

NewSkin Project Newsletter



July 2020

Welcome to this first newsletter and introduction for the H2020-funded project, NewSkin. Please visit our website newskin-oitb.eu and follow @NewSkinOITB on Twitter for the latest project updates.

Innovation Ecosystem to Accelerate Uptake of Advanced Surface Nano-Technologies

Nano-enabled surfaces and membranes have huge potential to offer material solutions to address the Sustainable Development Goals. Deployment of these Key Enabling Technologies (KETs) will result in positive and sound impacts for society and key industrial sectors, driving a significant part of the goods and services available in the market in the next decade.

The **NewSkin** project aims to create an Open Innovation Test Bed (OITB) to provide the European Innovation Ecosystem with the necessary technologies, resources and services to uptake a set of game-changing, efficient and cost-effective innovative processes to manufacture nano-enabled industrial and consumer products, as well as the necessary testing capabilities to demonstrate the features of nano-enhanced goods.

The consortium brings together key industry and research players from across the ecosystem and is coordinated by ECCS (European Convention for Constructional Steelwork).

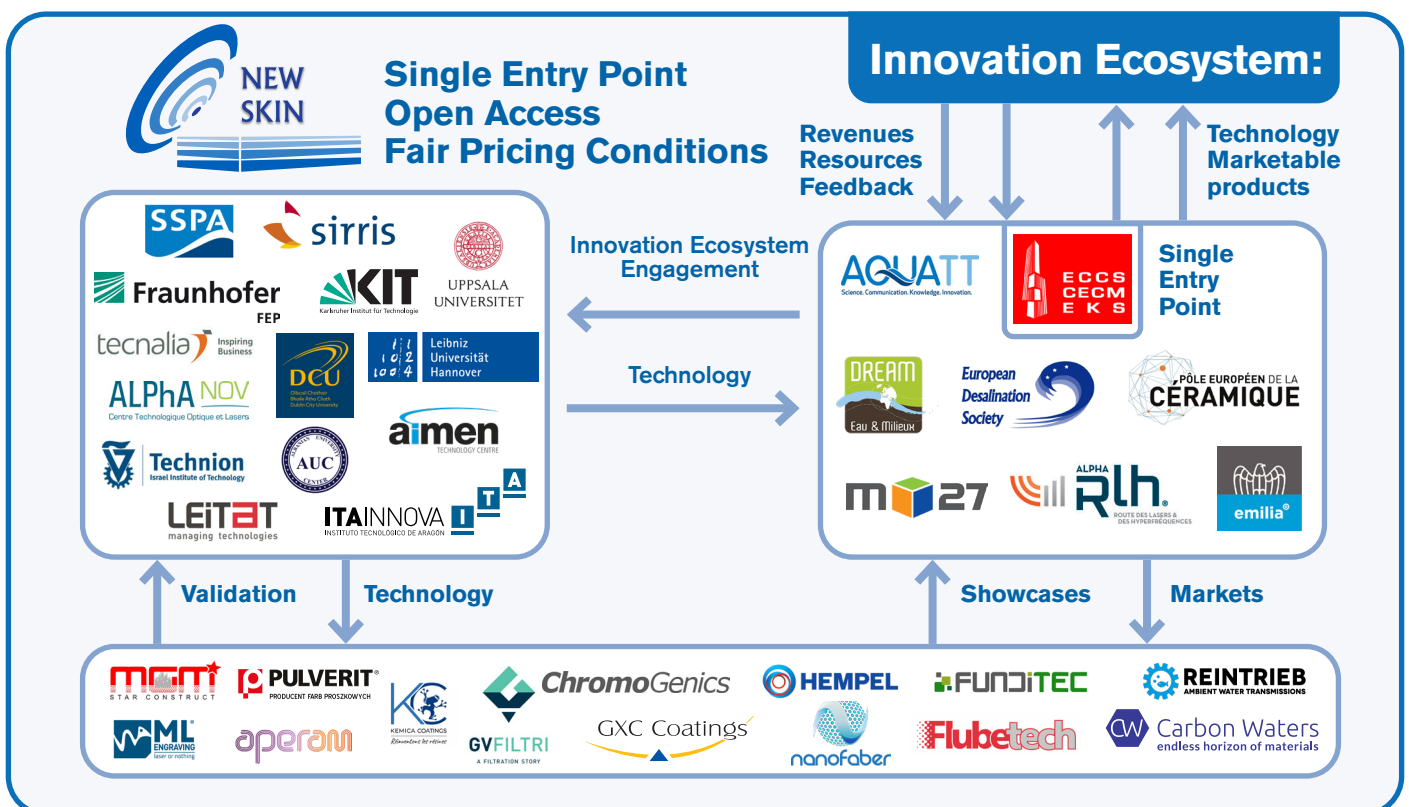


Fig 1. NewSkin OITB Partners and Innovation Ecosystem Interaction.

Project Goals

The **NewSkin** innovative manufacturing up-scaling and testing facilities will provide the Innovation Ecosystem the necessary tools to create and validate new technologies to TRL7 and higher (system prototype demonstration in operational environment), addressing the challenges of key European industries such as steel, ceramics, transport, and water treatment.

During the first two years, the **NewSkin** Consortium will work on the creation of the OITB structure, the Innovation Ecosystem engagement, the upgrade and calibration of the testing and pilot plant facilities and the generation of value proposition for the target industries.

Once the OITB structure is created, a set of 55 demos with the **NewSkin** OITB end users will be used to show case the commercial potential of **NewSkin** across different industries. The OITB will then start service provision. From April 2022, **NewSkin** services will be available on a free basis in four competitive calls that will be evaluated every six months over a period of two years. The OITB will be also available to offer private services under a payment scheme in fair pricing conditions from April 2022. After the conclusion of the fourth competitive call, the OITB will act as a self-sustainable entity that generates revenues from open access services under fair pricing conditions.

Services to be provided and key target industries:



Fig 2. NewSkin validation product cycle including services provided.

A diverse portfolio of technologies

The **NewSkin** nano-enabled surfaces and membranes technological portfolio includes:

- The complete set of processes for large-scale manufacturing of graphene nano-enabled membranes (from continuous graphene production to nano-pore creation and functionalization as well as testing facilities).
- Continuous laser texturing, roll to roll (R2R) and Texturing During Moulding (TDM) nano-textures mass production processes.
- Pilot plant semi-industrial facilities for the definition of efficient automated controlled and nano-safe nano-coating processes for large components.
- Continuous PVD (Physical Vapor Deposition) and CVD (Chemical Vapor Deposition) processes.

In addition, **NewSkin** will provide validation and testing facilities to demonstrate the performance of the manufactured components in real environments and applications. **NewSkin** will also provide route

to market services during the final commercialization stage including corporate funding, supply chain management, and access to market support.

Some examples of the NewSkin products are:

- **Nano-enhanced liquid and powder coatings:** i) Highly durable (+25 yrs) fire resistant fouling corrosion, wear and fatigue resistant coatings for steel, composites and ceramic components protection in immersed, off-shore, oil&gas and harsh conditions. ii) Anti-ice coatings for wind energy in cold climates. iii) Soil resistant coatings for photo-voltaic energy. iv) High durable release coatings for moulding, stamping and roll to roll processes.
- **Nano-enabled water membranes:** i) Graphene mono-atomic water treatment membranes for ultrafiltration (UF), nano-filtration (NF) and reverse osmosis (RO). ii) Textured and functionalized anti-fouling water treatment membranes.
- **Industrial components:** i) Low friction, wear, corrosion and cavitation resistant textured and coated seals, gears, shafts, pistons, propellers and others for engines, pumps, compressors actuators and other moving and reciprocating devices. ii) High wear and corrosion resistant tooling and machining components. iii) Textured and coated propellers and nozzles for low friction, anti-fouling and improved hydrodynamics. iv) Textured and coated molds and cylinders for roll to roll and texturing during molding processes. iv) Textured and coated molded components such as headlights, sensors and others.
- **Functional ceramics:** i) Anti-microbial, wear resistant bio-compatible prosthesis. ii) Infrared (IR) lenses. iii) Anti-reflective lenses. iii) Super-hydrophobic, improved wear and oleo-phobic tiles and bricks. iv) High thermal resistance reactor nozzles. iv) Transparent conductive layers for electrical components. v) Aesthetical and functional coatings for luxury sector. vi) Anti-microbial surgical tools.
- **Nano-enabled foils, envelops, films and packaging:** i) Anti-microbial laser textured aluminum and steel foils for pharma and food packaging. ii) Electro-chromic films for highly efficient windows. iii) Conductive photocatalysis. iv) Anti-soiling, conductive, photocatalytic and heat reflective steel and aluminum foils for facade panels. v) Conductive, UV, anti-microbial, barrier and photocatalytic nano-surfaces on packaging for smart packaging, packaging weight reduction, food increased life shell and to overcome the features gap between bio (renewable, compostable and biodegradable) and standard packaging.

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