Reaching the goal with know-how

Optimum results in precision machining

When selecting bonded abrasives for precision machining, the quality benchmark is increasingly how to manage the compromise between high stock removal, long tool life and excellent surface results. Bonding systems, abrasive grain selection and combination tools are key factors here.

Maximum performance with maximum economy

As everywhere else, the demands of the manufacturing industry on its suppliers in terms of attractive costs, fast availability, guaranteed process stability and competent advice are increasing in the field of precision finishing as well. The challenge for all grinding tool suppliers is therefore to provide products that meet these requirements and guarantee maximum performance with the greatest possible cost-effectiveness.

High stock removal rates are, among other things, the key to success, since they reduce the machining times significantly. However, the associated higher loads on the tools must not result in shorter tool lives and thus more frequent tool changes.

In order to guarantee long tool life and high productivity at the same time, grinding tool specialists such as Hermes Schleifmittel GmbH develop a grinding tool specification for each application that is adapted to the specific conditions, workpiece, task and machine, with the most suitable combination of cutting material and bond material.

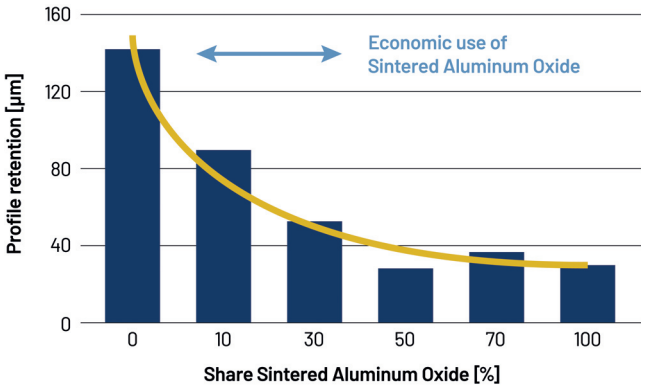
Always in focus: the optimum bond

The bond plays a decisive role in the self-sharpening effect of the grinding tool during the grinding process, as it holds the abrasive grains in the tool and gradually releases them. By modifying the strength of the bond or adjusting the bond volume, the wear behaviour of the grinding tool can be significantly optimised. The VITRA bond recently developed by Hermes takes this into account and, thanks to its high strength, guarantees a large pore volume, which favors chip removal as well as the transport of cooling lubricant. The result is particularly high productivity as well as reduced tool wear rate.

Sometimes less is more

It is generally known that the choice of abrasive grain has a decisive influence on the grinding process. However, it is less well known that a look at the level of concentration of the grain also has a decisive influence on efficiency.

Studies have shown that the profile retention of grinding wheels during surface grinding increases significantly, especially with sintered aluminum oxide concentrations of up to 30 percent. At higher concentrations, the profile retention improves only slightly despite significantly increasing tool costs, so that the tool life is also only slightly positively influenced.



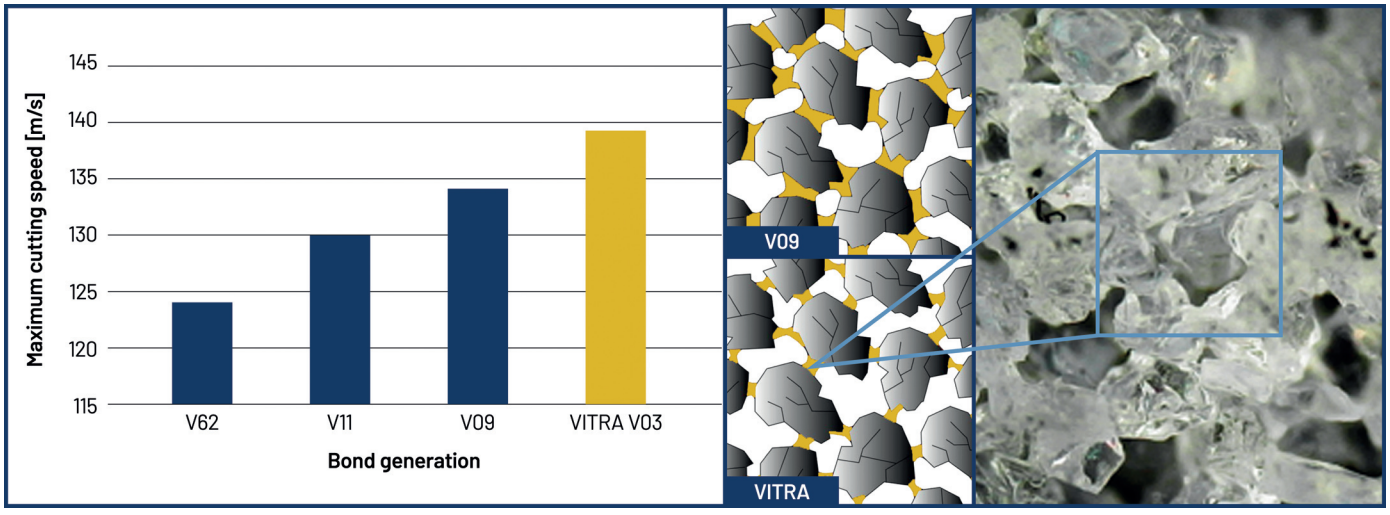
Profile wear as a function of sintered aluminum oxide concentration during surface grinding

Developed for highest performance

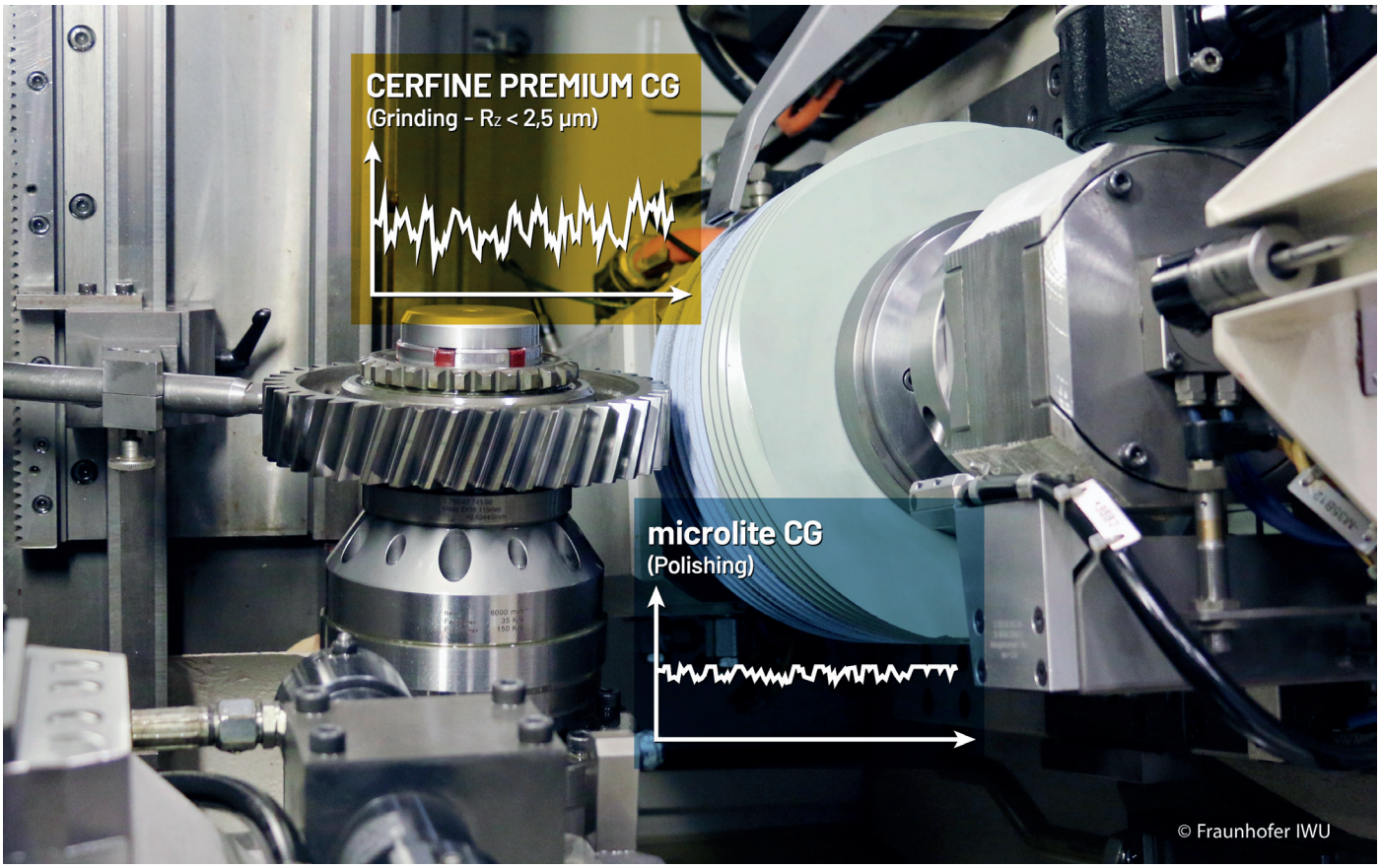
All these findings have been incorporated into the latest product development from Hermes Schleifmittel, CERFINE Premium+. A product line specifically for applications with the highest performance requirements, it guarantees extremely high stock removal rates under absolutely safe process conditions and can be used to optimise a wide range of grinding processes.

The best finish for high-quality surfaces

Optimum process productivity is only one of the requirements that



Performance comparison of cutting speeds of different bond generations



must be met. The quality of the surfaces produced must also meet the very highest standards for aesthetic or technological reasons.

To achieve these requirements, for example in the area of mass production of gears for the manufacture of transmissions for electrified vehicles, generating gear grinding processes with combination tools are used for many reasons.

These combination tools consist of a ceramic part for initial grinding and a microlite part with fine grit sizes for polishing the tooth flanks. These tools thus score not only in terms of increased efficiency, as they enable grinding and polishing in a single setup without time-consuming and error-prone tool changes. They also deliver optimum surface qualities, as both tool components and the technology that connects them are designed precisely to meet individual requirements and this interaction readily achieves the required surface finish.

The key to success: know-how and individual solutions

Universal solutions in terms of grinding tool selection and process control do not bring sufficient success when it comes to increasing production requirements or remain far below the achievable maximum. This can become apparent by falling short of the required surface quality, too low process productivity or too low economic efficiency.

Just as there is no need to use a sledge-hammer to crack a nut when grinding and use unnecessarily expensive tool specifications, thus driving up production costs for no reason.

Only through the targeted analysis of the process steps and the subsequent customized production of the corresponding tools can all component requirements be met while maintaining or optimising the required productivity and economic efficiency. With its comprehensive product portfolio and experienced application technology experts, Hermes is the ideal partner for anyone who wants to get more out of their processes.

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