

Coordinator:

Bart Modde

Bedrijvenpark "Coupure" 5
9700 Oudenaarde
Belgium

Email ID:

bart@vento.be

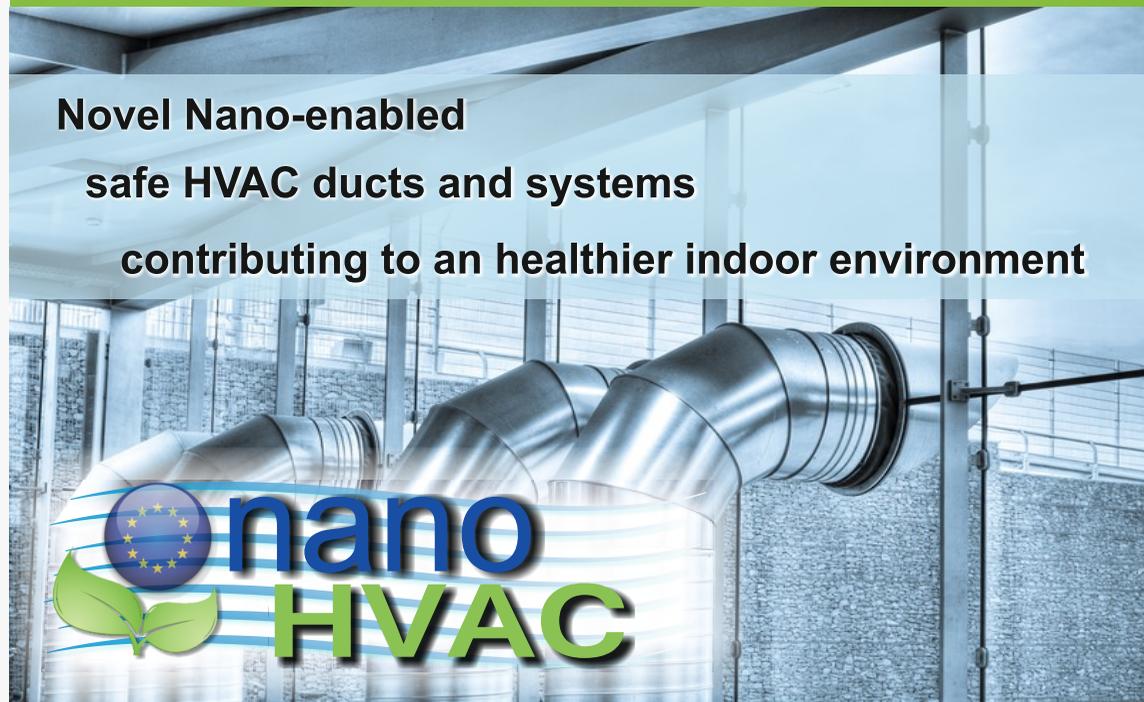


Project Website:

<http://www.nanohvac.eu/>



National Technical University of Athens



**Novel Nano-enabled
safe HVAC ducts and systems
contributing to an healthier indoor environment**

**Cost - effective, Safe Nanotechnology
Insulating Duct Layers**



**Research project funded under
Collaborative Project Scheme**



**Novel Nano-enabled Energy Efficient and Safe HVAC ducts and
systems contributing to an healthier indoor environment**

www.nanohvac.eu



Poorly insulated HVAC ducts can lose through conduction up to 50% of the energy used to heat and cool the indoor environment

NANO-HVAC project aims at developing an *innovative approach for ducts insulation* while introducing *new cleaning and maintenance technologies*, all enabled by *cost-effective application of nanotechnology*.

The whole system aims to be developed with a requirement of service life of the building of 25 years. Following the market needs the consortium will design and develop safe and high insulating HVAC-ducts enabling minimization of heat/cool losses and a Cost-effective pathogen and allergenic removal procedure which will be continuously effective during HVAC operation and maintenance.

Safe, high insulating HVAC-ducts enabling minimization of heat/cool losses: cost-effective, safe and extremely thin insulating duct layers that can be applied both to circular ducts (wet-spray solutions) and to square ducts (pre-cast panel). Insulation will be obtained using sprayable aeroclay-based insulating foams that can be automatically applied during manufacturing of ducts, avoiding manual operation needed for conventional materials. Such technologies, coupled with advanced maintenance systems will guarantee a 50% saving in energy losses compared with conventional ducts.

Scientific and technological objectives within NANO-HVAC project are grouped in four areas:

- (1) safe, effective and low cost insulation solutions for HVAC ducts
- (2) inhibition and removal of pathogens and allergenic
- (3) integration and lab scale characterization
- (4) demonstration and validation

THE FULL SCALE DEMONSTRATOR WILL BE DEVELOPED AND INSTALLED BY ACCIONA ON AN EXISTING COMMERCIAL DEMO BUILDING IN ALCOBENDAS, NORTH OF MADRID



Cost-effective pathogen and allergenic removal during operation and maintenance to reduce microbial growth:

- (a) development of anti-microbial, sprayable and self-adhesive photocatalytic coating, based on titanium oxide nanoparticles, for HVAC filters
- (b) development of an injectable liquid polymer matrix containing antimicrobial nanoparticles for air ducts in situ maintenance activities. The liquid polymer will polymerize in situ creating a thin coating which will cover the surface trapping dirt, debris and micro-organisms, thus "regenerating" the duct inner layer. The procedure may be repeated over time without affecting HVAC energy performance.

Health & environmental impacts

associated with the NANO-HVAC materials and processes (with focus on nanoclays and cleaning nanoparticles) will be evaluated, and an in-depth exposure monitoring on those identified with the highest risk potential will be performed. A risk management methodology will be developed to minimise any potential negative impacts caused by the NANO-HVAC materials and components.

