

# e-bulletin

Vaksis Vacuum Systems Bulletin  
Year: 4, No: 9, March 2014

## PVD AND CVD COATING SYTEMS FOR VARIOUS APPLICATIONS [www.vaksis.com](http://www.vaksis.com)



- DLC Coatings
- new product
- CVD-*handy*/PECVD
- activities

- PVD: Physical Vapor Deposition
- CVD: Chemical Vapor Deposition
- DLC: Diamond Like Carbon

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## Diamond-Like Carbon (DLC) Coatings

Carbon crystal has many different allotropic structures in nature. The most known allotropes are diamond and graphite. These two structures are different from each other. Diamond is the hardest material known. It is an electrical insulator and its conductivity is better than copper and its pure state is colorless. It is used as wide band gap semiconductor with additives. On the contrary, graphite is an electrical conductor and soft and black material.

Diamond is formed at high temperature and pressure with no oxygen so its synthesis is so hard. Although there is thermodynamic limitation, it is possible to synthesize diamond films by the help of advanced techniques and right choice of the parameters. Process temperature is 3000°C and substrate temperature is approximately 1000°C during the synthesis. Because of this high temperature, many scientists study about carbon films which are coated at low substrate temperatures. These films have similar properties with diamond and are described as diamond-like carbon: DLC

Properties of DLC films (hardness, coefficients of friction, surface interactions, electrical and optical properties etc.) change depends on the production techniques and parameters. Thus, its field of application expands according to the properties.

DLC coatings are commonly used in medicine as implant, moving parts as dry greaser, optic lenses as protective coating, photovoltaic sector for reducing reflection loss of Si power energy cells, electric circuits, cutting tool applications and machine part which works under excess load.

Vaksis produced DLC film coating system and sold it. We absolutely sure that we will meet the demand of customers based on our 24 years' experience.



**Dr. Baybars ORAL**  
**COMPANY MANAGER**

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## new product

### *CVD-handy/PECVD*

#### Plasma Enhanced Chemical Vapor Deposition System

System prepares DLC films on circular plate substrates with capacitive coupled PECVD technique.

Substrate holder can hold 4 inch diameter sample or, indistinct shape samples which has small dimension. Substrate can be heated up to 350°C. Vacuum level of the system is  $5 \times 10^{-7}$  Torr . Pressure measurement is read/made by one piece of cold cathode and one piece of pirani pressure gauges. Besides, there are 4 pieces of mass flow control units in the system.

All vacuum parameters and using operations (creating vacuum, break vacuum, substrate plasma cleaning and coating etc.) can be done on computer. Plasma cleaning and coating operation is also made by recipe which is in "operation and control" software. Recipes can be saved on system computer and reused. Also, preparation/arrangement of its content can be done.



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## activities

*Which we attended...*

International Semiconductor Science & Technology Conference ISSTC2014 (13-15<sup>th</sup> January 2014)

<http://www.isstc2014.org/>

International Semiconductor Science & Technology Conference (ISSTC) which was organized by İstanbul Medeniyet University was held at İstanbul.

Vaksis supported this activity as a sponsor and participant and informed about Vaksis products in detail during the activity.



International Winterschool on Bioelectronics Tiro, Austria (22<sup>nd</sup> February- 1<sup>st</sup> March 2014)

<http://www.jku.at/conferences/content/e216103>

International Winterschool on Bioelectronics which was organized by Austria Johannes Kepler University was held at Tiro, Austria between the date of 22<sup>nd</sup> February- 1<sup>st</sup> March 2014.

Vaksis supported this activity as a main sponsor and met with the relevant participants during the activity.



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