

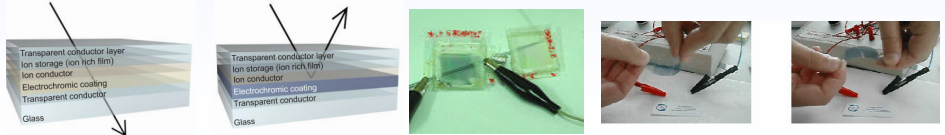
STREP-EU-2004: "NANO EFFECT: Nanocomposites with High Colouration Efficiency for Electrochromic Smart Plastic Devices"

GRF – role in Nanoeffects Project

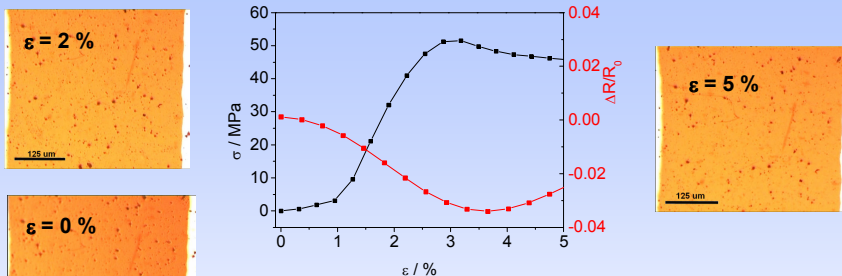
- Development of TCO films (Transparent Conductor Oxides) at room temperature for plastics of IND5 & IND8
- Development of deposition technology for curved & complex shaped plastic substrates
- Technology transfer to IND10

Objectives:

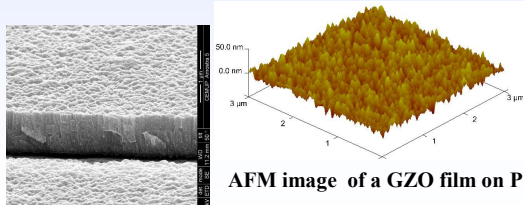
- Development of TCO thin films by magnetron sputtering for flat and curved plastics
- To deposit adherent transparent thin films at Room Temperature (and $T_d < 60\text{ }^\circ\text{C}$)
- To deposit of TCO on fabrics, textile surfaces
- To study the film morphology, structure, optical and electrical properties
- To study the mechanical integrity and durability of conductive plastics



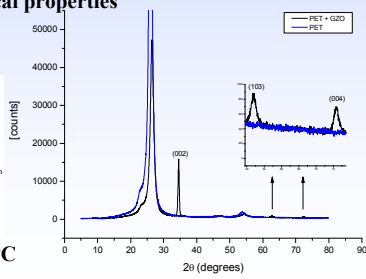
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PET + ITO system electromechanical properties



AFM image of a GZO film on PC



XRD spectra of GZO film deposited on PET

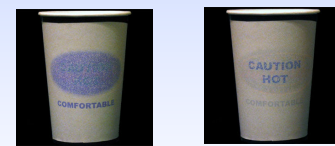
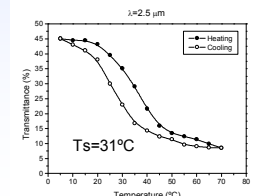
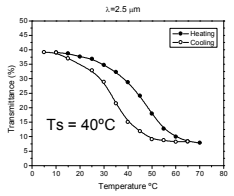
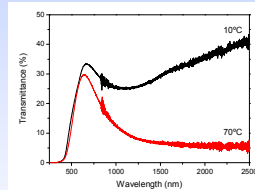
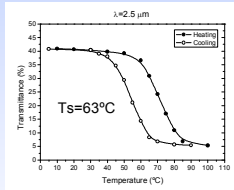
SEM micrograph of a GZO film on PET

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EU-6FP/2004: "TERMOGLAZE: Production of thermochromic glazings for energy saving applications"

GRF have developed doped vanadium oxides films with optimized transition temperatures.



Termoglaze?



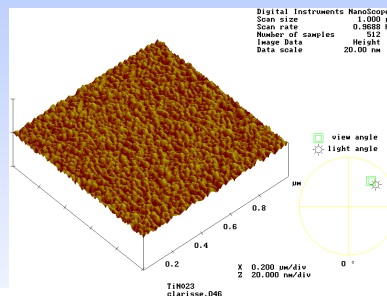
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Spectrally Selective Surface Coatings

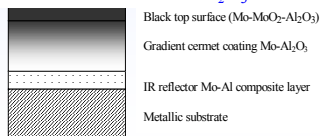
Nanolayered and nano-graded coatings – Solar selective surfaces

POCTI/P/CTM/11235/2001: "Spectrally Selective Coatings for Solar Energy Applications" (concluded)
 POC/ENR/62660/2004: Development of new spectrally selective coatings with organic pigments for absorbers of solar collectors



Representação esquemática de um nanocompósito multicamada produzido por pulverização catódica reactiva. Revestimento: Mo-Al₂O₃

Análise por AFM de um filme graduado de Ti-TiNyO_x



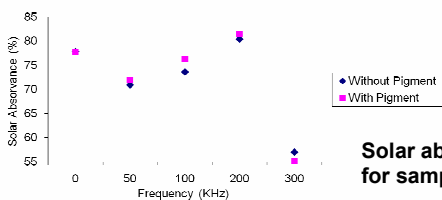
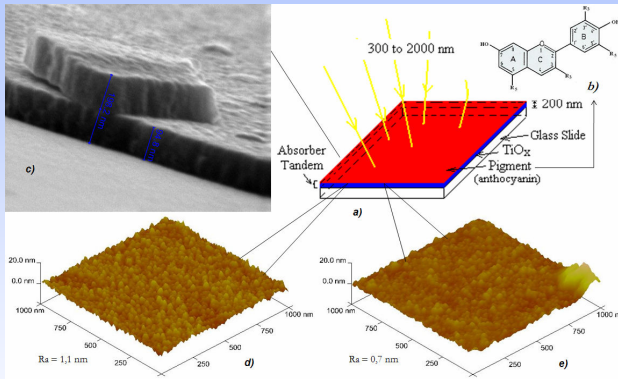
$\alpha = 91 \%$
 $\epsilon = 4 \%$

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SUPERFÍCIES COM SELECTIVIDADE ESPECTRAL

Nanograded thin films with dispersed organic particles for solar absorbers surfaces



Solar absorption variation with pulsing frequency for samples with and without pigment

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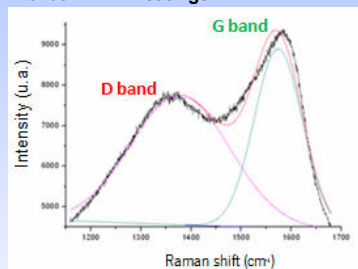


Nanocomposite metal-ceramic amorphous carbon thin films

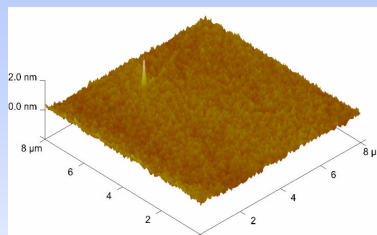
Thin films obtained by hybrid PVD and PECVD technique

POCTI/CTM/61589/2004: "NANOCARBON-Nanocomposite Metal-Ceramic Amorphous

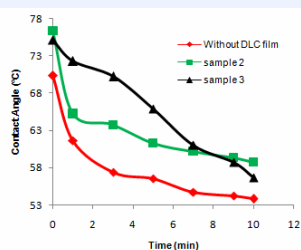
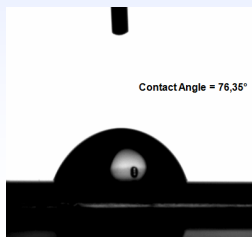
Carbon Thin Coatings"



Raman spectra for a-C thin films



AFM images of DLC's surfaces on silicon substrate, all the samples have a very small roughness (this sample presents Ra=0,100nm)



Contact Angle Test images of DLC's surfaces and effect of relaxation time on the contact angle

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New research projects



EU-FP7-2008 approved on 1st call in Nanomaterials and Nanotechnologies topic

(main role: TCO-Transparent Conductor Oxides thin films on plastics)
(UM-CFUM Team leader: V. Teixeira)

Proposals approved in the framework of FCT- Iberian Nanotechnology Laboratory call (Nanomedicine and Bionanotechnology research topics)

FCT-INL-2008: "NANOPACKSAFER: NANO-engineered PACKaging systems for improving quality, SAFETY and health characteristics of foods"

(UM-CFUM Team leader: V. Teixeira)

FCT-INL-2008- "NanoMeDiag : Nanobioanalytical platforms for improved medical diagnosis of infections caused by pathogen microorganisms"

(UM-CFUM Team leader: V. Teixeira)

FCT-INL-2008- "Smart joint implants using bionanocomposites"

(UM-CFUM Leader: Lanero-Mendez)

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