

INSPIRED SOLUTIONS



Films for Roll to Roll Electronics

ALCAN PACKAGING



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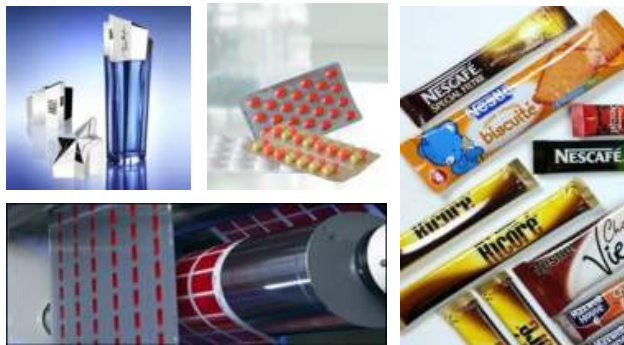
Outline

- Rio Tinto Alcan
 - Alcan Packaging company overview

- Substrates for flexible electronics
 - RFID
 - Lighting
 - Solar cells
 - Barrier films
 - Transparent conductive films

Part of Rio Tinto Alcan, a leading aluminum group

PACKAGING



73,000 employees
in 61 countries
US\$ 49 billion
revenues* 2006

BAUXITE AND ALUMINA



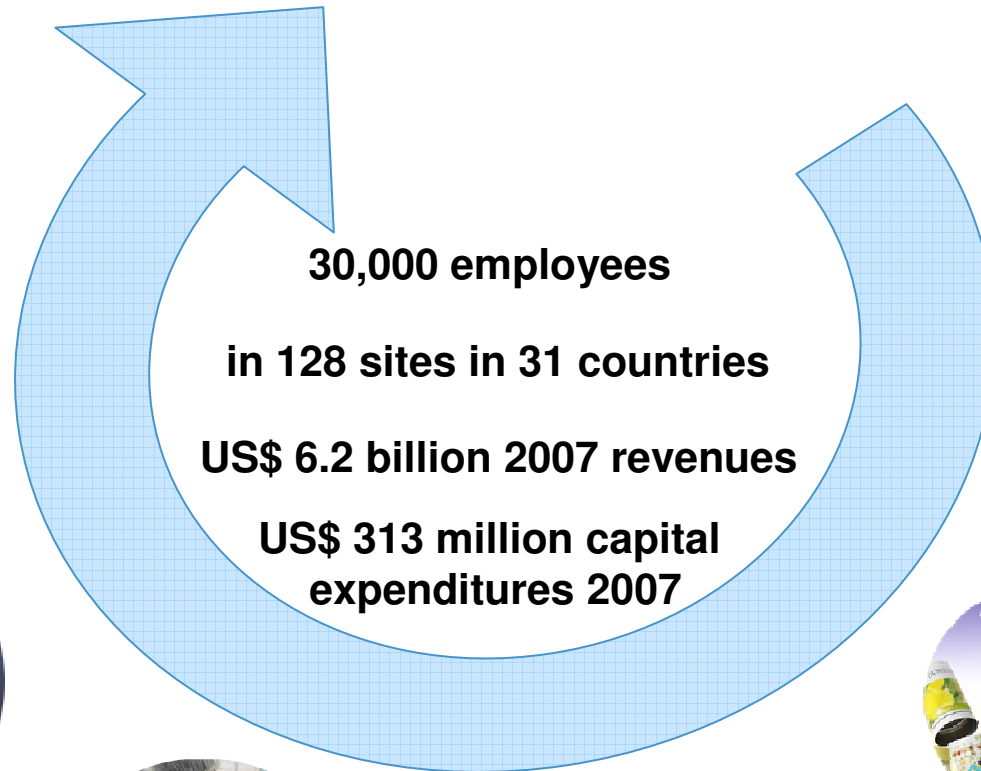
ENGINEERED PRODUCTS



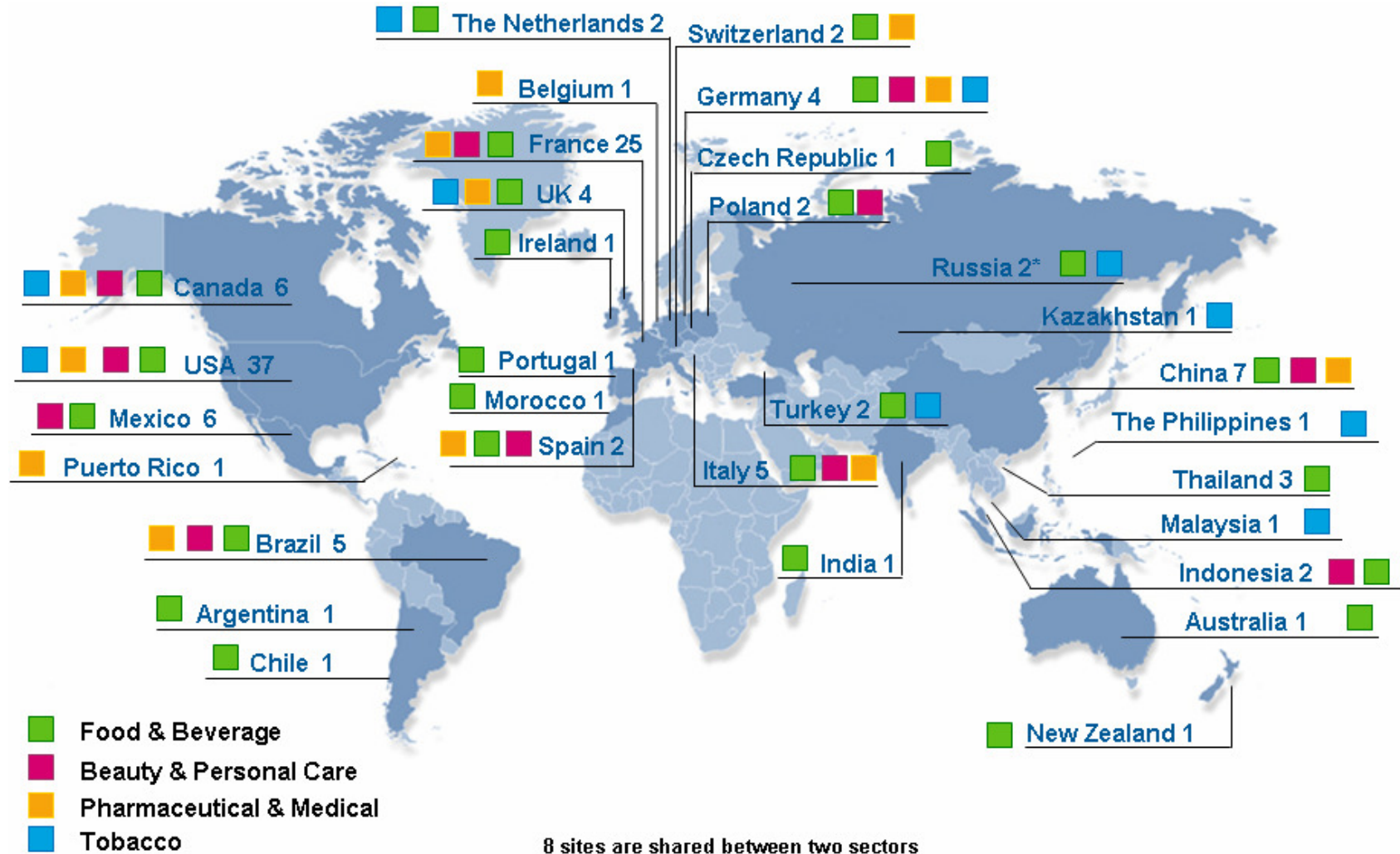
PRIMARY METAL




A global leader in packaging



Global reach in all our markets



Strong position in Switzerland

- Alusuisse was well known in Switzerland 
- Today plants in Kreuzlingen (300 empl.), Rorschach (290 empl.)
- Value Innovation Center in Neuhausen am Rheinfall (40 empl.)

Leadership position in our four main markets

Food Flexible Packaging

- ▶ US \$ 3.9 Bn revenues &
- ▶ 63% of AP revenues in 2007



Tobacco Packaging

- ▶ US \$ 0.5 Bn revenues &
- ▶ 8% of AP revenues in 2007



Pharma Packaging

- ▶ US \$ 0.95 Bn revenues &
- ▶ 15% of AP revenues in 2007



Cosmetics Packaging

- ▶ US \$ 0.85 Bn revenues &
- ▶ 14% of AP revenues in 2007

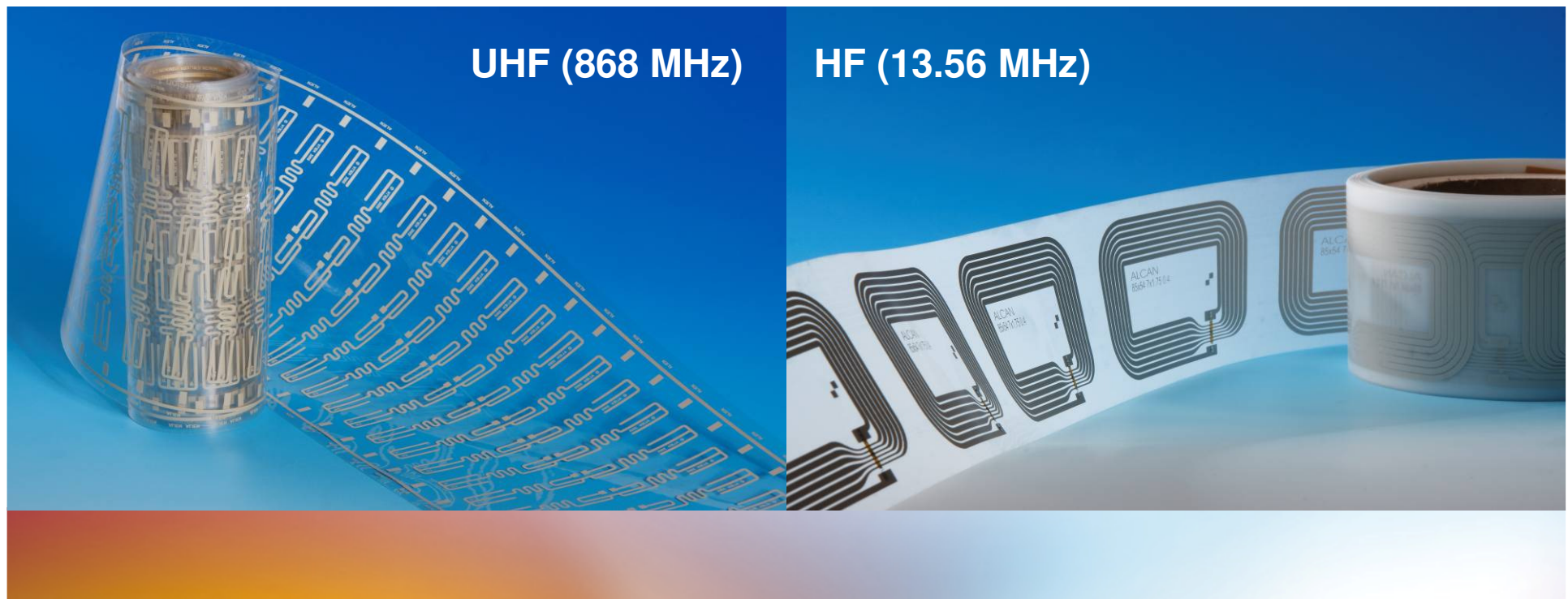


Useful technologies for flexible electronics

- Water vapor / oxygen barrier competence
- Roll2Roll production
 - Printing (gravure, flexo, inkjet, screen)
 - Coating (vacuum, wet)
 - Lamination
- High volumes, high speed (low cost)
- Substrate experience

RFID antennas in rotogravure printing

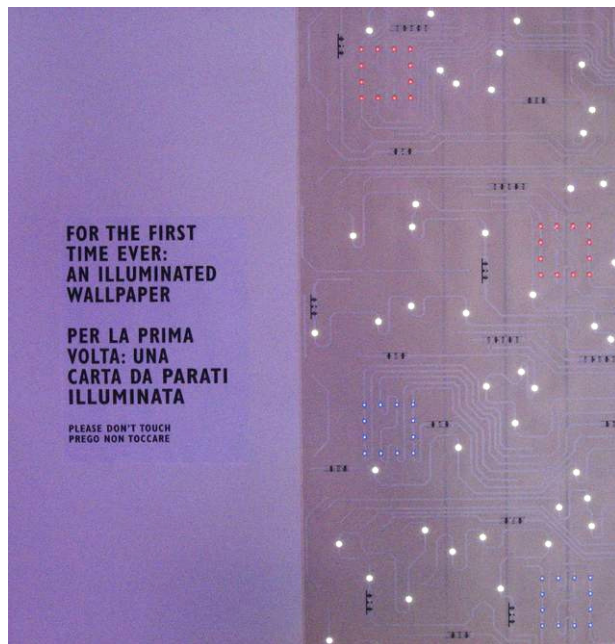
Assets	<ul style="list-style-type: none">- stable production process- environmentally friendly additive process- line resolution of 40-50 microns- greater antenna flexibility
Drawbacks	<ul style="list-style-type: none">- silver price- high volumes



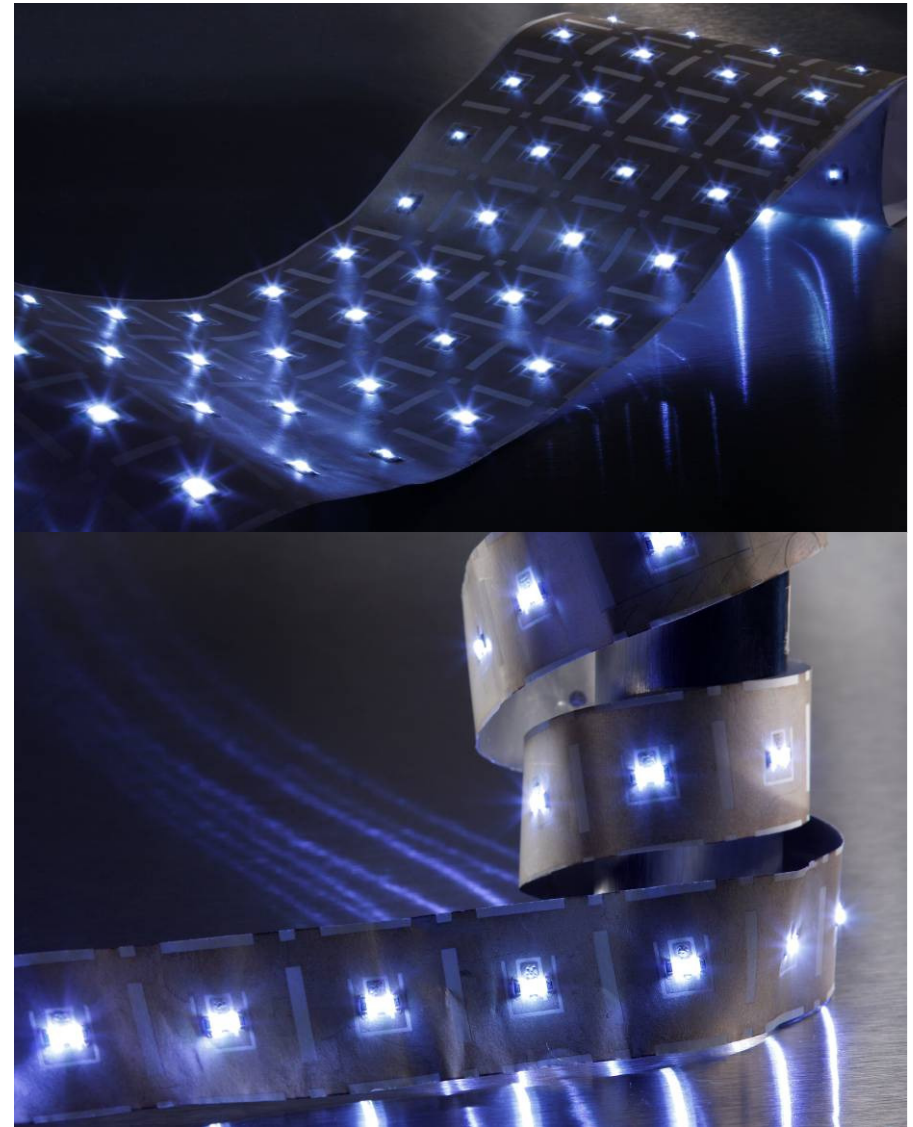
Flexible PCB for LEDs

Light-emitting wallpaper

Designed by Ingo Maurer

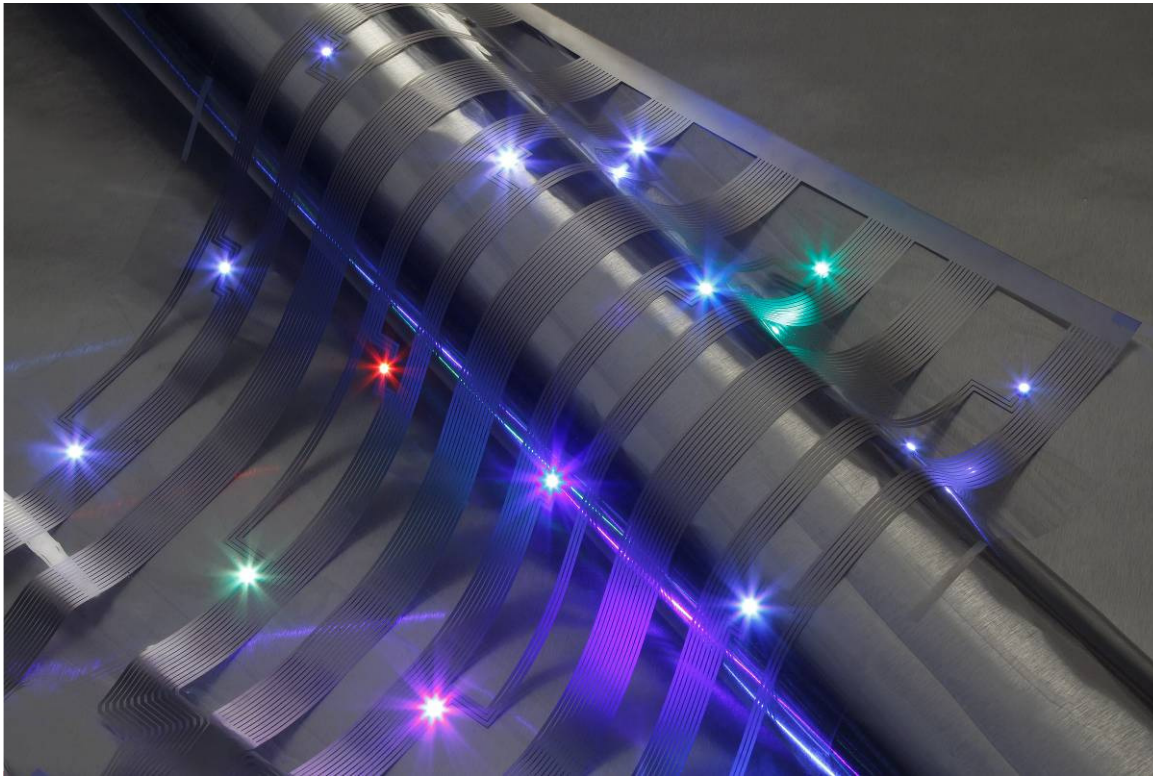


Cut & Light



Patent pending

RGB display



Interpack 2008 Düsseldorf

Flexible solar cells



Printed silver grids to enhance TCO conductivity

This example (left) **is not** printed by Alcan Packaging

Printed conductive polymers EU Olatronics

Printed electrochromic displays and photovoltaics

- **50 m/min gravure printed**
- **Special substrate (no plasma / corona needed)**



HORIBA JOBIN YVON

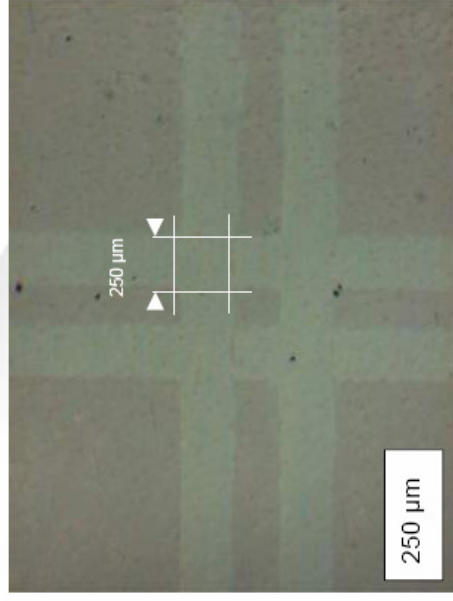
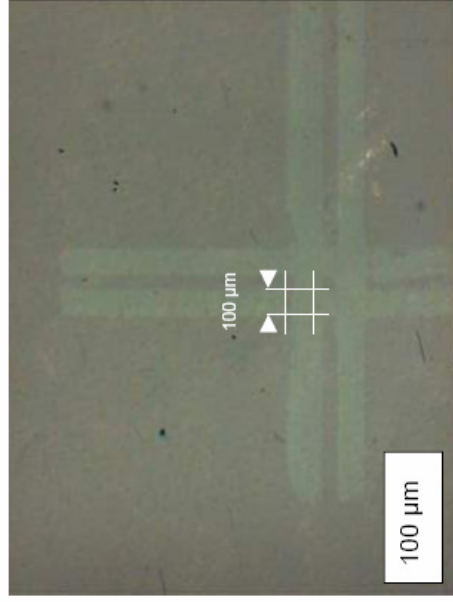
SIEMENS



H.C.Starck 



CLEVIOS™ Inkjet Line Printing on PET



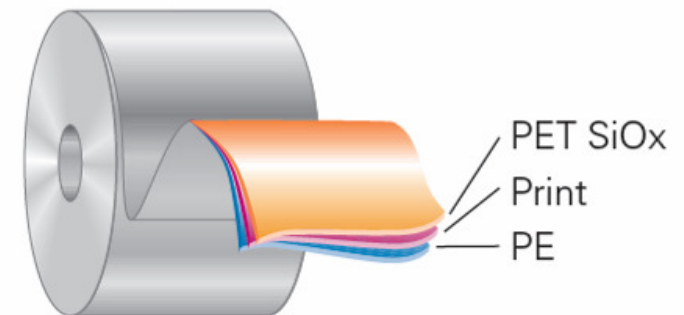
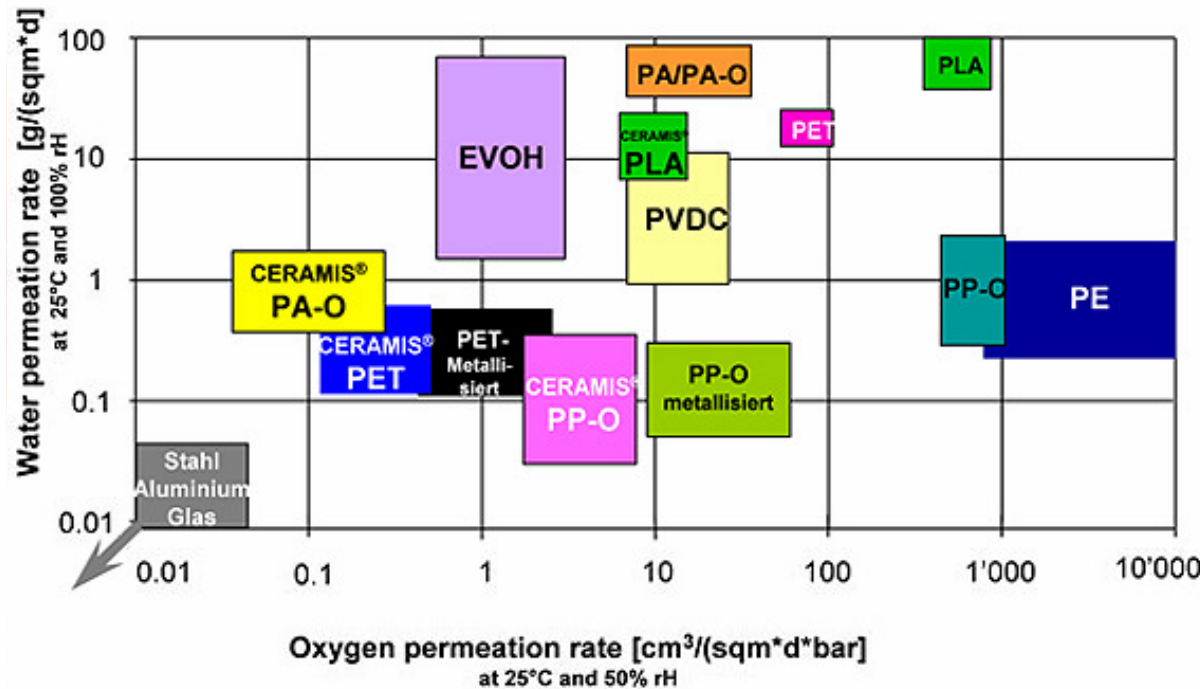
CLEVIOS™ P Jet HC V2

Drop spacing: 45 µm
 Temperature: 30 °C
 Filtration: 0,2 µm

Substrate: 50 µm PET film with a barrier layer from Alcan Packaging



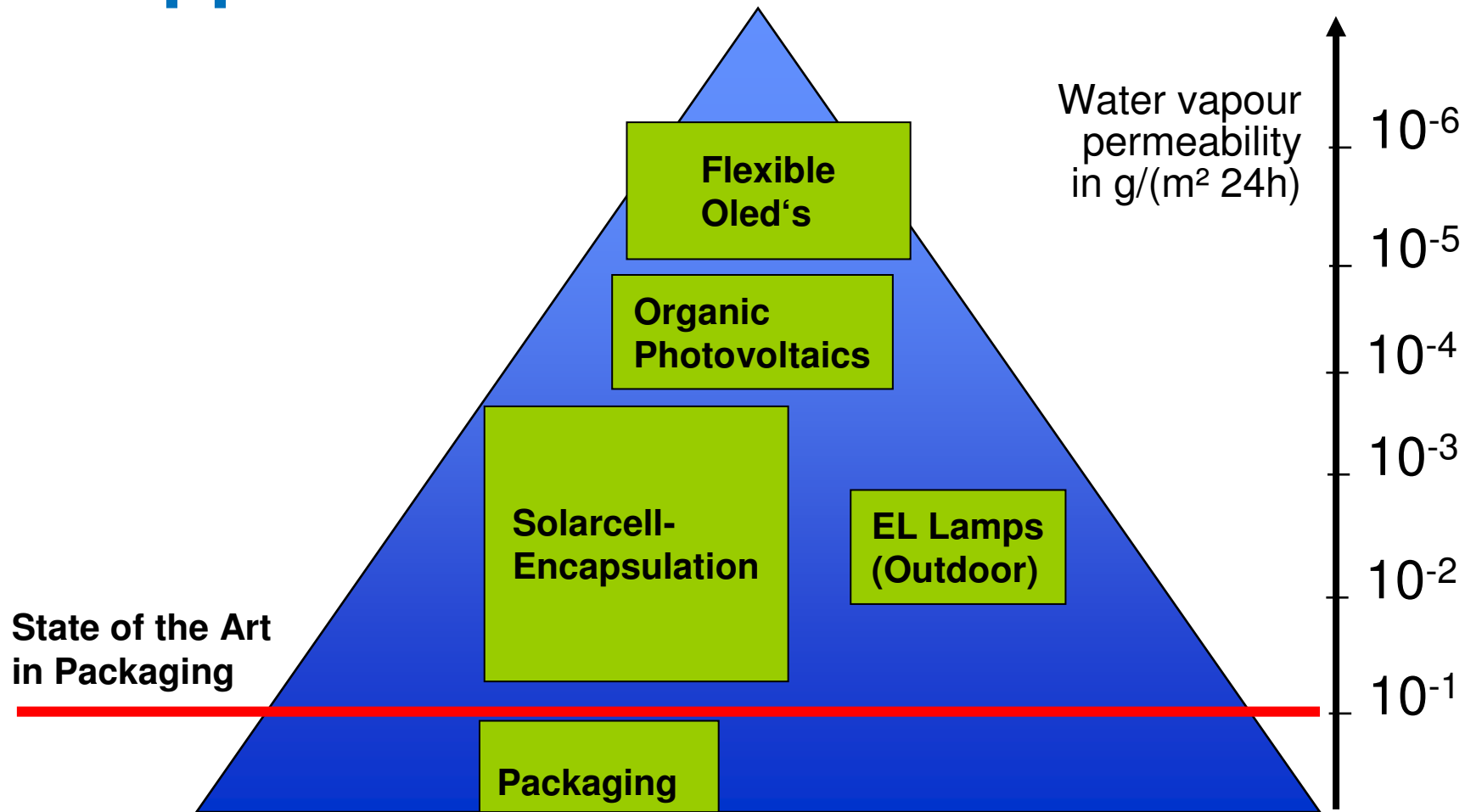
Barrier films



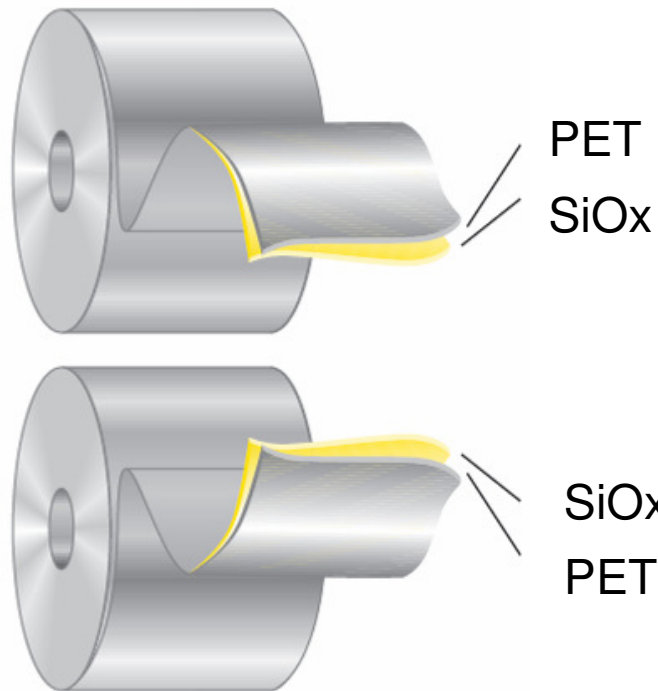
CERAFRESH LID

Deckelmaterial mit SiOx-Bariere, geeignet für alle MAP-Anwendungen

Barrier Coatings For Technical Applications



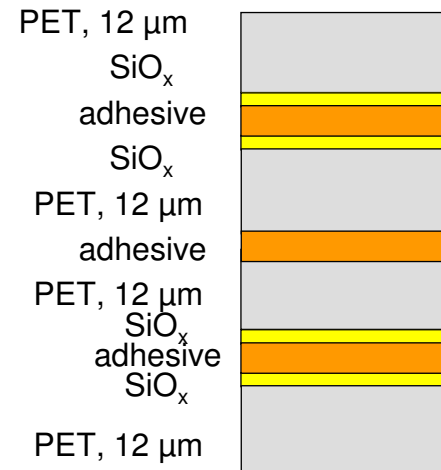
Multi Layer Lamination Approach



- Laminating 2 or more Face2Face Laminates:

Mechanically very robust !!!!

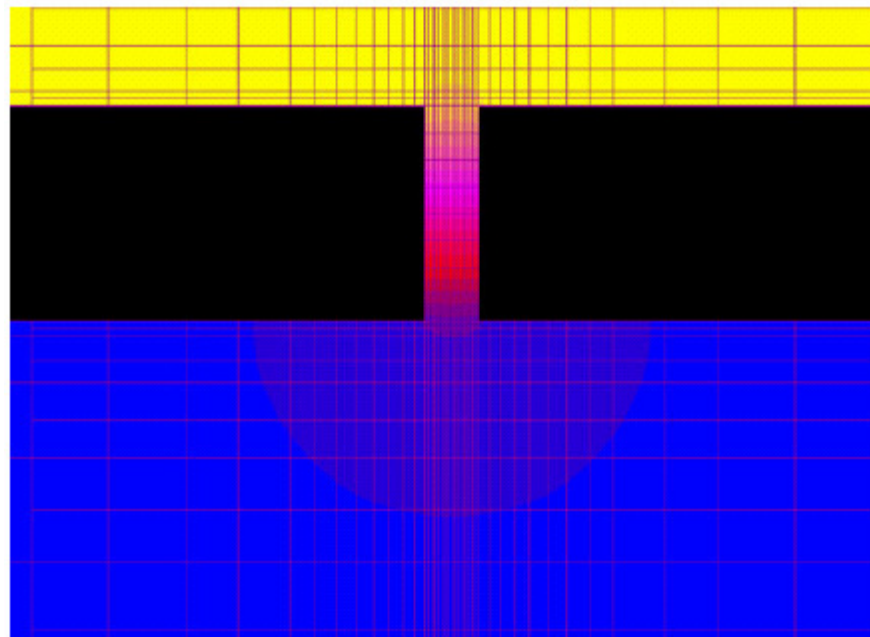
50 μm



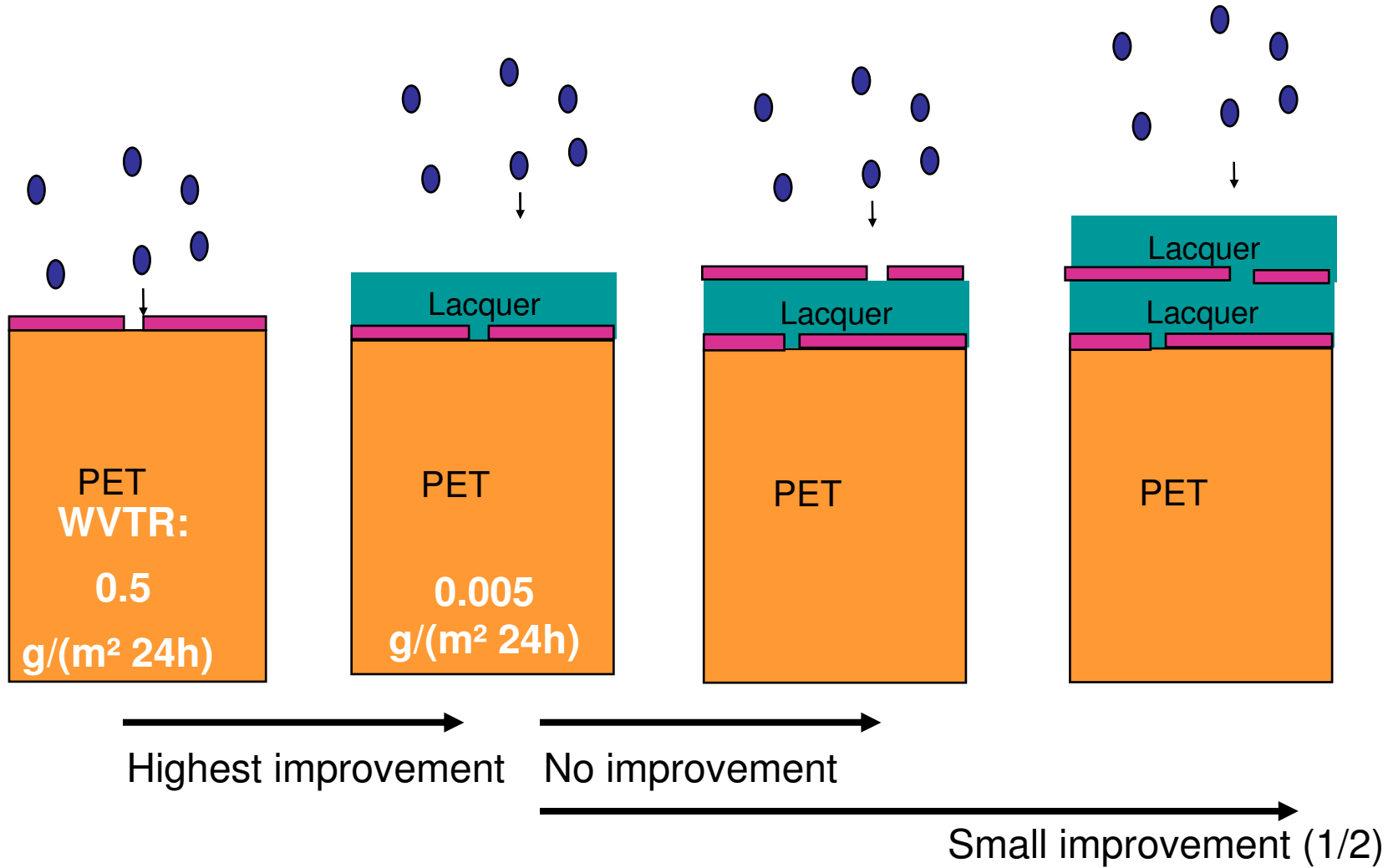
OTR-23 °C: < 0.01 ccm/m²dbar
 WVTR-38 °C: < 0.01 g/m²d

Lacquer approach / simulations

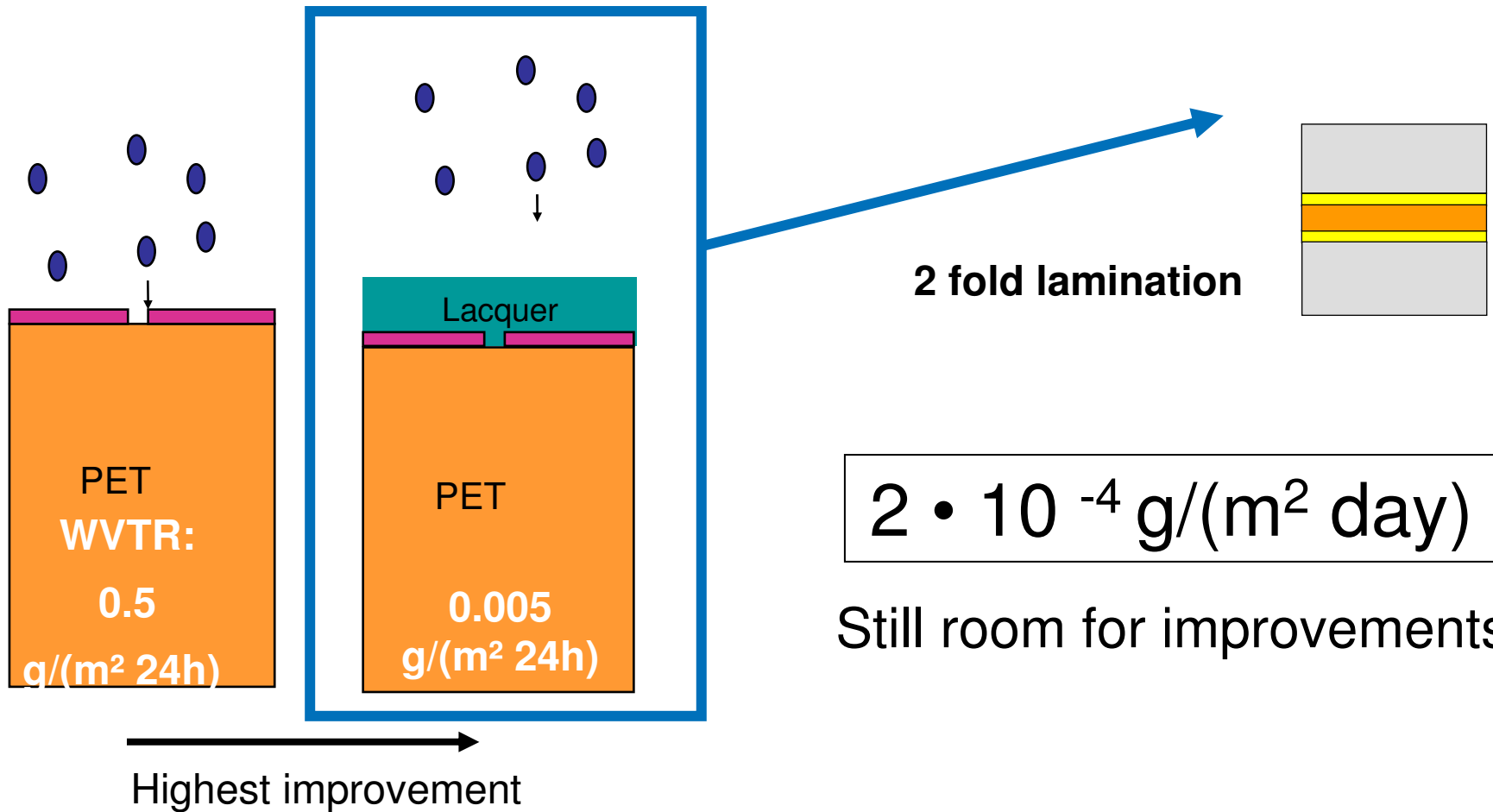
- organic top layers are reducing the permeation by more than one order of magnitude



Multi Layer Lacquering Approach



Our Approach



Applications

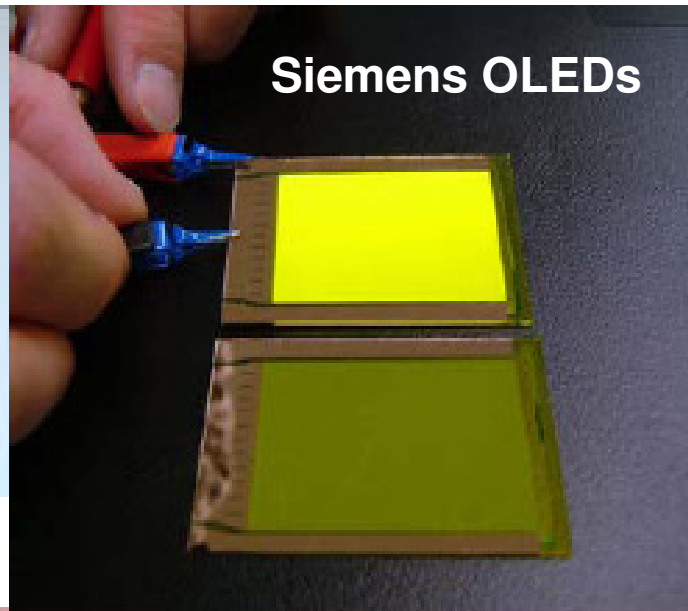
- Polymer solar cells
- OLEDs
- Industrial processes and volumes (available today)

EU Flexionics

		Aristotle University of Thessaloniki - LTFN (Coordinator)
		Fraunhofer-Gesellschaft POLO Alliance
		Horiba Jobin Yvon
		Applied Films GmbH & Co. KG
		Isovolta AG
		Alcan Packaging Services Ltd.
		Siemens Aktiengesellschaft
		Technical University Graz
		Konarka



Konarka Solarcell



Siemens OLEDs

Looking for partners

- Electrical characterization of devices
- Barrier testing with device demonstrators
- Testing of new concepts
- Partners with gravure printing capabilities

Thank you.

