



# e-bulletin

Vaksis Vacuum Systems Bulletin  
Year: 6, No: 17, August 2016

## PVD AND CVD COATING SYSTEMS FOR VARIOUS APPLICATIONS

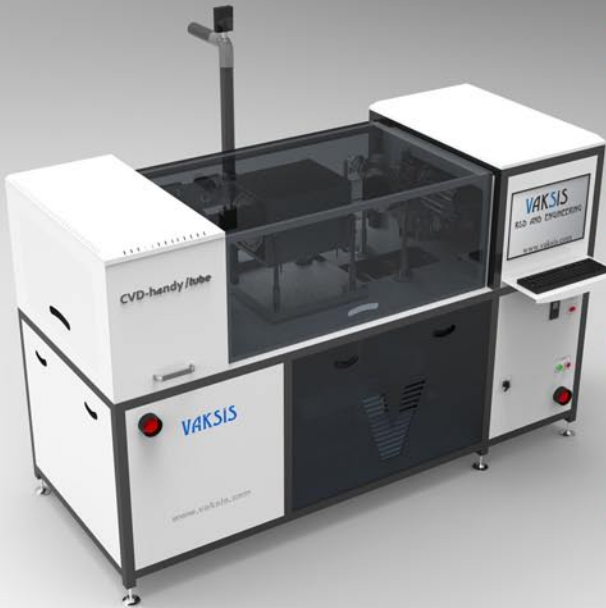
[www.vaksis.com](http://www.vaksis.com)

chemical vapor  
deposition  
systems

new product  
*CVD-handy/tube*

12<sup>th</sup> technology  
awards

activities



- PVD: Physical Vapor Deposition
- CVD: Chemical Vapor Deposition

**VAKSIS**<sup>®</sup>

All Rights Reserved. © 2016

# e-bulletin

Vaksis Vacuum Systems Bulletin  
Year: 6, No: 17, August 2016

## Chemical Vapor Deposition Systems

Chemical Vapor Deposition (CVD) Systems have been commonly used in production of thin films and coatings -classically- in optical, electronics and micromechanics areas for years. Furthermore, CVD systems has been started to be used heavily in flexible electronics and flexible sensor technologies areas which are very popular research topics recently, especially in the R&D works “for now”. As it is known, besides growing graphene and carbon nano-tubes (CNT) on substrates with chemical vapor deposition technique, by using proper carrier gas molecules, nano-sized wire (nanowire) or similar structures can be produced from materials such as ZnO, GeO.

In this highly popular area, Vaksis has designed and manufactured a customized chemical vapor deposition system for the most advanced “Applied Scientific Research Laboratories” in Eindhoven/ the Netherlands and Vaksis has installed and commissioned the system in July, 2016. In this system, four different gases and vapor are given the reaction area in a controlled manner. Pressure gauges which measure the partial pressure values of the gases and the sensors for the poisonous/explosive gases has been installed to the system. Vacuum chamber consists of a quartz tube which has been heated by a special design furnace including infrared (IR) lamps. With this furnace, the substrate which the thin film will be grown on it (under vacuum or in controlled atmosphere) can be heated up to 1000°C homogeneously with the heating rate up to 100°C per second. This furnace has been specially designed as deviating of only  $\pm 0,5$  °C from the target temperature even at this heating rate.

You can find the further details on the next page. For more information and your questions, please do not hesitate to contact with us.

Very Respectfully Yours,  
Baybars Oral



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

**VAKSIS<sup>®</sup>**

# e-bulletin

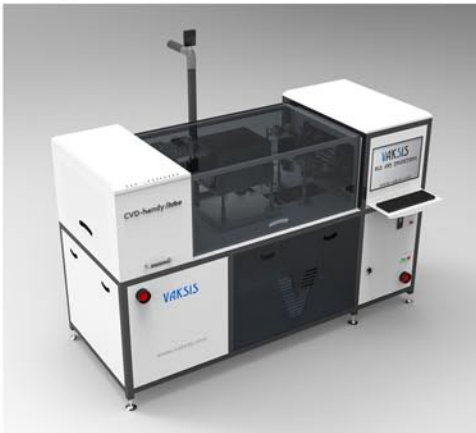
Vaksis Vacuum Systems Bulletin  
Year: 6, No: 17, August 2016

## new product

### CVD-handy / tube

The system has been especially designed for producing graphene and carbon nano-tube (CNT) on the proper substrates. Similarly, if proper carrier gas molecules are used, it is also possible to produce nanowires from variety of materials (such as, ZnO, GeO, etc.) using this system.

The vacuum chamber of the system consists of quartz tube and the tube is heated by infrared (IR) lamps. The system is controlled fully automatically through a computer.



### Technical Specifications

**Base Pressure:**  $5 \times 10^{-5}$  Torr or under.  
**Leak Rate:**  $10^{-6}$  Torr.l/s or under.  
**Quartz Tube Diameter:** 130 mm  
**Max. Temperature:** 1000 °C  
**Continuous Operating Temperature:** 950°C  
**Heating Zone:** min 200 mm  
**Mas Flow Controller:** Min. 3 pieces  
**Vacuum Pump:** 20 m<sup>3</sup>/h (mechanical pump)  
**Pressure Measurement:** Pirani and Capacitance Manometer  
**Control:** Fully automatic  
**Loading:** End of the tube cabin

**VAKSIS**<sup>®</sup>

All Rights Reserved. © 2016

# e-bulletin

Vaksis Vacuum Systems Bulletin  
Year: 6, No: 17, August 2016

## activities

12<sup>th</sup> Technology Awards  
İstanbul, Turkey (May 30<sup>th</sup>, 2016)

<http://www.teknoloji.org.tr/>

12<sup>th</sup> Technology Award which is organized by The Scientific and Technological Research Council of Turkey (TUBITAK) and Technology Development Foundation of Turkey (TTGV) and Turkish Industry and Business Association is the most prestigious technology award of Turkey and we are very proud to announce that Vaksis's system "GünEr: From sunlight to electricity" has won the award.

GünEr is the first thin film solar cell production system which can produce crystal layered industrial level thin film solar cells in Turkey. R&D research of this system had been held in cooperation of Vaksis and Center for Solar Energy Research and Applications (GÜNAM). The system is capable of coating large single substrate.

GünEr is the first and the only system which has been designed and manufactured in Turkey with its capabilities. GünEr includes both physical vapor deposition (PVD) and chemical vapor deposition (CVD) techniques and it can produce Si-layered thin film solar cells. The some of the research fields that these techniques can be used are vacuum technologies, plasma technologies, materials science, renewable energy, interdisciplinary research areas such as nanotechnology etc. This system has very high commercial potential in the international market.

The award ceremony was held at Wyndham Grand İstanbul Levent Hotel on 30<sup>th</sup> May 2016. We congratulate all the finalists.



**VAKSIS**<sup>®</sup>

All Rights Reserved. © 2016

# e-bulletin

Vaksis Vacuum Systems Bulletin  
Year: 6, No: 17, August 2016

## activities

*We will attend...*

2<sup>nd</sup> International Conference on  
Perovskite Solar Cells and Optoelectronics  
(PSCO-2016) Cenova, Italy (26-28 September 2016)  
<http://www.pSCO-conference.org/>

The second international perovskite conference will  
be held in Genova, Italy.

Vaksis will attend the conference as one of the  
sponsors and will share the information about the  
Vaksis perovskite systems in detail.

2016 MRS Fall Meeting and Exhibition  
Boston, MA, USA (27 November-2 December 2016)

<http://www.mrs.org/fall2016/>

The 2016 MRS Fall Meeting and Exhibit will be held  
in Boston, MA, USA in between 27 November - 2  
December 2016.

Vaksis will be at the booth 809 on the exhibition  
area and will share information about the Vaksis  
systems in detail.

The logo for PSCO-2016 features the text "PSCO-2016" in a bold, dark blue font. The text is set against a background of a bright orange and yellow gradient with a subtle pattern of light-colored, irregular shapes that resemble a map or a network of connections.

**VAKSIS®**

All Rights Reserved. © 2016