

Tuesday Morning, April 25, 2017

Exhibitors Keynote Lecture

Room Town & Country - Session EX

Exhibition Keynote Lecture

11:00am **EX-1 Success and Failure in the Commercialization of CVD Diamond**, *Chris Engdahl*, Crystallume, USA **INVITED**

The reality of diamond thin films caught the interest of many researchers when the rest of the world learned from the Soviet Union how to grow diamond from the gas phase in the early 1980s. Besides the allure of being highly sought after gem-quality crystals, diamond has some impressive physical attributes: highest hardness, best electrical insulator, best thermal conductor, broadband optical transparency, high acoustic velocity, and extreme chemical inertness. Funding for basic research and creation of private companies poured in. However, due to inadequate understanding of the scientific challenges during the early stages of research and difficulties in scaling up production-level deposition systems, this resulted in a long cycle of public and private investors spending large sums of money for products that proved to be not viable. As a result, most large commercial efforts ceased to exist, and investors turned their attention away from CVD diamond. The primary commercial success for CVD diamond for the next 15-20 years was as an abrasive material used on polishing pads, cutting tools, and low-volume niche markets.

This presentation will cover the early promise and evolution of the field of CVD diamond, illustrating some of the problems and advantages in developing a novel and compelling coating into useful products. Several commercial applications of CVD diamond in use today will be discussed, along with a few of the most interesting applications being positioned for the market in the near future. Interest in CVD diamond thin films has continued to thrive in academia, and commercial interest is undergoing a rebirth. Practical applications and useful deposition systems are now combining to support realistic commercial growth in the field.

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