

JOINT ACTIVITIES:  
Nanoparticles in industrial workplaces

Nanoscience and nanotechnology have a high potential for creating new opportunities and large benefits for society. However, the European Agency for Safety and Health at Work considers nanomaterials one of the major current emerging risks in workplaces (EU-OSHA, 2009). Interest is also emerging regarding airborne ultrafine (<100 nm) and nanoparticles (<50 nm; Hirano, 2009) emitted in workplaces during industrial processes, including those released unintentionally from conventional processes (not involving nanomaterials as raw materials or end-products). The latter are known as process-generated nanoparticles, and they may be similarly potentially hazardous depending on particle properties such as size, shape, surface area and composition (Scenihr, 2009; Van Broekhuizen et al., 2012).

In this framework, the CSIC and University of Helsinki HEXACOMM teams (ESRs 12 and 6, respectively) initiated a collaboration focusing on the characterisation of nanoparticle release mechanisms and exposure scenarios in workplaces. For her main secondment, ESR12 (based in Barcelona) participated in a monitoring campaign in an up-scaling factory producing carbon nanotube (CNT) films in Helsinki, with the aim to assess worker exposure to CNTs during the manufacturing process (Figure 1). The results from this work were published jointly (Fonseca, Ana Sofia, et al. "Characterization of Exposure to Carbon Nanotubes in an Industrial Setting." *Annals of Occupational Hygiene*; 2014).



Figure 1

Building on the experience obtained from this work, a second sampling campaign was planned in Zaragoza (Spain) in another pilot plant aiming to characterise exposure assessment although with a stronger focus on nanoparticle emission and release mechanisms (Figure 2). In this case, the pilot plant was dedicated to ceramic tile sintering, in the framework of LIFE+ project CERAMGLASS ([www.ceramglass.eu](http://www.ceramglass.eu)) and in close collaboration with our industrial partner Torrecid. In spite of the existing evidence that workers in tile and ceramic industry are exposed to harmful airborne particles (Hirtle et al., 1998; Monfort et al., 2008), few studies focus on workers' exposure during ceramic processes such as manufacture, handling and processing. To this end, ESRs 12 and 6 collaborated closely in the joint design and execution of the monitoring campaign in Zaragoza, and were actively involved in the field work and sample processing. The campaign was successfully completed and at present data processing is ongoing in Barcelona

by both ESRs. The results from the campaign are expected to be published also jointly by both ESRs.

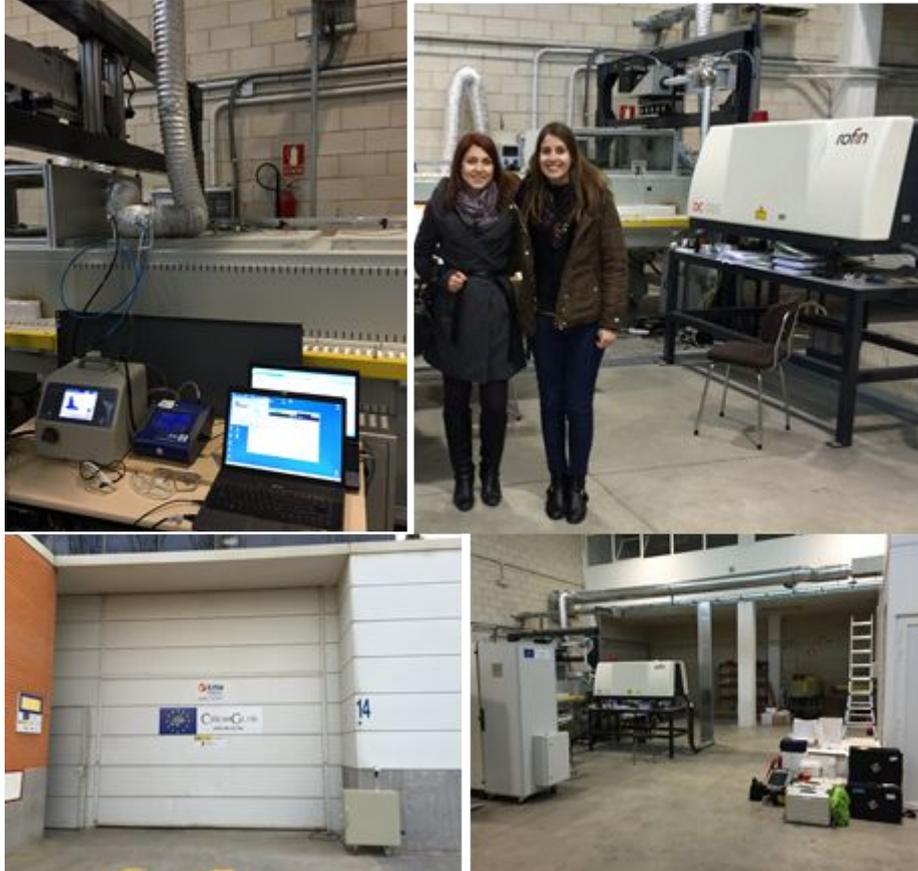


Figure 2