

## Technology for nanosafety challenges:



### Regulatory compliance

Regulations; standards; worker and user safety; measurement protocols; lifecycle analyses; waste and emissions management



# Proactive development of nanomaterials markets

Societal acceptance; awareness-raising; education and training; nanomaterials impact analyses (air, water, soil)

## CHALLENGES FOR NANOSAFETY

# CEA Tech technology

Safer by Design

Characterization Lifecycle analysis

Training and certification

Detection, measurement, and monitoring

Biological exposure indicators (Medical Biology Laboratory)

Incident management

Remediation

Toxicology



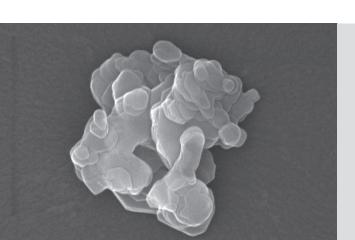
## Manufacturing and process safety

Safer by Design processes; quality control; process and worker-exposure monitoring; industrial health and safety



### Product competitiveness

Safer by Design products; product performance enhancements (to minimize release of nanomaterials into the environment); recycling



### CEA Tech can help the following businesses:

- Manufacturers of nanomaterials
- Companies that integrate nanomaterials in industries such as transportation, construction, chemicals, steel, microelectronics, aerospace, and others
- Waste collection, sorting, and treatment companies
- Environmental and health monitoring organizations

### Here are some of the ways CEA Tech can support your development:





Nanomaterials and Safer by Design processes

Nanomaterials and Safer by Design; choice of powders vs. solutions; surface engineering; synthesis and supply of calibrated reference nanoparticles

Characterization

Characterization of substances (including in complex environments); regulatory compliance systems; process optimization; product quality control and monitoring; nanoobject identification

Workstation and environmental measurement

Detection, identification, measurement, and monitoring; detection of air and water emissions

Confinement assessment and optimization

Worker protection; emissions control

Lifecycle analysis and improved recycling

Emission testing in real-life conditions; abrasion resistance; dissemination in the environment and traceability; end-of-life product recycling

Toxicology and ecotoxicology

Toxicological studies (advanced and for regulatory compliance)

Testing for biological exposure and impact indicators

Biological monitoring of potentially-exposed workers (Medical Biology Laboratory)

Nanosafety consulting

Analysis of existing safety systems in normal operating and incident conditions; assessment of personal and collective protective equipment and recommendations for use; risk assessments; employee and community education and outreach; regulatory compliance

Continuing education via the CEA's nuclear engineering school

Continuing professional development, inter-company training courses, and custom training courses including nanosafety awareness-raising; NanoCert certificate programs in partnership with INERIS for operators, prevention workers, incident-response workers, and emergency workers

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