership particularly strong is the combination of complementary strengths: Fraunhofer ILT brings deep process expertise, application experience and digital know-how, while Etxetar contributes its industrial vision and expertise in the development of additive processes, production-line solutions, LMD and EHLA cells and machines, as well as high-level software, monitoring and AI capabilities, all developed in-house.

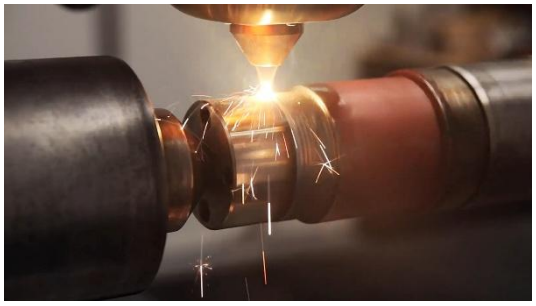


Image 1:
Laser metal deposition on a railway axle: Etxetar is applying LMD to high-value components where precise, localized material build-up support repair, reinforcement and extended service life.
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Image 2:
Laser metal deposition on a forged die: targeted material deposition helps restore worn or damaged tool areas and can reduce the need to replace entire high-value components.
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Image 3:
"Coating is where we see some of the strongest near-term industrial pull. Regulation is creating a clear and measurable demand, and EHLA is mature enough to meet it at scale." – Dr. Thomas Schopphoven, Fraunhofer ILT
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