Technological edge with CemeCon HiPIMS

Whether in the coating service or with an in-house coating system – the CemeCon experts support tool manufacturers in the design of a dedicated coating solution

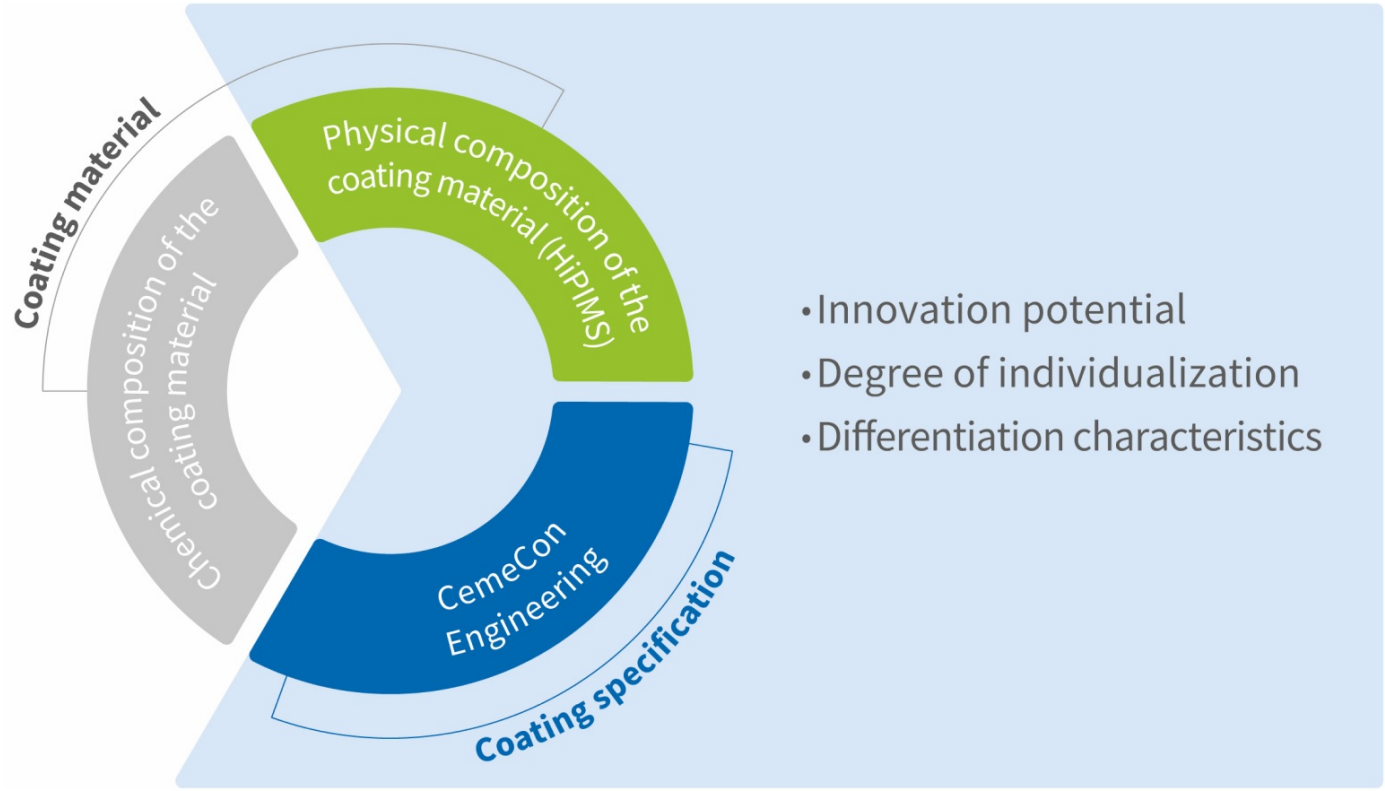
HiPIMS technology PROVIDES unique advantages

HiPIMS is the future of PVD coatings. The market agrees on this. The technology combines the advantages of all common coating processes. With CemeCon HiPIMS, tool manufacturers and machinists can open up even greater potential.

What makes HiPIMS so special?

HiPIMS enables the unique combination of the chemical composition of a coating material and new physical properties that are only possible in this form with HiPIMS. HiPIMS coatings are extremely smooth, exceptionally hard and tough at the same time. They have a dense, fine-grained structure, and low

compressive residual stresses.



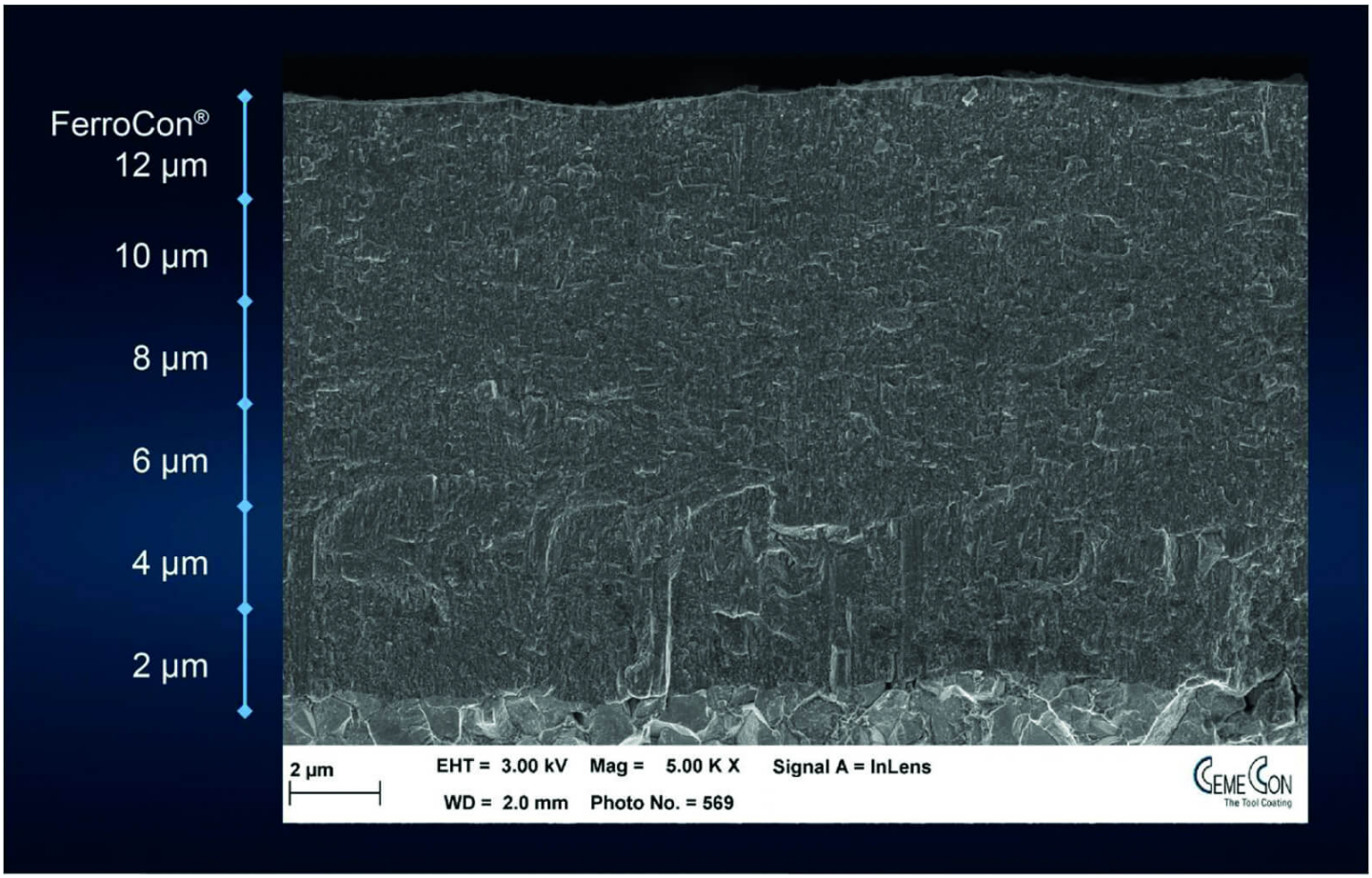
Securing unique selling points with HiPIMS: new physical properties redefine the coating properties

The new combination of hardness and at the same time finely balanced toughness is terrific and makes HiPIMS coatings powerful. Why is this combination so important? Dr.-Ing. Christoph Schiffers, Product Manager Technology, explains: “If hardness were the only decisive factor, glass would be the ideal coating material. Glass is hard – but also very brittle. Especially in interrupted cutting in milling applications or in grooving, the constant, periodic peaks of cutting forces on the surface damage any traditional coating that is only hard. This is even more true the smaller the tool. Combined with high toughness, the coating resists the stress.”

Since HiPIMS is the logical further development of sputtering, there are no droplets due to the process: This means extremely smooth surfaces without defects in the coating. The technology is very flexible: Almost any coating composition – including TiB_2, for example – can be applied to any substrate, including CBN and ceramics. A wide variety of tool types can be coated. The HiPIMS flexibility ranges from very thin coatings on micro tools to insert coatings with a layer thickness of 12 µm.

CemeCon has tailored the combination of positive properties specifically to the requirements of cutting tools. In joint engineering with the tool manufacturer, the CemeCon experts then match the premium coating precisely to the requirements so that it combines with the substrate and geometry to form an optimum machining solution for the respective application. To do this, they adjust various parameters: in addition to the coating material, also coating thickness, tolerance, pretreatment, finishing and much more. The process steps are sensibly combined and precisely adapted. The result is a customized coating solution. Those who want to precisley design their own innovative coatings to their precision tools with an in-house coating line have full access to all HiPIMS parameters with the CC800® HiPIMS. This enables a high

degree of individualization and differentiation from the competition.



HiPIMS makes it possible: the dense layer structure is a quantum leap in coating for cutting tools

Which further advantages does CemeCon offer?

Unlike other processes, HiPIMS uses high-energy power pulses. New and more finely adjustable set screws support the design of a coating solution. The power can be tailored specifically to the tool. CemeCon is constantly optimizing its HiPIMS technology: “Our HiPIMS technology works so well because we build our pulse generators ourselves, and have geared the machine precisely to coating cutting tools. We have a coherent overall concept,” adds Dr.-Ing. Biljana Mesic, Technology Development Manager PVD.

A particular CemeCon advantage is the synchronization of the HiPIMS pulses with the substrate table, where the coating grows purposefully on the tools. This reduces residual stresses significantly and enables much thicker coatings than with any other known process – an enormous plus for performance in many applications. The benefit for small and very small tools: sharp cutting edges can be finished with a dense coating with low residual stresses in a process-safe manner.

Christoph Schiffers: “HiPIMS may sound complicated at first glance – we have perfected this fascinating technology for cutting tools and stored it in the control system in such a way that users can handle it automatically. Anyone can do it. Operation is as simple as, for example, the brake in a car: The driver simply steps on the brake pedal and the ABS works automatically without any action on the part of the user. This is high-tech that adds value for the customer. Just like HiPIMS: The incomparable properties of the dense layer structure are a quantum leap in the coating of premium tools.“