INN PRESSME

Quality improvement of biobased coatings and nanoparticle synthesis

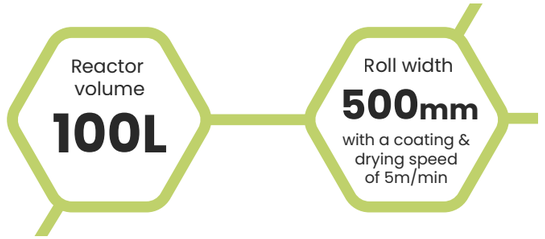
Fraunhofer ISC

APPLICATIONS: CONSUMER GOODS | PACKAGINGS | ENERGY & TRANSPORT

DEVELOPMENT: NANO MATERIALS & FORMULATION

CURRENT-STATUS

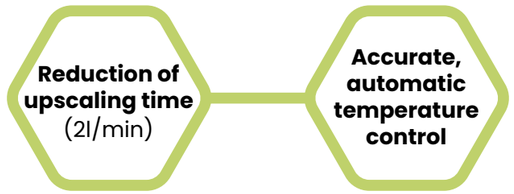
Bio-based and conventional coatings formulations can be produced in a batch reactor. Up to 100L can be stirred, cooled (- 5 °C) and heated (225 °C); evaporation, solvent exchange and filtration are also possible. Due to the normally very low coating thickness, up to 5000 m2 can be coated. In the roll2rooll (R2R) coating facility, polymer films can be coated by means of slot die. Drying takes place thermally.



CHALLENGE

The challenge in developing the coating formulation is to match the coating to the substrate quality and properties, as bio-based materials in particular have difficult surfaces, low temperature stability and are not stable over time.

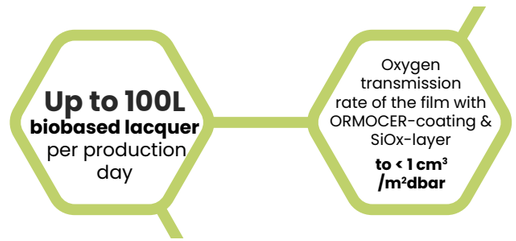
The machinability of biobased materials in R2R processes is often difficult and the expected cycle rates cannot be achieved.



FURTHER DEVELOPMENT

Better quality control during the synthesis.

Application of nanometer thick SiOx-layer in the R2R facility as a pretreatment and an additional barrier layer in combination with the bioORMOCER® barrier layer.



BENEFITS FOR COMPANIES AND SME'S

The advantage for customers is the flexibility in synthesis and handling. We can produce, process and modify almost all materials (bio-based or fossil-based). In addition to the technical equipment, the safety technology is also available.

Through our experience, we can also scale up laboratory synthesis, so that we can also increase the TRL that have run through third parties.

The coating facility is also very flexible and can even pro- cess rigid substrates. The equipment (upgrade of the pilot facility) with the SiOx system is unique in the world and offers barrier coatings without the use of vacuum.

APPLICATION EXAMPLES

TC 2:

Paper based packaging: Integration of barrier functionality on paper, cardboard

TC4/TC5:

Functional coatings on polymer based materials (easy-to-clean, hydrophobic, anti-finger-print, anti-microbial, barrier against oxygen, flavors, migration of monomers, odor release)

TC8/TC9:

Abrasion resistant and anti-fungicide functionality for consumer & sport goods, shoe soles

UV-STABLE COATINGS WITH HIGH STABILITY AGAINST CHEMICAL, MECHANICAL AND ENVIRONMENTAL IMPACT