



high precision tooling

Machine Tools, PCD, PVD, CVD, CBN, Hard Metal

materials & tools

LACH DIAMANT looks back on 100 years – 12th part

Poly – poly – or what?

Efficiency concept for re-sharpening all dia tools (PCD) for the wood, furniture and composite industry

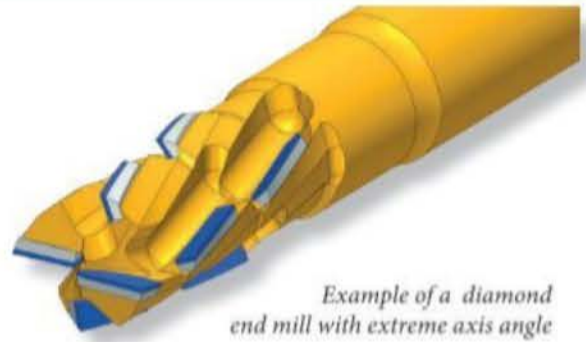
■ In times like these, a reliable and prompt service is particularly important – resources must be saved, stock-keeping must be kept as manageable as possible.

LACH DIAMANT, the global pioneer of diamond tools for the wood, furniture and composite industries, has extensive know-how in the development, production and application of polycrystalline diamond tools since 1973.

In the beginning, there was a single PCD cutting edge, soldered onto a holding device, and polished with diamond grinding wheels – a design based on the classic turning tool.

Initially, rotating diamond tools, such as milling cutters and saws, were out of the question – high machining times, i.e. grinding and sharpening times – opposed any commercial use.

LACH DIAMANT developed an overall service and user-friendly precision steel grinding machine for the grinding of the first single-tipped PCD (and CBN) turning tools in cooperation with a grinding wheel manufacturer. To this day, it is still built and sold as type PCD-100 and type PCD-300 grinding machine.



Example of a diamond end mill with extreme axis angle

With the development of ever larger PCD blanks by the established manufacturers, *General Electrics* and *deBeers*, tool manufacturers all over the world experimented with using this new cutting material, superior to carbide in terms of abrasiveness, also for milling and cutting tasks.

LACH DIAMANT achieved a breakthrough with my idea to use electric sparks for the electro-erosive machining of the conductive structure of polycrystalline diamonds (filed for patent registration in 1978); apart from grinding with diamond wheels, up to this point the diamond particles/layers, pressed onto carbide carriers under pressure and heat, had to be segmented in an elaborate process using diamond cutting discs.

This discovery – the use of spark erosion for manufacturing polycrystalline tools – may rightfully be called a moment of glory for the successful development of high-performance tools.

Beneficiaries of this new technology were at first medium-sized wood and furniture manufacturers who immediately recognized the value of diamond tools for their businesses; because up to this point, comparative carbide tools had to be exchanged after every shift by highly-trained specialists.



Inspection of a PCD monoblock milling cutter



Diamond joint milling cutter with extreme axis angles during sharpening on a «Dia-2200-mini» machine



Precision steel grinding machine, model «pcd-100» with rocker for grinding PCD and PCBN inserts and turning steels with diamond grinding wheel



«Dia-2200-mini», the universal sharpening machine for PCD tools



«3Dia Saw Grinder», a sharpening machine for diamond saws and chippers

However, diamond tools could be used continuously, without replacements, and even during 3-shift operations for three to four months.

The use of spark erosion for forming polycrystalline materials had been discovered. However, in the early 1970's only a limited number of numerically controlled EDM machines were available, e.g. wire and sinking machines.

LACH DIAMANT designers developed the so-called LACH EDG (= Electrical Discharge Grinding) electrical discharge procedure from the advantages and disadvantages of both systems – also internally called “spark grinding” by LACH DIAMANT.

Today, in 2022, the engineering department at LACH DIAMANT proudly looks back on 44 years LACH DIAMANT-EDG electric discharge machines are used all over the world and provided the business foundation for many of today's active manufacturers in the market of diamond tools for the wood and furniture industries. There is a reason for my comment towards the diamond tool manufacturers during recent strolls across *Ligna*, when I was overheard saying “These are all my children”.

Today, the LACH DIAMANT EDM programme culminates in the flexible, universal grinding machine «Dia-2200-mini» for fast, high-quality service – from diamond end mills to joint milling cutters – even with extreme axis angles – and saws with up to 600 mm diameter: tools and saws clamped together – also suitable for multiple production.

Among other machine models, the unique «3Dia Saw Grinder» stands out. It was developed for CNC grinding of diamond saws with up to 750 mm diameter and for all possible tooth geometries – it also allows for automatic placement during multiple operation without extensive programming knowledge.

All LACH-EDG machines manufactured at LACH DIAMANT are not only designed for flexible service tasks but equally suitable for the production of new diamond tools.

Finally, a very personal remark: “When I hear that the manufacturers of sharpening machines make good money with their service,...I have to say that this is not for servicing our rotation EDG machines... apparently they are too well designed, how else could it be that, in many cases, the first service notification for our machines only appears after 10-20 – in some instances even more – years of daily operation.”

Horst Lach



Presentation of the worldwide first diamond tools for wood and plastics at Ligna 1979

Note:

More information on this in part 10 of “Poly-poly-or what? When sparks learned to fly on diamonds” – special edition from hpt 2021-4.

Free copies are available from LACH DIAMANT via office@lach-diamant.de or at www.lach-diamant.de

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