



FUNCIONAL COATINGS AND INKS

FUNCIONAL AND INTELLIGENT SURFACES RESEARCH GROUP



ITENE - AREAS AND SERVICES

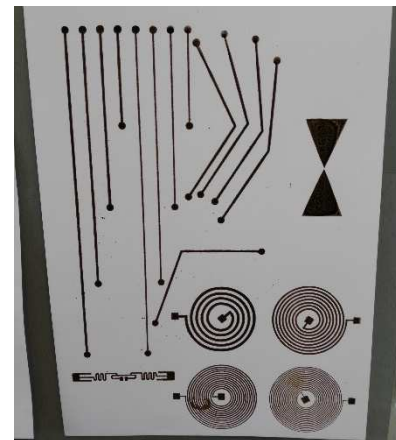
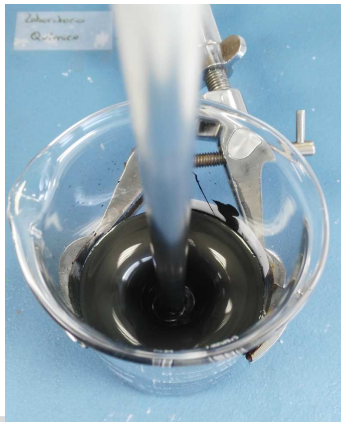


FUNCTIONALS COATINGS AND INKS. SMART PACKAGING

- ✓ Coatings and inks formulation with specific properties (conductive, indicator, barrier (OTR/WTR), repellent, environmental friendly, bio...)
- ✓ Printing techniques and deposition systems in different materials (spray, encapsulation, superficial treatments, etc...)



PRINTING TECHNOLOGIES FOR MATERIALS DEPOSITION WITH FUNCTIONAL PROPERTIES



¿WHY FUNCTIONAL COATINGS AND INKS?

MAIN REASONS

Functional coatings and inks give packaging improved properties, usually leading to an increase of product line profitability and improved sustainability.

Sustainability



Cost savings



Food waste reduction, food safety, interaction with consumer and brand positioning are the main drivers for improved properties packaging implementation.

¿WHY FUNCTIONAL COATINGS AND INKS?

DRIVERS



Sustainability



Brand positioning



Prevent food spoilage



Shelf life increase



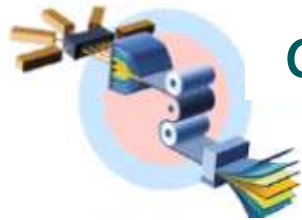
Improve food safety



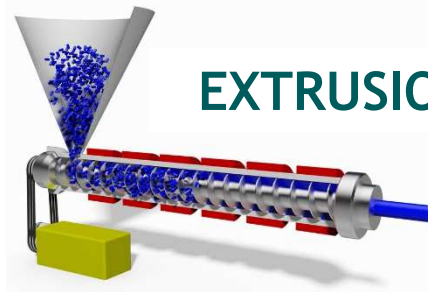
Preservatives reduction

¿WHY FUNCTIONAL COATINGS AND INKS?

SIMPLIFYING



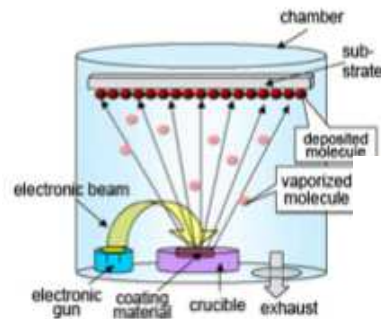
COEXTRUSION



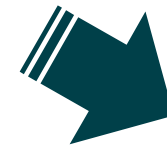
EXTRUSION



LAMINATION



STEAM DEPOSITION



FUNCTIONAL PRINTING





Intelligent packaging to identify product and track temperature.



Technology to improve safety, transparency and guarantee quality in Frozen product logistic chain. Tag inks that will reveal when the cold chain has been broken.



PARTNERS:

FUNDS:





Global and centralized system for authentication, Using smartphones to authenticate added value products and documentation

Development of an authenticity system based on antenna printing in paper based substrates for pharmaceutical products and official documentation

SISTEMA ANTIFALSIFICACIÓN electrónica impresa para determinar la autenticidad de los productos



PARTNERS:



FINANCING:





Development of indicators of time and temperature for refrigerated products.

Time-temperature indicators printed on the package, to control possible breaks in the cold chain of refrigerated storage products.

PARTNERS:



FINANCING:





Development a freshness indicator for beef products

Development of flexible, sustainable, active and intelligent packaging, which extends product's shelf-life. Improving safety and reducing waste



PARTNERS:

FINANCIACIÓN:





Freshcode. Smart Freshness

Exclusive new indicator. The Freshcode is a unique visual indicator, the only one of its kind on the market that displays the guaranteed real freshness of packaged chicken breasts.



PARTNERS:



Kao Chimigraf

FINANCIACIÓN:





Development of susceptors in paper based substrates

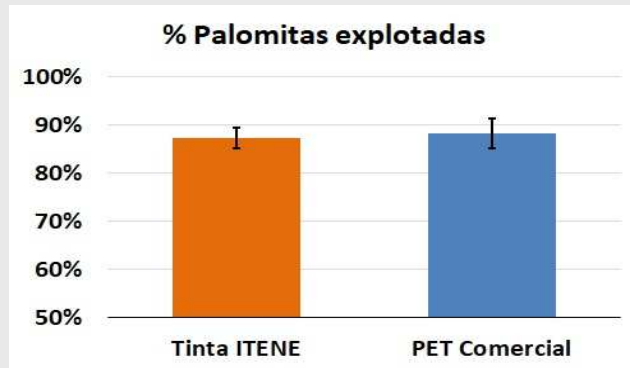
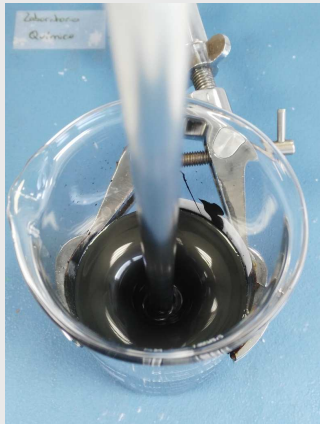


Ink formulation

Lab scale validation

Semi-industrial scale-up

Pilot trial



MICROWAVE SUSCEPTORS

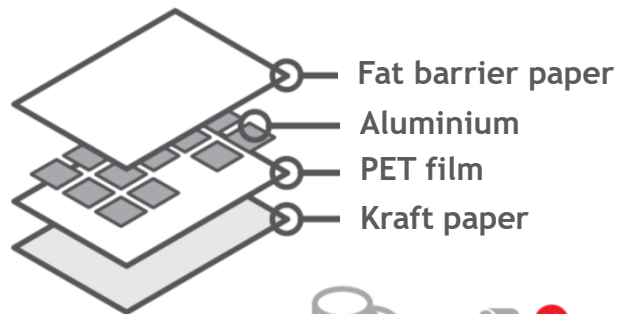
HOW IT WORKS



SUSCEPTOR INKS

- Alternative to metallized PET
- Turn microwaves into heat
- Regulate cooking in microwave packaging

Metallized PET



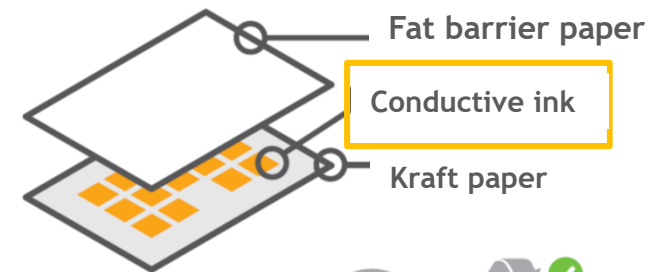
Expensive



Hard to recycle



Printed susceptor ink solution

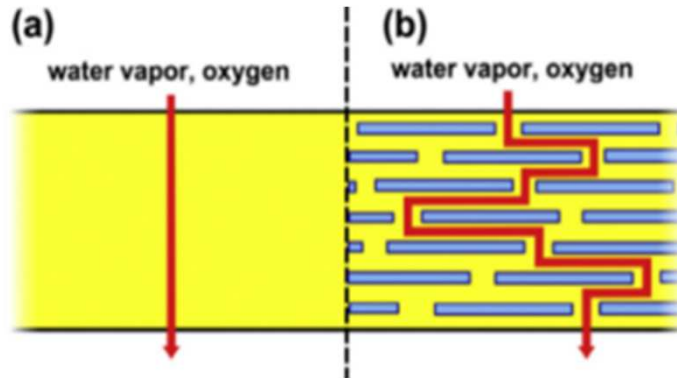


Cost effective



Recyclable

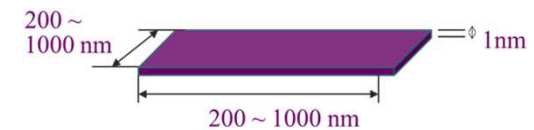
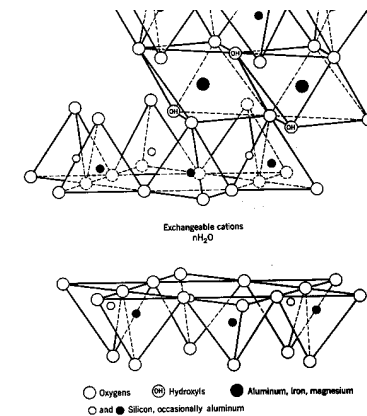
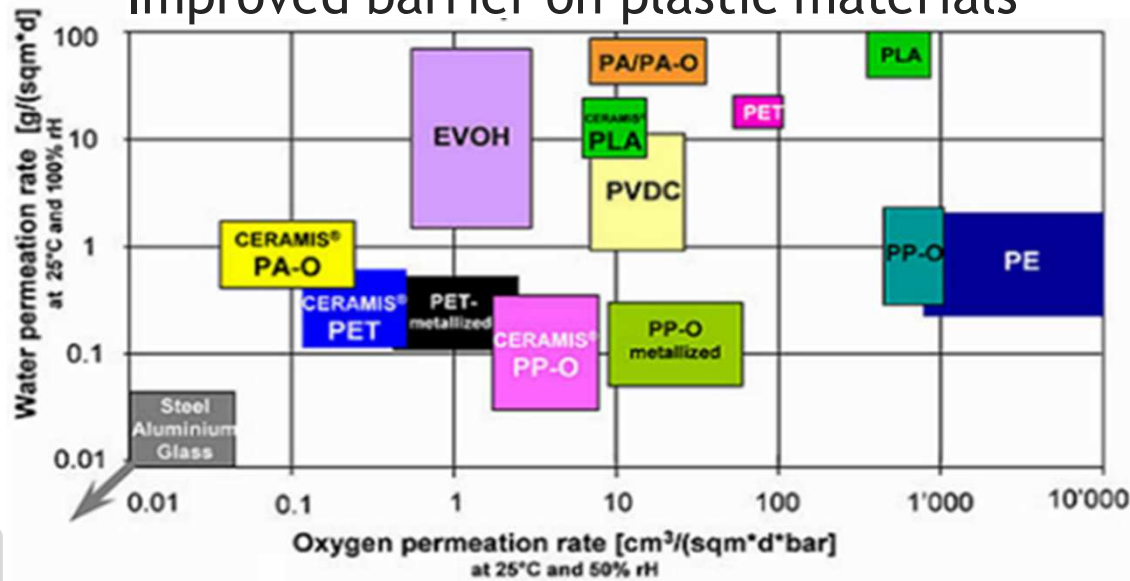
BARRIER IMPROVEMENT (O₂, H₂O, FATS) THE CONCEPT



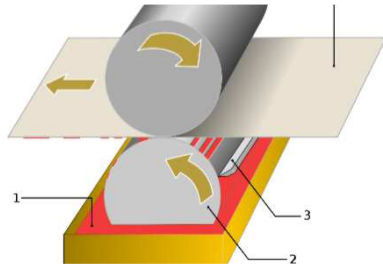
HYBRID COATING WITH LAMINAR LAYERS

- Exfoliation within the coating material
- Slow gases and other substances flow ratio
- Makes it difficult for gases to go through

Improved barrier on plastic materials



BARRIER IMPROVEMENT (O₂, H₂O, FATS) CRITERIA



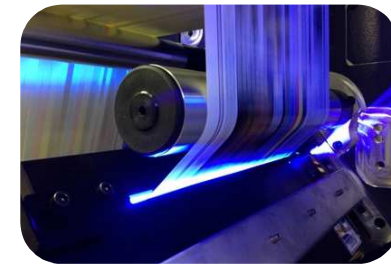
Printing
technique



OTR, WVTR



Ink supply
g/m²



Dry process



Cost



Anchorage



Legislation

MUST HAVE

REGULATORY LEGISLATION

EFSA RISK EVALUATION & AUTHORISATION PROCESS

PETITIONING SUMMARY DATA SHEET ("P-SDS")

ITENE has experience getting the approval for food contact substances by EFSA.



EXAMPLE



EQUIPMENT/PILOT LINES



LABSTAR - BEAD MILL



Three roll mill EXAKT 80 E



Formech HD686, vacuum forming machine



ROTARY KOATER PRINTING



TOTPRINT Screen printing machine



FUJIFILM Dimatix Materials Printer DMP-2850



FUNCTIONALS COATINGS AND INKS. PRINTING TECHNIQUES.



Meter bars aplicator



Screen printing



Roll to roll printing and lamination equipment



Flexo/Gravure



Inkjet



More equipment is coming soon

EQUIPMENT/PILOT LINES

LabStar - Bead mill



Agitator Bead Mill LabStar enables scientific academic work on difficult research and development tasks and impresses with its easy handling. The grinding results with finenesses down to the nanometer range allow an exact scale-up to production size machines

- Lot sizes between 1 and 7 liters.
- Results extrapolated to industrial equipment
- The materials inside the grinding chamber can be very varied, adapting to the different natures and compositions of the products
- Equipment designed to work with inks of any base (water, solvent, UV, etc).

EQUIPMENT/PILOT LINES

Three roll mill EXAKT 80 E



- Electronically controlled three roll mill
- Electronic control of the distances between rollers, speed, shear force
- 3 different nip guards
 - 85 mm
 - 170 mm
 - 200 mm
- 0.02-20 throughput liters/hour

EQUIPMENT/PILOT LINES

Formech HD 686, fully automatic vacuum forming machine



Forming area (mm/Inches)	647 x 622mm / 25.5 x 24.5"
Sheet Size (mm/Inches)	686 x 660mm / 27 x 26"
Max depth of draw	350mm / 13.8"
Max Material Thickness	6mm / 0.25"
Heating Zones	16
Heater type	Quartz

EQUIPMENT/PILOT LINES

Rotary Koater Printing

The Rotary Koater, a pilot printing, coating and laminating system that is an ideal system for those faced with daily coating/laminating challenges. As a research and development tool it enables the manufacturer, the printer, the converter and others, to undertake R & D on an economical scale and under precisely controlled conditions. It can be used to test different formulations, substrates and processes. It is also highly effective as production machine for the small-scale production of specialized materials.



- Coating and printing systems easily interchangeable
- Infra red and ultra violet drying/curing
- Corona treater, from VETAPHONE.
- Web widths up to 305mm, with a speed range of 0.4 to 100 metres per minute
- Printing/coating processes available are:
 - Gravure
 - Reverse gravure
 - Slot die
 - Meter bar
 - Flexographic
 - Laminating

EQUIPMENT/PILOT LINES

TOTPRINT Screen printing machine



- Semiautomatic parallel lifting machine
- Adjustable print height form 0 to 10 cm
- Print format: 50 x 70 cm
- Velocity: 800 print / hour

EQUIPMENT/PILOT LINES

FUJIFILM Dimatix Materials Printer DMP-2850

The DMP-2850 allows the deposition of fluidic materials on an 8x11 inch or A4 substrate, utilizing a disposable piezo inkjet cartridge. This printer can create and define patterns over an area of about 200 x 300 mm and handle substrates up to 25 mm thick with an adjustable Z height. The temperature of the vacuum platen, which secures the substrate in place, can be adjusted up to 60°C.



Ideal applications for the materials printer include:

- Material and fluid development and evaluation
- Prototype and sample generation
- Fluid and substrate interactions evaluation
- Product development
- Optimization and evaluation of digital patterns

CHARACTERIZATION EQUIPMENT



Dataphysics OCA Mod: OCA15E



- Contact angle measurements and drop shape analysis
- Software modules
 - SCA 20 — contact angle
 - SCA 21 — surface free energy
 - SCA 23 — liquid bridge analysis

Lumifuge



- Perform physically accelerated, direct and efficient stability testing and ranking of your formulations
- Can measure dispersion stability directly instantaneously across your whole sample.

CHARACTERIZATION EQUIPMENT

Sigma 702, force tensiometer



- Surface and interfacial tension measurements (Platinum Du Noüy ring, Platinum Wilhelmy Plate), manual determination of Critical Micelle Concentration (CMC) and density measurements



CHARACTERIZATION EQUIPMENT



RFID Pilot Line

RFID truck portal



RFID conveyor belt



Pallet identification



More information: www.itene.com

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