

PILOT PLANT AND MATERIAL CHARACTERIZATION

Material Characterisation

- RAMAN spectroscopy analyser
- Atomic Force Microscopy (AFM)
- FTIR spectrometer
- DSC and TGA Devices
- Surface characterisation, surface energy, roughness
- Tensile tests, laminate bond strength, adhesion, anti-stractch
- Anti-bacterial, anti-mould tests
- Friction properties
- Sealing layer properties

Multilayer nano-composite coatings on flexible substrates for construction industry
Coating of Anti-scratch, UV-Stable-, Anti-mould nano-enabled Lacquers
Deposition of anti-reflective layers
Functional Characterization of Multilayered structures
Simulation And Modelling of Coating Processes

Sample preparation - Pilot Lines

- Lacquering and laminating pilot line for multilayer production
- Extruder for seven-layered multilayer structures
- Vacuum web-coating plant

CONTACTS



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MEMBRANE MATERIALS FOR CONSTRUCTION

Application And Testting Of Nano-enabled Multifunctional Materials

**NANOLEAP CONTACT FOR
FURTHER INFORMATION ABOUT
THE USE OF THIS PILOT LINE:**

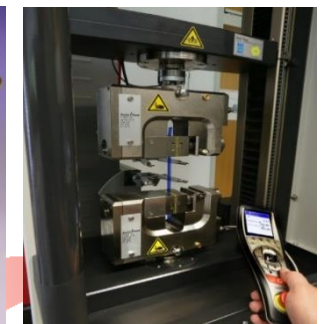
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TECHNICAL DEVELOPMENT

- The Pilot Plant can be used to:
- Develop multi-layered nanocomposite coatings on flexible substrates.
- Develop and test lacquering and laminating processes for customers.
- Coat two different nano-material based lacquers in one trial using primer station in combination with enclosed chamber.
- No contact between the functional film and the rolls after the coating process.
- Possible to process very sensitive films with thin-layers on one side and to vary the coating parameters and drying processes at considerably lower costs.



COATINGS

- Solvent-based coating systems: Low viscosity lacquers, adhesives
- UV-curing systems such as acrylate-based formulations and special inorganic-organic hybrid polymers
- In NANOLEAP, lacquers with anti-microbial, anti-reflective, anti-scratch, and UV-protective properties are coated.

SUBSTRATES

- Typical substrates are Aluminium foils, polymer films, vacuum coated films, biodegradable polymers, paper and cardboard
- In NANOLEAP, Poly(ethene-co-tetrafluoroethene) ETFE and Poly(ethylene terephthalate) PET are used.



SERVICES OFFERED

- Development of specific type of multi-functional flexible materials for light-weight construction.
- Roll-to-roll production, costs reduction
- Support in scale-up process with shortened times to production
- Experiments using much lower quantities of materials than required for trials in production plants
- Market research support.
- Support in the industrial start-up processes
- Consulting
- Support in the discussion of results.

TECHNICAL SPECIFICATIONS

- Substrate Geometry:
 - - Web width: up to 480 mm
 - - Application width: up to 460 mm
- Application Methods:
 - - Commaknife for highly viscous coating materials, gravure roll for low viscosity coating systems, heating of the smooth roll up to 80oC
- Corona Unit:
 - - Single-sided corona treatment of non-conducting films; corona power adjustable from 0.15 kW to 1.5 kW
- Web Control:
 - Web speed: max. 30 m/min
 - Special Film Feed for Lacquering:
 - The functional layer can be transported without coming into contact with the rolls after the coating process; separate servo-controlled winding
- Drying and Crosslinking via hot air and UV
- Dust-free coating by incorporating the plant in a housing and by film cleaning

