



## Innovation, Safe-by-design and nano-enabled products: ASiNA delivers its final results to the European Commission

ASiNA project comes to an end with the presentation of the ASiNA methodology and 10 key outcomes

In the safe and sustainable innovation panorama, ASiNA represented a step forward towards data driven and industrial oriented research on the ambitious path towards the development of intrinsically sustainable nano-enabled products addressing two representative value chains. Indeed, ASiNA project, funded under the European Union's Horizon 2020 program and ended in February 2024, addressed some of the most challenging question: *How can we ensure that nano-enabled products are "safe-and-sustainable" since their design phase, while maintaining their functionality, cost-efficiency and added value?*

Thanks to the synergistic commitment of leading research institutions, universities, and companies from various European Countries, coordinated by the Italian National Research Council (CNR), ASiNA developed a case-specific and quantitative-based **Safe-by-Design approach** (SbD) approach incorporating sustainability and safety issues right since the early design phase of nanomaterials and production processes.

Through data curation and the development of the ASiNA decision support system (ASiNA-Expert System) based on multicriteria decision analysis, ASiNA generated FAIR data, promoting transparency and enabling human centric informed decisions. This opens further implementation strategies to the Safe and Sustainable by design approach according to the JRC framework.

ASiNA's successes are vividly reflected in its pilot units and developed specific cases studies providing nanomaterials, nano-enabled components, and products prototypes, which demonstrated the applicability and effectiveness of the SbD approach. ASiNA SbD approach was applied to:

- **Antimicrobial and photocatalytic Coatings (Value chain 1):** this value chain highlighted how nanomaterial-based coatings can be developed and applied in highly controlled and safe processes, while guarantying the highest sustainability and technical performance of the final products such as active coated fabric or filtering elements.
- **Nanostructured capsules delivering active phases in cosmetics (Value chain 2):** ASiNA provided a design approach which promotes safe-by-design practices at early formulation stage of new cosmetic products, taking into consideration the safety, sustainability and product techno-economic performances through its life cycle, leading to increased trust - transparency of information. These pilot case studies validated the innovative quantitative based approach to SbD carried out by ASiNA, providing concrete examples of the **positive impact that nano-based solutions, developed with a responsible approach, can have on society.**

Another important result of the ASiNA stems from the realization that standardization is fundamental to promote safety and sustainability in the nanotechnology sector. Thanks to the participation in the consortium of UNI, the Italian Standards Body, the "**Standardization Toolkit**" was developed. The toolkit is a compass to confidently navigate towards the adoption of sustainable and safe development practices, representing a useful resource for the market with a detailed list of relevant national, European, and international standards, complete with key information such as the standard number, document retrieval URL, title, year of publication and purpose. It is destined to become an essential tool for facilitating the understanding and application of safety standards in the nanotechnology sector. This tool represents a significant step forward in promoting a **culture of safety and sustainability in the**



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**nanotechnology industry**, giving innovators the resources needed to successfully navigate the standardization landscape.

The results from ASiNA are therefore confirming and exceeding the initial project objectives expectations. The ASiNA methodology will be exploited after the end of the project, to offer nanotech and manufacturing companies a practical and science-based approach whose implementation is enabled by the ASiNA-ES decision-support tool, which can be easily applied to lower development cost and time-to market of nano-enables solutions, while assessing their safety and sustainability level.

ASiNA's publications are freely available on the website and will continue to be available to all stakeholders for the next 4 years.

## PROJECT DETAILS

PROJECT TITLE:	Anticipating Safety Issues at the Design Stage of NAno Product Development
ACRONYM:	ASiNA
STARTING DATE:	1 <sup>st</sup> March 2020
DURATION:	48 months
TOPIC:	NMBP-15-2019 Safe by design, from science to regulation: metrics and main sectors (RIA)
EU CONTRIBUTION:	5,998,386.06 euro
WEBSITE:	<a href="https://www.asina-project.eu">https://www.asina-project.eu</a>

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