

# PVD Products CC Deposition Systems



## PVD Products Coated Conductor Deposition System

PVD Products provides a wide variety of coated-conductor deposition systems for your specific applications. These include the following:

- 1) **IBAD** Deposition Systems for the deposition of MgO templates
- 2) **Magnetron Sputtering** systems for deposition of  $\text{CeO}_2$ ,  $\text{Y}_2\text{O}_3$ ,  $\text{LaMnO}_3$ , and Ag, single or multiple sources
- 3) **PLD Systems** for deposition of ReBCO and various buffer layers
- 4) **Solution Deposition Planarization**
- 5) **Combination Systems**

PVD Products has sold multiple R2R CC tools to customers around the world. Several customers have purchased multiple CC units. PVD Products has the depth and breadth of experience to provide unique solutions to each customer's R2R CC requirements which is followed up by first class service and technical support.

The following pages show some of the Reel-to-Reel Tools made or under development by PVD Products.

How can we help you with your needs?





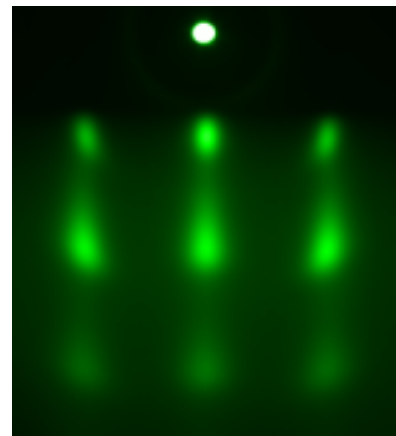
# Production Epi MgO via IBAD/Evaporation



**IBAD/Homo-Epi ebeam Evaporation R2R Deposition System.**

PVD Products provides equipment to deposit epitaxial MgO films on metal tapes using a dual chamber deposition tool similar to that of the Stanford/LANL approach. Our systems include multi-pass technology for high throughput on metal tapes from 4 to 12 mm in width, or single pass on tapes up to 100 mm wide up to 1 km in length.

Multi-pass tape speeds up to 120 m/hour have been achieved with highly oriented MgO buffer layer films.



**RHEED Picture of High Quality Homoepi MgO Layer**



# Production Sputter IBAD Systems



## IBAD Sputter R2R Deposition System with Scanning RHEED

PVD Products has fielded multiple reel-to-reel ion beam assisted deposition systems. These systems have been used for the deposition of highly oriented films of MgO on Hasteloy or Stainless tapes from 4 to 12 mm in width. Utilizing a Veeco linear ion source with 6 x 22 cm grids high quality materials are deposited at rates of 100 m/hour. With a 6 x 66 cm grid set speeds of 3x this can be achieved.

Multi-Pass reel handling for high throughput is used along with tape speed and tension control.



**Inside view of IBAD System with two 6 x 22 cm RF ion Sources and Multi-Pass Configuration.**



# Production Sputtering Systems



## Production Multi Source Sputter Deposition Tool

PVD Products provides a full range of production oriented RF, DC and Pulsed DC sputtering systems for deposition of amorphous films or highly textured buffer layers depending on the customer needs. Systems can be easily set up to deposit from single or multiple linear sources. Typical systems include multi-pass technology for tapes from 4 to 12 mm wide, or single pass systems for wider tapes. Our spools can handle tape lengths over 1 km. Systems include multi-pass contact heaters with tape temperatures as high as 850°C even at high tape transport speeds. Magnetrons can be designed to your specific target sizes.

Chambers can be connected together for continuous deposition of multiple epitaxial layers in a single deposition process. Features include closed-loop pressure control; multiple MFC's and power supplies, multi-zone tape heating, configurable multi pass capability. The systems come fully computer controlled with closed loop tape tension and speed control, variable target to substrate distance and full data acquisition of all relevant deposition parameters.

**CONTACT PVD FOR YOUR SPECIFIC  
SPUTTERING NEEDS**



**PVD Products, Inc. 35 Upton Drive Suite 200, Wilmington, MA 01887  
Tel: 978-694-9455 [www.pvdproducts.com](http://www.pvdproducts.com) email: [sales@pvdproducts.com](mailto:sales@pvdproducts.com)**



# R&D Sputter Systems



## R&D Buffer Layer CC Sputter Tool



## Linear Magnetron during Deposition



PVD Products, Inc. 35 Upton Drive Suite 200, Wilmington, MA 01887  
Tel: 978-694-9455 [www.pvdproducts.com](http://www.pvdproducts.com) email: [sales@pvdproducts.com](mailto:sales@pvdproducts.com)

# Gen II Pulsed Laser Deposition Systems



## Gen II Pulsed Laser Deposition Coated Conductor Tool

PVD Products provides both Production and Research PLD deposition systems for your specific coated conductor applications. These include the following:

- 1) PLD Deposition systems for REBCO and multiple buffer layers
- 2) Multi-Pass heaters for tapes up to 12 mm in width and 1-km in length
- 3) Black Body Substrate heater
- 4) Closed-loop tension and speed control
- 5) Multi-plume capability
- 6) Multi Zone Heaters
- 7) Unique XYØ Target Manipulator
- 8) Extra Large Intelligent Window for running 1 km of tape
- 9) Can handle tapes from 4 to 12 mm wide and 1 km in length.
- 10) Custom configurations available

Systems are all provided complete with 150, 300, or 600 Watt Excimer lasers, with full optical trains and multi plume laser scanning.

**CONTACT PVD PRODUCTS FOR YOUR SPECIFIC NEEDS**





# R&D PLD Coated-Conductor Systems



## R&D Pulsed Laser Deposition Coated Conductor Tool

The PLD T-1000 is used for R&D applications. These systems include many of the same unique features of the GEN II PLD System. Such systems have demonstrated over 750 amps for 2  $\mu\text{m}$  thick films on 1 cm wide tape.

- Multi-Pass heater for tapes from 4 to 12 mm in width and ~500 meters in length
- High temperature, multi-zone, contact substrate heater
- Closed-loop tension and speed control
- Unique XY $\theta$  Multi- Target Manipulator
- Large Intelligent Window

- Multi-Plume Optics
- Lasers with 80-300 Watts available



Photo of YBCO Multi Plume

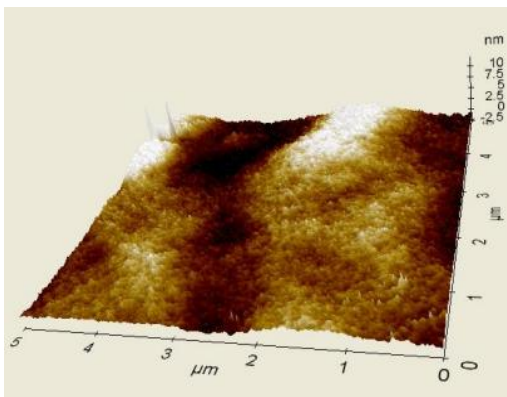




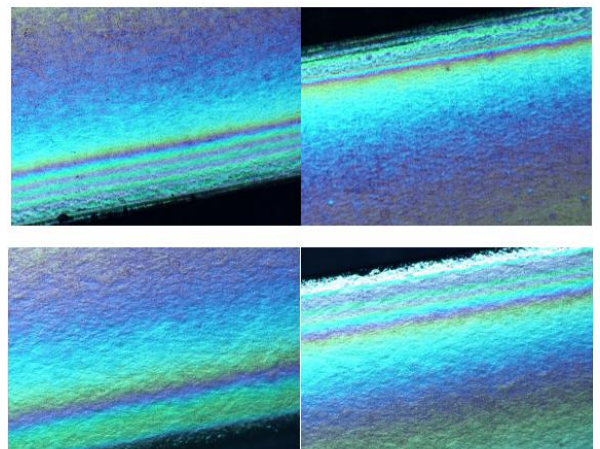
# Solution Deposition Planarization



## iBeam Materials/LANL Prototype SDP System



5 $\mu$ m x 5 $\mu$ m AFM scan of Hamilton Hastalloy tape coated with 8 coats of 0.35M yttrium acetate solution at 20 cm/min Rq=0.9 for this section



Three coatings of 0.3 M Yttrium Acetate solution at 25 cm/min above and 33 cm/min below.

