

Request for Universities/Knowledge institutes (26/10/2018)

**Project title: Plasma as green Solution for enhanced adhesion or functionalisation**

Acronym: PlasmaSol

Project ID	
Type	ICON
Period	2 years
Starting date	April 2019
Total project budget (€)	TBD
Total man months	TBD
Subsidy percentage	According to SBO- and O&O regulations
Amount of subsidy (€)	TBD
Coordinator	TBD
Industrial partners	Current partners not disclosed at the moment
Executing partners	TBD

Project description

Reference Situation

To this day, the adhesion between two incompatible types of material is often realized with solvent-based or water-based primers in industry. These pose health and safety concerns, require long process time, are energy intensive and often the quality control remains very challenging. This quality control is of extreme importance, taking into account a guaranteed adhesion for minimum 10 years in extreme conditions (e.g. outside exhibition and weathering). To enhance the lamination process of polymers or polymer to metal interface, new innovations in plasma technology need to be investigated.

The goal is to benefit from an atmospheric plasma technology focused on depositing a functional layer in a homogeneous way, both in thickness and quality of the film layer. The functionality of the layer is controlled by the type of precursor used, which can be any type of liquid. Some examples are (meth)acrylates, amines or organo-siloxanes, etc. The biggest advantage of such a technology is that the functional layer is irreversibly bound to the surface that is treated.

Within this project, the goal is to irreversibly deposit reactive functional groups on the application material to participate in the curing reaction of PUR glues (e.g. -OH, -NH<sub>2</sub> or -N=C=O). This new method will be much more advantageous compared to the current state-of-the-art used in industry (typical corona process), which only creates roughening or oxidation of the surface that is treated.

Next to the potential application in polymers (e.g. PVC profiles and foils), other substrates could be investigated with this plasma technology (e.g. wood, metal & textile materials). Further research in the precursor used with this plasma technology could also lead to broader and multiple functional properties and applications with e.g. anti-corrosion, antimicrobial properties, hydrophobicity (fluor replacement), flame retardancy, etc.

To achieve these goals, a fundamental knowledge of the specific atmospheric plasma process is required, including both the plasma and precursor chemistry, characterization of plasma treated surfaces and testing of the adhesion properties (or other specific properties).

## Research Target

The present research project aims to provide a green solution for adhesion applications with atmospheric plasma technology , this project envisions:

1. Proof of principle
2. Screening of the precursors and developing the formulation
3. Optimisation of the plasma proces - labscale
  - a. Characterisation of the treated surface
  - b. Testing of the adhesion properties
4. Application and testing in an industrial environment

## Request

To complete the consortium, Catalisti is searching for knowledge partners with expertise in atmospheric plasma technologies and surface characterization of plasma treated materials.

*Important notice: To be eligible to receive funding from Catalisti in Catalisti-supported projects, industrial partners must be (at least) project member of Catalisti. For more information on membership and membership fees, please visit our website: <http://catalisti.be/membership-2/>*

## How to reply to this request

Please send an e-mail before **November 12th, 2018, 12:00 PM (noon)** to your association representative (see contacts listed below), and describe your organisation or research group, the technology, expertise or solution you can offer and your experience:

- KULeuven: Bert Lagrain ([bert.lagrain@kuleuven.be](mailto:bert.lagrain@kuleuven.be) );
- UAntwerpen: Ann Aerts ([annfb.aerts@uantwerpen.be](mailto:annfb.aerts@uantwerpen.be) );
- UHasselt: Lieve De Doncker ([lieve.dedoncker@uhasselt.be](mailto:lieve.dedoncker@uhasselt.be));
- UGent: Elisabeth Delbeke ([Elisabeth.Delbeke@UGent.be](mailto:Elisabeth.Delbeke@UGent.be));
- VUB: Philippe Westbroek ([Philippe.westbroek@vub.ac.be](mailto:Philippe.westbroek@vub.ac.be) );
- Centexbel: Isabel De Schrijver ([isabel.deschrijver@centexbel.be](mailto:isabel.deschrijver@centexbel.be) );
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- BBEU: Brecht Vanlerberghe ([brecht.vanlerberghe@bbeu.org](mailto:brecht.vanlerberghe@bbeu.org) );
- Other: Wannes Libbrecht ([wlibbrecht@catalisti.be](mailto:wlibbrecht@catalisti.be) )

## Evaluation

The initiating industrial partners, together with Catalisti, will review all responses obtained and will make a selection of the best (complementary) proposals. After submission of your offer, you can be contacted by telephone or invited to a live meeting (if this is deemed necessary by the industrial partners) to further elaborate your offer.

The final decision on selected research partners and whether or not the project will be further developed and finally submitted to VLAIO will be communicated the latest on November 16<sup>th</sup>, 2018. This will depend (among others) on how many companies have expressed their interest in participating in the project. Please contact Wannes Libbrecht ([wlibbrecht@catalisti.be](mailto:wlibbrecht@catalisti.be)) (+32499.31.56.04) or your association representative if you have any questions concerning this RFP.