METAL MATRIX NANO-COMPOSITE COATINGS UTILIZATION AS ALTERNATIVE TO HARD CHROMIUM

www.mozart-project.eu

MOZART

MOZART IN A NUTSHELL

MOZART project has the ambitious purpose of assisting the fulfillment of REACH requirements to eliminate Hard Chromium (HC), a toxic and carcinogenic substance, offering an environmentally less harm and less toxic alternative to the coating industry. Its main goal is to replace the HC coatings by developing high quality durable metal ones, based on Nickel (Ni) matrix nano-composite electroplating processes following Safe and Sustainable by Design (SSbD) principles. MOZART aspires to develop the first in the world real applicable nano-composite coatings that will revolutionize the surface finishing industry in specific applications such as the automotive, manufacturing and machining industry.

A 42-MONTH PLAN

- WP1: Management and Coordination (M1-M42)
- WP2: SSbD strategy (M1-M18)
- WP3: In silico approaches (M4-M36)
- WP4: SSbD use of particles in plating process (M4-M36)
- WP5: Development of HC alternative coatings (M4-M42)
- WP6: Demonstration Activities (M30-M42)
- WP7: Sustainability assessment & market replication (M1-M42)
- WP8: Dissemination, Exploitation & Communication (M1-M42)

3 INDUSTRIAL APPLICATIONS

AUTOMOTIVE
car piston rods
DIAD Group

MANUFACTURING
stamping dies
Coskunoz Kalip Makina (COS)

MACHINING
helical gears
Kampakas (KAMP)

TECHNOLOGIES

- Reinforcement of composite coatings using ceramic nanoparticles and 2D materials
- Data driven model for coating's structure using physical informed neural networks
- Simulation/modelling of composite plating using Computer Aided Engineering (CAE)
- Online monitoring of nanomaterials using Optofluidic Force Induction (OF2i®)
- Ultrasonication for achieving mono-dispersed composite electrolytes

IMPACTS

SCIENTIFIC

ADVANCED NANOCOATINGS & AI MODELS & SIMULATIONS

- Fabrication of new types of nanocomposite coatings
- Faster deployment of the new coatings
- Better understanding of electroplating process mechanisms

TECHNOLOGICAL

2 NEW FAMILIES OF SSbD NANOCOMPOSITE COATINGS

- More durable and protective coatings
- 3 real industrial applications: automotive, manufacturing and machining industry
- Decision Support Tool for SSbD application on novel coatings

ECONOMIC

50% MORE EFFICIENT Ni-BASED NANOCOATINGS

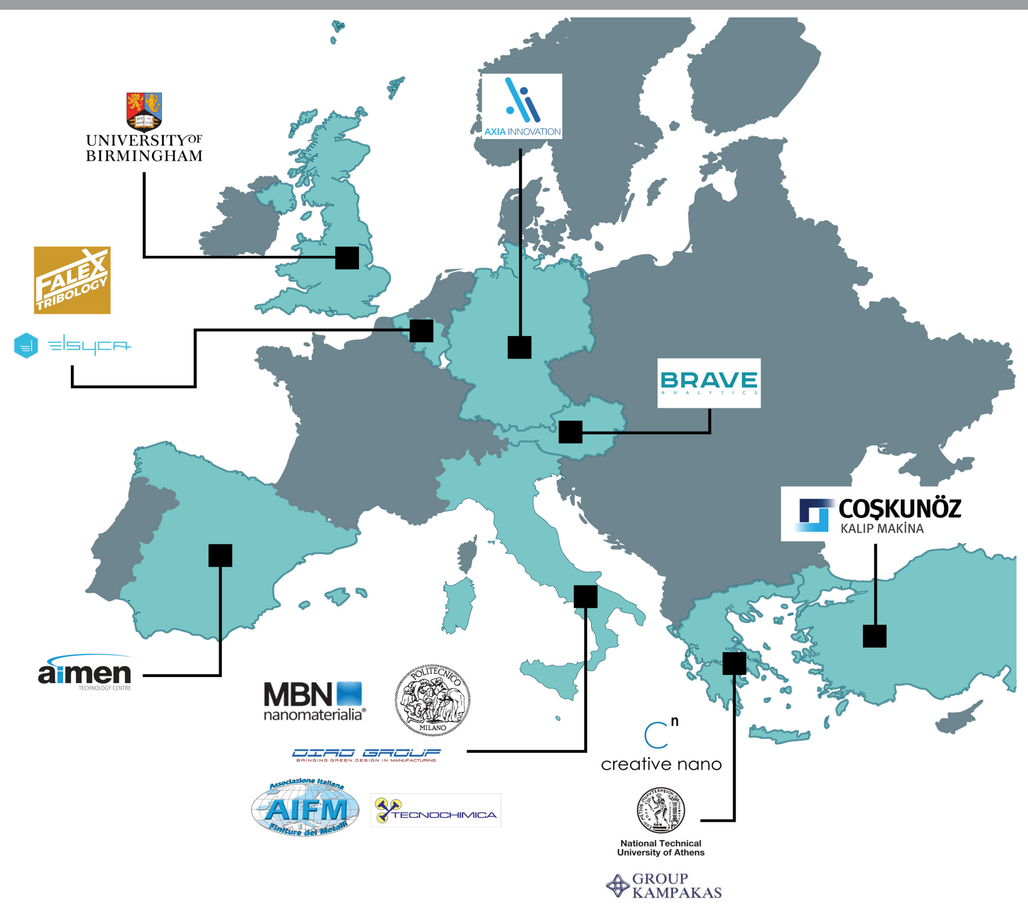
- Double the productivity of plating shops
- Opening a new technological niche in the surface finishing market
- Increasing EC competitiveness in the sector by producing clean and less toxic materials

SOCIETAL

HEALTHIER & SAFER ENVIRONMENT DUE TO ELIMINATION OF HC

- Safer occupational environment
- Less pollution in the neighboring areas to plants
- 80% reduction of occupational cancer incidents and deaths, in the long-term

PARTNERS



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