



Do's and dont's in EC cooperative research: Best practice and leassons learned for SME, industry and academia

Mrs. Andrea Elisabeth Reinhardt

Shareholder board member of microTEC Gesellschaft für Mikrotechnologie mbH

Co-founder of NTC Nano Tech Coatings GmbH

Founding member of nanofutures a.s.b.l

Member of Technology Advisory Board Rhineland-Palatinate 2010-2015

IAG member Industrial Technologies 2014



Mrs. Andrea Elisabeth Reinhardt

microTEC (since 1996): Micromechanics, MEMS, Plastic Lab-on-a-chip
Customized Production Services, Packaging and R&D, Advanced Micro-
and Nanotechnologies, Registered Trademark and Patented Technologies:
Production of MEMS and high-integrated 3D Chip Size Packaging
www.microtec-d.com



NTC (since 2000): NTC Nano Tech Coatings GmbH
Patented Sol-Gel Materials (incl. UV curing) e.g. applications Coil Coating
(anti corrosion for metals), easy to clean for metals and glass
R&D for self-lubricant coatings and MEMS materials with high-temperature
resistance
www.ntcgmbh.com
CEO: Dr. Georg Wagner



microTEC EC projects:

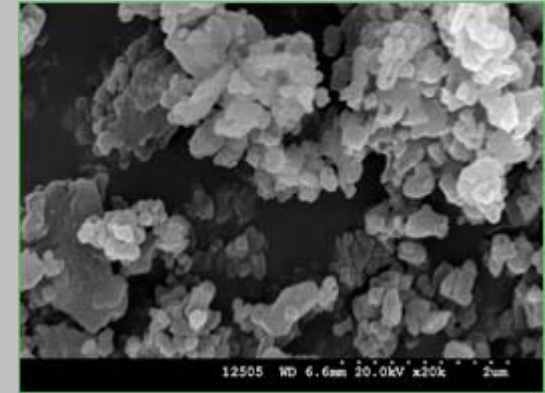
FP5: micromaking; FP6: INOS, Healthyaims;

FP7: Ultra, Light-Rolls, Priam, Nanofutures,

NanoDiode, NanoEIS, Value4Nano

Product life time, Nano in Steel? CNT > 500 years..

Carbon nanotubes in an ancient Damascus sabre



Nano in Construction

Additive to ordinary cement

Reduces shrinkage of pre-fabricated structures

Rapid set times

Significant increase in compressive strength

Minimizes energy consumption and carbon footprint by reducing material requirements

Low-impact manufacturing process

Nano for Cleaning, samples by Reckitt-Benckiser

www.reckittbenckiser.com

World market leader in cleaning, sells products in 180 countries, has operations in 60 countries across all continents, with global sales in excess of £5 billion and owns a wide range of trademarks, e.g. nano shield, nano action, nanopowder. Products using nano effects today:



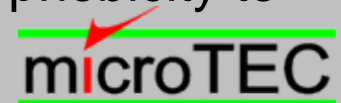
Electrasol and Jet-Dry were the first automatic dishwashing detergent and first rinse aid respectively

www.oxy.co.kr/eng/product/hama/ha_sub02_4.asp

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to solve questions like e.g. “Technology to impart temporary hydrophobicity and oleophobicity to fabric substrates”



Shiseido

Shiseido independently developed the "nano-coating technology" in 1988 to treat the powder surface with an ultra thin film. The technology improved the functions of cosmetics in various ways: The color production and dispersibility of colored powder were improved and the smell change was reduced (www.shiseido.co.jp/e/ken/develop/dvp_fti.htm)

And a wide range of SME, selling e.g. nano enhanced sol-gel based nail coatings



Nano in Cosmetics, >20 year old story of money making

Besides all the small SMEs, e.g. selling nano-based sol-gel nail coatings are also some samples how big industries benefit from nano-inside:

L'oreal

L'Oreal, the world's largest cosmetics company, is devoting about 600 million dollars, of its 17 billion dollar revenues, to nano patents, and has patented the use of dozens of “nanosome particles” 800 times smaller than a human hair as delivery systems for nutrients. With 192

patents in Nanotechnology, L'Oreal now ranks no. 6 among nano patents in the United States. At L'Oreal factories, nanosize bits are being created with high-pressure machinery that fires droplets of material at the speed of sound.

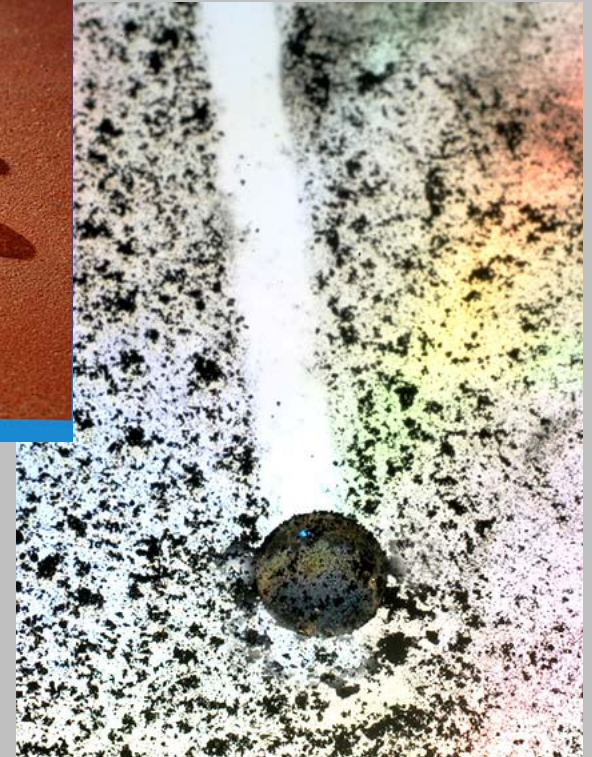
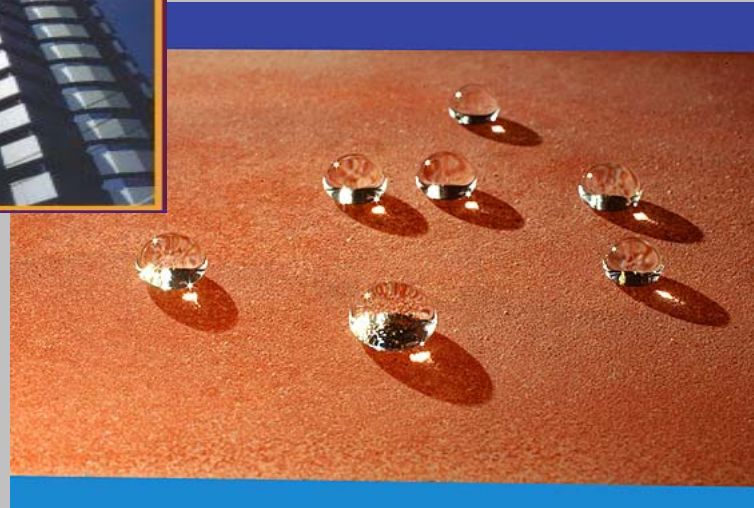


www.nanoscienceinstitute.com/NanoCosmetics.htm

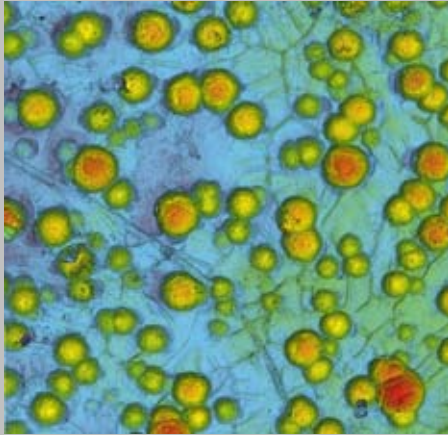
Functional self cleaning for applications in Construction and Automotive



NTC[®]
NANO TECH COATINGS GMBH



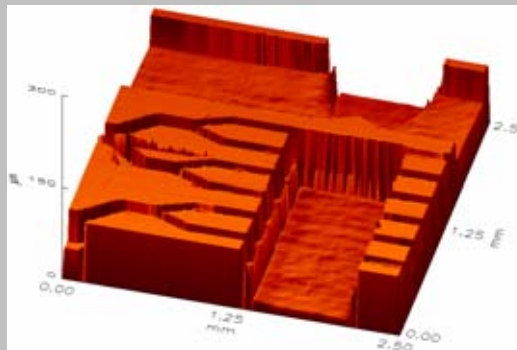
Quality Control? Basic for efficient production



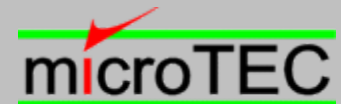
Source NanoFocus:
Surface of the texture of
a thin sheet for the
automotive engineering.
www.nanofocus.de



Markets: MEMS, Automotive,
Semiconductor, Optics und PV/Solar
www.frt-gmbh.com



Source FRT, picture of fluidic structure.



microTEC locations

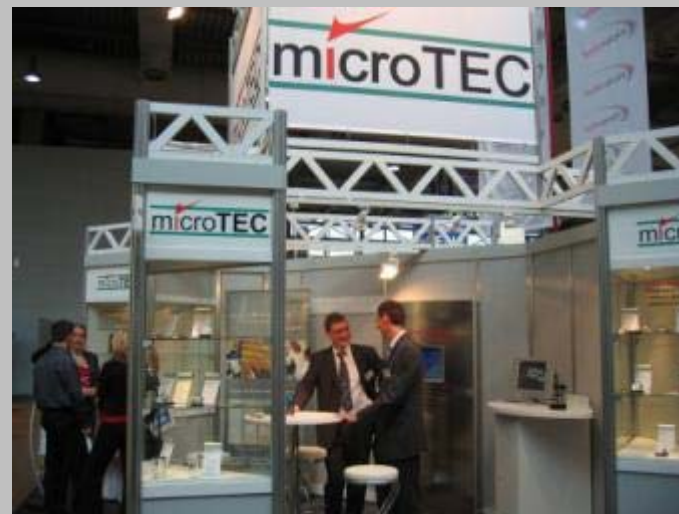
Duisburg



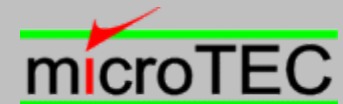
Bad Dürkheim



Customer idea + microTEC
Consulting
R&D, Simulation
Prototyping
Direct Mass Production
Training/Licensing
= Customer Products Innovation



Germany



Lessons learned: Do it!

Make your self visible online, publish your profile, your know-how and needs directly at Cordis. Partners will find YOU! Humans are making projects. Use brokerage events and check EC news. Publish, talk and write about your R&D results and products. Use free of charge channels, e.g. Cordis Wire. Research about calls, about existing competence, about potential partners at Cordis, about running and former projects and of course, just don't forget patent research and google – maybe your question is solved anywhere else in the world. Use your local European experts and free of charge consulting there, e.g. for pre-check of consortium agreements. Before you sign anything, check not only the paper, check first if the partners you selected are the right ones.

For companies:

If you are invited to projects, check if the topic is within your needs and you are able to use the results for your products/markets. Generate a clear vision of tasks, task leaders and milestones. Write a 3-pager.

For institutes/universities:

Think about the needs of companies. When you send them a draft-proposal, make clear that you are looking for R&D partnership and solve their needs together with them. Ask them about their needs. Only if you have a clear idea about their needs, then invite them to write the proposal together.



Lessons learned: Please avoid!



Don't run after every call, after every proposal idea. Think and select first.

Don't try to get money for "re-inventing the wheel". Maybe the proposal is successful and you will get funding, but IPs are owned by the early birds, the market is blocked by others. On this way no new businesses and new jobs will be built.

Don't panic about foreigners. EC projects are made to learn from each other, from Russia, France, Finland, Spain and all the others. In some calls even from Japan, China, USA and Mexico, too.

Don't wait that others are doing the job for you. You have to protect your know-how yourself. You have to check several networks and calls to find your partners. You have to contribute to the proposal writing, to the reports, to dissemination. It is your job and of course: Take care to contribute to the EC goals. Use R&D results fast for products, build jobs and respect diversity.

For universities/institutes:

Don't forget about building jobs/spin-offs yourself. Help your PhD to think like entrepreneurs when they run their projects. Support any self-motivated activities, because high-class innovation is not coming from doing what others tell you. It's coming from working in a team about a question you want to solve quickly for clear benefit of a new product/new technology/new business.

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Pictures by DesingLED (partner in Light-Rolls)

microTEC

Advanced Micro- and Nanotechnology

Direct Manufacturing

Database, Image, Visibility – open to be used by partners too:

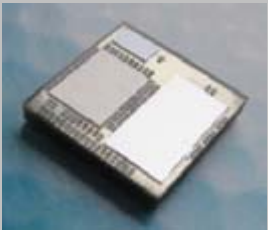
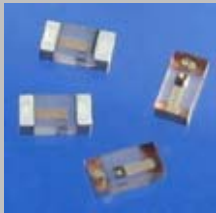
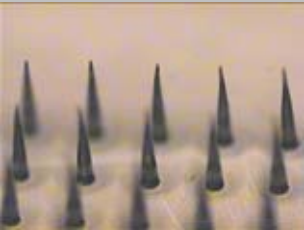
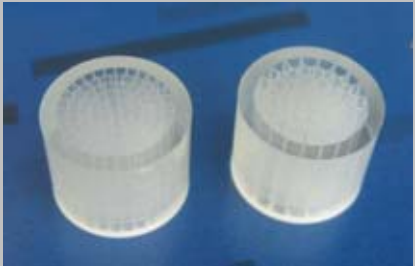
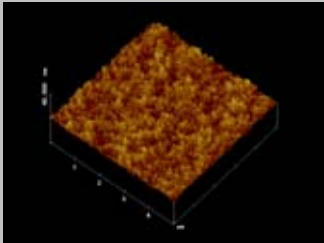
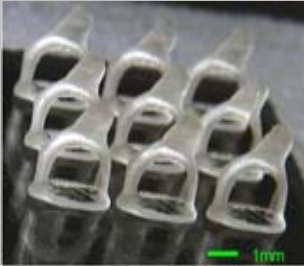
Contact database of more than 30 thousand qualified decision makers with interest in applied nano- and MEMS technologies. Our sales focus selected market leaders and innovative newcomers/SME, our trademark is international protected. microTEC is known as one of the innovation leaders.

microTEC is looking for:

Industrial partners: Continue and speed up growth by exploiting R&D results in applied nanomaterials for MEMS in main industries (life science and consumer communication) and strategic partners: To exploit RMPD and 3D-CSP technologies by R&D, training and licensing.

- ⇒ Technology Platforms, a speed way to European (and international) exploitation of know-how
- ⇒ Technology Platforms, to find the best possible partners for further R&D steps
- ⇒ Special for SME: Technology Platforms, to learn about the state of the art and share information in an interactive way for better understanding of big industry needs and the regional, national and European decision makers positions

RMPD and 3D-CSP Technologies: Product Samples



Contract Manufacturing, Contract R&D, Licensing

Using nanoenhanced UV-curing materials for customized production of precision parts (gas flow laminators, connectors, lab-on-a-chip products):

microTEC is focused on customized series production of polymer chips, micromechanics and multi-material parts.

MEMS Packaging Services and R&D Services

Highly integrated products speed up the need of 3D-packaging technologies.

This will become a fast growing market for microTEC's patented 3D-CSP process.

Running projects with SMEs and also industry head-users.

Besides the technical advantages of microTEC-based MEMS production there are also cost advantages for industries interested in licensing/buying:

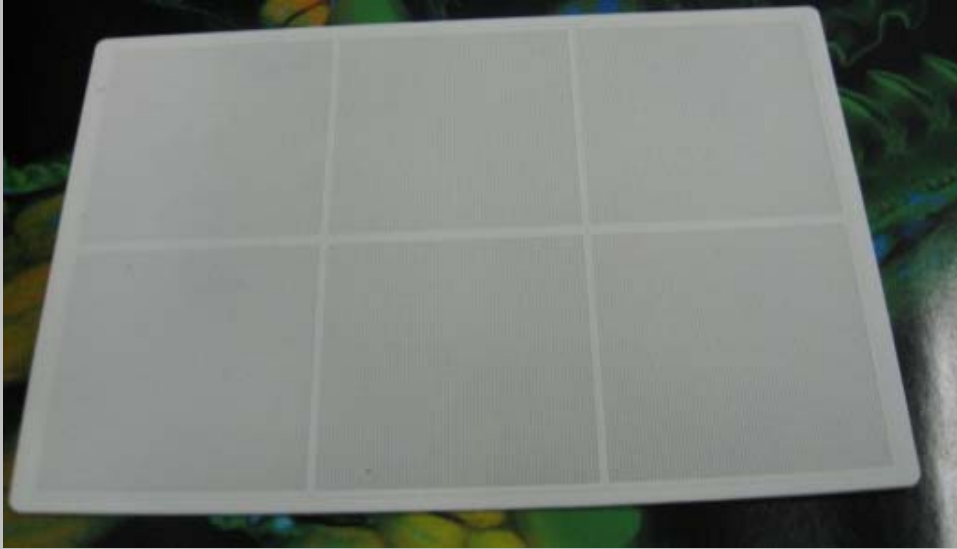
RMPD systems are easy to use and easy to maintain

=> Fast deliverable series parts in flexible units in high precision at low cost

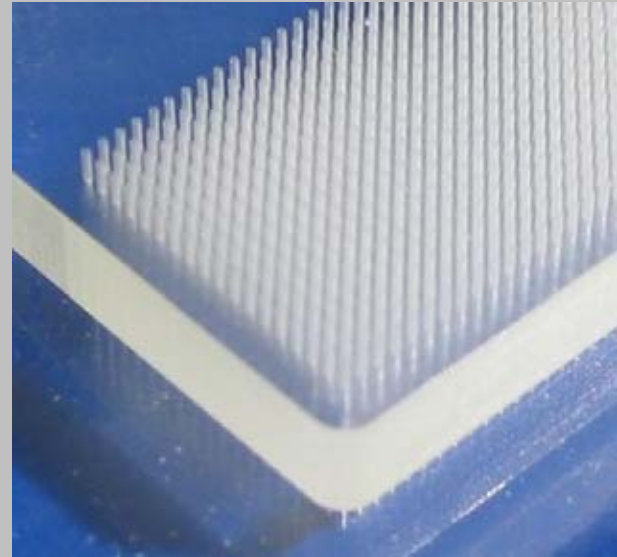
Easy to handle materials (fluid monomers/polymers)

=> No high-risk chemicals

Bio sample: 36000 wells in one plate + dispenser



Outer Diameter: 0.3 mm
Inner Diameter: 0.1 mm
Distance: 0.55 mm
Channel Length: 12.5 mm



Planetary gear wheel components



Diameter = $828\mu\text{m}/1200\mu\text{m}$

Modul = 0,06; $n_1/n_2 = 20/24$; $d_i = 400\mu\text{m}$

Lubricants integrated by nano enhanced materials

High volume production by RMPD-mask technologies

Fluidic- stop structure, as ventilation duct

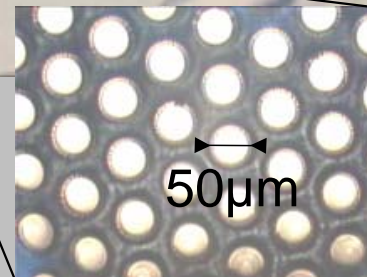
Principle:

Gases pass through,
liquids are blocked

Applications:

- Ballpoint pen
- Air vent ampule

Tube diameter	50 μm
Tube length	3 mm
Distance between holes	30 μm
Aspect ratio	60



Customers Advantages:

- One stop shop (full service: consulting, R&D, series production)
- Unique and patented technologies (IP security to customers), basic technologies are protected by patents, some of them are international (e.g. Europe, US, Canada, Russia, Asia)
- Capability to integrate market and customer needs very early in product development, without additional costs (3D-CAD to series product)
- Speeding up time to market (no tooling)
- Low waste, wide range of UV-curing materials available incl. those FDA approved
- Direct integration of existing software (3D-CAD like Solidworks; eCAD programs)
- Production systems can be build up and maintained as desktop production and also as high-volume units



Value4Nano

The Value4Nano project aims at developing an Implementation Roadmap of 4 value chains and their target products. The Roadmap will include business modelling and planning for a set of pilot lines and it will involve strategic industry and other stakeholders. The selected value chains are:

- Nano and micro printing for industrial manufacturing;
- Nano-enabled, depollutant and self-cleaning surfaces;
- Manufacturing of powders made of functional alloys, ceramics and intermetallics;
- Lightweight multifunctional materials and composites for transportation.

You are all invited to contribute. The Value4Nano website will start soon and ask for your input. All deliverables will be public for your future free use.

The Consortium is composed by D'Appolonia (Coordinator), PRODINTEC and NANOofutures Association, which includes several Third Parties from different organizations around Europe (FIAT Research Centre, Fraunhofer-IPA, CEA, microTEC, MBN, Institute of Occupational Medicine, TNO, TU-Dresden and Spinverse) as well as Bayer and Steptoe and Johnson as voluntary group.

Please join NANO futures and Value4Nano Activities

www.nanofutures.eu

NANO futures environment is an ETIP European Technology Integrating and Innovation Platform, multi-sectorial, cross-ETP, integrating platform with the objective of connecting and establishing cooperation and representation of Technology Platforms that require nanotechnologies in their industrial sector and products. NANO futures and its operative branch NANO futures association act as a “Nano-Hub” by linking JTIs, associations, ETPs with expert groups in a collaborative environment.

www.value4nano.eu/survey

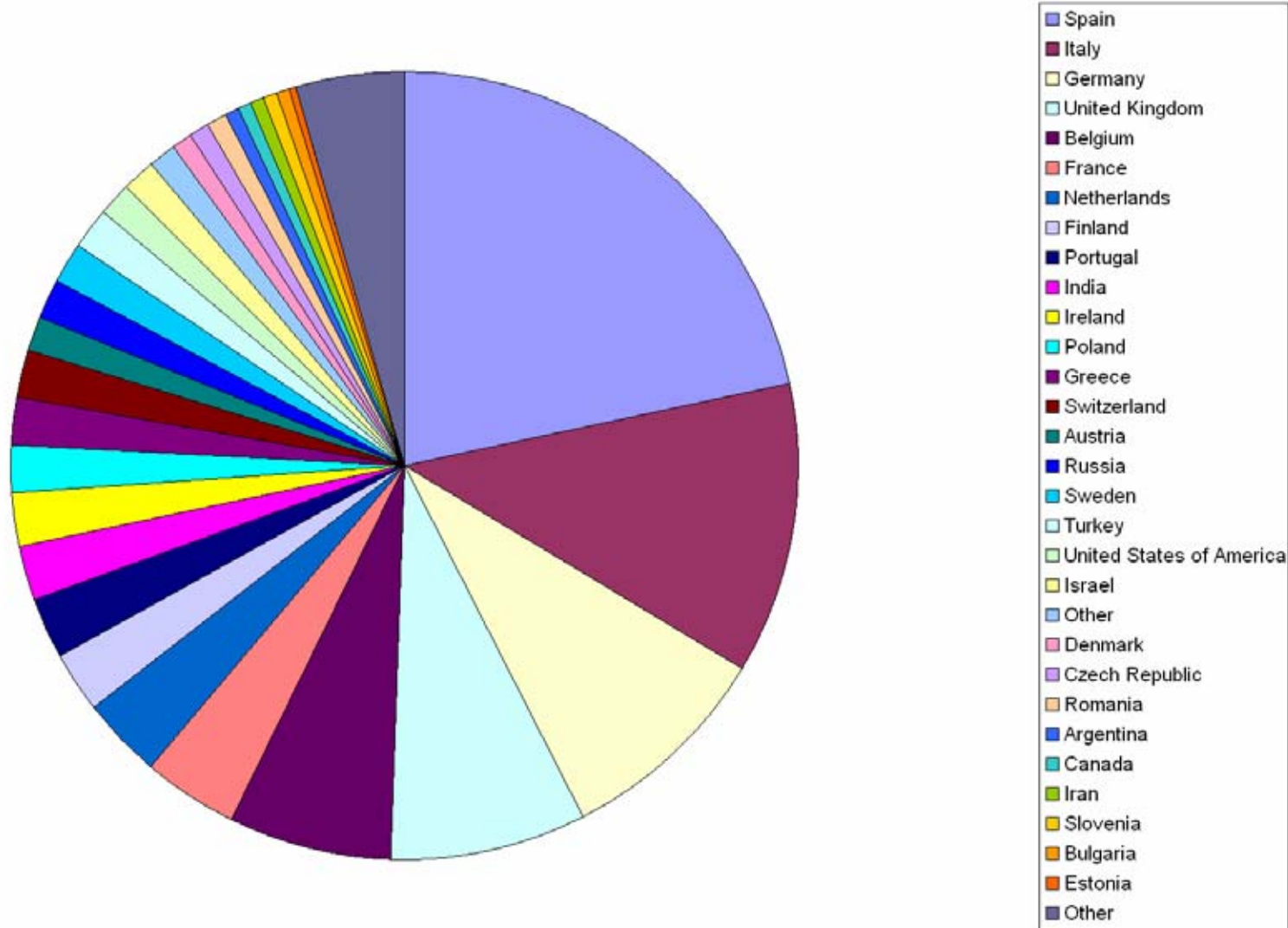
This survey is part of the VALUE4NANO project, a Coordinated Support Action funded by the European Commission to deliver recommendations for future program topics. The project aims at developing an Implementation Roadmap of 4 value chains and their target products.



NANO*utures* Initiative

- NANO*utures* is an **European Integration and Innovation Platform** which main objective is to facilitate the **nanotechnology development and commercialization** by connecting **all relevant nanotechnology stakeholders** (e.g. European Technology Platforms that require nanotechnologies in their industrial sector and products, industries, research institutions, universities, associations, regional and national clusters etc.).
- NANO*utures* acts as a “**Nano-Hub**” by linking ETPs, JTIs, associations with expert groups in a collaborative environment.
- NANO*utures* is an **open platform** with free access to any nanotechnology stakeholder.
- NANO*utures* activities are partially sustained by the CSA project funded by the European Commission and entitled “NANO*utures*: A cross-ETP Coordination Initiative on nanotechnology” (Contract No.: NMP4-CA-2010-266789). The project started in October 2010 and 4 follow up CSAs were started in 2013.

NANO futures members from 51 countries (Summer 2013)



Did you know on NANO*fu*tures you can...

- ... build business one2one or discuss in the WG forums with other members?
- ... contact the regional and local lighthouses for support?
- ... run your own polls and get feedback from the NANO*fu*tures members?
- ... search for companies by keywords and other criteria?
- ... learn about the members and their background?
- ... invite new members by just one click?
- ... promote your at web and in newsletters?

All this free of charge!

10 Working Groups

Chair

Members

Communication	Andrea E. Reinhardt	259
Industrial Safety Strategy	Peter Krüger	190
Industrialisation/Nanomanufacturing	Vito Lambertini	360
Networking	David Gonzalez	322
Regulation	Anna Gergely	176
Research/Technology	Udo Gommel	464
Safety Research	Rob Aitken	249
Skills and Education	Costas Kiparissides	227
Standardization	Michael Stintz	200
Technology Transfer and Innovation Financing	Donato Zangani	350

NANO futures has 893 members (summer 2013)

~35% of them are from industry and industry associations.

Get involved! It's easy!

Are you an active member of NANOofutures yet?

Yes? Great!

No? Become a member now at nanofutures.info/user/register

Join one or more Working Groups (same page)

You can now post in the discussion forums

(nanofutures.info/community/group)

FAQ and help at **nanofutures.info/help**



Thank you for your attention!

microTEC/NANO futures Germany

<http://www.microtec-d.com>

<http://www.nanofutures.info>

**Bismarckstraße 142b
47057 Duisburg
Tel: +49 203 306 2050
Fax: +49 203 306 2069**



**Kaiserslauterer 353
67098 Bad Dürkheim
Tel: +49 6322 650 220
Fax: +49 6322 650 221**