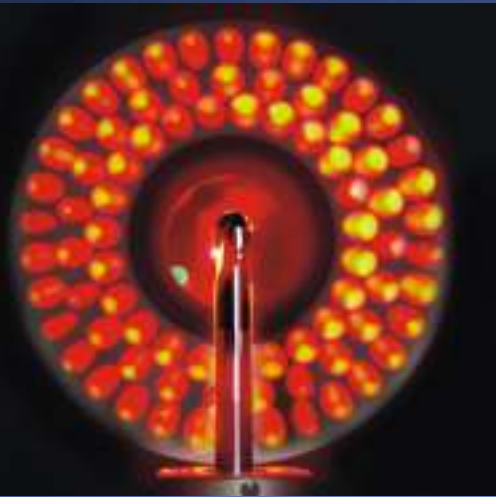


Non-contact and μ -accurate 3D laser measuring of all milling tools with the measuring machine Zoller »genius micro 3«



HSC processing of graphite and copper electrodes has developed into one of the most important processes in tool and die production. Modern machine tools allow for the manufacturing of even minimum dimension 3D contours in the μ range. The full utilization of this potential requires solid carbide milling tools of extremely high precision and extremely long service life.

For this purpose, we have made great development efforts, in which we have



created two new product lines with minimum tolerances in concentricity (tol. 0.003 mm), accuracy of shape and diameter (tol. 0.010 mm).

Optimized coatings, polished cutting edges and special geometries guarantee long service life and maximum process reliability.

[High-precision milling tools for graphite processing.] Innovative detail solutions and very smooth, relatively thick diamond coatings enable



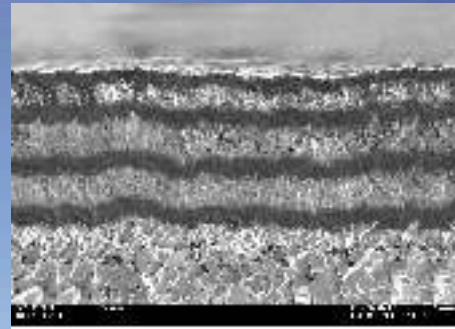
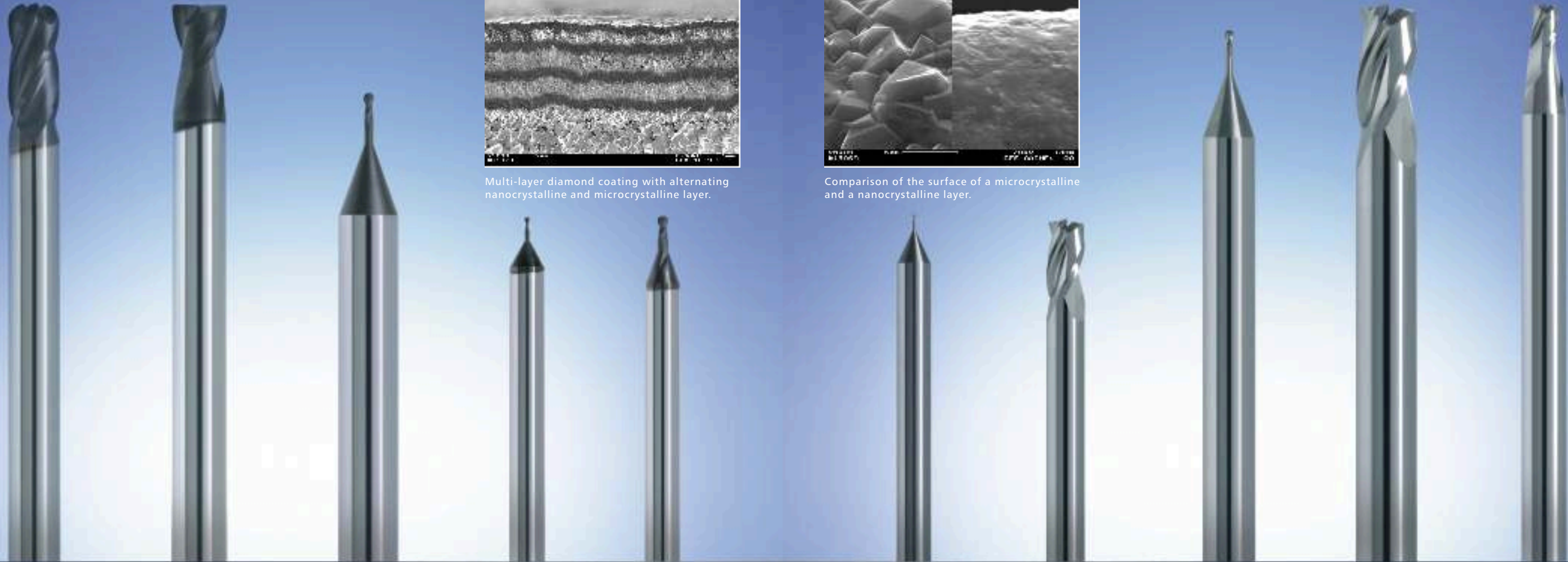
us to offer milling tools, which are leading in the market in respect to tolerances and service life.

Since the diameter, the accuracy of shape and the concentricity of low-dimension and minimum dimension milling tools are affected by even extremely thin wear protection coatings, we have developed a multi-layer diamond coating, which is especially adapted to the extremely narrow tolerance ranges of our tools, in cooperation with CemeCon, the specialist for

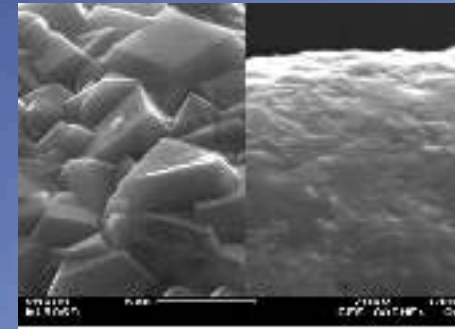
super hard coatings. Milling tools made by ZECHA thus provide enormous contouring accuracy rates, whose reliable repeatability is guaranteed by ensured manufacturing processes. At present, we are capable of manufacturing end mills, radius mills and edge radius mills with diameters down to 0.2 mm with this special coating.

[High-precision milling tools for copper processing.] HSC milling tools for copper processing are available in a diameter range starting from 0.05 mm.

Since copper is a soft metal with a tendency to burr formation, extremely sharp cutting edges and high-brilliance polished chipping spaces have turned out to be very efficient in the reduction of sticking of the chips. The chipping forces thus are reduced, which provides an extension of service life. Additionally, we have developed a special coating for copper processing, also in cooperation with CemeCon, which guarantees minimum edge roundness and high contouring accuracy due to a minimum layer thickness.



Multi-layer diamond coating with alternating nanocrystalline and microcrystalline layer.



Comparison of the surface of a microcrystalline and a nanocrystalline layer.

