

FP7 Project- CP-FP 228536-2

NEPHH

NANOMATERIALS RELATED ENVIRONMENTAL POLLUTION AND HEALTH HAZARDS THROUGHOUT THEIR LIFE CYCLE

February, 2010

N°1

NEPHH Project

NEPHH project will take a further step forward in current researches by analysing, primary nanomaterials or nanoparticles, secondary and tertiary products derived from nanocomposites

NEPHH projects involves a global focus, considering all stages of the life cycle of the nanomaterials, from their production to their elimination.

The aim of NEPHH is to identify and rate important forms of nanotechnology-related environmental pollution and health hazards that could result from activities involved in nano-structures throughout their life cycle, and to suggest means that might reduce or eliminate these impacts. The **NEPHH project** will consider the **safety, environmental and human health implications of nanotechnology-based materials and products.**

The nanomaterials selected are Silicon based laboratory materials which will be supplemented with nanomaterials from industry. On the one hand, Silicon based nanoparticles including (nano)silica (SiO₂), layered silicates (MMT), glass (nano)fibres and foam-glass-crystal materials have been selected. On the other hand, a total number of three engineering polymeric matrixes have been selected, including polyamides and polypropylenes as bulk materials and polyurethanes as foamed polymeric materials, which will be used to produce nano-induce polyurethane foams.

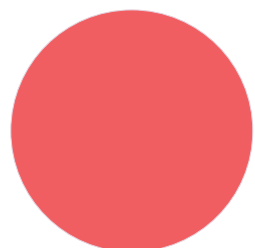
NEPHH Consortia

The consortium taking part in the project is made up of ten entities from seven countries, amongst which there are important benchmark references in nanotechnology: University of Cranfield in the United Kingdom, the University of Technology of Cracow in Poland, the Institute of Biochemistry of the Ukrainian National Academy of Sciences, the Polytechnic University of Tomsk in Russia and the CNRS from France, Ekotek, INASMET-Tecnalia and the Association for the Prevention of Accidents from Spain, LAVIOSA Chimica Mineraria, specialists in nanoclays design and production, and Grado Zero Espace, both based in Italy, providing the industrial input to the

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For further information, please visit www.nephh-fp7.eu



NEPHH Objectives

1. Development of a **systematic, continuous practice for selecting and prioritizing engineered nanomaterials** in order to assess their safety, environmental and human health implications.
2. Contribution to the standardization and validation of test methods and test schemes for nanomaterials.
3. **Collection of nanocomposites samples**, including laboratory and industrial Silicon based materials.
4. **Achievement of a better understanding of the health impacts of the selected nanomaterials** by *in vitro* methodologies.
5. **Assessment of the human and environmental exposure throughout the life cycle**
6. **Selection and dissemination of the best practices** (in the fields of manufacture and disposal), **and actuation guidelines for exposed workers**.
7. **Contribution** to the '**Code of Conduct for Responsible Nanosciences and Nanotechnologies Research**', an action to ensure that nanotechnologies are developed in a safe manner.

It is estimated that the global market for products related to nanotechnology could reach a value of 2.6 trillion dollars in 2014

WHY NEPHH

Nanotechnology is a new field of research and development in which great hopes have been placed for significant social and environmental benefits linked to a greater economic development. It is estimated that the global market for products related to nanotechnology could reach a value of 2.6 trillion dollars in 2014.

While all the trends point to a rapid launching of nanotechnological products onto international markets, a successful and sustainable incorporation of the Nanotechnology is conditioned by the safe use thereof. A number of research studies have shown that there are potential risks for human health and the environment arising from exposure to nanoparticles, giving rise to the current debate amongst researchers, legislators, industrial players and consumers on the risks and opportunities of Nanotechnology. Currently, there are many unanswered questions as regards these potential risks associated with the production, use, distribution and waste elimination of nanomaterials.

NANOTECHNOLOGY IN EUROPE

The risk assessment of engineered nanomaterials has become the focus of increasing attention. Although a high number reports have been published discussing the potential environmental and health risks associated with the manufacture, use, distribution and disposal of nanomaterials, there are many unanswered questions. The European Commission aims at reinforcing nanotechnology and, at the same time, boosting support for collaborative R&D; into the potential impact of nanotechnology on human health and the environment via toxicological and ecotoxicological studies.

<http://cordis.europa.eu/nanotechnology/home.html>

Project Workplan

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In order to ensure that the research and innovation objectives of this project are achieved, a clearly defined work-programme has been set up and divided into a number of **Work Packages (WP)** and **Tasks** to allow the team of researchers to focus on the development of the project:

- During the 1st stage, the **set up of a Technological Surveillance System** will be carried out (**WPI**). The target is to develop a systematic, continuous practice for the selection of engineered nanomaterials to assess their safety, environmental, and human health implications.
 - During the **WP2**, the **selected engineered nanomaterials will be synthesised and macro-scale structural specimens will be manufactured**. This will enable the consortium to analyse the implications of such nanomaterials from synthesis to disposal.
 - The **WP3** involves the **generation of nanoscale dust particles from the macro-scale fibre reinforced nanostructures** fabricated in WP2, to consider the exposure throughout the whole life cycle of nanomaterials in as near 'real life' exposure as possible.
 - The 4th and 5th stages will assess **the health implications (WP4) environmental implications (WP5)** and of the selected engineered nanomaterials in parallel. The health effects of nanoparticles **(1) lungs; (2) the structural study of cells and protein expression**, and **(3) the genotoxicological effects** will be studied. During **WP5** the potential of nanomaterials to damage the environment (or human health through the environment) will be assessed, based on **persistence, bioaccumulation and ecotoxicity studies**. Moreover, the environmental performance of nanocompounds from cradle to grave will be assessed.
 - **WP6** aims to make available the understanding of the safety, environmental and health implications of nanomaterials to define the appropriate measures and minimise the exposure of workers. Guidelines for responsible management of waste nanomaterials are also intended.
- Finally, the 7th stage of the project will envisage the **dissemination of the research results (WP7)**.

The project involves a global focus, considering all stages of the life cycle of the selected nanomaterials, from their production to their elimination, including their use.

EVENTS

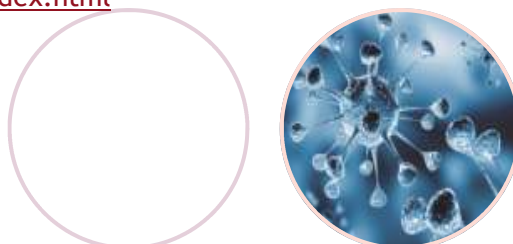
22 April 2010 - 24 April 2010 in Dresden, Germany- **Innovation through Nanotechnology and Nanomaterials - Current Aspects of Safety Assessment and Regulation**- http://www.tox-online.de/eurotox/scientific_post_satellite_meeting_to_eurotox_2009.html

16 May 2010 - 19 May 2010 in Kerkrade, Netherlands- **Rolduc Polymer Meeting 2010**

- <http://www.rolducpolmeeting.org>

June 8-10, 2010, London, **Nanomaterials 2010**- <http://www.nanomaterials2010.com>

07 May 2010 - 08 May 2010 in Boston, MA, United States. Global Regulation of Nanotechnologies Conference. <http://www.northeastern.edu/law/academics/conferences/nano-conference/index.html>





Survey: In force health and safety procedures for Silicon based materials

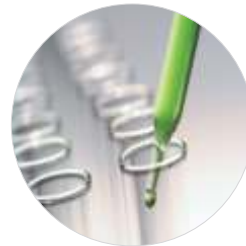
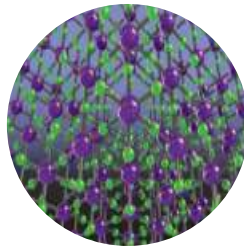
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THEME 4 NMP

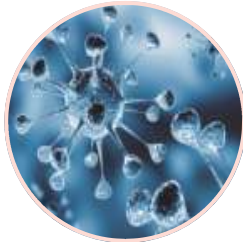
**Project
Coordinator
EKOTEK**

Project Acronym: NEPHH
Project Reference: 228536
Start Date: 2009-09-01
Duration: 36 months
Cost: 3.19 million euro
Contract Type: Small or medium-scale focused research project
Funding: 2.5 million euro

One of the task of the **NEPHH Project** is the assessment of the occupational health and safety procedures by means of a survey focused on in force procedures for silicon based materials. For this purpose, a number of selected companies, research organizations and production industries related to nanotechnology sector are being consulted. Should you want to participate in this survey, please send a mail to



WWW.NEPHH-FP7.COM



NEPHH has kicked-off

NEPHH consortium got together in Bilbao, Spain on **October 22-23** for the first General Meeting after project kick-off in September, 2010. Ekotek, as Project Coordinator, hosted the kick-off meeting.

During the meeting, the forthcoming objectives for the **NEPHH Project** were discussed and decided. On one hand, the evaluations and developing of Sampling Protocols was discussed as well as the identification of industrial nanocomposites samples. Another issue addressed was the need for detailed definition of the project scope, its distribution by Work Packages and activities and dependencies amongst them by the implementation of the Project Management Plan.

This first general meeting provided a chance to disseminate work performed, report on project status and better clarify ideas from different partners.

