

Rapid coating of brake discs: laser cladding that enables sustainability

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We are about to witness an event that could have a huge impact on metal additive manufacturing technologies. With the future entry into force of the Euro 7 regulation and other similar anti-pollution regulations in other parts of the world, car manufacturers will be required to create less polluting vehicles by reducing emissions from each component. Among the parts that will be affected by the regulations are brake discs, which today contribute around 21% of the PM10 emissions generated by a car. To reduce the release of PM10 generated by brake discs, the best solution is to coat traditional cast iron discs with two layers of more resistant metals using Rapid Coating technology (also known as High-Speed Laser Cladding), derived from Direct Energy Deposition. This application, which involves the use of steels (316L or 430L) and a matrix of steel and titanium or tungsten carbide, presents several peculiarities and pitfalls. First of all, the need to carry out this process very quickly, to remain within the cycle times required by automotive environments, but there are also various problems from the point of view of the materials, their adhesion to the substrate, their porosity, the quality of the surface and above all, the repeatability of the process. In recent years, Prima Additive has developed important innovations from a process point of view, which today place it among the main players in this market and among the few companies that have already sold fully automated lines for coating brake discs. This application will, in fact, be the first time that an additive manufacturing process will be used extensively on a mass market. This will lead to an increase in demand for metal powders which, we are sure, in the long term will translate into a reduction in powder costs and, consequently, an increase in the competitiveness of metal additive manufacturing technologies. We can therefore say that this process is not only revolutionary as it enables sustainability, but also for its ability to have a very significant future impact on the diffusion of additive technologies.