Admont

This project has received funding from the ECSEL Joint Undertaking under grant agreement No 661796.
This Joint Undertaking receives support from the European Union's Horizon 2020 research and innovation programme and Germany, Finland, Sweden, Italy, Austria, Hungary."

ECSEL Joint Undertaking

ADMONT

ADMONT Essential Capabilities & Services FhG-FEP Dresden

Information for potential ADMONT pilot line user

Status 07/2015

Advanced Distributed Pilot Line for More-than-Moore Technologies

Who is ADMONT?

Advanced Distributed Pilot Line for More-than-Moore Technologies

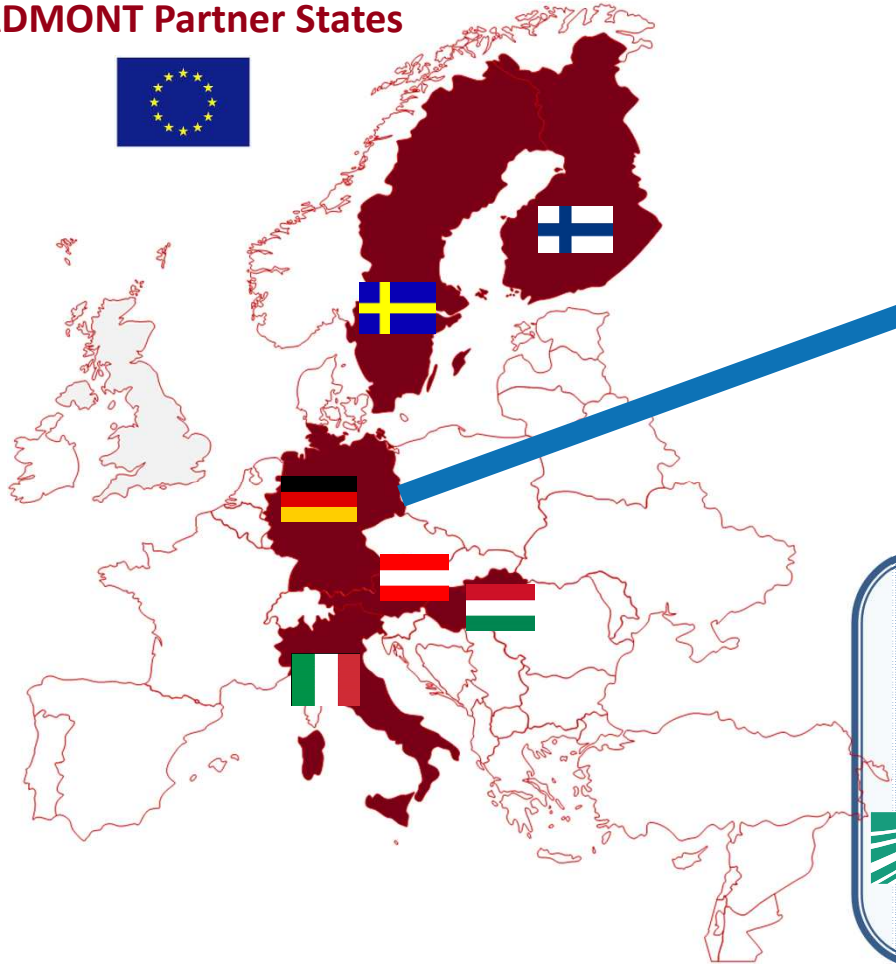
ADMONT is a **multi-KET pilot line** driven by a **combination** of **technology platforms** in Dresden carried by industry and research institutes serving pilot line clients in Europe

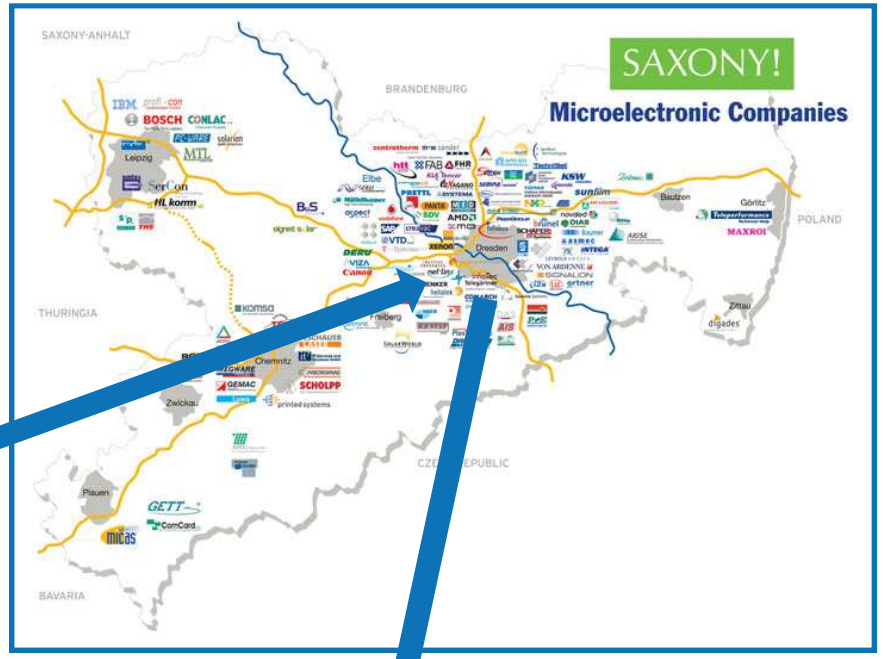
- ADMONT is organised along the **value chain** from wafer material, CMOS wafer, sensor and OLED processing to silicon system integration in one production flow
- ADMONT is an **ECS** (European Electronics Components and Systems) **ecosystem** in **Saxony** for Europe with sustainable impact on economic growth and employment in the European Union
- ADMONT addresses key applications: **smart mobility**, **smart energy**, **smart health** and **smart production** in excellent agreement with the **ECSEL Multiannual Strategic Plan**
- ADMONT addresses essential capabilities: **semiconductor process equipment** and **materials**, **design technology**, **smart system integration**

ADMONT as a distributed More-than-Moore pilot line is unique in Europe and worldwide.

Where is ADMONT?

ADMONT Partner States





FAB
MIXED-SIGNAL FOUNDRY EXPERTS

Fraunhofer FEP

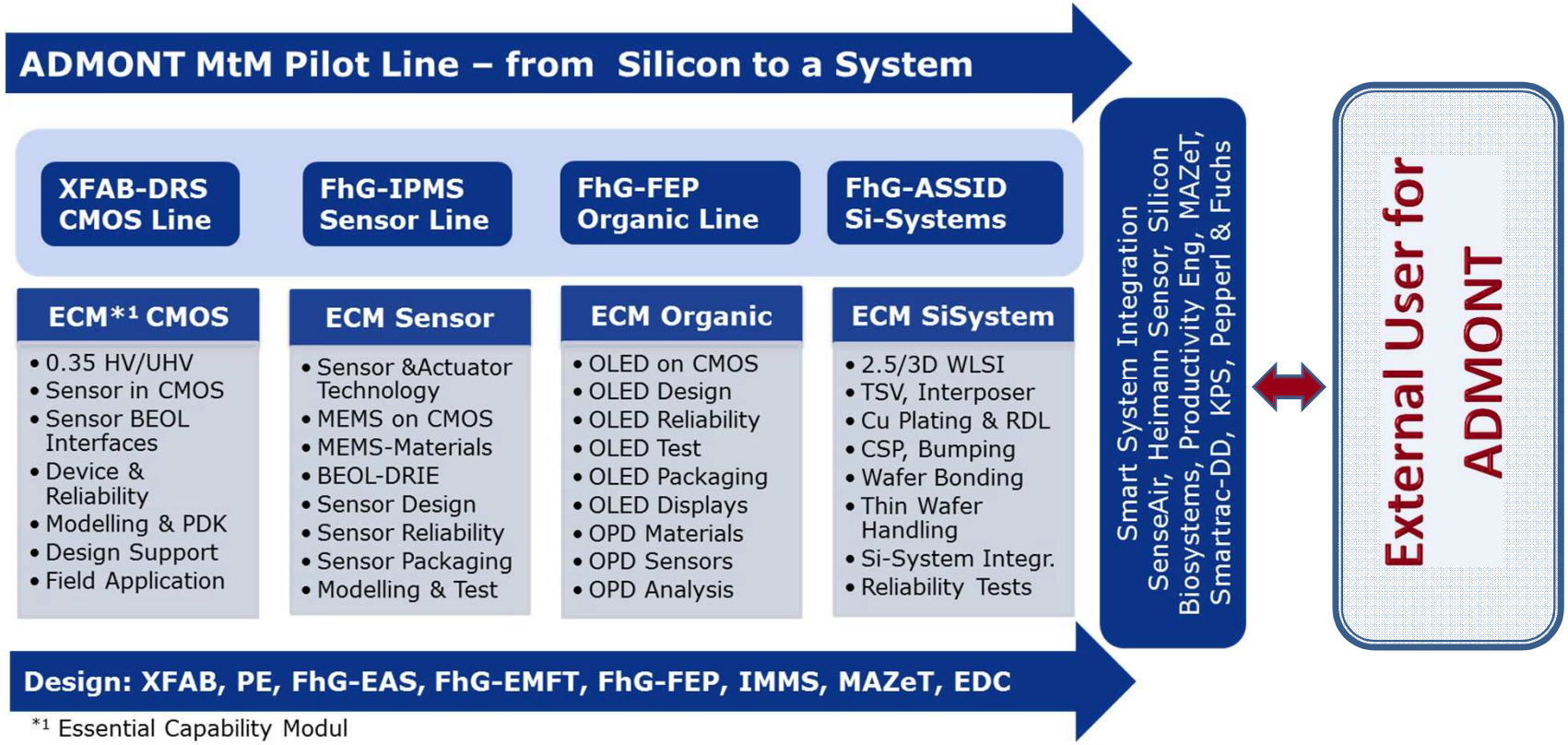
ADMONT Pilot Line

Fraunhofer IPMS

Fraunhofer IZM

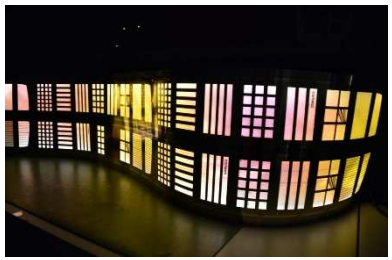
ADMONT Concept & Capabilities

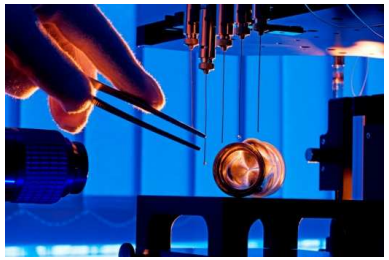
- ADMONT pilot line concept, structure and excellences

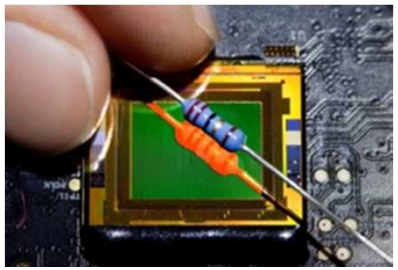


- Detailed Information are available under (Link: XFAB, IPMS, FEP, ASSID)

Fraunhofer Institute for Organic Electronics, Electron Beam and Plasma Technology FEP





VERSION 2015-03-13

Admont

ECSEL Joint Undertaking

Fraunhofer FEP

Fraunhofer FEP and COMEDD

History

- 1991 — foundation of the Fraunhofer FEP with approx. 70 employees of the former research institute “Manfred von Ardenne”
- 1991 – 1996 — construction and extension of the Technology Center Helmsdorf
- 1998 — inauguration of the Dresden part of Fraunhofer FEP at the Fraunhofer Institute Center at Winterbergstrasse
- 2002 – 2004 — extension of the technology buildings at Winterbergstrasse
- 2013 — inauguration of the Fraunhofer research center “resource-saving energy technologies – RESET“ by Fraunhofer FEP, Fraunhofer IKTS, and Fraunhofer IWS
- 1. July 2014 — Merger of Fraunhofer COMEDD and Fraunhofer FEP

Fraunhofer FEP

Fields of Application

OPTICS, SENSOR TECHNOLOGY AND ELECTRONICS

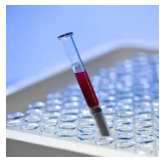
DISPLAYS

SMART BUILDING AND ARCHITECTURE

MECHANICAL ENGINEERING

ENVIRONMENT AND ENERGY

TRANSPORT



BIOMEDICAL ENGINEERING

LIGHTING

SOLAR ENERGY

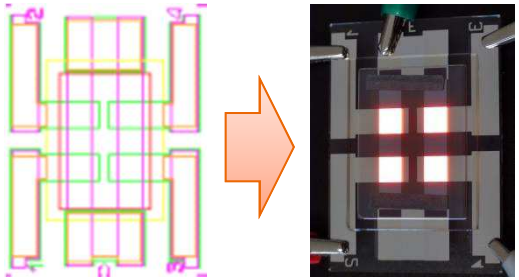
PACKAGING

AGRICULTURE

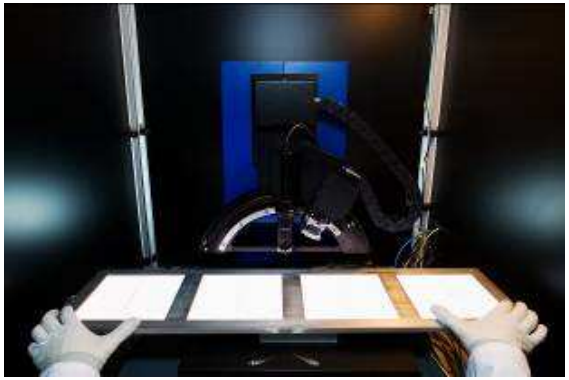
PRESERVATION

Fraunhofer FEP

Fraunhofer FEP services for customers

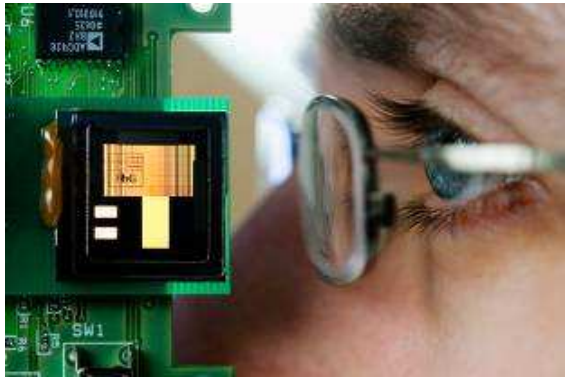


Device concept and layout

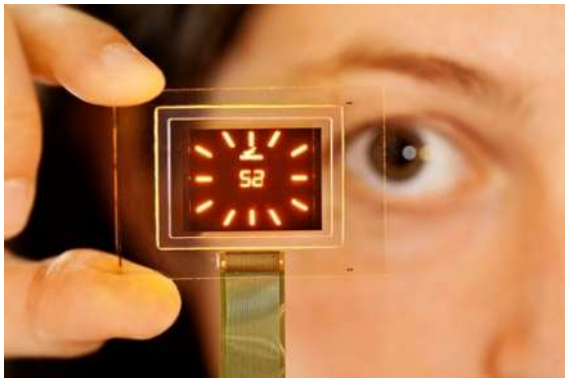


Fabrication and characterization technology

Deposition and structuring of electrodes and passivation



Integration technology for organic devices

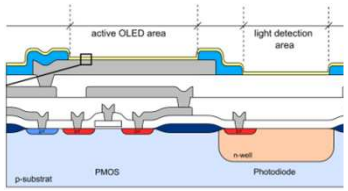


Product related R&D

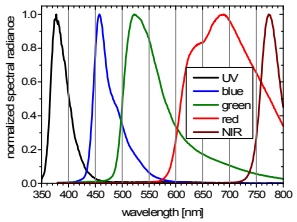
Pilot production of organic devices

Fraunhofer FEP

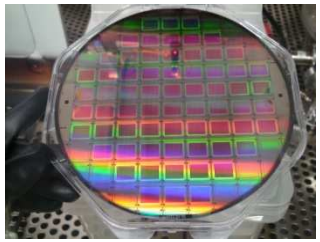
FEP offers complete chip development and demonstrator manufacturing

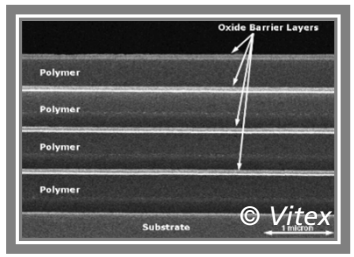


IC-Design of CMOS and transfer to wafer fab



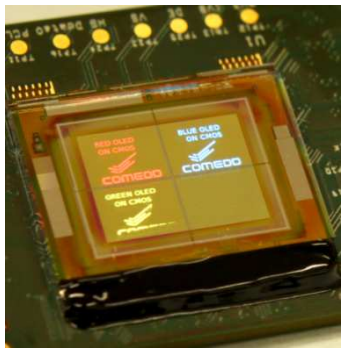
OLED and OPD development to customers needs





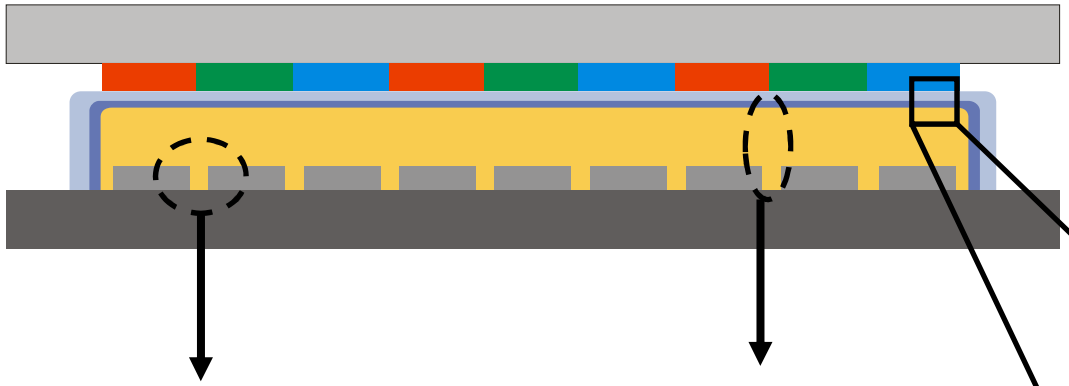
Development of sensor on 8" wafer production equipment with state of the art Vitex encapsulation

- *Software and interface development*
- *Wafer dicing / chip on PCB*



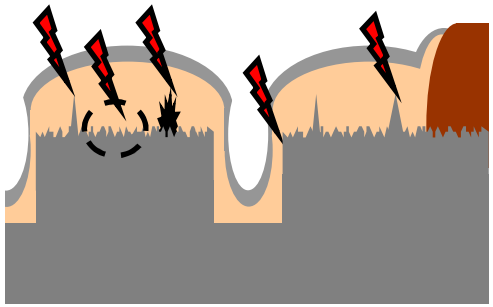
Fraunhofer FEP

MAIN RESEARCH TOPICS FOR OLED MICRODISPLAYS AND SENSORS

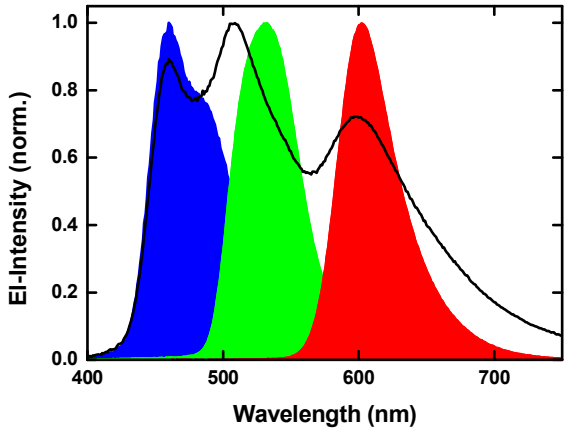


Encapsulation glass
Colour filter (optional)
Thin film encapsulation
Cathode
pin-OLED
Pixel
CMOS

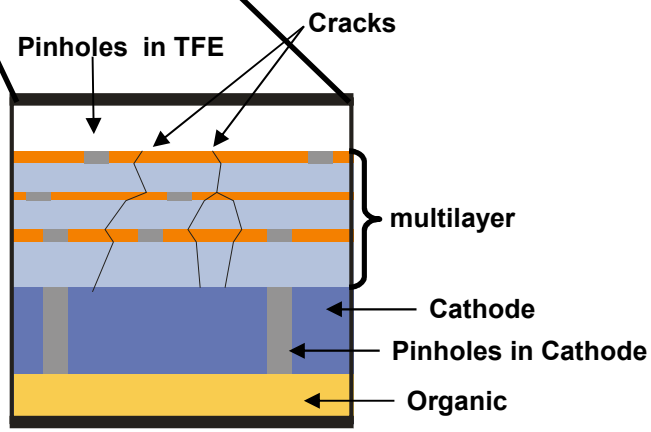
CMOS top metal (reverse currents in OLEDs)



***pin*-OLED efficiency and lifetime**



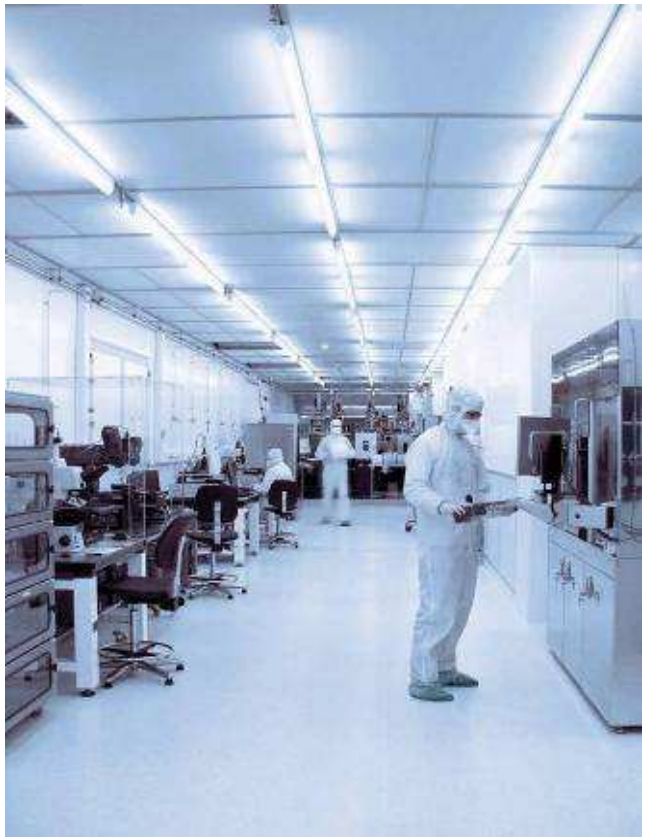
Oxygen and water barrier



Fraunhofer FEP

OLED/PLED Microdisplay clean room at FEP

- Process flow - process line for PLED and OLED microdisplay production within 300m² class 100 clean room
  - Anode metal deposition
  - Spin coating of organics
  - Structuring of organics via etching or shadow masks
  - Cathode deposition
  - thin film encapsulation
  - 200mm wafer level device test
  - Silicon wafer to color filter lamination



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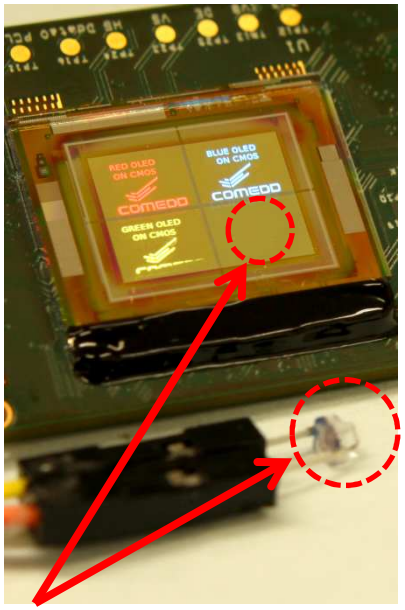
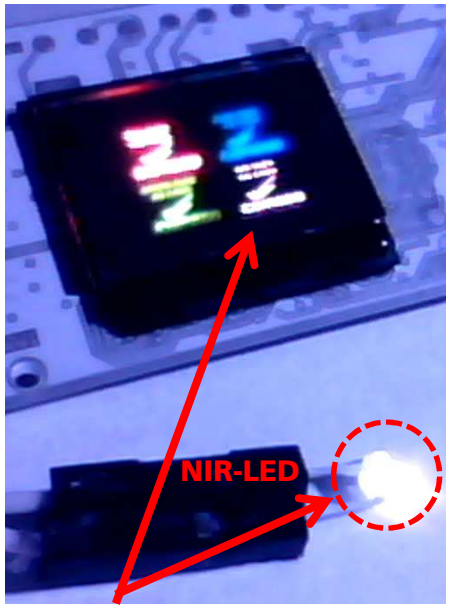
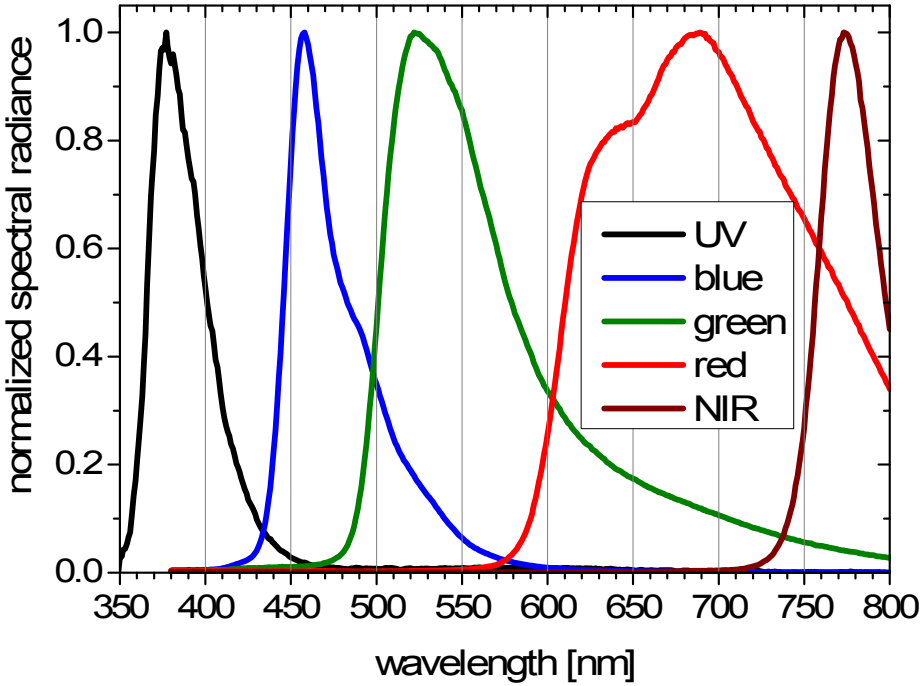
UV-VIS-NIR-OLEDs on CMOS backplanes



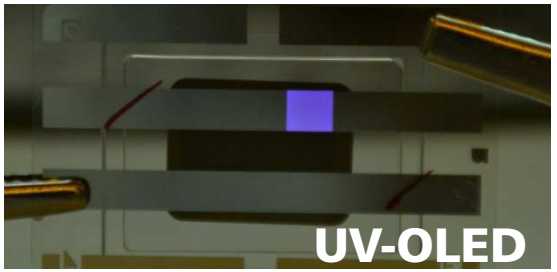
NIR-not visible for standard cameras



*Only visible **without** NIR-filter*



- Integration of various emission spectra within the visible range as well as in NIR and UV on CMOS.
- Peak wavelength and efficiency of all emitter can be optimized by using OLED stacks for every emitter.



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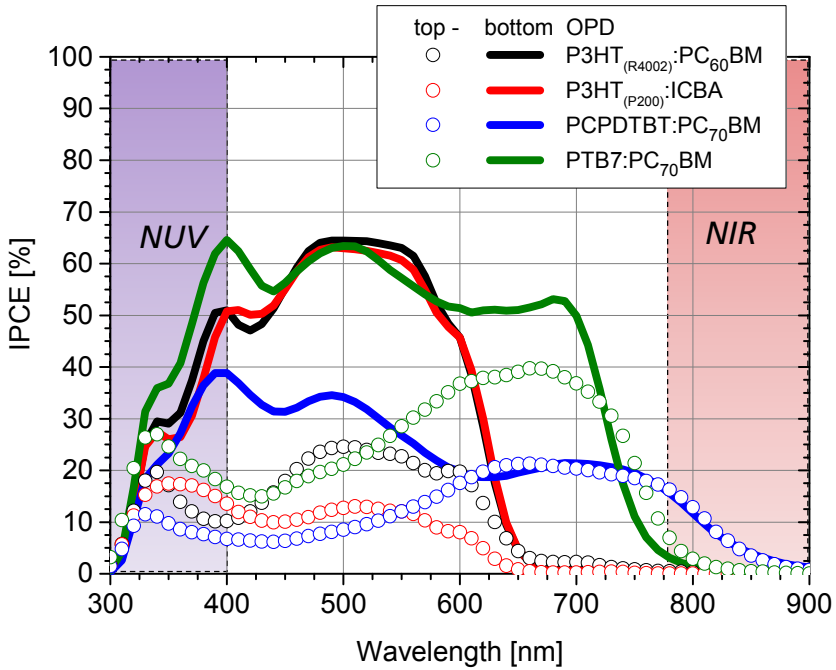
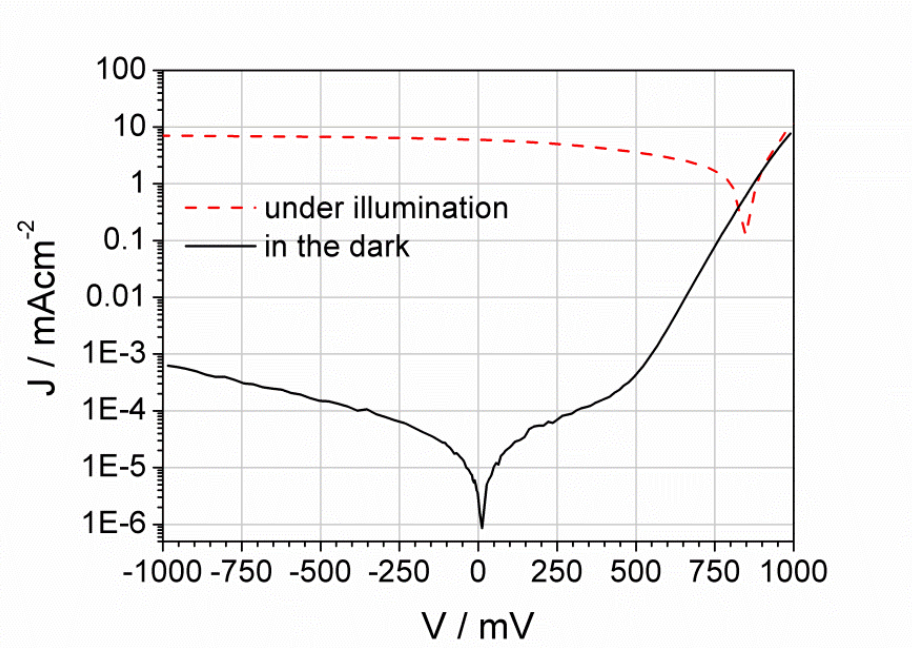
Organic Photodiodes



Spectral sensitivity in dependence on the material composition.



J-V curve of an organic photodiode

- *Properties such as spectral sensitivity, capacitance and dark current can be adjusted*
- *OPDs show better sensitivity values in blue and UV than Si based photodiodes*

Fraunhofer FEP

Contact

Fraunhofer Institute for Organic Electronics,
Electron Beam and Plasma Technology FEP
Maria Reiche Str. 2
01277 Dresden, Germany

Karsten.fehse@fep.fraunhofer.de

Phone +49 351 8823-367
Fax +49 351 8823-394
info@fep.fraunhofer.de
www.fep.fraunhofer.de

We look forward working with you from the concept phase right through to industrial implementation.

Fraunhofer FEP

ADMONT Grant Agreement No. 661796

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If you need further information, please contact the coordinator:

X-FAB Dresden GmbH & Co. KG

Grenzstrasse 28, 01109 Dresden, GERMANY

Tel: +49 351 40756 214 Fax: +49 351 40756 274

E-Mail: karl-heinz.stegemann@xfab.com