

EMO 2017: LACH DIAMANT Looks Back on 95 Years.

BorazonT – A New Ara of Abrasives

Horst Lach, managing director and CEO of LACH DIAMANT agreed to write an ongoing series of articles about the development of diamond and CBN tools and grinding wheels in modern industries. The occasion: LACH DIAMANT's 95th anniversary in the run up to EMO.

Horst Lach is known as a true industry veteran, and we are excited to have this pioneer of technology share some insights from 55 years of professional experience in the diamond tool business.

In the second part of this (almost) historical review, Horst Lach remembers the beginnings:

It was 1969 when manufacturer General Electric offered small amounts of a new abrasive "Borazon" to the diamond tool industry. Unlike diamonds, the new abrasive

was to be offered in grams and not per carat (1 carat = 0.2 grams). This meant that one gram would cost 5 US dollars – at the time more than the cost of a gram of gold. When the first samples arrived in the spring of 1969, the Hanover Trade Show was only weeks away. As in every year, LACH DIAMANT meant to present its latest innovations in Hanover.

Quality diamond grinding wheels in resin and metal bond were already part of LACH DIAMANT's product portfolio since 1963. What could this new cubic crystalline boron nitride (CBN) "Borazon" be used for? General Electric recommended producing grinding wheels for steel grinding using it. Operational conditions were wet grinding at a cutting speed of 28 m/sec. But there was a catch: The limited sample of the test material was barely enough to produce a 200 x 10 mm wheel for a surface grinding machine. But why do the surface grinding first? We could try the new CBN grain directly for tool grinding.

Technical Notes:

- BorazonT = Cubic crystalline boron nitride (CBN)
- 1969: General Electric introduces CBN for the first time as Borazon
- Specific weight: 3,48
- Thermal resistance: 1400 °C
- Knoop hardness: 4700

The first CBN grinding wheels for tool grinding were made: A 125 x 12.5 cup wheel and a cone cup grinding wheel 11V9 with 125 x 3. Our best diamond and grinding wheel customer at the time, Simon machine manufacturer for steel and tool grinding machines in Neu-Isenburg, was chosen for the first test.

The first CBN Grinding Wheel in Action

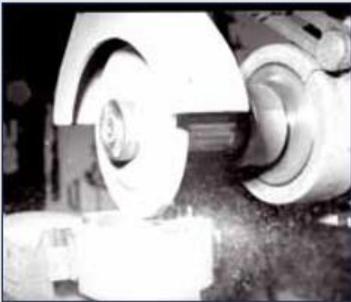
At first, we were very disappointed. It was neither possible to do wet grinding nor were we able to reach the required cutting speed of 28 m/sec. – we only had a steel grinding machine, type L15 with only 18 m/sec, available for the cup wheel. "Let's try it anyway, since you're here", said the machine operator, and the test started with a clamped in piece of HSS turning steel. The grinding noise and sound, was excellent, there was no "turning blue". It worked with the chosen machine conditions and a CBN volume concentration V120 (12 % CBN percent by volume). The world's first CBN grinding wheel for dry grinding of tools was in action. Even today, I have to admit that I was totally thrilled. This new abrasive Borazon offered a new perspective for our relatively new portfolio of grinding wheels.



The entire Borazon/CBN grinding wheel assortment was already offered at Hanover Trade Shows in 1969/70.



The Beginnings: HSS Tool Grinding - Examples. © Filmstreifen www.stilkunst.de



Deep grinding with CBN grinding wheel K-MX7, with dry tressex, on Saacke universal grinding machine, type UW3.

Metal covered synthetic diamond grits were available since 1966/67, therefore we were able to grind steel containing materials and carbide, e. g. steel templates with a carbide content of five percent, but hardened high-alloy steels with over 60 HRc. That was a result no one had anticipated at this time.

Because of this development, performance shows on a Saacke universal grinding machine UW3 at the Hanover Trade Show at IHA (a precursor of EMO) were nothing short of sensational. No one had seen HSS chips before until demonstrated in 1970 with the

further advanced K-MX7 dry cutting wheel with "tressex" fillers; with a creep feed of up to 10 mm.

The CBN Grinding Wheel Proves to be Unstoppable

At LACH DIAMANT, the enthusiasm for Borazon was so great that we designated a whole area of our stand to the Borazon product line, and large posters of Apollo's moon landing with the lunar module Eagle in July of 1969 were visible from far away. We had received special permission from NASA to use this image. Even though a few exhibitors of the diamond tool industry were still skeptical in the 1970s, the success of CBN grinding wheels was unstoppable, and CBN wheels soon replaced conventional grinding wheels. Already at the end of 1969, LACH DIAMANT was showcasing the entire program of potential applications, from tool grinding, surface grinding, and external cylindrical grinding. Other resin, metal and electro-plated bonds were offered as well. To this day, at EMO 2017, CBN still offers more potential applications. Even after almost 50 years with CBN, questions regarding applications and machine specifications



EMO 2017 – NEW – Metal-bond precision CBN profile grinding wheels with Evolvent profiles.

demonstrate that there are many more future opportunities to utilize the second hardest grinding crystal after diamonds for time and cost savings and conservation of energy and the environment.

LACH DIAMANT's latest innovation will surprise many EMO visitors in Hanover: Metal-bond CBN precision grinding wheels for deep grinding of complex Evolvent profiles.

Horst Lach

P. S. I ALMOST FORGOT

Due to the high brand awareness of LACH Borazon grinding wheels at the end of the 1970s, General Electric asked us to give up the name Borazon and use only "CBN" instead. ■



HSS chips during production of an HSS turning steel (EW9Co4).

References (published in German):

Lach, Horst: Die BorazonT-Schleifscheibe Oberfläche Nr. 10 (1970); Lach, Horst: Borazon kontra Diamant Schweizer Maschinenmarkt Nr. 18/1972