

2016 DOE SSL R&D Workshop OLED Manufacturing Challenges

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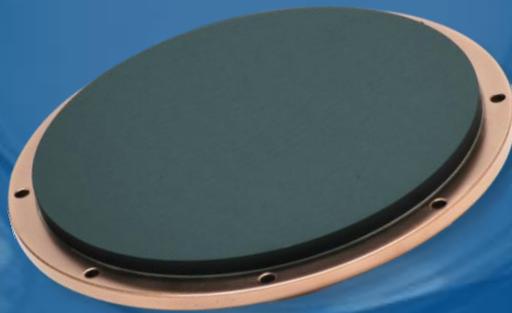
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- Kurt J. Lesker corporate mission is **Enabling Technology for a Better World**
- For 20+ years Kurt J Lesker has been enabling customers in the OLED and Organics industry primarily in materials and stack development.

Typical Equipment for Materials & Stack Development



Challenges for US Equipment Manufacturers

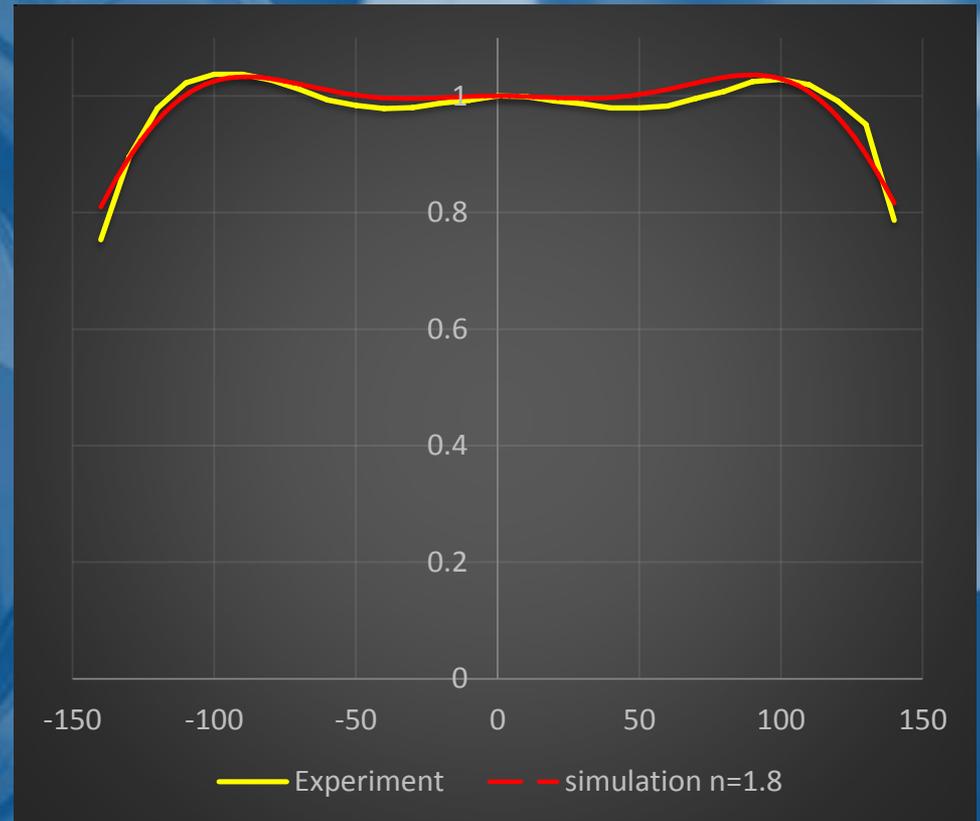
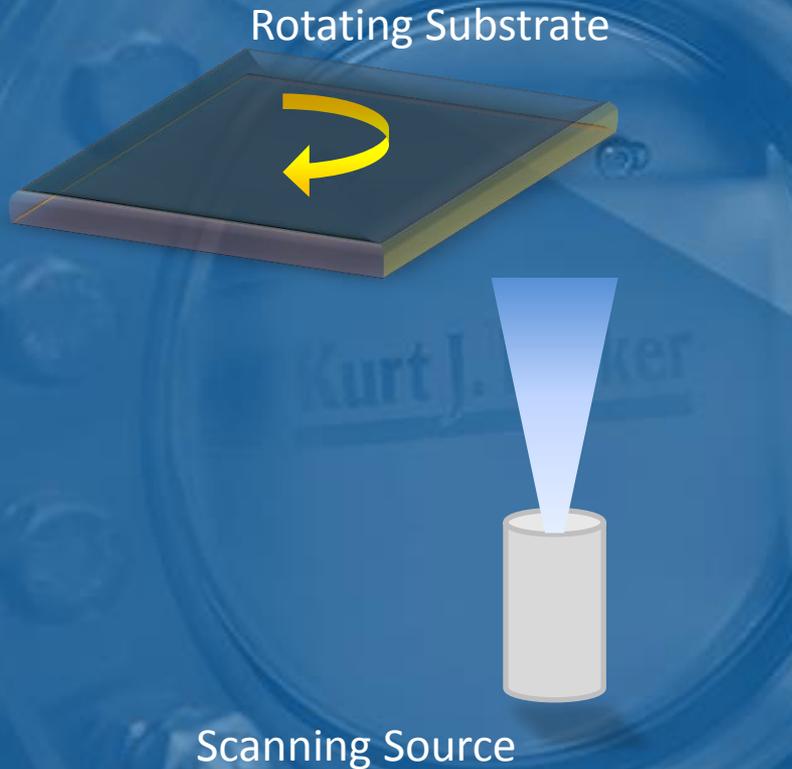
- Varied and proprietary device structures and materials.
 - Many different structures and materials that are difficult to access.
- Limited US demand for OLED Production equipment.
 - Lesker wants to help our customers enable OLED production but there just aren't many US customers asking.

Highly Efficient Rate Optimisation (HERO)

- Innovative deposition approach using moving point source(s) and rotating substrate.
- Compact Design
- Substrate size 200 x 200 mm
- Deposition rates $< 0.01 - 20 \text{ \AA/s}$.
- Film Non-Uniformity $< +/- 3\%$.



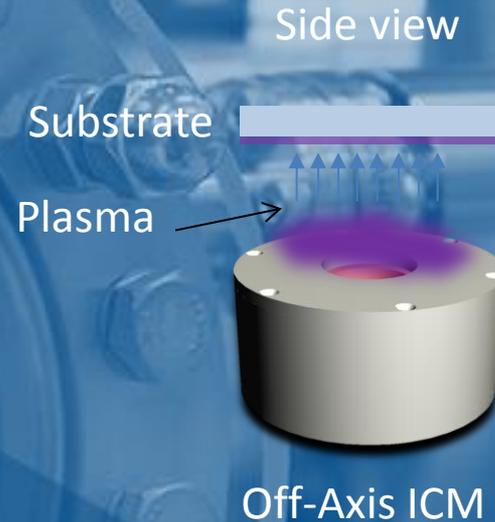
HERO: Simulation Vs. Reality



- Reduce Throw Distance which increases deposition rate while maintaining Uniformity.
- Fabricate smaller panels (4"x4") but faster!

Off Axis ICM Sputtering

- Off axis sputtering for electrodes or encapsulation layers providing:
 - Low energy deposition
 - Low substrate temperature
 - Uniform coating
- Scalable in cylindrical cathodes and possibly a linear cathode.



ICM in operation

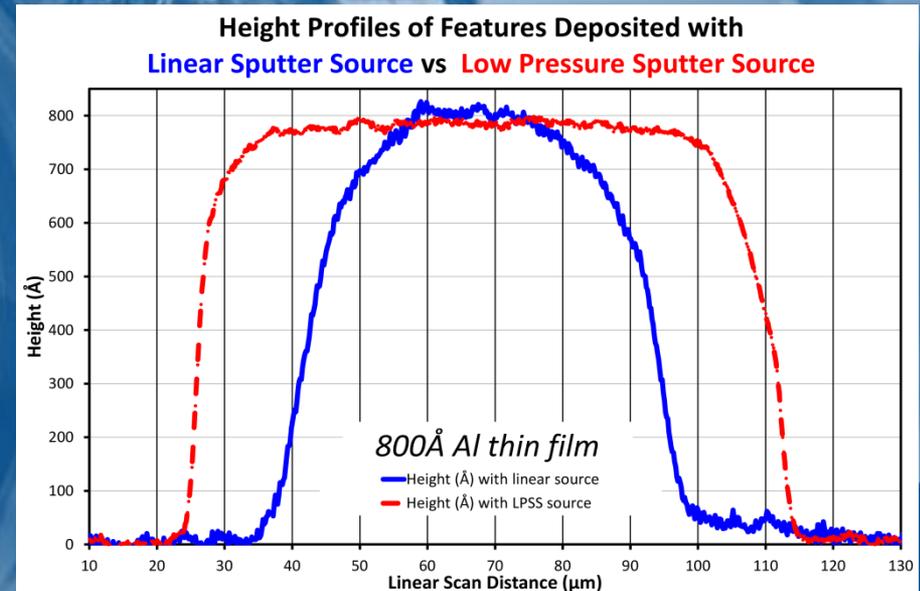


Kurt J. Lesker
Company

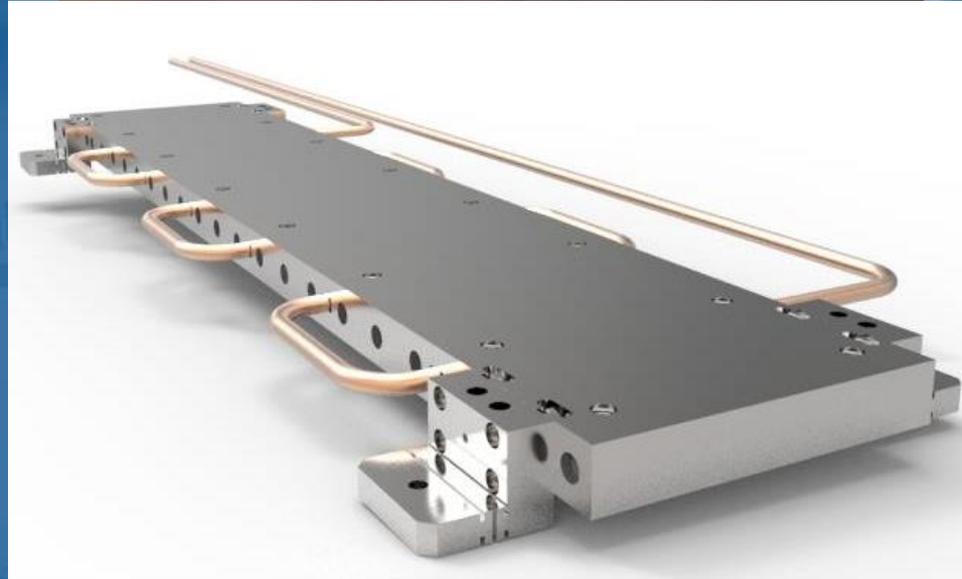
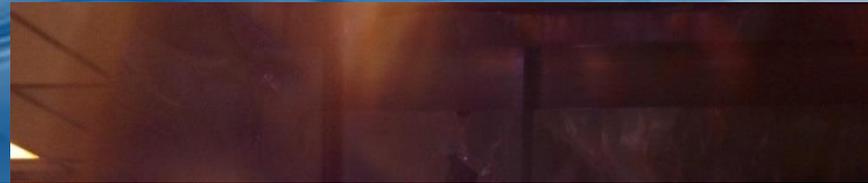
Enabling Technology For A Better World

Low Pressure Sputtering

- Low Pressure Sputtering source
 - Operates down to 1×10^{-4} Torr
- Sputters from both major target faces
- Produces sharp features when sputtering through masks.



Low Pressure Sputter Source



Enabling US OLED Manufacturing

- Enable a focus on panel production and/or creating more panel producers.
- Drive demand for panels.
- Enable sharing of core stack and materials technology that can be used to help manufacturers design equipment.

Your Primary Vacuum Supplier

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