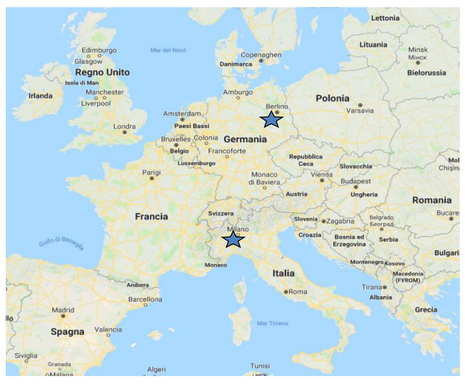
LIFE-BIOPAINT

An innovative and sustainable continuous process for the development of novel bio based paints
Life17/IT/00164

BUDGET INFO:

Total amount:	**€ 3,065,930**
% EU Co-funding:	**60%**
EU Co-funding:	**€ 1,839,557**

DURATION: **Start: 02/07/18 - End: 02/01/21**



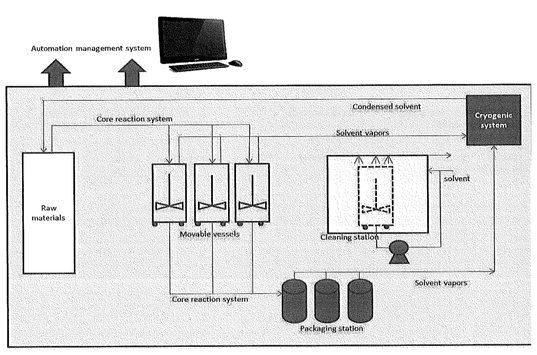
PROJECT LOCATION: **Milan and Berlin**

PROJECT'S IMPLEMENTORS:

Coordinating: **ITALY**

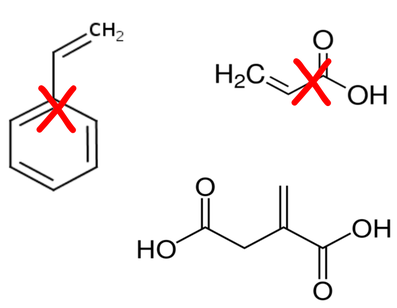
Associate: **GERMANY**

OBJECTIVES



- Demonstrate a sustainable, efficient process for the production of UV-curable bio-based paints characterized by very low product variability
- Develop a fully automated, closed-loop process that will not produce any waste nor emit any VOC, and will use less energy than the state of the art

- Replace traditional noxious petrochemicals (especially styrene and acrylic/methacrylic acid) with safer and environmentally friendly bio-based materials



SCOPE

- Establish optimal process conditions and innovative formulations for bio-based resins containing itaconic acid and other bio-based components.
- Establish optimal process conditions and innovative formulations for UV-curable bio-based paints comprising itaconic-acid-based resins.
- Design, assemble, start-up and validate a pilot production line for bio-based paint and prototype bio-based paints, moving TRL from 6 to 7/8
- Carry out an Environmental and Socio-economic Impact Assessment, as well as an LCA, establishing firmly the parameters of life cycle assessment for bio-based resins and paints

BACKGROUND

Sustainability is no longer a «nice to have» but a necessity that every industry must now pursue ever more urgently. It has also become increasingly clear that it must be assessed multi-dimensionally.

It depends on the environmental impact of:

1.product composition – materials of which it is made

2.product production process – how it's made

3.product application or use – how it is used

4.end-of-life management – how it is disposed of

Sustainable improvements over state of the art for paints and coatings are, for example:

1. high bio-based content, low VOC content, low health and pollution risk associated to the component materials and the products themselves
2. low energy draw, low emissions, low waste, highly efficient, low variability production process so that there are no bad batches
3. low energy draw, low emissions, low waste, highly efficient, low variability application process on an equally sustainable substrate, such as wood from sustainably-managed forests
4. long useful life and well-managed collection and disposal process

LIFE-Biopaint targets decisively all environmental impact improvement vectors

1. the intended products will have high bio-based content, beginning from highly innovative binders based on safe itaconic acid replacing oil-derived and noxious acrylic/methacrylic acid or styrene.
2. bio-based paint production will be achieved in a completely new production plant and process, characterized by closed circuit raw material inputs, extremely low energy use, highly efficient dispersion processes, no VOC emissions, innovative closed circuit batch-to-batch cleaning process, ensuring very high batch-to-batch consistency.
3. the intended products are UV-cured coatings with very low or zero VOC at application, highly efficient, room-temperature radiation curing, to be applied on sustainable wood-based substrates.
4. the coatings so obtained have very high mechanical and chemical resistance characteristics, thereby ensuring a long useful service life for the resulting wood components (furniture, parquet, doors, fixtures etc.), without impeding final disposal of said wood in a variety of recycling schemes.

CONTINUATION
(REPLICATION, TRANSFER, MARKET UPTAKE)

- The pilot plant will serve as a model for a large scale production plant for bio-based paints and/or smaller ones at IVM associate companies' sites around Europe

- Bio-based radical-cured wood coatings will be formulated for all the appropriate application niches
- Further products will be formulated for other sectors such as packaging, consumer electronics, food & beverage, vinyl floors etc.
- Market uptake is foreseen to be 5% of total industrial wood coatings after 5 years

- Market pull for bio-based material is growing – the rigorous LCA and novel production process of these products constitute their unique selling proposition