

# Nanomatch



**NANO-SYSTEMS FOR THE CONSERVATION OF IMMOVABLE AND MOVEABLE POLYMATERIAL CULTURAL HERITAGE IN A CHANGING ENVIRONMENT**

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[WWW.NANOMATCH-PROJECT.EU](http://WWW.NANOMATCH-PROJECT.EU)



### SYNTHESIS OF METAL ALKOXIDES

**DEVELOPMENT OF TWO ALKOXIDE CONSOLIDANT PRECURSORS:**

- EVOLVING TO **NANO-STRUCTURED ADHERENT COATINGS**
- **COMPATIBLE** WITH THE MAIN MATERIALS USED IN HISTORIC BUILT HERITAGE
- **ENSURING ENHANCED SUSTAINABILITY, DURABILITY AND EFFICIENCY** COMPARED TO CONVENTIONAL CONSERVATION PRODUCTS

**FOR THE CONSERVATION OF STONE AND WOOD:**

**CALCIUM ALKOXIDE PRECURSORS OF CORRESPONDING CARBOHYDRATES**



**FOR THE CONSERVATION OF GLASS:**

**ALUMINIUM ALKOXIDE PRECURSOR OF AL<sub>2</sub>O<sub>3</sub> (DEVELOPED IN EU PROJECT CONSTGLASS)**



### PERFORMANCE ASSESSMENT IN LABORATORY

**STONE SUBSTRATES:** CARRARA MARBLE, JAVONNIÈRES LIMESTONE, MAASTRICHT LIMESTONE

**STONE LIKE SUBSTRATES:** LIME MORTAR WALL PAINTING, REPLICA WITH FRESCO / EGG BINDER / OIL BINDER PAINT LAYER AND THREE DIFFERENT SETS OF FIGMENTS

**WOODEN SUBSTRATES:** PINE, POPLAR, LINDEN

**GLASS SUBSTRATES:** MODEL

➤ **PERFORMANCE ASSESSMENT OF MODEL SAMPLES WITH AND WITHOUT ARTIFICIAL AGEING IN COMPARISON TO COMMERCIAL PRODUCTS IN TERMS OF CONSOLIDATION AND BIDDIE EFFECT**



### PERFORMANCE ASSESSMENT IN FIELD

**S. GIORGIO CATHEDRAL FIRENZE (ITALY)**

**STAVROPOLIS MONASTERY BUCHAREST (ROMANIA)**

➤ **PERFORMANCE ASSESSMENT OF MODEL SAMPLES IN COMPARISON TO COMMERCIAL PRODUCTS IN TERMS OF CONSOLIDATION EFFECT**

➤ **PERFORMANCE ASSESSMENT OF HISTORICAL SAMPLES**

**COLOGNE CATHEDRAL (GERMANY)**

**OVIEDO CATHEDRAL (SPAIN)**



### RISK ASSESSMENT & MARKET UP-SCALING

➤ **RISK ASSESSMENT FOR HEALTH & ENVIRONMENT IN RELATION TO:**

- TOXICITY OF METAL ALKOXIDE SOLS AND SOLUTIONS
- NANO-PARTICLES EXPOSURE
- PRODUCTION OF?
- **APPLICATION GUIDELINES**
- **MATERIAL SAFETY DATA SHEET (MSDS)**

➤ **INDUSTRIAL UP-SCALING: FROM LAB SCALE TO PILOT PLANT**

**LAB-SCALE PRODUCTION:** 100 TO 800MG METALLIC CALCIUM

**FIRST UP-SCALE BULK-SCALE:** (1 TO 100G METALLIC CALCIUM)

**INDUSTRIAL UP-SCALE:** 300KG METALLIC CALCIUM

➤ **COSTS/BENEFITS ANALYSIS**

➤ **MARKET RISK ASSESSMENT**

➤ **BUSINESS PLAN**



**PARTNERS**



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