

A new concept combining light curing and Michael addition for coating applications

- Combination of aza-Michael addition and light-curing to generate thin polymer layers exhibiting high elongation at break and flexibility
- A versatile and effective pathway for the creation 3D polymer network and thermoformable coating



KEYWORDS

- Click chemistry
- Photopolymerization
- Acrylates and amines
- Aza-Michael addition

PATENTS

- EP15306146
July 6th, 2015

INVENTORS

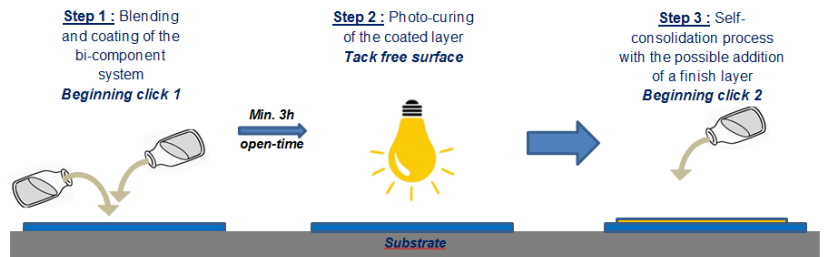
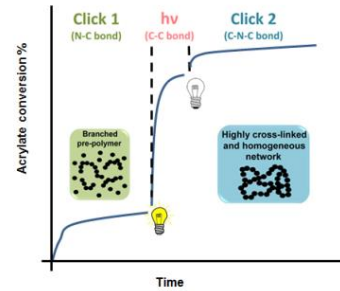
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TECHNO-STATUS

- Under Development**
290 000 euros of ongoing Conectus investment for proof of concept
- planned project end date:
Proof of concept achieved
- Ready to market :**
open for licensing

TECHNOLOGY

- An **innovative** bi-composant polymerization technology combining sequentially two different chemical reactions offering a self healing coating.
- Combination of in-situ Aza-Michael addition and photopolymerization
- Step 1:** pre-polymer formation, liquid malleable formulation with min. 3h pot-life.
- Step 2:** light curing, fast acrylate photopolymerization conducting to a dry coating formation in a few seconds.
- Step 3:** slow post-consolidation leading to a highly crosslinked 3D polymer network and consumption of the residual unreacted acrylates



Retailleau M. et al. (2015), *ASC Macro Lett.*, 4, 1327-1331; DOI: 10.1021/ascmacrolett.5b00675
Retailleau M. et al. (2016), *RSC Adv.*, 6, 47130-47133; DOI: 10.1039/c6ra07610f

INNOVATION ADVANTAGES

- Peroxide free system** with high flash point resin (security of use and storage)
- Solvent free system** with low VOC during the processing, **smell-free**
- Controllable open-time** through UV curing process, **pot-life** at least 3h
- Low energy curing technology** based on LED light source
- Allows polymerization of coating (10 to 100 μm)
- Compatible with **fillers and pigments**
- High elongation at break of the final material.

APPLICATIONS

- Flexible substrates
 - Thermoforming capability after curing
 - Exterior clear coat
 - Self-healing properties

DEVELOPMENT STATUS

- Proof of concept of the technology has been achieved
- Scale-up on large surface demonstrated

Conventional light curing of acrylates vs 3-step concept combining aza-Michael addition and photopolymerization

