

Thin Film Diamond Inspection Using UltraWin™ C-Scan

Current Condition

Ultra thin film diamond coatings are used for a variety of applications. In this application, a thin-film di-amond coating is deposited on a tungsten carbide substrate. Both disbonds and even moderate variations in coating thickness can cause product useful-life reduction or catastrophic failure in critical applications. The inspection focuses on the location and extent of any disbonds, as well as the uniformity of the thick-ness of the coating.

Solution

ULTRAPAC™, MISTRAS Products & Systems line of Ultrasonic immersion inspection systems, provides an automated, programmable, ultrasonic inspection solution that supplies a 100% scanned image of the internal bonding condition of the coating, as well as the overall thickness and thickness variation. A high frequency tuned pulser with remote driver and preamp, coupled with an ultra-sharp focus 75 MHz transducer, provides the ultrasonic signal needed to resolve the thickness and delamination sizes that the application requires. In this case, a 500 MHz A/D board was used.

Systems are available with up to a 1 GHz A/D and 100 MHz ultrasonic transducers and its accompanying pulser/receiver circuitry.

In addition to the high-performance UT system and acoustic-microscope resolution capacity, the scanning system has been designed with a combination of structural rigidity, high scanning resolution and high-speed performance capabilities.

MISTRAS Products & Systems division, is a team of skilled researchers, engineers, technicians and manufacturing personnel dedicated to the development ov practical and cost saving solutions to your challenging inspection needs.

For a demonstration or additional information, please contact our Princeton Junction headquarters at 609-716-4000.

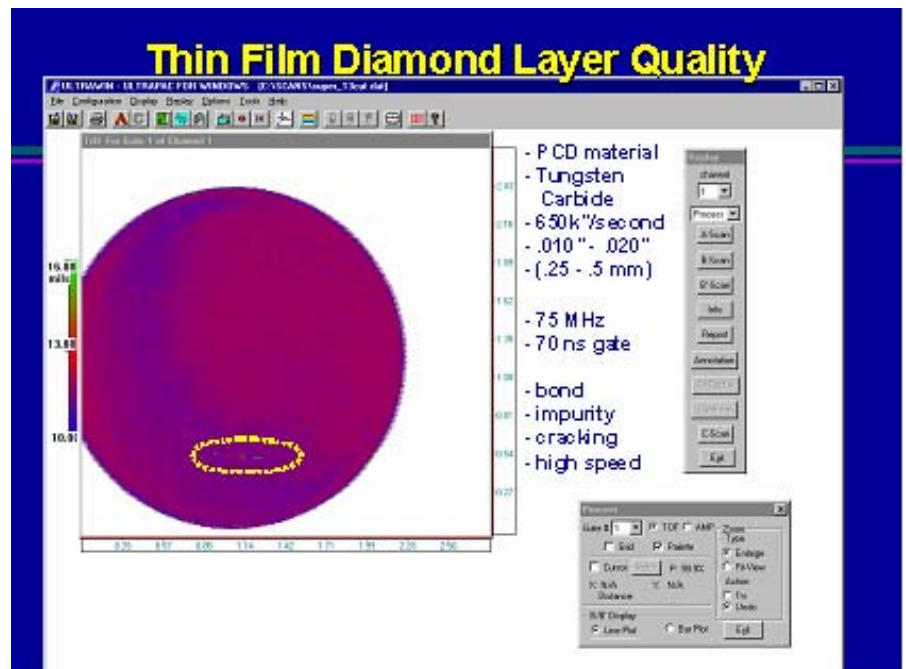


Figure 1: Overall C-Scan of diamond coated substrate showing a man-made (for calibration) disbond (circled). The difference in color shading represents minute differences in diamond coating thickness over the area of the scan. Thickness differences of less than 0.01 mm are routinely detectable.

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