



ERA-NET SIINN
Safe Implementation of Innovative
Nanoscience and Nanotechnology

Deliverable D1.3 (M36)
Overview of Data and Documents:
Overview of existing data and document sources,
EHS-related studies, reports and databases
(deliverable updates in months 24 and 36)

Version No. 3

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1. RELEVANT DATA BASES

1.1 Organisation for Economic Cooperation and Development (OECD)

An international collaboration on Environment and Health Safety aspects (EHS) of nanotechnology is organized by the Organisation for Economic Cooperation and Development (OECD). A “Working Party on Safety of Manufactured Nanomaterials” (WPMN) was established in 2006 that consists of OECD member countries and organisations. It focuses on safety aspects relating to human health and the environment over the whole lifecycle. More information about the work of the WPMN, as well as publications and updates on efforts of governments and other stakeholders to address safety issues of nanomaterials is available at <http://www.oecd.org/env/nanosafety>. The OECD working party creates a very important platform for the diverse tasks and activities relating to the assessment of nanomaterials at international level. The results of this ongoing activity are presented at the OECD website (www.oecd.org/ehs/).

Internet Homepages on specific OECD documents:

- For all OECD publications:
http://www.oecd.org/document/53/0,3343,en_2649_37015404_37760309_1_1_1_1,00.htm
- OECD Working Papers
http://www.oecd.org/findDocument/0,3770,en_2649_33703_1_119684_1_1_1,00.html
- OECD Database on Research into Safety of Manufactured Nanomaterials (Projects)
<http://webnet.oecd.org/NanoMaterials/Pagelet/Front/Default.aspx>
 - a) Safety of Manufactured Nanomaterials
http://www.oecd.org/department/0,3355,en_2649_37015404_1_1_1_1_1,00.html
 - b) Publications in the Series on the Safety of Manufactured Nanomaterials (for all OECD reports)
http://www.oecd.org/document/53/0,3343,en_2649_37015404_37760309_1_1_1_1,00.html
 - c) OECD Road Map 2009 – 2010
<http://www.oecd.org/officialdocuments/displaydocumentpdf/?cote=env/jm/mono%282009%2934&doclanguage=en>
- OECD nanomaterials conference
Opportunities of nanomaterials and current state of knowledge about potential health and environmental risks – what regulators need to know
<http://www.nanomaterialsconf.eu/documents/1-RobVisser.ppt>
- ENV/JM/MONO(2009)20/REV. OECD. 2010. Guidance manual for the testing of manufactured nanomaterials: OECD’s sponsorship programme; first revision. No. 25, Paris: OECD.
- Organisation for Economic Co-Operation and Development, ‘Tour de Table at the 3rd Meeting of the Working Party on Manufactured Nanomaterials’, Current Developments/Activities on the Safety of Manufactured Nanomaterials/ Nanotechnologies, Paris, France, 28-30 November 2007.)
- Organisation for Economic Co-operation and Development (OECD), “Current Developments/Activities on the Safety of Manufactured Nanomaterials,” OECD Environment, Health and Safety Publications Series on the Safety of Manufactured Nanomaterials, Berlin, Germany, 25-27 April 2007.



- Organization for Economic Co-operation and Development, OECD guidelines for the testing of chemicals, accessed on 22 September 2008.
http://oberon.sourceoecd.org/vl=3019884/cl=17/nw=1/rpsv/periodical/p15_about.htm?jnllisn=1607310x
- Organisation for Economic Co-operation and Development. 2010. Preliminary guidance notes on sample preparation and dosimetry for the safety testing of manufactured nanomaterials. OECD Environment, Health and Safety Publications Series on the Safety of Manufactured Nanomaterials. No. 24. ENV/JM/MONO (2010) 25, Paris, France.
- Organisation for Economic Co-operation and Development. 2010. Current developments/activities on the safety of manufactured nanomaterials. OECD Environment, Health and Safety Publications Series on the Safety of Manufactured Nanomaterials. No. 26. ENV/JM/ MONO (2010) 42, Paris, France.
- OECD: Series on the Safety of Manufactured Nanomaterials No. 27, 2010 List of Manufactured Nanomaterials and List of Endpoints for Phase One of the Sponsorship Programme for the Testing of Manufactured Nanomaterials: Revision
<http://www.oecd.org/officialdocuments/displaydocumentpdf/?cote=env/jm/mono%282010%2946&doclanguage=en>
- OECD 301 A-F OECD (OECD 105, OECD 107/117/123, OECD 111, OECD 106/121; OECD 305; OECD 315, 317) GUIDELINE FOR TESTING OF CHEMICALS, ENV/JM/TG(2005)5/REV1, 2005
- OECD Environment, Health and Safety Publications, Environment directorate joint meeting of the chemicals committee and the working party on chemicals, pesticides and biotechnology, Series on the Safety of Manufactured Nanomaterials No. 28, Compilation of nanomaterial exposure mitigation guidelines relating to laboratories, 01-Dec-2010
- ENV/JM/MONO(2009)17, Environment directorate joint meeting of the chemicals committee and the working party on chemicals, pesticides and biotechnology, Series on the Safety of Manufactured Nanomaterials Number 12, Comparison of guidance on selection of skin protective equipment and respirators for use in the workplace: manufactured nanomaterials, 19-jun-2009
- NAPIRAhub is a comprehensive IT platform dedicated to the management of information on nanomaterials, relevant for safety/risk assessment.
<http://napira.jrc.ec.europa.eu/>
 - a. OECD WPMN Projects
 - OECD-NanoMaPPP
 - OECD-PROSPECT
 - OECD-RefNanoCLAYM
 - OECD-WPMN Ceria
 - OECD-WPMN SG7
 - OECD-WPMN Silicon Dioxide
 - OECD-WPMN Silver
 - OECD-WPMN Titanium Dioxide
 - OECD-WPMN Zinc Oxide
 - b. Projects
 - BMBF-UMSICHT
 - ENPRA InLiveTox
 - NANOGENOTOX
 - NANOimmune



- NANOPOLYTOX
- NANOtest
- NanoMile
- NanoSolution
- DaNa
- eNanoMapper
- Modern

- **Databases under construction:**

The need to define and agree on specific testing procedure for nanomaterials and to have a better view of concrete exposure scenarios remains amongst the highest priority. As from the EC mandate, an increasing commitment on the matter is expected by the European Agency for Safety and Health at Work (EU-OSHA). A database on information sources and case studies on nanomaterials is expected in 2011 [OECD 1, EU17].¹

1.2 World Health Organization (WHO)

- World Health Organization, Summary listing of projects within six Activity Areas. Work plan 2006-2010 of the WHO Global Network of Collaborating Centres, accessed on 23 April 2008.
http://www.who.int/occupational_health/network/summary_listing_projects_apr08.pdf
- World Health Organization, Work Plan 2006-2010 of the WHO Global Network of Collaborating Centres, accessed on 23 April 2008.
http://www.who.int/occupational_health/network/compendium_apr08.pdf

WHO projects connected with nanomaterials

AA6:NM 1 Dialogue on Nanoparticles Federal Institute of Occupational Safety & Health – BAuA, Germany

AA6:NM 2 How to assess the adequacy of safety measures for manufactured nanoparticles, Institute for Work and Health, Lausanne, Switzerland

AA6:NM 3 Best practices globally for working with nanomaterials NIOSH – National Institute for Occupational Safety and Health, USA

AA6:NM 4 NANO-Comms: A Technical observatory for the dissemination of information regarding nanoparticles health and safety issues HSL, - Health and Safety Laboratory, UK

AA6:NM 5 Assessing the Hazard of Nanoparticles Institute of Occupational Medicine – IOM, UK

- WORLD HEALTH ORGANIZATION INTERNATIONAL AGENCY FOR RESEARCH ON CANCER, *IARC Monographs on the Evaluation of Carcinogenic Risks to Humans*, VOLUME 93, Carbon Black, Titanium Dioxide, and Talc, LYON, FRANCE 2010, This publication represents the views and expert opinions of an IARC Working Group on the Evaluation of Carcinogenic Risks to Humans, which met in Lyon.

¹ [ObservatoryNano, DEVELOPMENTS IN NANOTECHNOLOGIES REGULATION & STANDARDS - 2011](#), page 8



1.3 SCENIHR

Scientific Committee on Emerging and Newly Identified Health Risks,
http://ec.europa.eu/health/scientific_committees/emerging/index_en.htm

- Scientific Committee on Emerging and Newly Identified Health Risks, The synthesis report on the public consultation of the SCENIHR opinion on the appropriateness of existing methodologies to assess the potential risks associated with engineered and adventitious products of nanotechnologies, 2006, accessed on 13 November 2008.
http://ec.europa.eu/health/ph_risk/documents/synth_report.pdf
- SCENIHR. 2007, "Opinion on the appropriateness of the risk assessment methodology in accordance with the technical guidance documents for new and existing substances for assessing the risks of nanomaterials", European Commission.
- SCENIHR (Scientific Committee on Emerging and Newly Identified Health Risks). 2009, *Risk assessment of products of nanotechnologies*, European Commission.
- SCENIHR. 2010, (Scientific Committee on Emerging and Newly Identified Health Risks), "Scientific basis for the definition of the term nanomaterial", Pre-consultation opinion, 6 July 2010.
http://ec.europa.eu/health/scientific_committees/emerging/docs/scenihr_o_030.pdf
- SCENIHR. 2010, (Scientific Committee on Emerging and Newly Identified Health Risks), "Scientific basis for the definition of the term nanomaterial", The SCENIHR approved this opinion by written procedure on 8 December 2010
http://ec.europa.eu/health/scientific_committees/emerging/docs/scenihr_o_032.pdf

2. Relevant Data collections

- ECHA database on registered Substances
<http://echa.europa.eu/information-on-chemicals/registered-substances>
- DaNa Knowledge base
<http://www.nanoobjects.info/cms/lang/en/page3.html;jsessionid=D24C8289F8E022C378861E9FA6FBA208>
- RSC (advancing the Chemical Sciences)
<http://www.rsc.org/chemistryworld/News/2009/March/09030901.asp>
March 2009
- GoodNanoGuide - Beta Version
<http://goodnanoguide.org/tiki-index.php?page=HomePage>
 - a. The GoodNanoGuide provides both environmental, health and safety ("EHS") Protocols and an EHS Reference Manual
 - b. The EHS Reference Manual outlines the approaches taken by professionals using research about nanomaterials and other precedents to develop appropriate protocols and guidelines.
<http://www.goodnanoguide.org/OHS+Reference+Manual#/>
- NanoRisk (private news letter)
<http://www.nanorisk.org/>
- European Nanotechnology Gateway
<http://www.nanoforum.org/>
- European Union Funded Projects (6th and 7th Framework):
<http://cordis.europa.eu/nanotechnology/src/safety.htm>



- Institute of Technology Assessment of the Austrian Academy of Sciences (2007): <http://nanotrust.ac.at/>
- Nanotechnology Industries Association (NIA): <http://www.nanotechia.org/nia-activities>
- Safety of Nanoparticles Interdisciplinary Research Centre (SnIRC, 2004): <http://www.safenano.org/>
- Observatory NANO: <http://www.observatorynano.eu/>
- Woodrow Wilson Inventories: <http://www.nanotechproject.org/>
- EU-OSHA – European Agency for Safety and Health at Work, <http://www.osha.gov/>
- National Institute for Occupational Safety and Health (NIOSH) <http://www.cdc.gov/niosh/topics/>
- US-EPA, Environmental Protection Agency, <http://www.epa.gov/>
- CEFIC, The European Chemical Industry Council <http://www.cefic.org/Policy-Centre/Environment--health/Nanomaterials/>
- Experts recommendations - RIP-oNs (REACH Implementation project on Nanomaterials): <http://ec.europa.eu/environment/chemicals/nanotech/index.htm>

3. Action Plans

- Action Plan Nanotechnology 2015 of the Federal Government of Germany, BMBF (2011) http://www.bmbf.de/pub/aktionsplan_nanotechnologie_2015_en.pdf
- Nano Action Plan of the Austrian Ministry on Traffic, Innovation, and Technology (BMVIT) http://www.lebensministerium.at/publikationen/umwelt/gefaehrliche_stoffe/austrian_nanotechnology_action_plan.html
- Action Plan of Switzerland on Nanomaterials <http://www.baq.admin.ch/nanotechnologie/12167/index.html?lang=en>
- Swiss action plan for synthetic nanomaterials, Federal Office of Public Health, FOPH <http://www.bafu.admin.ch/publikationen/publikation/00574/index.html?lang=en>
- Nanotechnology and the Nanotechnology Action Plan (EU, 2004) <http://cordis.europa.eu/nanotechnology/actionplan.htm>
- National Nanotechnology Initiative (NNI, USA), founded in 2001 <http://www.nano.gov/>
<http://www.cdc.gov/niosh/topics/>
- Precautionary Strategies for managing Nanomaterials, Conclusions and Recommendations, SRU, German Advisory Council on the Environment, June 2011

4. Standards and standards under development by the referenced committees

Committee	Reference	Title	Current state	ICS/DAV codes
ASTM International	ASTM E2490-09.	Standard Guide for Measurement of Particle Size Distribution of Nanomaterials	April 2009 published	ICS: 71.100.01 (Products of



		in Suspension by Photon Correlation Spectroscopy (PCS) http://www.astm.org/Standards/E2490.htm		the chemical industry in general)
ASTM International	ASTM E2456 - 06	Standard Terminology Relating to Nanotechnology/ http://www.astm.org/Standards/E2456.htm	DOI: 10.1520/E2456-06	ICS: 01.040.71 (Chemical technology (Vocabularies)); 71.100.01 (Products of the chemical industry in general)
ASTM International	ASTM E2524 - 08	Standard test method for Analysis of Hemolytic Properties of Nanoparticles http://www.astm.org/Standards/E2524.htm	DOI: 10.1520/E2524-08	ICS: 11.040.20 (Transfusion, Infusion); 71.100.01 (Products of the chemical industry in general)
ASTM International	ASTM E2525 - 08	Standard Test Method for Evaluation of the Effect of Nanoparticulate Materials on the formation of Mouse Granulocyte-Macrophage Colonies http://www.astm.org/Standards/E2525.htm	DOI: 10.1520/E2525-08	ICS: 07.100.10 (Medical microbiology)
ASTM International	ASTM E2526 - 08	Standard Test Method for Evaluation of Cytotoxicity of Nanoparticulate Materials in Porcine Kidney Cells and Human Hepatocarcinoma Cells http://www.astm.org/Standards/E2526.htm	DOI: 10.1520/E2526-08	ICS Number Code 07.100.10 (Medical microbiology)
ASTM International	ASTM E2578 - 07	Standard Practice for Calculation of Mean Sizes/Diameters and Standard Deviations of Particle Size Distributions http://www.astm.org/Standards/E2578.htm	DOI: 10.1520/E2589-11	ICS Number Code 19.120 (Particle size analysis. Sieving)
ASTM International	ASTM E2535 - 07	Standard Guide for Handling Unbound Engineered Nanoscale Particles in Occupational Settings http://www.astm.org/Standards/E2535.htm	DOI: 10.1520/E2535-07	ICS: 71.100.01 (Products of the chemical industry in



				general)
ASTM International	ASTM E729 – 96	Standard guide for conducting acute toxicity tests on test materials with fishes, macroinvertebrates, and amphibians. http://www.astm.org/Standards/E729.htm	2007 published	ICS Number Code 07.080 (Biology, Botany, Zoology)
ASTM International	ASTM F1671 - 07	Standard Test Method for Resistance of Materials Used in Protective Clothing to Penetration by Blood-Borne Pathogens Using Phi-X174 Bacteriophage Penetration as a Test System	2007 published	ICS Number Code 11.140 (Hospital equipment); 13.340.10 (Protective clothing)
ASTM International	E 2019-99	Standard Test Method for Minimum Ignition Energy of a Dust Cloud in Air	2007 published	ICS Number Code 13.230 (Explosion protection)
Australian Standard (AS)	AS 3544—1988	Industrial vacuum cleaners for particulates hazardous to health	1988 Published by Standards Australia	ISBN 0 7262 5148 8
Australian Standard (AS)	AS 4260—1997	High efficiency particulate air (HEPA) filters —Classification, construction and performance	1997 Published by Standards Australia	ISBN 0 7337 1060 3
BSI - British Standards Institution	BS EN 13925-1:2003	Non-destructive testing. X-ray diffraction from polycrystalline and amorphous materials. General principles http://shop.bsigroup.com/ProductDetail/?pid=000000000030027544	March 2003 Published	ICS Number Code 19.100 (Non-destructive testing)
BSI - British Standards Institution	BS EN 13925-3:2005	Non-destructive testing. X-ray diffraction from polycrystalline and amorphous materials. – Part 3: Instruments http://shop.bsigroup.com/ProductDetail/?pid=000000000030071999	July 2005 Published	19.100 (Non-destructive testing)
European Committee for Standardization (CEN)	CEN/TC 137	Assessment of workplace exposure to chemical and biological agents		
European Committee for Standardization (CEN)	CEN Nanotechnologies	http://www.cen.eu/CEN/sectors/sectors/nanotechnologies/Pages/default.aspx		



European Committee for Standardization (CEN)	CEN/TC 352	'Nanotechnologies' work programme http://www.cen.eu/cen/Sectors/TechnicalCommitteesWorkshops/CENTechnicalCommittees/Pages/default.aspx?param=508478&title=CEN/TC%20352		
European Committee for Standardization (CEN)	CEN/TC 352	Published standards http://www.cen.eu/cen/Sectors/TechnicalCommitteesWorkshops/CENTechnicalCommittees/Pages/WP.aspx?param=508478&title=CEN/TC%20352		
European Committee for Standardization (CEN)	CEN/TC 352 2011	Standards under development: Guidance on the labelling of manufactured nano-objects and products containing manufactured nano-objects (ISO/TS 13830:2011) http://www.cen.eu/cen/Sectors/TechnicalCommitteesWorkshops/CENTechnicalCommittees/Pages/WP.aspx?param=508478&title=CEN/TC%20352	2011, Under Approval	DAV: 2011-04
European Committee for Standardization (CEN)	EN 943-1:2002	Protective clothing against liquid and gaseous chemicals, including liquid aerosols and solid particles. Performance requirements for ventilated and non-ventilated gas-tight (Type 1) and non-gas-tight (Type 2) chemical protective suits	2002 <i>Published</i>	
European Committee for Standardization (CEN)	<i>CEN/TC 137</i> EN ISO 28439	Workplace atmospheres. Characterization of ultrafine aerosols/nanoaerosols. Determining the size distribution and number concentration using mobility particle sizers/differential mobility analysers.	April 2011 Published	13.040.30 (Workplace atmosphere)
International Standards Organisation (ISO)	ISO/TR 12885:2008.	ISO/TR 12885:2008, Nanotechnologies -- Health and safety practices in occupational settings relevant to nanotechnologies http://www.iso.org/iso/catalogue_detail?csnumber=52093	TC 229 Published	ICS: 13.100; 07.030 Stage: 60.60 (2008-09-30)
International Standards Organisation (ISO)	ISO/TS 80004-1	ISO/TS 80004-1:2010, Nanotechnologies -- Vocabulary -- Part 1: Core terms http://www.iso.org/iso/catalogue_detail.htm?csnumber=5124	TC 229 Published	ICS: 01.040.07; 07.030 Stage: 60.60 (2010-10-



		0		06)
International Standards Organisation (ISO)	ISO/13321:1996	ISO 13321:1996, Particle size analysis -- Photon correlation spectroscopy http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=21707	TC 24/SC 4 Published	ICS: 19.120 Stage: 90.93 (2007-05-02)
International Standards Organisation (ISO)	ISO/13318-1:2001	ISO 13318-1:2001, Determination of particle size distribution by centrifugal liquid sedimentation methods -- Part 1: General principles and guidelines http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=21704	TC 24/SC 4 Published	ICS: 19.120 Stage: 90.92 (2006-05-30)
International Standards Organisation (ISO)	ISO/TS 13762:2001	ISO/TS 13762:2001, Particle size analysis -- Small angle X-ray scattering method http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=22376	TC 24/SC 4 Withdrawn	ICS: 19.120 Stage: 95.99 (2011-11-04)
International Standards Organisation (ISO)	ISO/13322-1:2004.	ISO 13322-1:2004, Particle size analysis -- Image analysis methods -- Part 1: Static image analysis methods http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=38664	TC 24/SC 4 Published	ICS: 19.120 Stage: 90.92 (2008-01-23)
International Standards Organisation (ISO)	ISO/TC 146/SC-2	ISO/TC 146/SC-2 "Air Quality, Workplace Atmospheres", working in the field of assessment of workplace exposure to different agents. http://www.iso.org/iso/iso_technical_committee.html?commid=52736	Published	
International Standards Organisation (ISO)	ISO Concept Database	The address (URL) of the ISO/CDB is: http://cdb.iso.org .	Launched on 2009	
International Standards Organisation (ISO)	TC 229 Nanotechnologies	http://www.iso.org/iso/standards_development/technical_committees/list_of_iso_technical_committees/iso_technical_committee.htm?commid=381983		
International Standards Organisation (ISO)	BUSINESS PLAN ISO/TC 229 Nanotechnologies 2011	Glossary of terms and abbreviations used in ISO/TC Business Plans http://isotc.iso.org/livelink/livelink/fetch/2000/2122/687806/ISO_TC_229_Nanotechnologies.pdf?nodeid=6507632&vernum=-2	2011	
International	ISO/TC 229	Workprogramme		



Standards Organisation (ISO)		http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_tc_browse.htm?commid=381983&development=on		
International Standards Organisation (ISO)	ISO/TC 229	Working area on ISOTC http://isotc.iso.org/livelink/livelink/open/tc229		
International Standards Organisation (ISO)	ISO/TC 229	Objectives TC 229 (WG1 Roadmap, Outline Strategy for ISO TC 229 WG2, WG3 Roadmap, WG4 Roadmap) http://isotc.iso.org/livelink/livelink/fetch/6261792/641932/JWG2_N092b_Strategy_Paper_Review_8.0.pdf?nodeid=7279299&vernum=-2	April 2008	
International Standards Organisation (ISO)	ISO 9276-1	Representation of results of particle size analysis -- Part 1: Graphical representation	TC 24/SC 4 1998	ICS: 19.120 Stage: 90.93 (2009-10-22)
International Standards Organisation (ISO)	ISO 9276-2	Representation of results of particle size analysis -- Part 2: Calculation of average particle sizes/diameters and moments from particle size distributions	TC 24/SC 4	ICS: 19.120 Stage: 90.92 (2010-10-22)
International Standards Organisation (ISO)	ISO 9276-3	Representation of results of particle size analysis -- Part 3: Adjustment of an experimental curve to a reference model	TC 24/SC 4 2008	ICS: 19.120 Stage: 90.93 (2011-11-24)
International Standards Organisation (ISO)	ISO 9276-4	Representation of results of particle size analysis -- Part 4: Characterization of a classification process	TC 24/SC 4	ICS: 19.120 Stage: 90.20 (2012-04-15)
International Standards Organisation (ISO)	ISO 9276-5	Representation of results of particle size analysis -- Part 5: Methods of calculation relating to particle size analyses using logarithmic normal probability distribution	TC 24/SC 4	ICS: 19.120 Stage: 90.93 (2009-10-22)
International Standards Organisation (ISO)	ISO 9276-6	Representation of results of particle size analysis -- Part 6: Descriptive and quantitative representation of particle shape and morphology	TC 24/SC 4	ICS: 19.120 Stage: 90.93 (2011-12-28)
International Standards Organisation (ISO)	ISO 9277	Determination of the specific surface area of solids by gas adsorption using the BET method	TC 24/SC 4 1995	ICS: 19.120 Stage: 95.99 (2010-08-20)
International Standards Organisation (ISO)	ISO 13099-1:2012	Colloidal systems -- Methods for zeta-potential determination -- Part 1: Electroacoustic and electrokinetic phenomena	TC 24/SC 4	ICS: 19.120 Stage: 60.60 (2012-06-18)
International Standards Organisation (ISO)	ISO 13099-2:2012	Colloidal systems -- Methods for zeta-potential determination -- Part 2: Electroacoustic and electrokinetic phenomena	TC 24/SC 4	ICS: 19.120 Stage: 60.60 (2012-06-18)



Organisation (ISO)		tion -- Part 2: Optical methods		0 (2012-06-18)
International Standards Organisation (ISO)	ISO/NP 13099-3	Methods for zeta potential determination -- Part 3: Acoustic methods	TC 24/SC 4	ICS: 19.120 Stage: 10.99 (2010-10-04)
International Standards Organisation (ISO)	ISO/DIS 26824	Particle characterization of particulate systems -- Vocabulary	TC 24/SC 4	ICS: 01.040.19; 19.120 Stage: 40.60 (2012-07-08)
International Standards Organisation (ISO)	ISO/NP 27891	Aerosol particle number concentration -- Calibration of condensation particle number counters	TC 24/SC 4	ICS: 19.120 Stage: 10.99 (2010-11-08)
International Standards Organisation (ISO)	ISO/NP 12187	Particle size analysis – Dispersed stability characterization in liquids	Under development	Current Stage: 00.20
EC: M/461 EN	Mandate addressed to CEN, CENELEC and ETSI for standardization activities regarding nanotechnologies and nanomaterials	ftp://ftp.cenorm.be/CENELEC/EuropeanMandates/M_461.pdf	2010	
International Standards Organisation (ISO)	BS EN ISO 18757:2005	BS EN ISO 18757:2005, Fine ceramics (advanced ceramics, advanced technical ceramics). Determination of specific surface area of ceramic powders by gas adsorption using the BET method http://shop.bsigroup.com/ProductDetail/?pid=000000000030117333	International Equivalent : EN ISO 18757:2005, ISO 18757:2003 Dec 2006 Published	BSi code: BS EN ISO 18757:2005 Product code: 30117333
International Standards Organisation (ISO)	ISO/20998-1:2006	ISO 20998-1:2006, Measurement and characterization of particles by acoustic methods -- Part 1: Concepts and procedures in ultrasonic attenuation spectroscopy http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=39869	TC 24/SC 4 Published	ICS: 19.120 Stage: 90.93 (2011-02-13)
International Standards Organisation (ISO)	ISO/21501-2:2007	ISO 21501-2:2007, Determination of particle size distribution -- Single particle light interaction methods -- Part 2: Light scattering liquid-	TC 24/SC 4 Published	ICS: 19.120 Stage: 90.92 (2010-10-25)



		borne particle counter http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=40275		
International Standards Organisation (ISO)	ISO/TR 27628:2007	ISO/TR 27628:2007, Workplace atmospheres -- Ultrafine, nanoparticle and nano-structured aerosols -- Inhalation exposure characterization and assessment http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=44243	TC 146/SC 2 Published	ICS: 13.040.30 Stage: 90.93 (2010-07-14)
International Standards Organisation (ISO)	ISO/22412:2008	ISO 22412:2008, Particle size analysis -- Dynamic light scattering (DLS) http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=40942	TC 24/SC 4 Published	ICS: 19.120 Stage: 90.93 (2011-11-24)
International Standards Organisation (ISO)	ISO/13320:2009	ISO 13320:2009, Particle size analysis -- Laser diffraction methods http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=44929	TC 24/SC 4 Published	ICS: 19.120 Stage: 60.60 (2009-09-18)
International Standards Organisation (ISO)	ISO/15900:2009	ISO 15900:2009, Determination of particle size distribution -- Differential electrical mobility analysis for aerosol particles http://www.iso.org/iso/catalogue_detail.htm?csnumber=39573	TC 24/SC 4 Published	ICS: 19.120 Stage: 60.60 (2009-05-12)
International Standards Organisation (ISO)	ISO/21501-1:2009	ISO 21501-1:2009, Determination of particle size distribution -- Single particle light interaction methods -- Part 1: Light scattering aerosol spectrometer http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=42728	TC 24/SC 4 Published	ICS: 19.120 Stage: 60.60 (2009-05-22)
International Standards Organisation (ISO)	ISO 9277:2010.	ISO 9277:2010, Determination of the specific surface area of solids by gas adsorption -- BET method http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=44941	TC 24/SC 4 Published	ICS: 19.120 Stage: 60.60 (2010-08-20)
International Standards Organisation (ISO)	ISO 28439:2011	ISO 28439:2011, Workplace atmospheres -- Characterization of ultrafine aerosols/nanoaerosols -- Determination of the size	TC 146/SC 2 Published	ICS: 13.040.30 Stage: 60.60 (2011-03-



			distribution and number concentration using differential electrical mobility analysing systems http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=44697		18)
International Standards Organisation (ISO)	ISO/AWI 10797	TS	ISO/PRF TS 10797, Nanotechnologies -- Characterization of single-wall carbon nanotubes using transmission electron microscopy http://www.iso.org/iso/catalogue_detail?csnumber=46127	TC 229 Under development	ICS: 07.030 Stage: 50.00 (2011-11-17)
International Standards Organisation (ISO)	ISO/AWI 10798.	TS	ISO/TS 10798:2011, Nanotechnologies -- Characterization of single-wall carbon nanotubes using scanning electron microscopy and energy dispersive X-ray spectrometry analysis http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=46128	TC 229 Published	ICS: 07.030 Stage: 60.60 (2011-07-14)
International Standards Organisation (ISO)	ISO/AWI 10929.	TS	ISO/PRF TR 10929 Nanotechnologies -- Characterization of multiwall carbon nanotube samples http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=46424	TC 229 Under development	ICS: <u>07.030</u> Stage: <u>50.00</u> (2011-10-31)
International Standards Organisation (ISO)	ISO/CD 12025		ISO/DIS 12025, Nanomaterials -- Quantification of nano-object release from powders by generation of aerosols http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=51162	TC 229 Under development	ICS: 07.030 Stage: 40.60 (2011-03-03)
International Standards Organisation (ISO)	ISO/CD 13099-1.		ISO/DIS 13099-1, Colloidal systems -- Methods for zeta-potential determination -- Part 1: Electroacoustic and electrokinetic phenomena http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=52807	TC 24/SC 4 [Committee Draft]. Under development	ICS: 19.120 Stage: 40.60 (2011-04-11)
International Standards Organisation (ISO)	ISO/CD 13099-2.		ISO/DIS 13099-2, Colloidal systems -- Methods for zeta-potential determination -- Part 2: Optical methods http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=52832	TC 24/SC 4 [Committee Draft]. Under development	ICS: 19.120 Stage: 40.60 (2011-04-11)
International	ISO/NP	TS	Nanotubes - Use of UV-Vis-	ISO/TC22	ICS: 07.030



Standards Organisation (ISO)	10868.	NIR absorption spectroscopy in the characterization of single-walled carbon nanotubes (SWCNTs) http://www.iso.org/iso/catalogue/catalogue_tc/catalogue_detail.htm?csnumber=46247	9 [Final Draft International Standard]. Published 2011	Stage: 60.60 (2011-08-17)
International Standards Organisation (ISO)	ISO/AWI TR 13014.	ISO/DTR 13014, Nanotechnologies - Guidance on physico-chemical characterization of engineered nanoscale materials for toxicologic assessment http://www.iso.org/iso/catalogue/catalogue_tc/catalogue_detail.htm?csnumber=52334	ISO/TC 229 [Committee Draft]. Under Development	ICS: 07.030 Stage: 30.60 (2011-08-11)
International Standards Organisation (ISO)	ISO/DTS 11888	Determination of mesoscopic shape factors of multiwalled carbon nanotubes (MWCNTs) http://www.iso.org/iso/catalogue/catalogue_tc/catalogue_detail.htm?csnumber=50969	ISO/TC 229 [Committee Draft] 2011 Published	ICS: 07.030 Stage: 60.60 (2011-11-08)
International Standards Organisation (ISO)	ISO 6341	Water quality- Determination of the inhibition of the mobility of Daphnia magna Straus (Cladocera, Crustacea). In Acute Toxicity Test, 3rd ed., Geneva, Switzerland. http://www.iso.org/iso/catalogue/catalogue_tc/catalogue_detail.htm?csnumber=21923	TC 147/SC 5 1996	ICS: 13.060.70 Stage 90.92
International Standards Organisation (ISO)	ISO/TS 27687:2008	Nanotechnologies -- Terminology and definitions for nano-objects -- Nanoparticle, nanofibre and nanoplate	TC 229 <i>Published</i>	ICS: 01.040.07; 07.030 Stage: 90.92 (2012-01-26)
International Standards Organisation (ISO)	ISO 13982 - 1: 2004	Protective clothing for use against solid particulates -- Part 1: Performance requirements for chemical protective clothing providing protection to the full body against airborne solid particulates (type 5 clothing)	TC 94/SC 13 <i>Published</i>	ICS: 13.340.10 Stage: 90.93 (2009-07-20)
International Standards Organisation (ISO)	ISO 16604:2004	Clothing for protection against contact with blood and body fluids -- Determination of resistance of protective clothing materials to penetration by blood-borne pathogens -- Test method using Phi-X 174 bacteriophage	TC 94/SC 13 <i>Published</i>	ICS: 13.340.10 Stage: 90.93 (2008-10-28)
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OSHA Washington, DC: Occupational Safety and Health Administratio n Occupational Safety and Health Standards	29 CFR 1910.1200.	Hazard communication, toxic and hazardous substances.	Date accessed: December 15, 2011.	

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- Different research projects on nanomaterials, Federal Ministry for Education and Research, (BMBF), Project Management Jülich PtJ, ongoing. Projects, actions, toxicity, research and academic activities, industrial processes, <http://www.nanopartikel.info/cms> and <http://www.nanoobjects.info/cms>
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- Guide des bonnes pratiques Nanomatériaux et HSE, UIC, Valérie LUCAS, completed.
<http://www.uic.fr/edition-12107-guide-bonnes-pratiques-nanomateriaux-hse>
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- NanoKommission, Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU), completed
<http://www.bmu.de/chemikalien/nanotechnologie/nanodialog/doc/46552.php>
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- Nanosost, *Hacia una nanotecnología responsable y segura* Towards a sustainable, responsible and safe nanotechnology, IQS, Julià Sempere, Completed,
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- Nanotrap, *Desarrollo de Técnicas de Inmovilización y Captura de Nanopartículas* Development of Monitorization and Capture Techniques for Nanoparticles, CIBER-BBN, ongoing, Francisco Balas Nieto.
- National project “New technological concepts regarding the development of some nano-materials with low environmental impact”, National Institute of R&D for Non-Ferrous and Rare Metals, Roxana Mioara Piticescu, Ongoing, Funding Programme: Partnerships in Priority Domains, Period: 2008-2011
<http://www.imt.ro/NANOPROSPECT/databases-advanced-search/formular/view/?t=7&ID=153>
- National project “Silicon based multifunctional nanoparticles for cancer therapy”, National Institute for R&D in Microtechnologies IMT Bucharest, Adina Bragaru, Completed, Fields of application: toxicity, Funding Programme: Partnerships in Priority Domains, Period: 2007-2010
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Projects/Notes/Activities developed by the different laboratories/Institutions

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Some of the FP7 projects related to nanosafety:

- NanoImpactNet (<http://nanoimpactnet.eu>) - The European network on the health and environmental impact of nanomaterials.
- NanoTEST - Development of methodology for alternative testing strategies for the assessment of the toxicological profile of nanoparticles used in medical diagnosis.
- Nanodevice - Novel concepts, methods and technologies for the production of portable easy-to-use devices for the measurement and analysis of airborne engineered nanoparticles in workplace air.
- Nanoimmune - Comprehensive assessment of hazardous effects of engineered nanomaterials on immune system.
- NanoReTox (proposal under negotiation) - The reactivity and toxicity of engineered nanoparticles, risks to the environment and human health.
- Neuronano (proposal under negotiation) - The brain will be explored as NP target organ.
- NanoSustain, www.nanosustain.eu
- NanoHouse, www-nanohouse.cea.fr
- A Novel Nanocontainer drug carrier for targeted treatment of prostate cancer "Nanotherapy" approved by ERC, **N.C.S.R. 'Demokritos', G. Kordas**, started on February 1, 2009. This project deals with the development of nanocontainers exhibiting triple stimuli response to cancer. <http://www.ims.demokritos.gr/nanotherapy/>
- Multi-level protection of materials for vehicles by "Smart" nanocontainers (SEVENTH FRAMEWORK PROGRAMME THEME [NMP-2007-4.0-3], Multifunctional materials for future vehicles, Contract N° NMP3-LA-2008-214261, N.C.S.R. 'Demokritos', G. Kordas, The project MUST aims at providing new technologies based on active multi-level protective systems for future vehicle materials
- Code-of-conduct SQTS – Swiss, Quality Testing Services, Thomas Gude, published, Syndicate of Swiss, retailers, <http://www.nfp64.ch/E/Pages/home.aspx>
- Co-operatives for Research and Technological Development in Sectors of National Priority: Technology Development for Optimising Air Quality in Industrial Buildings: Characterisa-



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6. Selected Publications in Science Journals and Books

Some selected published papers which are representative for environment, health and safety (EHS) nano-related relevant information are listed in the following table. Due to the enorm space of research in this field, this list is not intended to cover all the bibliographic information in the field, but only a small part which could be used (together the other information listed in the present document) to develop a consolidated framework with which to address and manage nano-related EHS risks.

Authors	Journal, Vol. No(Issue): first page	Year
Aggarwal P., J. B. Hall, C. B. McLeland, M. A. Dobrovolskaia, S. E. McNeil	<i>Adv. Drug Deliv. Rev.</i> 61: 428.	2009
Andrievsky G, Klochkov V, Derevyanchenko L	<i>Fullerenes, Nanotubes, and Carbon Nanostructures</i> , 13: 363	2005
Auffan, M., M., Rose, J., Wiesner, M.R. & Bottero, J.Y.	<i>Environmental Pollution</i> , 157(4): 1127	2009
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