



EU-Japan Centre
for Industrial Cooperation

日欧産業協カセンター

Nanotech Cluster and Industry Landscape in Japan

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List of Abbreviations

AFM	Atomic force microscopy
Ag	Silver
AIST	National Institute of Advanced Industrial Science and Technology
ALD	Atomic Layer Deposition
Au	Gold
B2B	Business to business
CAO	Cabinet office
CLUSTER	geographic concentration of interconnected businesses
CNTs	Carbon nanotubes
CVD	Chemical vapor deposition
DDS	Drug deposition system
EEN	Enterprise Europe Network
ESH	Environment, safety & health
EU	European Union
Expo	Exhibition
FIB-SEM	Focused Ion Beam Scanning Electron Microscope
Horizon 2020	Framework program for Research and Innovation
ICT	Information and communication technology
JETRO	Japan External Trade Organization
JEUPISTE	Japan-EU Partnership in Innovation, Science and Technology
KEIDANREN	Japan Business Federation
KEK	High Energy Accelerator Research Organization
KET	Key Enabling Technologies
METI	Ministry of Economy, Trade and Industry, Japan
MEXT	Ministry of Education, Culture, Sports, Science and Technology
N-MEMS	Nano – micro electromechanical systems
NBCI	Nanotechnology Business Creation Initiative
NCP	National contact point for Horizon 2020
NEDO	New Energy and Industrial Technology Development Organization
NIMS	National Institute for Materials Science
NM	Nanometer (10^{-9} meter)
OEM	Original equipment manufacturer
PVD	Physical vapor deposition
R&D	Research and development
RIT	Regional Industry Tie-up program
SCR	Super Clean Room
SDK	Showa Denko
SEM	Scanning electron microscope
Si	Silicon
SiC	Silicon Carbide
SME	Small and Medium-sized Enterprise
SPM	Scanning probe microscopy
STBP	<i>Science and Technology Basic Plan</i>
STEM	Scanning transmission electron microscope
STI	Science, Technology and Innovation
TIA	Tsukuba Innovation Area

TiO ₂	Titanium dioxide
VC	Venture Capital
XRF	X-ray fluorescence
ZnO	Zinc oxide

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1. Nanotechnology

1.1 Introduction

Nanotechnology is a technology of producing very small “things”, which are particularly less than 100 nm in size. One nanometer is 10^{-9} meters or about three atoms wide and for comparison, a human hair is about 60-80,000 nanometers wide. Nanotechnology has the potential to change every part of our lives, and will greatly impact us in the coming decade. The technology affects all materials (ceramics, metals, polymers, biomaterials, etc.), which are the foundation of major technological advances.

Traditionally, Japan has been very active in the field of nanotechnology. In the 14th century the golden pavilion in Kyoto was built, later on when it was coated with gold leaf, the thickness of the coating was 100 nanometers¹. Although that technique is not used anymore, it exemplifies that the Japanese are historically innovative and precise engineers. Japan has been among the top three countries in patents and publications in the field of nanotechnology, although lately Asian countries such as China and Korea are gaining the momentum surpassing Japan in many fields.

Market size of the Japanese nanotech sector has ranged 29,6 billion euros in 2010 and is projected to grow extensively in the future reaching 94,4 billion euros in 2020 and should be worth 188,9 billion euros in 2030².

Japan has produced some important innovations and developments in the field of nanotechnology; invention of carbon nanotubes has had a great impact on the area and it has been the foundation for diverse directions of development. Advancements in Silicon carbide lead to effective semiconductors bringing smaller computer devices with greater performances. Further developments have been done on Gallium arsenide used also for thin films in solar cells and detectors; all those achievements can bring new niches or major markets to Japanese companies.

Despite the economic difficulties that Japan is tackling with, advanced technologies have always been the driving force of new opportunities and further development. Constant research and development on new technologies namely nanotechnology can bring market advantage for innovative companies.

This report aims to provide an overview of the Japanese nanotech sector, its structure and an industry landscape. The author has had a European and business oriented perspective on Japan, therefore this report is perhaps more suitable for European nanotechnology companies potentially planning to enter the Japanese market. One can get the understanding of the structure of the nanotechnology sector in Japan, as well as the key government and research bodies, clusters, pointing out how to enter the market, etc. In the last part of the report one can find the nanotechnology industry landscape and in the annexes a broad database of Japanese companies that have activities in nanotechnology.

¹ Wikipedia: Kinkaku-ji, Golden pavilion. <http://en.wikipedia.org/wiki/Kinkaku-ji>

² Market size estimations by METI

Additionally to the report, the author has made an interactive map displaying nanotechnology companies across Japan; their details, contacts and activities. This map can be found on the website of EU-Japan Centre for Industrial Cooperation – <http://www.eu-japan.eu/interactive-map-nanotech-cluster-and-industry-landscape-japan>

1.2 Methodology

Main points which the report is thriving to are: Who are the key players in the Japanese nanotech sector, clusters, research and major companies involved in this area? How can an EU nanotech company enter the market? What kinds of companies are present in this field?

Data was collected through literature review and interviews with experts from Japanese government and related organisations, nanotech clusters, research and development institutes, Japanese and EU nanotechnology companies.

To provide a clear view of the nanotech sector a review of 150 nanotechnology related companies have been made, that is found in the annex.

1.3 Nanotechnology applications

Nanotechnology has a wide area of applications. Numerous new applications are being developed across the globe. The diagram bellow shows commercial applications of inorganic nanoparticles, focus of research and development as well as future directions is comprehensively displayed.

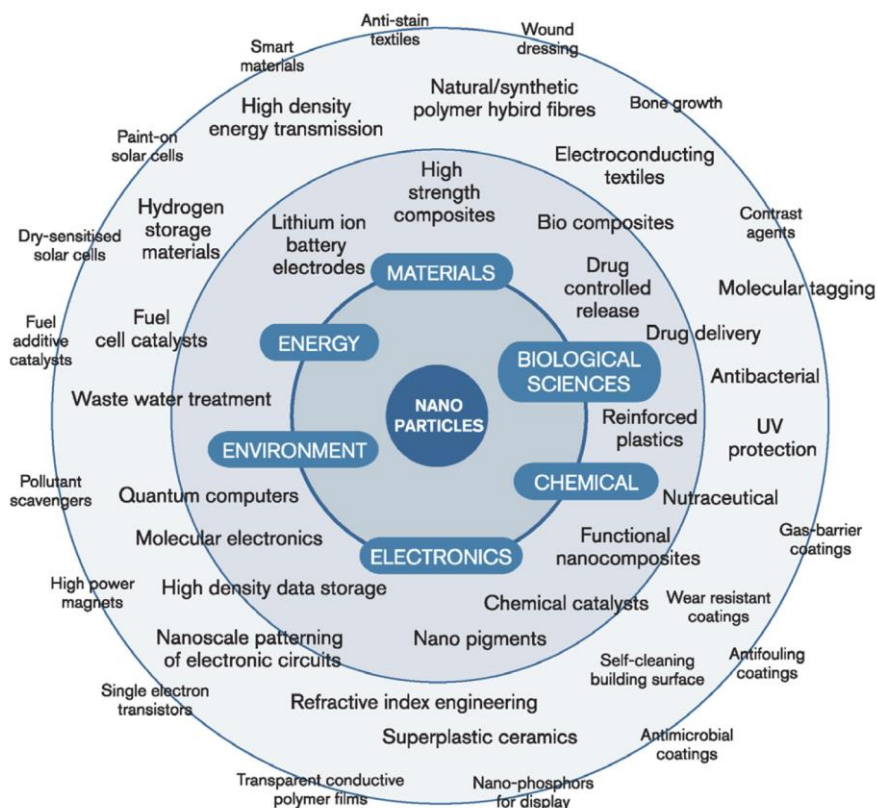


Figure 1: Nano particles applications,

Source: McDermott, Will & Emery, 2013 Nanotechnology Patent Literature Review

1.4 Trends in Nanotechnologies

Patent trends shows that nanotechnology has been growing exponentially since the 2000s. At that time, technology has matured and first nanotechnology products rolled out such as coatings, nanoparticles, nanostructured metals, polymers, etc. Up to 2005, new active nanostructures were developed: 3d transistors, target drugs, actuators, adaptive structures, etc., giving new grounds for further development, that is evident in the shown graphs.

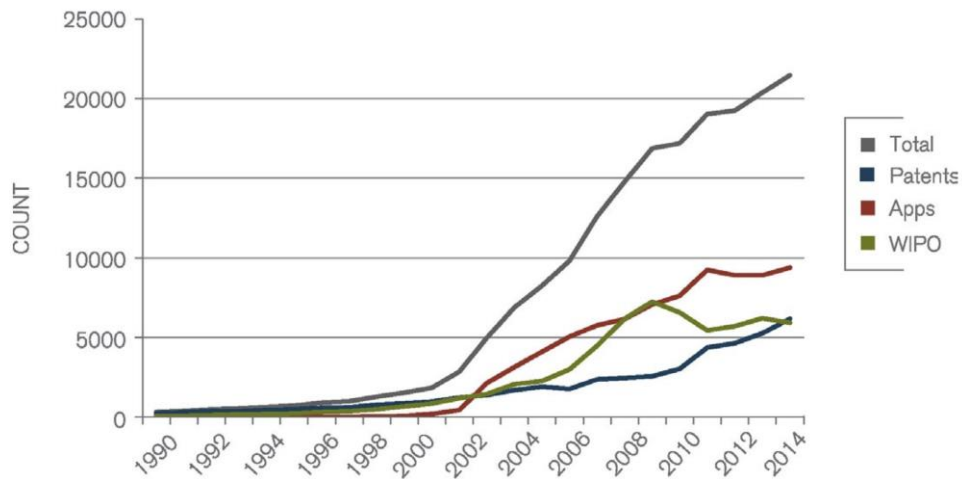


Figure 2: Nanotechnology patents
 Source: McDermott, Will & Emery, 2013 Nanotechnology Patent Literature Review

With development of new electronic devices using semiconductors and other nanotech elements, the most emphasis has been put on computers and electronics followed by materials and chemistry patents.

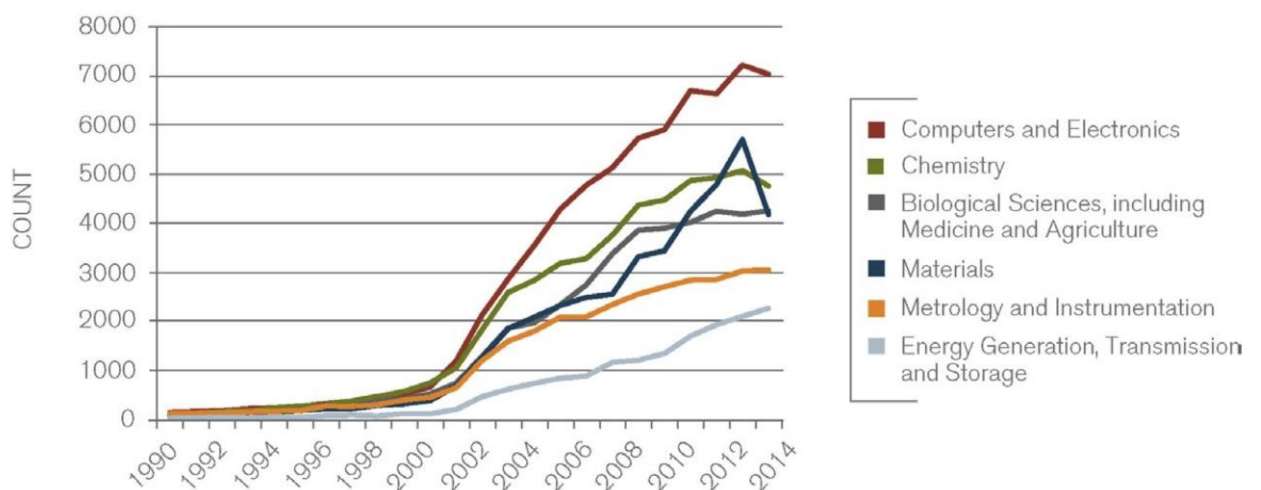


Figure 3: Nanotechnology patents, by applications.
 Source: McDermott, Will & Emery, 2013 Nanotechnology Patent Literature Review

1.5 Future of nanotechnology in Japan

Future advances could change approaches to manufacturing, electronics, IT, communications, energy and medicine.

Japan priorities for further development of nanotechnology is divided in three pillars: Green innovation, Life innovation, Recovery and reconstruction from the disaster. Total budget for this plan that includes nanotechnology is 25 trillion yen (179 billion euro) for the next 5 years.

Key decision makers in Japan have tailored a strategic program for nanotechnology; named *Cross-ministerial strategic innovation promotion program (SIP)*³ has selected future priority policy issues segmented to:

- Energy
 - Next-generation power electronics
 - Innovative combustion technology
 - Innovative structural materials
 - Energy carriers
 - Next-generation ocean resources development technologies

- Next-generation infrastructures
 - Technologies for avoidance of accidents and alleviating congestion
 - Low-cost operation & maintenance system and long life materials for infrastructure
 - Natural disaster forecasts and prediction

- Local resources
 - Advanced IT (Quantum computing)
 - Additive manufacturing

³ Presentation: Overview of Materials Science and Nanotechnology R&D in Japan - MEXT (Material Science and Nanotechnology Development Division, Research Promotion Bureau), May 29, 2014, Kobe University

2. Government

2.1 Japanese government activities on nanotechnology

Years of investments into nanotechnology have made Japan amongst the leading countries in this field. Nanotechnology becoming a national priority technology has brought immense investments into research and development as well as the research infrastructure. Cabinet office of Japan, MEXT and METI has recognized the necessity and has dedicated divisions in the ministries focused only on nanotechnology. Strategic technology roadmap⁴ has been produced to outline priorities in future technological development.

In 2001 the government started its *2nd Science and Technology Basic Plan*⁵ (STBP) where nanotechnology and nanomaterials have been prioritized as one of eight national issues of importance.

In 2006 the government created the *3rd Science and Technology Basic Plan*⁶ and pursued nanotechnology as one of four priority research fields. At that period Cabinet decided to support regions that has certain potential and developed “world-class clusters”. Clusters were established around research institutions such as universities and research institutes connecting R&D field with companies, SMEs, and venture businesses. Most emphasized nanotechnology clusters were Kyoto nanotechnology cluster, Nagano, Hamamatsu, Aichi/Nagoya, etc. Some of these clusters still remain, many in different forms and sizes, due to lower funding by the government.

In 2011 the current 4th STBP was introduced, which now focuses on development of green and life innovations. Nanotechnology is not an independent field but is an important way to strive to these innovations. The government investments for nanotechnology have lowered and now the private sector is taking a huge roll and is starting to commercialize and further develop these technologies to the market.

The Japanese government has established platforms for development of nanotechnology. These include nanotechnology clusters around Japan, formed by R&D institutes, Universities and companies involved in the field. Many of these also form nanotechnology platforms that connect Japan’s knowledge and specialised equipment. The platform consists of 25 Universities and Research Institutes, which can be utilised by domestic and international companies seeking for high quality equipment and staff to perform research and development.

2.2 Government investments in nanotechnology

Japan has been dedicatedly investing in nanotechnology since introducing the *2nd Science and Technology Basic Plan*. Since then it has invested about 800 million US dollars annually⁷ (see table 1).

⁴ METI: Strategic Technology Roadmap 2010: Roadmap for Strategic Planning and Implementation of R&D Investment. http://www.meti.go.jp/policy/economy/gijutsu_kakushin/kenkyu_kaihatu/index.html#shokai

⁵ Cabinet office, Government of Japan, Science and Technology business plan: <http://www8.cao.go.jp/cstp/english/basic/>

⁶ OECD, Japan’s R&D strategy of nanotechnology including Nano-medicine. <http://www.oecd.org/sti/nano/44859900.pdf>

⁷ Cabinet office, Government of Japan. http://www8.cao.go.jp/cstp/budget/h24yosan_bunya.pdf

Table 1: Science and technology budget (2006 - 2012)

- (in 100 million yen = approx. 1 million USD)

Year	2006	2007	2008	2009	2010	2011	2012
System revolution	3173	3259	3456	3910	3778	3726	3403
Frontier	1679	1681	1809	1821	1764	1713	1688
Infrastructure	3342	3050	3681	3261	3265	2521	2919
Manufacturing	305	331	356	277	306	283	321
Energy	5603	5050	4598	4462	4896	5465	4942
Nanotech	762	786	865	881	759	814	883
Environment	1190	1281	1228	1217	1112	1131	1277
ICT	1726	1681	1613	1580	1392	1262	1245
Life Science	3154	3137	3315	3461	3300	3171	3201
Basic R&D	14809	14856	14786	14769	15319	16563	17047
Sum	35743	35112	35707	35639	35891	36649	36926

Share of investments into nanotechnology has been inconsiderable regarding the size of the Science and technology budget.

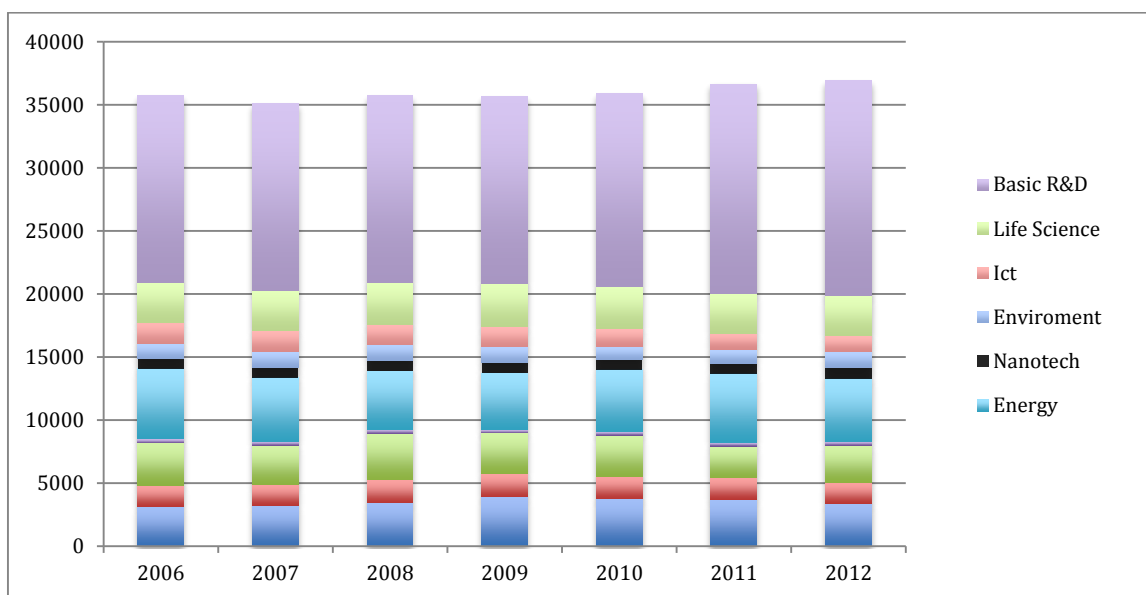


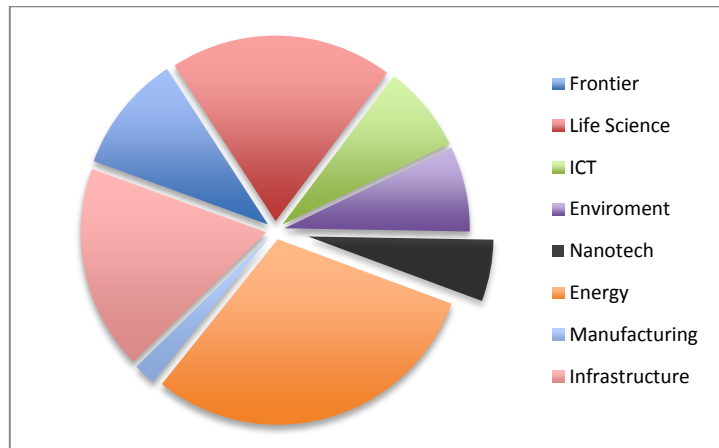
Figure 4: Science and technology budget

Source: Nanotechnology business creation initiative (2014)

Table 2: Science and technology budget frame (2012)

- (in 100 million yen = approx. 1 million USD)

Budget frame (in million yen)	
Frontier	1688
Life Science	3189
ICT	1246
Environment	1219
Nanotech	883
Energy	4941
Manufacturing	321
Infrastructure	2932

**Figure 5: Share of investments in Science and Technology in Japan,**

Source: Nanotechnology business creation initiative (2014)

2.3 Nanotech Clusters in Japan

In light of the 2nd Science and Technology Basic Plan (STBP), Japan introduced regional R&D focused Knowledge Clusters. Knowledge clusters are a system for technological innovation, which are organized around Universities, public research institutions and companies. Through project planning, exchanging ideas and joint-research, clusters are developing new technologies and are implementing them on the market.

Knowledge Clusters⁸ were segmented in to:

- Life Sciences
- IT (Information Technology)
- Environment
- Nanotech/Materials

Some essential still active nanotechnology clusters are: Kyoto, Nagano, Toyama/Takaoka, Aichi/Nagoya, etc.

Many successful developments were resulted in the clusters:⁹

- Kyoto – succeeded to commercialize SiC (Silicon Carbide) in several applications, largely for electricity saving applications. This was conducted under Dr. Matsunami and later followed by Prof. Kimoto of Kyoto University.
- Shinshu (Nagano) – progress in developments on Carbon nano-tubes (Prof. Endo)
- Nagoya – progress in further developments in Gallium arsenide GaAs

Testimonials indicate that Knowledge Clusters could be carried out more deliberately with better focus on funds distribution to relevant fields. These indications follow the results of numerous nanotech clusters to stop their activities, deriving to not intended results. Concern that the clusters couldn't spend funds for foreign research activities is significant, reflecting on the closed Japanese society.

⁸ MEXT, Knowledge Cluster Initiative http://www.mext.go.jp/a_menu/kagaku/chiiki/cluster/h20_pamphlet_e/001.pdf

⁹ Information obtained through interview

3. Government bodies active in Japanese nanotechnology

3.1 CABINET OFFICE, Government of Japan

Cabinet office at the Japanese government plays an important role in Japanese nanotechnology¹⁰. The council for Science, Technology and Innovation (STI) investigates and discusses basic STI policies, allocates resources and evaluates key research and development paths for Japan. The Cabinet office initiates STBP that includes nanotechnology as an important subject.

3.2 METI

Ministry of Economy, Trade and Industry¹¹ has the role of financing nanotechnology activities especially investments in nanotech infrastructure. It has co-financed the largest research and development nanotechnology platform – Tsukuba Innovation Arena (TIA NANO).

3.3 MEXT

Ministry of Education, Culture, Sports, Science and Technology¹² Japan is one of the largest financiers of nanotechnology activities in Japan. MEXT is mainly responsible for support of basic and fundamental research in STI in Japan. It supports nanotechnology clusters as well as nanotechnology platforms (Japan nanofabrication platform). Materials, science and nanotechnology development unit is in charge of nanotechnology in the ministry¹³.

3.4 NEDO

New Energy and Industrial Technology Development Organization (NEDO) coordinates integration of the technological capabilities of private enterprises and research abilities of universities and organizes technology development activities as national projects to realize common fundamental technologies (including technology demonstrations) that are difficult for private enterprises to develop by themselves due to the high level of risk before practical application¹⁴. NEDO produces roadmaps for future developments and projects, promotes R&D and cooperation between different parties such as supply, R&D and end product companies – anticipating practical applications.

One of the key focuses is “materials and nanotechnology” with many projects ongoing at this time. NEDO will invest approx. 85 million euros in nanotechnology project in 2014¹⁵. For foreign companies to participate in the project, it is essential to have a Japanese subsidiary and R&D facilities in Japan and should cooperate with Japanese companies and/or research institutions in order to be eligible for NEDO projects.

3.5 JETRO

Japan External Trade Organization (JETRO) is an organization promoting mutual trade and investment between Japan and the rest of the world. Its slogan is “Talk to JETRO first” which encourages foreign companies trying to enter the Japanese market to exploit free expert

¹⁰ Cabinet Office, Council for Science, Technology and Innovation, <http://www8.cao.go.jp/cstp/english/index.html>

¹¹ Ministry of Economy, Trade and Industry, Strategic Technology Roadmap, <http://www.meti.go.jp/english/information/downloadfiles/STR2006outline.pdf>

¹² Ministry of Education, Culture, Sports, Science and Technology, R&D in Nanotechnology field, http://www.mext.go.jp/english/research_development/1303912.htm

¹³ Information obtained through interview

¹⁴ NEDO, mission statement http://www.nedo.go.jp/english/introducing_index.html

¹⁵ NEDO http://www.nedo.go.jp/english/introducing_pja.html

consultation and free temporary office space. Regional Industry Tie-up ¹⁶(RIT) program facilitates industry partnerships between regions in Japan and foreign countries. Some success stories relating to nanotech have already been accomplished through RIT.

¹⁶ JETRO, Regional Industry tie-up program <http://www.jetro.go.jp/en/jetro/activities/business/rit.pdf>

4. Nanotechnology platforms in Japan

4.1 NBCI

Nanotechnology Business Creation Initiative (NBCI) is an industrial organisation interested in nanotechnology and consists of around 180 industrial members.

NBCI's mission is to accelerate the creation of new business based on utilization of nanotechnology, by promoting cooperation of various industries and public research laboratories, and exchanging up-to-date information about nanotechnology businesses.

NBCI's main activities are :

1. Business matching among big enterprises and SMEs & Venture businesses
2. Technology matching based on nanotechnology business road-map
3. Networking and collaboration with member companies, academia, government
4. Standardization and social implications for nanotechnology
5. Proposals for nanotechnology policies to the government
6. Nanotechnology information exchange (seminar, symposia and forums)

As one of its important activities, NBCI has provided opportunities of business matching between big member enterprises and SMEs & VCs. Starting from its own member network, it has expanded its web alliance involving regional public bodies dedicated to industry promotion in advanced technology fields. NBCI now has better relationships with over 6,000 manufacturers in greater Tokyo, Central Japan, and Western Japan. It has great interest to bridge the Japanese industry to counterparts in EU in the burgeoning nanotechnology field.

NBCI is one of the most important platforms regarding business in nanotechnology. It can be used to bridge Japanese and EU industries¹⁷. EU-Japan Centre for Industrial Cooperation is the member of NBCI.

4.2 Nanotechnology events

Japan has many international nanotechnology related exhibitions and events throughout the year. The main exhibition is "Nanotech Expo" in Tokyo, followed by Micro-Nano Biz in Yokohama, which is smaller than the former. Other exhibitions including nanotechnology are usually a part of larger exhibitions with its own separate focus. Smaller events, seminars and symposiums are usually held in Japanese, creating an obstacle for EU participants.

4.2.1 Nano tech Expo

The world's largest exhibition held annually in Tokyo, taking place in Tokyo Big Sight at the end of January. Comprised of 600 companies and 800 booths, which hosts over 45,000 visitors in three days. The Nanotech expo is the optimal way to present the company, its products and get in contact with potential customers or partners¹⁸.

¹⁷ More about NBCI on: <http://www.nbci.jp>

¹⁸ More about Nanotech Expo on: <http://www.nanotechexpo.jp>

4.2.2 Nanomicro biz

The nanomicro biz is held in Yokohama in the biggest venue - Pacifico Yokohama. The exhibition is organized towards the end of April and consists of approximately 160 participants attracting over 18.000 visitors¹⁹.

4.3 Nanotech Cluster Support Mission to Japan – EU-Japan Centre

EU-Japan Centre for Industrial Cooperation is organizing a 5-day mission for European nanotech SMEs trying to internationalize their businesses into Japan. The mission will be held in January 2015 at the time of the Nanotech expo Japan. The participants will benefit from market-specific business seminars, group visits to nanotechnology companies and institutes. The Centre will organize a booth at the Nanotech expo 2015 where participants can present their companies. Participants can use English interpretation assistance at B2B meetings held at the expo. The objective of the mission is to maximize the opportunities for EU participants²⁰.

¹⁹ More about Nanomicro biz on: <http://www.micromachine.jp/en/>

²⁰ More about Nanotech Cluster support mission to Japan on: <http://www.eu-japan.eu/detail-business-programmes/Nanotech-Japan-Cluster-Mission-2015>

5. Research & development activity

Research and development on nanotechnology is substantial in Japan. Following are the main institutions related to nanotechnology.

5.1 TIA - Nano

Tsukuba Innovation Arena for Nanotechnology is the largest R&D innovation hub for nanotechnology in Japan. Consists of four core organizations: AIST (National Institute of Advanced Industrial Science and Technology), NIMS (National Institute for Materials Science), University of Tsukuba and KEK (High Energy Accelerator Research Organization). Supported by Japan Business Federation (KEIDANREN)²¹.

TIA-Nano focuses on various fields:

- Nanoelectronics
- Power electronics
- N-MEMS
- NANO-GREEN (environmental energy)
- Carbon nanotubes
- Nano-Material Safety
- Networking school for nanotechnology

5.2 Super Clean Room (SCR)

3,000 m² is the core facility in the TIA-Nano infrastructure. Located at the AIST offers latest research and development equipment and it is one of the world's most advanced research facilities. The super cleanroom (SCR) provides process equipment for the fabrication of general-purpose semiconductor integrated circuits using 300 mm and 100 mm silicon wafers²².

Equipment includes: Lithography, PVD, CVD, Etching, Cu process, CMP, etc. SCR is specialized for nanoelectronics and Nano-MEMS fabrication.

5.3 NIMS

National Institute of material science is the biggest material focused institute involved in nanotechnology in Japan²³. Its R&D focus is on: Nanoelectronics, Photonics, Material science, Environmental technologies, energy related technologies and ESH (environment, safety & health). It is the leading institute for the Microstructural Characterization platform, which is a part of the Nanotechnology platform. World renowned institute is also well connected with world-leading organizations, institutes and industry.

5.4 AIST

National institute of Advanced Industrial Science and Technology located in Tsukuba and it is one of the largest public research institutes in Japan²⁴. AIST performs research activities on fields: environment and energy, life science and biotechnology, information technology and

²¹ Tsukuba innovation arena- Nano pamphlet http://tia-nano.jp/en/pamphlet/pdf/TIA-nano_E201409.pdf

²² More information on: https://unit.aist.go.jp/tia/scr-mo/index_en.html

²³ More information on: <http://www.nims.go.jp/eng/>

²⁴ More information on: <http://www.nims.go.jp/eng/>

electronics, nanotechnology, materials and manufacturing, metrology and measurement science, etc.

It hosts a “one stop service” for Nanofabrication platform where interested parties can consult with coordinators get introduced with offered services most suitable for ones needs.

5.5 Bio-Nano Electronics Research Centre

Established in 1996 the Centre is independent and working under private Toyo University. It is one of the rare independent Nanotechnology institutes with great knowledge, international collaborations and resources.

Performing research on nanotechnology (carbon nanotubes, carbon fibers, Si, etc.) and also bio related nanotechnology (carbon nanotubes hybrids, enzyme/magnetic particle hybrids, nanomaterials for bio-medical studies, etc.).

The Centre also offers nanoelectronics super clean rooms and biotechnology clean rooms and other facilities. Open for international and domestic cooperation the Centre welcomes start-ups, institutions and industry to use their research and incubation facilities under favourable conditions.²⁵

5.6 Nanotechnology platform Japan

Nanotechnology platform is user-friendly platform to establish a reliable research infrastructure for scientific innovation.

Established in 2002, the platform now and consists of 25 Japanese Universities and research institutions offering services and equipment for outsourcing to third parties.

Nanotechnology platform is divided in three segments:

- Microstructural Characterization platform
- Nanofabrication platform,
- Molecule & material synthesis platform.

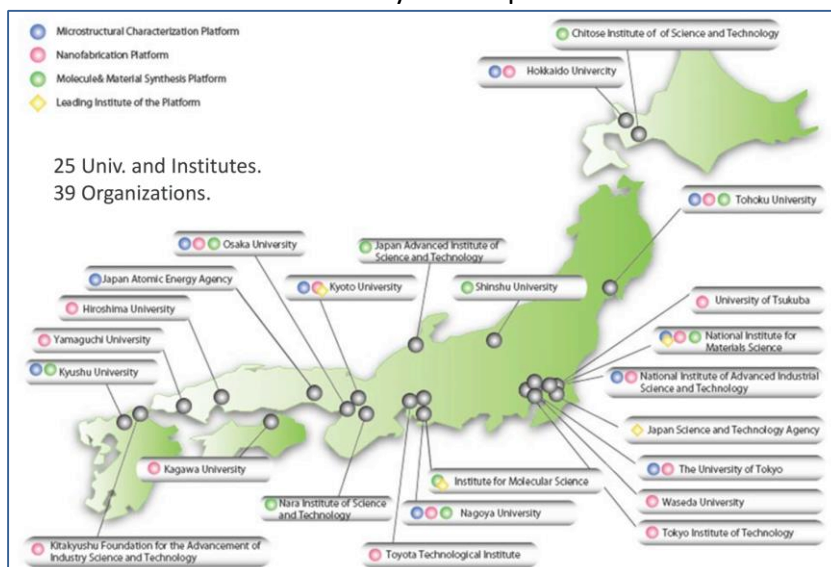


Figure 6: Nanotechnology platform Japan, Source: NanotechJapan

²⁵ More information on: <http://bionano.toyo.ac.jp/indexpage.html>

5.7 Nanofabrication platform

Nanofabrication platform unites 16 Universities and Institutes around Japan²⁶. For reasonable rent, one can use all varieties of cutting-edge equipment and staff, specifically trained to use the equipment. This infrastructure can be utilised by any industry (domestic or international) for researching new solutions in science and technology.

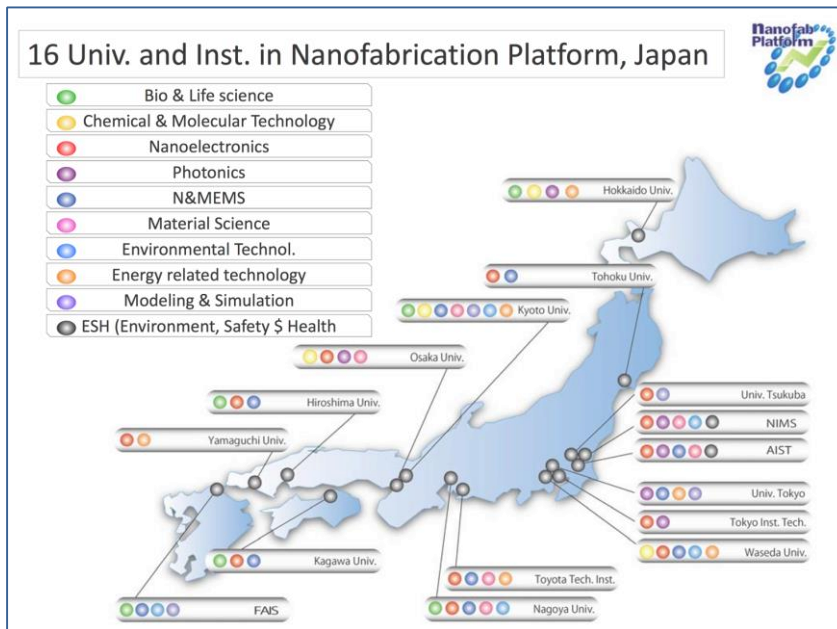


Figure 7: Nanofabrication Platform Japan,
Source: Nanofab Platform

Types of support for the third party users²⁷:

1. Technical consultation – Users can have consultations with the scientists of the organization.
2. Remote assistant - The technical staff performs the experiment as required by the user.
3. Technical assistant - Users can solely operate the equipment with presence of the technicians
4. Hands-on use – Users with skills can operate the equipment by themselves. Institute provides trainings for users.
5. Joint research – The project can be conducted together with the institution.

²⁶ More about Nanotech platform on: <http://nsn.kyoto-u.ac.jp>

²⁷ NanofabPlatform <https://nanonet.go.jp>

Pricelist of the available equipment and technical assistance:

Table 3: Equipment and technical personnel prices,

Source: Nanotechnology platform

	Apparatus	Academic		Industry	
		Unit: Yen/hour (100yen = about \$1)	Hands-on use	Technical assistant, Remote assistant	Hands-on use
1.	Electron beam	1500	2250	3000	4500
2.	Laser lithography	500	1250	1000	2500
3.	Mask aligner	500	1250	1000	2500
4.	Nanoimprint	500	1250	1000	2500
5.	Sputter	500	1250	1000	2500
6.	Ald	500	1250	1000	2500
7.	Dry etching	500	1250	1000	2500
8.	SEM	500	1250	1000	2500
9.	FIB-SEM	1500	2250	3000	4500
10.	CMP	500	1250	1000	2500
11.	Wire bonder	500	1250	1000	2500
12.	Low Temp. Prober	500	1250	1000	2500

Prices of the equipment in comparable European institutions are usually higher, making the use of Nanotechnology platform in Japan high in cost effectiveness.

5.8 Universities

Considerable amount of research and development is done in Japanese universities. Many of them are also part of the Nanotechnology Platform Japan sharing their facilities for public-private partnerships. In the table can be found some of the major Universities that have different activities in the field of nanotechnology.

Universities	
Hokkaido University	Kyoto University
Tohoku University	Osaka University
University of Tsukuba	Kagawa University
Waseda University	Hiroshima University
Nagoya University	Yamaguchi University
Kwansei Gakuin University	Shinshu University
University of Hyogo	Yokohama National University
Kobe University	Ritsumekian University
Keio University	Meji University
Chuo University	Kyushu University
The University of Tokyo	Toyo University

Figure 8: Major Universities with activities in nanotechnology

6. Nanotech companies in Japan

Succeeding are the Case studies of five nanotech companies active in Japan (two Japanese companies and three EU companies) displaying the reflection of the Japanese nanotech market.

6.1 Case Studies:

6.1.1 Showa Denko (Japan)

Showa Denko ²⁸(SDK) is large Tokyo based company with a focus on chemicals, electronics, petrochemical, advanced material, etc. It invests great amounts of funds into R&D on nanotechnology and is involved in a project with TIA-Nano. Diverse nanotech products are integrated in various applications. Showa Denko produces: Carbon nanotubes, Carbon nanofibers, Silicon fullerene, Titanium Oxide, Fullerene, etc.

SDK is one of the world's largest producers of Carbon nanotubes (VGCFtm – Vapor Grown Carbon Fiber); its capacity is more than 200 tonnes per year²⁹. Main application at the moment is Lithium Ion batteries which market is growing immensely, therefore making SDK one of the biggest suppliers of CNTs. Joint venture with Mitsubishi Corporation creates new business with production of fullerene and other advanced materials. Showa Denko has a strong presence in Europe through its subsidiary in Germany.

6.1.2 GeneLite + GL materials (Japan)

GeneLite + GL materials ³⁰is a small company based in Tokyo. Pioneer company to introduce next generation Nano Particles on plasma technology. It uses physical deposition method and its advances are no impurity mixing, good and adjustable size, quick probing, etc.

Business fields:

- Plasma and Ion beam controlled devices (R&D, manufacturing and sales)
- Metal and precious metal Nano materials (manufacturing and sales)
- Metal Nano particles/Metal oxide and ceramic based mixture (manufacturing and sales)

Products:

Platinum Nano particles in carbon particles, Ag/Au Nano particles on base particles, Ag Nano particles on TiO₂, Si nano particles in graphite. Manufacturing on demand related to customers' needs.

Currently their market is domestic working with major Japanese companies. Future plan is expanding overseas in the future.

6.1.3 Oxford Instruments (United Kingdom, EU)

A British company Oxford Instruments³¹ (OI) has been in the Japanese market since the 1960's through distributors and from 1991 they sell through their Japanese subsidiary Oxford Instruments Japan. The company is manufacturing high quality tools and equipment for research and industry needs. They have a long list of nanotechnology related systems such as nano analysis systems, Atomic force microscopy, UHV nanoprobe and many others.

²⁸ More information on: <http://www.sdk.co.jp/english/>

²⁹ Information obtained through an interview

³⁰ More information on: <http://genelite.co.jp/glmaterials/>

³¹ More information on: <http://www.oxford-instruments.jp/home>

The Japanese market is a highly important one for OI, where they operate in niche markets with limited domestic competition. Being one of the best in the field, demanding Japanese customers are very receptive to their products. They do not report any special obstacles regarding various regulations in entering the Japanese market, which can be encouraging for EU companies thinking to enter the market³².

6.1.4 Carbodeon (Finland, EU)

Carbodeon³³ is a private SME with corporate headquarters in Helsinki, Finland. Their main activities are applications in Superhard nanomaterials. Its main products are nanodiamond used as additives to improve product performances (thermal conductivity, wear resistance, strength, etc.). The company also produces graphitic carbon nitride used in various applications as coatings, thin films and such.

Carbodeon entered the Japanese market in 2008 through and by that had no difficulties due to their experienced local partner. Companies technology exceeds the technology possessed by the competition, therefore, is positively recognized in the market. Their advice is that when trying to approach the Japanese market you should consecutively participate in the local trade shows, find valuable representation and work closely with them to get feedback in order to learn about the specifics of the market³⁴.

6.1.5 Graphenea (Spain, EU)

Graphenea³⁵ is a small company from Spain and is one of Europe's main producers of graphene. It has received an investment by a Spanish oil and gas company Repsol to boost its business and growth. Company exports grapheme material to 40 countries and supplies its products for Universities, Research Centers and Industry. It produces various graphene products such as: monolayer, bilayer, tilayer graphene and graphene oxide.

Graphenea has entered the Japanese market in 2011 through a distributor. Japan is a very important market for them because many Japanese companies are already applying nanotechnology in their products. Although the market is still at early stages, the domestic competition is building and has well developed technology. They recommend entering the market through intermediaries by offering the best quality³⁶.

³² Information obtained through interview

³³ More information on: <http://www.graphenea.com>

³⁴ Information obtained through interview

³⁵ More information on: <http://www.graphenea.com>

³⁶ Information obtained through an interview

7. Nanotech industry landscape

7.1 Nanotech industry landscape map

Nanotech companies in Japan are mostly concentrated among large cities across the country. Mainly the companies' headquarters are in and around Tokyo.

Alongside the report, a web application for searching among nanotech companies has been made.



Figure 6: Map of nanotech companies in Japan

On the website of the EU-Japan Centre for Industrial Cooperation (<http://www.eu-japan.eu/interactive-map-nanotech-cluster-and-industry-landscape-japan>), one can find an interactive map that shows companies involved in nanotechnology.

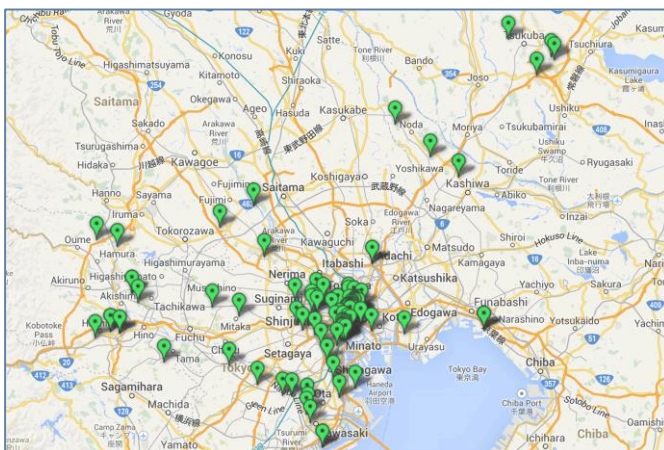


Figure 7: View of nanotech companies in Tokyo area

The map is interactive and further details (contacts, activities, locations, etc.) are displayed while sliding over the green marker.

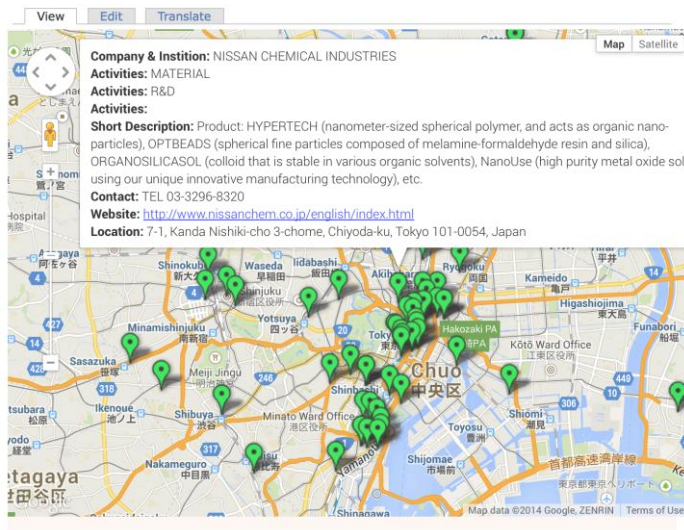


Figure 8: Nanotech interactive map with company details.

Source: <http://www.eu-japan.eu/interactive-map-nanotech-cluster-and-industry-landscape-japan>

7.2 Nanotechnology industry landscape

Japanese nanotechnology industry landscape is very diverse. In Japan there are over 600 companies³⁷ related to nanotechnology and this number is increasing daily. The report covers 150 major Japanese companies³⁸, active in the nanotechnology field.

These companies were separated into five categories:

- Equipment (companies that have activities in the field of equipment, machinery and device manufacturing)
- Research and development (companies that have activities in R&D of nanotechnology)
- Materials (companies that have activities in the field of materials)
- Products (companies that have activities or are selling nanotechnology related products)
- Service (companies offering services related to nanotechnology)

Many companies are operating in more than one field, therefore, included in multiple categories. Out of 150 profiled companies, there are 57 companies operating in the “equipment” field, 51 in “materials”, 38 in “products” and 47 active in “research and development” field and 25 in the field of “services”.

Traditionally, strong equipment manufacturing is also emphasized in the nanotechnology landscape. There is a variety of companies involved with development in “hardware” for nanotechnology; there are many already established and new companies in various niche segments.

³⁷ Source: JETRO

³⁸ Data obtained through internet, interviews, literature. Database is found in the annex

Likewise activities in materials are also abundant in the Japanese nanotech sector. Companies are developing new, innovative and improved materials. Many of them are pioneers and leading in the world segments.

In the annex are compiled databases of 150 Japanese companies that have activities in the nanotechnology sector.

7.3 Nanotechnology industry landscape graphic display

Below is a graphic display of the Japanese nanotechnology landscape. Compiled into five groups: Material, Equipment, Product, R&D and Services.



Figure 9: Nanotechnology innovation business landscape in Japan

8. Nanotechnology in European Union and supporting programs

Nanotechnology in European Union has been set as a priority research topic. In the largest open research fund Horizon 2020 nanotechnology is considered a key enabling technology (KET). From 2014 until 2020 near to 4 billion euros will be invested into nanotechnology research projects in the EU.

Japanese individuals and organizations have the opportunity to participate in these projects, gaining access to EU research area and potential market advantage. Following are described the key institutions that can assist with applying to Horizon 2020 funds, searching for partners and acquiring information on this matter.

8.1 Horizon 2020

Horizon 2020 is a Framework Programme for Research and Innovation created by the European Union in order to implement the Innovation Union flagship initiative by encouraging and supporting collaborative R&D and innovation for the competitiveness of the EU³⁹. The programme will run from 2014 to 2020 and provides an estimated €80 billion of funding for research and innovation projects as well as other supporting activities. This is, if not unique, one of the largest research funds open to the entire world.

"Leadership in enabling and industrial technologies" is under "Industrial Leadership", one of the 3 priorities of the programme with the budget of 14 billion euros and focuses on areas with strong industrial dimension and potential to drive innovation, such as Information and communication technologies (ICT), Key Enabling Technologies (KETs), and space.

8.2 Key enabling technology – Nanotechnology

Nanotechnology is considered as a KET and therefore is a priority topic for R&D in the Horizon 2020. Dedicated funds for nanotechnology are 3.85 billion euros until year 2020⁴⁰.

Although Japan is not eligible for automatic funding from the EU, Japanese organizations and individuals can join the projects, potentially with the following benefits:⁴¹

- Creation of a large network with top class research organizations and researchers in the EU
- Role in standardization and rulemaking, therefore a key market advantage
- Access to databases not available in Japan and/or devices not (yet) authorized in Japan
- Possibility of doing technology watch

The participation enables researchers; research organizations and companies to have direct access to newly developed technologies and therefore permits them to be the first in capitalizing innovations. Japanese subsidiary companies in Europe are eligible for Horizon 2020 funds as European legal entities.

³⁹ Horizon 2020 framework programme. <http://ec.europa.eu/programmes/horizon2020/>

⁴⁰ Horizon 2020, Key enabling technologies. http://ec.europa.eu/research/industrial_technologies/policy_en.html

⁴¹ JEUPISTE presentation 2014

8.3 JEUIPSTE

Japan-EU Partnership in Innovation, Science and Technology (JEUIPSTE) is a project co-financed by FP7 (Framework Programme prior to Horizon 2020) aiming to promote EU-Japan bilateral cooperation in Science, Technology and Innovation (STI) through support to STI policy dialogues, deployment of bilateral information services, organization of academic/innovation workshops, networking events, etc.

JEUIPSTE is a consortium of 10 partners from Japan and Europe, coordinated by the Institute for International Studies and Training of which the EU-Japan Centre for Industrial Cooperation is a branch⁴².

8.4 Horizon 2020 - National Contact Point Japan

The EU-Japan Centre for Industrial Cooperation has been nominated as the National contact point (NCP)⁴³ in Japan for Horizon 2020.

Supported by the Japanese government, NCP in Japan offers accessible and free of charge, impartial and confidential services for all types of organizations interested in participating in Horizon 2020 and tailored to the needs of each individual businesses and organization. The services include:

- Guidance on choosing relevant Horizon 2020 topics and types of action
- Advice on administrative procedures and contractual issues
- Assistance on proposal preparation
- Distribution of documentation (forms, guidelines, manuals etc.)
- Assistance with consortium building (in cooperation with the Enterprise Europe Network, if appropriate)
- Information on other European opportunities

8.5 Enterprise Europe Network (EEN)

Enterprise Europe Network is an international network of close to 600 partners, committed to providing excellent customer service to clients across 48 countries. The partnering organizations which are members of the Enterprise Europe Network offer support to small and medium-sized companies in the fields of international business cooperation, innovation, knowledge and technology transfer, financial sources and participation in EU-funded programmes.

Main support activities:

- Support to the B2B Partnering Process
- Online database with 20,000 partnership requests and offers (<http://www.een-japan.eu/content/network-database>)
- Selective search for partnerships in business or technology transfer
- Support to matchmaking events in Europe
- EEN co-organizes brokerage and matchmaking events across Europe to facilitate face to face B2B meetings
- Information Service – inquiry helpdesk
- Provision of sources of information on EU Market, regulations and innovation

EU-Japan Centre for Industrial Cooperation is the coordinator for EEN in Japan⁴⁴.

⁴² More information at <http://www.jeupiste.eu>

⁴³ More about NCP at <http://www.jeupiste.eu>

⁴⁴ More about EEN on: <http://www.een-japan.eu>

9. Business opportunities

In developing a broad market for nanotechnology, business opportunities are abundant. Nanotechnology being a sector based on disruptive innovation, there are many fields of potential application. Japan is more open to new advanced technologies that can be implemented into their product spectrum, but on the other hand quite closed for entire products from overseas. For companies in the sector to be successful, they must meet high Japanese standards and receive the best references which is sometimes very challenging

Japanese strengths in the nanotechnology field⁴⁵:

- **Materials** – The Japanese research and development field is constantly pursuing new materials for further improvements. The following companies have discovered new materials: NEC, Hitachi, Flox Corporation, Hodogaya, Toshiba, etc. Most emphasized are carbon nanotechnology products – CNTs, Fullerenes, Multi-walled carbon nanotubes.
- **Equipment** - Traditionally, Japanese companies are strong in high-tech research and manufacturing equipment and devices. Companies such as Hitachi, Jeol, Horiba, Fujitsu and many others, provide equipment for nanotechnology related activities.

Opportunities for EU companies:

- **Niche markets are open for companies with advanced technologies⁴⁶** - Testimonials show that Japan is a good market for niche nanotechnology products, advanced technologies and materials. Most of the interviewed companies stated that they didn't have many obstacles with entering the Japanese market and that state-of-the-art technologies have advantages in the niche markets where some enjoy the lack of domestic competition. The majority of the Japanese market will always remain protected and will be harder to access.
- **Joint R&D projects through Horizon 2020** – In 2014, the EU introduced the world's largest open research fund. European companies can create consortiums with Japanese companies and institutions conducting joint research and development. This can result in partnerships with both sides that give market advantage through representation. Final products or technologies that are the end-result of the projects can be more easily introduced to the Japanese market due to references, links and information gained through Horizon 2020 projects.
- **Japanese companies want “future” technologies⁴⁷** - Experience shows that Japanese companies are interested in new foreign technologies. While large Japanese companies still have well established markets in Asia and the US, and have an immense reach in the region, due to the increasing developments in China and Korea, Japan is sometimes struggling with keeping its presence in the markets. The Japanese by nature emphasize the optimization than innovation. Therefore, foreign advanced technologies are welcomed. Although implementation and technology transfer can take much time, the results can be well compensated.

⁴⁵ Information acquired through interviews

⁴⁶ Information acquired through interviews

⁴⁷ Information acquired by author through business development experience

9.1 Entering the Japanese nanotech market

There are - direct and indirect paths for European nanotech companies to enter into Japan. For smaller not well-recognized companies, it is advised to search for a local partner. This saves on the costs, which can be immense due to unique ways of business in the Japanese market. Those well-established companies can enter the market without intermediaries yielding better returns in the long run.

Trade fairs – An efficient way to promote the company’s products is through participation on trade fairs. Largest nanotechnology fairs in Japan are: Nanotech expo (Tokyo Big Sight, January) and Micro-nano biz (Pacifico Yokohama, April). There are many other exhibitions and seminars on nanotechnology, unfortunately mostly held in Japanese, usually causing a barrier for foreign companies.

Generally, when searching for partners and representatives, usually exhibitions are the most effective field for successful matches.

Subsidiaries - Companies with the intention of entering the market can open a subsidiary in Japan. There are many incentives for foreign direct investments and subsidiaries have easier access to public procurement. When establishing a subsidiary in Japan, one should first approach the Japanese External Trade Organisation ⁴⁸(JETRO), which is responsible for this field and can provide all the necessary information, useful niche programs as well as free-of-charge office space for limited time in order to establish a company in Japan.

Platforms – When entering the nanotechnology market, considering to use nanotechnology platforms should be one of the paths. Nanotechnology business creation initiative is an industry-driven platform that can provide information on the market, technology and partner matching. It is suitable for companies of any size searching for market information, partners, new technologies, etc.

Large corporations – Contacting large corporations when presenting your products should always be done through a formally established contact. Direct contact can be successful only on rare occasions due to the unique business culture in Japan. Fruitful contacts of large corporations in Japan (Large companies, Trading houses) usually yield faster communication and results.

Business missions – EU nanotech companies and clusters can use specific theme missions organized by EU institutions, Chambers of commerce or Embassies. A reference should be made to the EU-Japan Centre, which organises business support missions for EU nanotech companies and clusters with interests in Japan. The mission is to be held annually at the time of the Nanotech expo in Tokyo.

⁴⁸ More information at <https://www.jetro.go.jp/en/invest/ibsc/>

10. Conclusions and Recommendations

The Japanese market is considered to be one of the top markets for nanotechnology applications, considering many of the Japanese companies are implementing new materials and technologies into their products. With further developments in this field, continued growth is expected.

Testimonials of European companies that have been present in Japan emphasize that Japan is a good market for nanotech, particularly for niche sectors which regularly have limited domestic competition. It has been noted that Japan represents one of the most important markets besides USA, mainly because many Japanese companies are applying nanotechnology into their products. Small companies with weak recognition should use intermediaries in order to achieve their goals accordingly and conserve resources of marketing and sales. Due to the extensive world developments, Japanese companies cannot rely solely on domestic research and development and, consequently, are pushed towards international cooperation.

Thus, the following basic recommendations should be considered by the European companies targeting the Japanese market:

Research the market – Before entering the Japanese nanotechnology market, a comprehensive market research should be made. The market is specific and can be difficult, approaching it unprepared can be time consuming and expensive. Such reports as this can give an introduction to interested companies, indicating the paths needed to take for successful market entry. Utilising local representatives or platforms such as the EU-Japan Centre, Enterprise Europe Network (EEN), NBCI can get you much needed information, particularly because much more information is available in the Japanese language, therefore difficult to access.

Find a local partner – A local representative can be the key to a successful entry into the Japanese nanotechnology market, especially for smaller companies. Participation in the nanotech events is most appropriate, establishing of personal contacts, which is an integral aspect of securing a local representative in Japan. The “Enterprise Europe Network”, web based partnership service can be instrumental in finding a local partner in Japan (either for distribution or for technological cooperation).

Use the Nanotechnology Research Platform – High-end equipment and technical personnel can be exploited all over Japan at favorable terms through the Nanotechnology platform, generally at lower prices as compared to similar platforms in Europe. Other notable advantages of utilizing such platforms are local integration and establishing of connections within the field.

Cooperate with Japanese partners through EU Programmes (Horizon2020) – The Japanese participation in Horizon 2020 is promoted and supported by a number of assisting projects. Partner search can be done through Enterprise Europe Network reaching wide network eligible companies and institutions. The JEUPISTE (FP7 Project for the promotion of Horizon2020 in Japan, hosted by the EU-Japan Centre for Industrial Cooperation) project offers an info helpdesk and partnership services, besides opportunities to network via

various events/workshops/seminars, organized in Europe and Japan. The Japan National Contact Point for Horizon 2020 has been established in April 2014, at the EU-Japan Centre for Industrial Cooperation and it offers relevant guidance for participating in projects, information on various opportunities and assistance regarding the applications etc.

Find potential Japanese partners using the interactive “Japan Nanotech Map” –accessible through the EU-Japan Centre website (<http://www.eu-japan.eu/interactive-map-nanotech-cluster-and-industry-landscape-japan>)

11. ANNEX

List of companies active in Japanese nanotechnology sector.

These companies were separated into five categories: Equipment (equipment, machinery and devices manufacturing), Materials, Products (end-products), Service (nanotech related services).

Company	Activities			Short Description	Contact	Website	Location
Ashizawa Finetech	EQUIPMENT			Product: Grinding and dispersing machines. Developing new materials, dispersion of nano-size particles	TEL +81-47-453-8111 FAX +81-47-453-8378	http://www.ashizawa.com/english/index.html	1-4-2 Akanehama, Narashino-shi Chiba 275-8572 JAPAN
NARA MACHINERY	EQUIPMENT			Product: Laser Ablation System - generating nanoparticles by irradiating the solid target with high energy pulsed laser.	Tel +81-3-3790-8011 Fax +81-3-3790-8055	http://www.naram.co.jp/english/index.html	2-5-7, Jonan-Jima, Ohtaku, Tokyo, Japan
NIKKISO	EQUIPMENT	R&D		Product: Particle Size analyzer, Zeta Potential Analyzer, 3D Image Analyzer. R&D - Nikkiso has established technology to continuously manufacture multi-layer, even-quality carbon nanotubes (CNT), evaporating raw materials based on the vapor grown method for thermal decomposition of hydrocarbons.	Phone: +81-3-3443-3711, Fax +81-3-3473-4963.	http://www.nikkiso.com/index.html	20-3, Ebisu 4-Chome, Shibuya-ku, Tokyo 150-6022, Japan

NISSIN ELECTRIC	R&D			Carbon nanotubes (synthesize nano-carbon materials such as carbon nanotubes and carbon nanowalls (CNW) by thermal CVD or plasma CVD)	TEL +81-75-861-3151 FAX +81-75-864-8312	http://nissin.jp/e/	47, Umezu-Takase-cho, Ukyo-ku, Kyoto 615-8686, Japan
TOKYO KOGYO BOYEKI SHOKAI	MATERIAL			Product: Nano colloidal dispersion, Antimonial pentoxide, multi-layer ceramic capacitor, Colloidal silica.	TEL 03-3436-4521/FAX 03-3436-8272	http://www.tkbs.co.jp	3-13-3 Nishi Shimbashi, Minato-ku Tokyo
TOSHIBA	PRODUCT	R&D		Product: Wafer technology, quantum computing, NAND flash memory process technology, mask patterning technology, Self-assembly lithography. Materials: li-ion materials, Photo catalyst, Ceramics, etc. Energy: Organic photovoltaics, Dy-free magnet for motors, Rechargeable battery (electrode technology), etc.	TEL:+81-3-3457-4511, FAX: +81-3-3456-1631	http://www.toshiba.co.jp/index_j3.htm	1-1, Shibaura 1-chome, Minato-ku, Tokyo
Acteiiive	R&D			Nano vesicle, Drug delivery system.	TEL: +81 050 3768 2855	http://acteiiive.com/english/index.html	2641 Yamazaki, Noda City, Chiba, Japan
Adachi-New Industrial co., ltd	MATERIAL			Material manufacturer: - Organic non-organic chemicals, plastics. - Precious metals, rare earths, - metal complex, organic metal complex. - Electric and electronic materials. Coatings, Various Nano-particles etc.	06) 6536-2051 / FAX (06) 6536-2015	www.adachi-new.com	Osaka City West State Sales Hori 1-chome 14 Fan 20, Hikaru Bldg 10F

Advanced Nano Technology	EQUIPMENT			Product: Nano dispersing equipment - High Pressurized Homogenizer / Wet type Jet Mill	Tel : 048-485-2738 Fax : 048-485-2747	www.ant-jp.com	4-13-24 Shimo-Muneoka, Shiki, Saitama,
ADVANTEST	SERVICE	EQUIPMENT		Semiconductor and Component Test System Business, Mechatronics System Business, Service, Support and Others	TEL: +81-3-3214-7500 FAX: +81-3-3214-7712	https://www.advantest.com/DE/index.htm	Shin Marunouchi Center Bldg., 1-6-2, Marunouchi, Chiyoda-ku, Tokyo 100-0005
Aichi Science & Technology Foundation / Tokai Region Knowledge Cluster	R&D	SERVICE		Nanotechnology manufacturing cluster. Advanced material processing supporting industries. Connecting Universities and institutes (Nagoya, Gifu, Meijo, Toyohashi, Chubu, Toyota Tech. Institute, etc.) Technology transfer.	TEL: +81-561-76-8327, FAX: +81-561-76-8328, global@astf.or.jp	http://www.astf.or.jp/cluster/english/index.html	1267-1 Akiai, Yakusa-cho, Toyota, Aichi
AISAN INDUSTRY	PRODUCT			Water purification catalysts, Photo catalytic material. Heavy metal cleaning materials, etc.	TEL 053-426-0711 FAX 053-426-0712	http://www.aisan-ecomax.co.jp/index.php	Hamamatsu-Shi Minami-ku, Kitano-Cho 3 378
Applied Micro Systems Inc	EQUIPMENT			Product: Picolitre dispenser - liquid dispenser with Pico liter size accuracy. Use of liquids of high viscosity.	Tel : +81-3-6407-0910 Fax : +81-3-6407-0932	http://www.applied-micro-systems.net	MANSION KIRII 401, 3-26-7 Uehara, Shibuya, Tokyo, 151-0064, Japan
ARIOS	EQUIPMENT			Plasma-related products, Coating, Carbon diamond, MBE, Surface treatment & modification, Vacuum equipment.	Tel : 042-546-4811/fax : 042-546-4814	http://www.arios.co.jp/products/index.html	196-0021, Japan 3-2-20 Musashino akishima-city, Tokyo
ASAHI KASEI FINECHEM	MATERIAL			Product: Bulk materials, Additives, Vinyl Sulfonic Acid	TEL +81-6-7636-3170 FAX +81-6-7636-3172	http://www.asahikasei-fc.jp/eng/index.html	Nakanoshima-Dai building, 3-3-23, Nakanoshima, Kita-ku, Osaka 530-6130

Ashizawa Finetech	EQUIPMENT			Bead Mills - Grinding and Dispersing Machines (Grinding to nano and submicron size particles)	TEL: +81-47-453-8111 FAX: +81-47-453-8378 E-mail: onuki@ashizawa.com	http://www.ashizawa.com/english/index.html	1-4-2 Akanehama, narashino-shi, Chiba 275-8572 JAPAN
ASUMI GIKEN, Limited	EQUIPMENT			Manufacturer of dip coating equipment	TEL 03-3830-7900/FAX 03-3830-7901, website	www.dip-coater.com	14-16 3-Chome HONGO, bunkyo-Ku, Tokyo 3F
attotec	EQUIPMENT			<ol style="list-style-type: none"> 1. Sales of vacuum pumps, vacuum parts, vacuum valves and vacuum gauges 2. Design, manufacture and sale of vacuum equipment, furnaces, laboratory equipment 3. Manufacture and sale of carbon, molybdenum, tantalum, and tungsten products 4. Import and export of vacuum equipment and components 5. Maintenance of vacuum systems and pumps 6. Related to the above business 	Phone - 03-3840-5151 (Main), FAX - 03-3840-5333., Info@attotec.co.jp	www.attotec.co.jp	5-5 1-Chome Adachi Adachi-Ku, Tokyo 120-0015, Japan
attotec co., ltd	EQUIPMENT			<ol style="list-style-type: none"> 1. Sales of vacuum pumps, vacuum parts, vacuum valves and vacuum gauges 2. Design, manufacture and sale of vacuum equipment, furnaces, laboratory equipment 3. Manufacture and sale of carbon, molybdenum, tantalum, and tungsten products 4. Import and export of vacuum equipment and components 	Phone - 03-3840-5151 (Main), FAX - 03-3840-5333., Info@attotec.co.jp, Masaharu Watanabe, Representative Director and President	www.attotec.co.jp	5-5 1-Chome Adachi Adachi-Ku, Tokyo 120-0015, Japan

				5. Maintenance of vacuum systems and pumps 6. Related to the above business			
Bando Chemical Industries, Ltd.	MATERIAL	PRODUCT		Non-tire rubber and plastics industry products.	TEL.81-78-304-2923 FAX.81-78-304-2983 email: int.business@bando.co.jp	http://www.bando.co.jp/english-1/en-nt3.html	6-6, Minatojima Minamimachi 4-chome, Chuo-ku, Kobe, 650-0047, Japan
CleanNano	MATERIAL	PRODUCT		Production of nanotech glass materials for buildings. Catalyst coatings for stain resistant surfaces. Thermal coatings for windows.	TEL:03 - 5844 - 6200 Email on website.	http://cleannano.iskweb.co.jp/contact/index.html	3-15 Edobori 1-chome, Nishi-ku, Osaka 550-0002
Cluster Technology	MATERIAL	R&D		Composite material development and manufacturing technologies, Precision molding and machining technologies, MEMS machining technologies, Analysis and measurement techniques, Fusion technologies.	Phone. +81-6-6726-2711, Fax: +81-6-6726-2715	www.cluster-tech.co.jp/english/index.html	5-28, 4-chome, Shibukawa-cho, Higashi-Osaka, 577-0836, JAPAN
Cluster Technology Co., Ltd.	MATERIAL	R&D		Composite material development and manufacturing technologies, Precision molding and machining technologies, MEMS	Phone. +81-6-6726-2711, Fax: +81-6-6726-2715	www.cluster-tech.co.jp/english/index.html	5-28, 4-chome, Shibukawa-cho, Higashi-Osaka, 577-0836, JAPAN

				machining technologies, Analysis and measurement techniques, Fusion technologies.			
CRESTEC	EQUIPMENT	SERVICE		Services: Nano fabrication. Product: Lithography system, mastering system, surface emission ballistic exposure system.	TEL: +81-42-660-1195, FAX: +81-42-660-1198	http://www.crestec8.co.jp/englishF/	1-9-2, Owada-machi, Hachioji-shi, Tokyo 192-0045 Japan
CRESTEC CORPORATION Ltd.	PRODUCT	SERVICE		Services: Nanofabrication. Products: X-Y-Z TYPE EB lithography system, X-theta type EB MASTERING SYSTEM.	TEL: +81-42-660-1195(General), FAX: +81-42-660-1198, email: pwwilmshurst@hotmail.com	http://www.crestec8.co.jp/englishF/	1-9-2, Owada-machi, Hachioji-shi, Tokyo 192-0045 Japan
Cyber Laser	EQUIPMENT			Product: Femtosecond lasers (10000 hours of continuous operation), nanosecond laser.	Telephone: +81-48-460-3803 FAX:+81-48-460-3804	http://www.cyber-laser.com/e/e_index.html	2-3-13 Minami, Wako-shi, Saitama, Japan
DENKI KAGAKU KOGYO KABUSHIKI KAISHA	MATERIAL			Products: Organic Materials Business (Elastomers & Performance Plastics), Inorganic Materials Business (Infrastructure & Inorganic Materials), Electronic Materials Business (Electronics & Innovative Products), Functional Materials and Processed Products Business (Life Science & Environment Products)	Main telephone:+81-3-5290-5055 Main facsimile:+81-3-5290-5059	http://www.denkaco.jp/eng	Nihonbashi Mitsui Tower,1-1,Nihonbashi-Muromachi 2-chome,Chuo-ku,Tokyo 103-8338,JAPAN
Dylec	EQUIPMENT			Product: Nano particle size distribution scanning equipment, nano-particle sampler, electro spray	TEL 03-3355-3632 / FAX 03-3353 - 6895	http://www.t-dylec.net/index.html	1 ,Naito-machi, Shinjuku, Tokyo, Japan

				generator, nano-particle monitor, etc.			
ELIONIX	EQUIPMENT			First 125kV Ultra High Precision Electron Beam Lithography System, Electron Beam 3D Surface Roughness Analyzer, High-Resolution SEM Sample Coating System.	TEL: +81-42-626-0611, sales@elionix.co.jp	http://www.elionix.co.jp/english/index.html	3-7-6 Motoyokoyamacho Hachioji, Tokyo 192-0063, Japan
ELIONIX INC.	EQUIPMENT			Products: Ultra-High Precision Electron Beam Lithography System, Electron Beam 3D Surface Roughness Analyzer, High-Resolution SEM Sample Coating System	Oversea sales department: Tel: +81-42-626-0611	http://www.elionix.co.jp/english/index.html	3-7-6 Motoyokoyamacho Hachioji, Tokyo 192-0063, Japan
FANUC	EQUIPMENT			Product: Multifunctional nano technology machine - ROBONANO α -0iB. (scribbling, measurements, milling)	Tel: +81-555-84-5555 Fax: +81-555-84-5512	http://www.fanuc.co.jp/eindex.htm	Oshino-mura, Yamanashi Prefecture 401-0597, Japan
Filgen	EQUIPMENT	PRODUCT		Products: Accessories for electron microscopy, vacuum electron stainer, calotester, dipping equipment, plasma equipment, LB film manufacture equipment, coaters, Nano-particles, Carbon nano tubes, SPM probes etc.	Phone 052-624-4388 Fax 052-624-4389, sales@filgen.jp	http://www.filgen.jp/Contact/ContactE.htm	1-1409, Jonoyama, Midori-ku, Nagoya, Aichi
FLOX Corporation	MATERIAL			Developing tailor-made Fullerene oxide expressing unique functions in areas such as electronics and pharmaceuticals and its derivatives for nanocarbon technology development and dissemination.	TEL: 044-344-1963 FAX: 044-344-1964	http://www.flox.jp/company/company.html	Kanagawa 210-0858, Japan Nagasaki City Kawasaki district Okawa-Cho 7-3

FLOX Corporation	MATERIAL			Developing tailor-made Fullerene oxide expressing unique functions in areas such as electronics and pharmaceuticals and its derivatives for nanocarbon technology development and dissemination.	TEL: 044-344-1963 FAX: 044-344-1964	http://www.flox.jp/company/company.html	Kanagawa 210-0858, Japan Nagasaki City Kawasaki district Okawa-Cho 7-3
FORWARD SCIENCE LABORATORY	MATERIAL	SERVICE		Manufacture and sale of high-performance materials, Science and technology information service, Water environmental consulting, Patent & license management Chemical analysis and testing	info@fslabo.com	http://www.fslabo.com/	870-1124, Japan Oita-Shi dannoharu plateau 900 - 103
Fuji Chemical	MATERIAL			Product: Carbon nanotube dispersion, Nano zeolite, Mesoporous Silica, Nano Sheet Silica, etc.	Tel +81(0)76-472-2323 Fax +81(0)76-472-2330	http://www.fujichemical.co.jp/english/index.html	55 Yokohoonji, Kamiichimachi Nakaniikawa-gun, Toyama-Pref. Japan
Fuji Pigment	PRODUCT			Product: pigments, resins, ceramics, metals, emulsions, etc.	TEL +81-72-759-8501 FAX +81-72-759-9008	http://fuji-pigment.co.jp/en/index.html	2-23-2 Obana Kawanishicity Hyogo pref. 666-0015, Japan
FUJIFILM	PRODUCT	R&D		Product: "Nanocubic" technology allows the production of nanometer-scale ultra-thin coatings. (1 Nm thin) Collagen skin products. - Ultra thin coatings for media storage (magnetic tape data storage). - Nano dispersion technology	TEL: +81-120-508620, Mail: FDI-NET@fujifilm.co.jp	http://www.fujifilm.com	7-3, Akasaka 9-chome, Minato-ku, Tokyo 107-0052, Japan
FUJIKURA	PRODUCT	R&D		Product: Silicon Photonic Device, Dye sensitized solar cells,	TEL:+813-5606-1030 FAX:+813-5606-1503	http://www.fujikura.co.jp/eng/	1-5-1, Kiba, Koto-ku, Tokyo

FUJITSU	PRODUCT	R&D		Development: CNT, quantum dot, nanotechnology simulation software.	Tel: +81-3-6252-2220	http://www.fujitsu.com/global/	1-5-2 Higashi-Shimbashi Minato-ku, Tokyo 105-7123
FUMIN	MATERIAL			Coating manufacturer, thin film manufacturer	TEL +81-24-544-0223 FAX +81-24-545-0620	http://www.fumin.jp/index_en.html	21, Gonome Aza Kami, Fukushima City, Fukushima, 960-8161
FUMIN CO., LTD.	MATERIAL			Coating manufacturer, thin film manufacturer	TEL +81-24-544-0223 FAX +81-24-545-0620	http://www.fumin.jp/index_en.html	21, Gonome Aza Kami, Fukushima City, Fukushima, 960-8161
FURUKAWA CO.,LTD.	MATERIAL			Inorganic industrial chemicals such as sulfuric acid, liquid aluminum sulfate and polymeric ferric sulfate solution, paint materials such as cuprous oxide as well as functional materials such as basic copper carbonate.	TEL: +81 3 3212 6570 FAX: +81 3 3212 6578	http://www.furukawakk.co.jp/e_index.htm	2-3, Marunouchi 2-chome, Chiyoda-ku, Tokyo Japan
FUTEX	PRODUCT			Product: High-voltage power supply for electron beam and ion beam devices. (OEM)	TEL: (81) 42-549-2888	http://www.futex.jp/english/index.html	2-28-3 Fukujima-cho, Akishima City, Tokyo 196-0031, Japan
GL Materials Holdings	PRODUCT	SERVICE		Next generation plasma control technology. Business content: -Plasma and Ion beam controlled device R&D, Manufacturing and Sales -Metal and Precious metal Nano materials Manufacturing and Sales -Metal Nano particles/Metal oxide and ceramic based mixture Manufacturing and Sales Products: Platinum Nano particles in carbon particles,	TEL: 03-3253-9300, FAX: 03-3253-9302, email: sales@genelite.co.jp	www.genelite.co.jp	2-3-2, Kaji-cho, Chiyoda-ku, Tokyo 101-0044 Japan

				Ag/Au Nano particles on base particles, Ag Nano particles on TiO ₂ , Si Nano particles in graphite We can support manufacturing to correspond customer's order. Advantages: quick probing test, No dispersant use, high purity, particle uniformity and size adjustability, etc. Product: Plasma control devices.			
GRAFTON LABORATORIES INC.	PRODUCT	R&D		Product: Grafton (patented technology) - induced graft polymerization. Wide-range applicability (liquid, granules, sheets, gels, etc.)	Tel.03-3741-7215 Fax.03-6679-8343	http://www.graftonlab.com	4 Chome-6-15 Ōmoriminami Ōta-ku, Tōkyō-to Japan
GSI Creos	PRODUCT	SERVICE	MATERIAL	R&D: established a research and development facility, Nano Carbon Development Center working with industry and academia to develop future CNT products. Product: Paints & Coatings surface treatment (anti corrosive coatings), Impregnations, fuel cell catalyst, etc.	TEL +81-3-5211-1800 FAX +81-3-5211-1900	http://www.gsi.co.jp/en/	2-3-1, Kudan Minami, Chiyoda-ku, Tokyo, 102-0074, Japan
GUNZE	PRODUCT	R&D		Many products implementing nanotechnology. Developed a touch screen that differentiates between people by touch.	TEL: 06-6348-1313	http://www.gunze.co.jp	5-25, Umeda 2-chome, Kita-ku, Osaka 530-0001, Japan
HAMAMATSU Nano Technology	PRODUCT			Product: Particle deposition system, Sample preparation system for SEM/TEM, Electrostatic-type dispensing	e-mail : info@hamanano.com TEL : (81)53-489-6530 FAX : (81)53-489-6531	http://www.hamanano.com/e/index.html	5000, Hirakuchi, Hamakita-ku, Hamamatsu City, Shizuoka Pref., 434-0041, Japan

				technology, Nano suspension system.			
Hitachi	EQUIPMENT			Equipment products: - STEM, FIB, XRF, SPM, mask preparation. - Semiconductor manufacturing equipment, etc.	TEL 81-3-3504-7111 FAX 81-3-3504-7123	http://www.hitachi-hitec.com	24-14, Nishi-Shimbashi 1-chome, Minato-ku, Tokyo 105-0003, Japan
Hitachi Chemical Co., Ltd.	PRODUCT	MATERIAL	R&D	Functional Materials: Electronic materials (semiconductor mat., PV mat., etc.), Polymer materials, Inorganic materials (carbon, ceramics), base and process materials for PWBs. Advanced components: Li-ion, batteries, powder metal products, electronic components, diagnostics etc.	Phone: +81-3-5533-7000 Fax: +81-3-5533-7077	http://www.hitachi-chem.co.jp/english/index.html	1-9-2, Marunouchi, Chiyoda-ku, Tokyo 100-6606, Japan
Hitachi High-Tech Science Corporation	EQUIPMENT			Products: Thermal analysis, Scanning Probe Microscope, Scanning Ion Microscope, ICP-OES, ICP-MS, Photo mask Repair, XRF, X-ray detector etc.	On website, Telephone : +81-3-3504-3966	www.hitachi-hitec-science.com/en/	24-14, Nishi-Shimbashi 1-chome, Minato-ku, Tokyo 105-0003, Japan
Hitachi. Ltd	EQUIPMENT			Equipment products: - STEM, FIB, XRF, SPM, mask preparation. - Semiconductor manufacturing equipment, etc.	TEL 81-3-3504-7111 FAX 81-3-3504-7123	http://www.hitachi-hitec.com	24-14, Nishi-Shimbashi 1-chome, Minato-ku, Tokyo 105-0003, Japan
Hodogaya Chemical	MATERIAL	R&D		Functional Colorants (imaging materials, organic photo conductor (OPC) materials, Color Formers (CF), Dyes & Colors, Paper Dyes, etc. Specialty Polymer Segment: Functional polymers, CNT,	TEL +81-3-5299-8000	http://www.hodogaya.co.jp/english/	Jowa Yaesu Building, 2-4-1, Yaesu, Chuo-ku, Tokyo 104-0028, Japan

				Agro-science, construction materials, etc.			
HODOGAYA CHEMICAL	PRODUCT	MATERIAL	R&D	Product: Multi-walled carbon nanotubes, Multi-walled carbon nanotube dispersion.	TEL +81-3-5299-8000 FAX +81-3-5299-8250	http://www.hodogaya.co.jp/english/	2-4-1, Yaesu, Chuo-ku, Tokyo 104-0028, Japan
HOLON	EQUIPMENT			Specialized in Mask & Wafer metrology. Product: Mask CD-SEM, Charge-free SEM, Mask defect imaging system.	Phone : +81-4-2945-2951 FAX : +81-4-2945-2962	http://www.holon-ltd.co.jp/english/index.html	1026-1 Minaminagai, Tokorozawa-si, Saitama 359-0011, Japan
HORIBA	EQUIPMENT	SERVICE		Product: Raman spectroscopy - Such combined Raman-AFM systems allow the benefits of both Raman and AFM to be explored on a single bench top unit, and offer the capability to explore tip enhanced Raman spectroscopy (TERS) for true nanoscale Raman analysis.	TEL:+81 75 313 8121 FAX: +81 75 321 8312	http://www.horiba.com	2, Miyano Higashi, Kisshoin Minami-Ku Kyoto 601-8510
HOSOKAWA MICRON CORPORATION	EQUIPMENT			Powder and Particle Processing. Design, manufacture and sales of equipment and systems to a wide range of industries.	Tel : 072-855-2226 Fax : 072-855-5197	www.hosokawamicon.co.jp/en	573-1132, Japan, Osaka, Hirakata city merchants offer tajika 1-9,
Innovation Engine	SERVICE			Leading venture capital in the future technologies field. Covers devices, materials, products, basic tech.	Phone: 81-3-5730-6721 Fax: 81-3-5730-6722	http://www.innovation-engine.co.jp/e/top.htm	3F, Shiba-Habitation Bldg., 2-3-12, Shiba, Minato-ku, Tokyo 105-0014, Japan
ISHIHARA SANGYO KAISHA, LTD.	MATERIAL	R&D		Leading manufacturer of titanium oxide. Products: TiO ₂ , ZnO, electro conductive materials, etc.	TEL: +81-6-6444-1450 FAX: +81-6-6444-5865	http://www.iskweb.co.jp/eng/index.html	3-15 Edobori 1-chome, Nishi-ku, Osaka 550-0002

Japan Fine Ceramics Center	SERVICE			Solving various technical problems on fine ceramics, using proprietary seed technologies, know-how, analysis/evaluation technology, research and development functions, and industrial properties.	Phone : +81-52-871-3500 FAX : +81-52-871-3505	http://www.jfcc.or.jp/en/	2-4-1 Mutsuno, Atsuta, Nagoya, 456-8587, Japan
Japan Ion Corporation	MATERIAL			Nanosilver and nanocopper products	Tel : 03-6304-2525, Fax : 03-6304-2515, E-mail : info2@ion-net.co.jp, on website	www.japan-ion.com	1-54 -7, sasazuka, Shibuya-ku, Tokyo 151-0073 Japan KS Bldg. 2f
JAPAN LASER	EQUIPMENT			Product: Nano positioner, Nano-second laser, light nano scattering laser, superconducting nanowire single-photon detection system.	TEL 03-5285-0861 FAX 03-5285-0860	http://www.japanlaser.co.jp	2-14-1 Nishi-Waseda, Shinjuku-ku, Tokyo 169-0051 Japan
Japan Vilene Company	MATERIAL	PRODUCT		Product: Nano nonwovens for reinforcing ion conductive materials, nonwoven fabrics, Fibrous nano powders.	TEL:03-4546-1111	http://www.vilene.co.jp/en/index.htm	6-4, Tsukiji 5-Chome, Chuo-ku, Tokyo 104-8423, Japan
JASCO	EQUIPMENT			Nanospectroscopy, Near-field scanning optical microscopy (NSOM) for quantitative evaluation, Raman spectroscopy.	TEL: 81-426-66-1322 FAX: 81-426-65-6512 E-mail: asia@jascoint.co.jp	http://www.jascoint.co.jp/index_e.html	4-21 Sennin-cho 2-chome Hachioji, Tokyo 193-0835 Japan
JEOL	EQUIPMENT			Instruments for high-level research and development activities. Products: Scientific (TEM, SEM, EPMA, SEM-FIB, XRF, NMR etc.), Industrial (Electron beam lithography,	Tel : 042-543-1111 (main) Fax : 042-546-3353	http://www.jeol.co.jp/en/	1-2, Musashino 3-chome Akishima Tokyo 196-8558, Japan

				DEPO, EB), Medical equipment (CA)			
JFE-Techno Research corporation	SERVICE	MATERIAL		Divisions: Integrated Solution Center (Nano-scale Characterization Centre, Battery-Materials analysis & evaluation Centre, Medical devices testing, material evaluation), R&D and design (quantitative analysis, surface analysis etc.) Products: Reference materials, analysis materials, metal materials etc.	email: jfetecsalesmarketing@jfe-tec.co.jp TEL: +81-3-5821-6812 FAX: +81-3-5821-6855	http://www.jfe-tec.co.jp/en/	2-7-1 Otemachi, Chiyoda-ku, Tokyo 100-0004, Japan
JNC Corporation	MATERIAL	R&D		Product: Nanofibers, cathode material for LI-ION, coatings, resins, etc. Part of SHJ Consortium that won 2013 award for pinnable multi-layered carbon nanotubes.	PHONE. +81-3-3243-6760 FAX. +81-3-3243-6960	http://www.jnc-corp.co.jp/english/index.html	2-2-1 Otemachi, Chiyoda-ku, Tokyo 100-8105
KATO TECH	EQUIPMENT			Product: Nanofiber electro spinning unit - can produce nanofibers from 50nm to 800nm in diameter.	Tel : +81-75-681-5244 Fax : +81-75-681-5243	http://english.keskato.co.jp	26 Karato-cho, Nisikujo, Minami-ku, Kyoto, Japan
Kawaken Fine Chemicals	MATERIAL			House hold chemicals (surfactants, cosmetic ingredients, OEM manufacturing, etc.) Specialty Chemicals (catalyst, precious metal catalysts, pharmaceutical and agrochemical intermediates etc.)	Phone: +81-3-3663-9521, Fax:+81-3-3661-5630	www.kawakenfc.co.jp/e/top.html	Horidome Chuo Bldg., 2-3-3 Nihombashi Horidome-cho, Chuo-ku, Tokyo 103-0012

KAWAKEN Fine Chemicals	PRODUCT			Product: Specialty chemicals, catalysts, etc.	Phone: +81-3-3663-9521 Fax: +81-3-3661-5630	http://www.kawakenfc.co.jp/e/top.html	2-3-3 Nihombashi Horidome-cho, Chuo-ku, Tokyo 103-0012 Japan
Kawamura Institute of Chemical Research	R&D			Research Laboratories: Synthetic Chemistry, Material Chemistry, Polymer Chemistry, Analysis Laboratory	Tel: + 81-43-498-2111 Fax: + 81-43-498-2229 E-mail: kicr-info@kicr.or.jp	www.kicr.or.jp	631, Sakato, Sakura-shi, Chiba-ken, 285-8668, JAPAN
KEYENCE	EQUIPMENT			Measurements and analysis of nano-structures and nano-materials. Product: 3D laser scanning microscope, super resolution digital microscope. Won an award for the two products in Nano tech expo 2013.	TEL:0120-1004-70, FAX: 0120-69-3000, email: info@keyence.co.jp	http://www.keyence.com	1 Chome-3-14 Higashinakajima Higashiyodogawa-ku, Ōsaka-shi, Ōsaka-fu Japan
KOTOBUKI INDUSTRIES	EQUIPMENT			KOTOBUKI Nano Dispersion Mill uses a unique Centrifugal Separation mechanism for beads separation, which allows the Mill to use very small size beads (~0.015mm) and not to have any screen to be replaced regularly.	TEL: (03)3226-6511 FAX: (03)3226-9778 email: info.kakoki@kotobuki-ind.jp	http://www.kotobuki-ind.jp/index.html	Ohashi Gyoen Bldg., 1-8-1, Shinjuku, Shinjuku-ku, Tokyo 160-0022 Japan
KRI KUNIMINE INDUSTRIES	MATERIAL			Nanoclay for water-vapor-barrier films to be used as damp-proof sheets for solar cells.	Phone: 03-3866-7251	http://www.kunimine.co.jp/english/index.htm	1-10-5 Iwamoto-cho, Chiyoda-ku, Tokyo 101-0032 Japan
KURASHIKI KAKO	PRODUCT	MATERIAL		Seals and rubber products for various industries.	TEL:81-86-465-1111/ FAX:81-86-466-2500	http://www.kuraka.co.jp/index-e.html	4630 Yagara Tsurajima Kurashiki, Okayama 712-8555, Japan

Kurita Water Industries, Ltd.	R&D	MATERIAL		Advanced removal technology of Hydrogen peroxide using Nano-size Pt-catalyst resin	TEL: +81-3-6743-5000 Fax +81-3-3319-2037	http://www.kurita.co.jp/english/index.html	Nakano Central Park East, 10-1, Nakano 4-chome, Nakano-ku, Tokyo 164-0001
Kyodo International, Inc.	SERVICE	PRODUCT		Services: Thin film deposition, etching and other fabrication services, Sputtering targets and Bonding, MEMS Total Solutions, Nano imprint Lithography Total Solutions, Consumable parts for Semiconductor manufacturing, Precision Cleaning Service, Dry ice (CO ₂) cleaning system and services. Food, Biotechnology services and products.	TEL: +81-044-853-2611(Main Office), FAX 044-854-1979, e-mail: info@kyodo-inc.co.jp	http://www.kyodo-inc.co.jp/english/index.html	2-10-9, Miyazaki, Miyamae-ku, Kawasaki-shi, Kanagawa-ken, 216-0033, Japan
LANTECHNICAL SERVICE	EQUIPMENT	SERVICE		Product: Ion beam, vacuum deposition, thin film,	TEL +81-3-5322-2061 FAX +81-3-5322-2060	http://www.lantechanical.co.jp/english/	1-26-2-32F, Nishi-Shinjuku, Shinjuku-ku, Tokyo, 163-0532, Japan
M Technique	EQUIPMENT			Manufacturer of various lab equipment, production machinery, heat/exchanger, Defoaming/Deaeration, Grinding, thin film micro reactor	Phone +81-725-54-0096 Fax +81-725-53-3332, contact on website	www.m-technique.co.jp/e/	2-2-16, Technostage, Izumi city, Osaka 594-1144, Japan
Marubeni Information Systems Co.,Ltd.	PRODUCT			Carbon nanotubes. Company is representative for US company Cnano Technology.	Tel: 03-6658-1770 Fax: 03-6658-1780	www.marubeni-sys.com	Tokyo, Shibuya-ku, Shibuya 3-Chome 12-18, Shibuya Minami Tokyu building
MECC	EQUIPMENT			Product: Nanofiber systems for semi mass production and laboratories.	Phone: +81-942-72-7266, Fax: +81-942-73-3545, E-mail:	http://www.mecc.co.jp/en/index.html	196-1 Fukudo, Ogori-shi, Fukuoka 838-0137 JAPAN

					askmecc@mecc.co.jp		
MEIJO NANO CARBON	MATERIAL			Nano materials: Carbon nanotubes, graphene.	TEL : +81-52-971-2408 / FAX : +81-52-955-3257 / e-mail : info [-at-] meijo-nano.com	http://www.meijo-nano.com/en/index.php	Otsubashibuilding, 3-4-10, Marunouchi, Naka-ku, Nagoya 460-0002, Japan
MEISYO KIKO	EQUIPMENT			Nano imprint equipment, numerical control etching equipment.	Phone 0795-82-7111 FAX 0795-82-7648 E-mail infom@meisyo.co.jp	http://www.meisyo.co.jp/0503company.html	148 Hikamichōnuma Tanba-shi, Hyōgo-ken, Japan
MICROJET	EQUIPMENT			Product: Nano printer - ultra high precision patterning equipment. Nano Jet - ultra high precision pipetting.	Phone: 0263-51-1734	http://www.microjet.co.jp/index.html	79-2 Daimon Gobanchō Shiojiri-shi, Nagano, Japan
Microphase Nano	EQUIPMENT	SERVICE		Product: Nanocarbon Synthesis Production - CVD apparatus for CNT synthesis, Thermal CVD system for CNT synthesis. Nano-carbon material (CNT, Nano-ceramic, Carbon-black fibers etc.), Nano-material, Film formation (nanoparticle, Zinc oxide formation system), Analytical, etc. Services: Analysis (TEM, SEM, EDX, RAMAN, etc.)	Phone +81-29-848-3322 Fax +81-29-848-3323 E-mail info@microphase.co.jp	http://www.microphase.jp/e_index.html	1147-9 Onigakubo, Tsukuba-city, Ibaraki
MITSUI ELECTRIC	EQUIPMENT			Product: Nanomixer - dismantles interface power of the solution electrically, and	TEL 04-7125-5761 FAX 04-7125-6105	http://www.mitsui-ec.co.jp	three 233-10 Nodashi, Chiba

				can create emulsion of the nanosize.			
MUSASHI ENGINEERING	EQUIPMENT			Product: Dispensers for low viscosity liquid materials down to 1 Nano liter quantity.	TEL. 0422-76-7111 FAX. 0422-76-7122	http://www.musashi-engineering.co.jp.e.cn.hp.transer.com	8-7-4, Shimorenjaku, Mitaka-shi, Tokyo
NAGASE & CO.	MATERIAL			Semi-conductor, visual display, photo resist, water processing. Nanomaterial's. Coatings.	+81-3 (3665) 3021	http://www.nagase.co.jp	5-1, Nihonbashi-Kobunacho, Chuo-ku, Tokyo 103-8355
NAGASE SCREEN PRINTING RESEARCH	EQUIPMENT			Product: Screen printing equipment (desktop type machine)	TEL (052) 400-1341 FAX (052) 400-7239	http://www.nagase-s-p-r.com/index.html	386-4 one, Kiyosu, Aichi 452-0931, Japan
NANO CONTROL	EQUIPMENT			Product: Piezo Position equipment: Nano Servo Stage – piezo-positioner that enables position control of the nanometer accuracy using a piezoelectric actuator and capacitive sensor.	TEL +81-3-6404-2820 FAX +81-3-6404-2822	http://www.nanocontrol.co.jp/english/index.html	6-17-17, Minami-oi, Shinagawa-ku, Tokyo 140-0013 Japan
Nano Corporation	EQUIPMENT			Small precision lathe and super-small precision milling machine for precision processing.	E-mail: info@nanowave.co.jp FAX : +81-45-791-5574	http://nanowave-mts.com	86-1 Yatsumachi Kanazawa-ku Yokohama, Kanagawa-Pref. 236-0016 Japan
Nano Frontier Technology	MATERIAL	R&D		Product: Carbon nanotubes - mass production made with CVD and ARC discharge method. Solar absorption coating, Nano-metal catalyst, Carbon nanotube dispersions, Distributed solution, etc.	TEL : 03-3493-1201	http://www.nanofrontier.com/index.html	3-10-6-105 Osaki, Shinagawa-ku, Tokyo
NanoDex	R&D			Drug deposition system, cancer treatment	TEL & FAX : 044-299-9044, E-mail : info@nanodex.jp	http://www.nanodex.jp/english/	214-0034, Japan Kanagawa Prefecture Kawasaki-Shi Tama-Ku, Mita 2-3227

NanoSystem Solutions	EQUIPMENT			Products: Maskless lithography system.	TEL : +81-42-339-8440 FAX : +81-42-339-8451	http://www.nanosystem-solutions.com/english/index2.html	1-33-3 Ochiai, Tama City, Tokyo 206-0033, Japan
N.E. Chemcat	R&D			Joint venture between BASF and Sumitomo Metal Mining Co. Products: Catalysts - containing precious metals nanoparticles (Fuel cells, chemical, etc.)	TEL : 81-3-3435-5490 FAX : 81-3-3435-5484	http://www.nchemcat.co.jp/eg/index.html	2-4-1, Hamamatsu-cho, Minato-ku, Tokyo 105-6124
NEC	R&D	PRODUCT	MATERIAL	Product & R&D: Carbon nanohorns. NEC succeeded the world's first mass production of carbon nanotubes. (1.1 kg)	TEL: +81-3-6746-1500, FAX: +81-3-6746-1520	www.nec.jp	3rd Sumitomo Fudosan Shiba bldg.F2 7-17 Shiba 1-Chome Minato-ku Tokyo, 105-0014 Japan
NEW METALS AND CHEMICALS CORPORATION	PRODUCT			Product: Nano materials - Carbon nanotubes, Graphen, Nano Amando, Nano Porous Carbon, etc. Metal powder manufacturing equipment - High-pressure nano grinding mill and High-pressure nano creating system.	Telephone: 81 (3) 3201-8600 Facsimile: 81 (3) 3271-5860 E-mail: info_nmcc@newmetals.co.jp	http://www.newmetals.co.jp/english.html	2-5, 1-chome, Kyobashi Chuo-ku, Tokyo, Japan
Nippon Sheet Glass Co.	MATERIAL	PRODUCT		One of the world's largest suppliers of automotive glazing products, world leader in float glass technology and coatings, world leader in thin display glass and optical devices for office machinery.	TEL: +81 (0) 3-5443-9500, contact on website.	http://www.nsg.com/en	Nippon Sheet Glass Co. Ltd. 5-27, Mita 3-chome, Minato-ku, Tokyo 108-6321 Japan
Nippon Steel & Sumikin Chemical	MATERIAL	R&D		Product: dye-sensitized solar cell, negative electrode material for LiB, thin films, Carbon functional material.	TEL.81-3-5207-7600 FAX.81-3-5207-7647	http://www.nssc.nssmc.com/english/index.html	14-1, Sotokanda 4-Chome, Chiyoda-ku, Tokyo 101-0021, Japan

NISSAN CHEMICAL INDUSTRIES	MATERIAL	R&D		Product: HYPERTECH (nanometer-sized spherical polymer, and acts as organic nano-particles), OPTBEADS (spherical fine particles composed of melamine-formaldehyde resin and silica), ORGANOSILICASOL (colloid that is stable in various organic solvents), NanoUse (high purity metal oxide sol using our unique innovative manufacturing technology), etc.	TEL 03-3296-8320	http://www.nissanchem.co.jp/english/index.html	7-1, Kanda Nishiki-cho 3-chome, Chiyoda-ku, Tokyo 101-0054, Japan
NISSIN ELECTRIC	EQUIPMENT			PVD Thin film coating equipment, Electron Beam Processing System equipment, Electric equipment	TEL (075) 861-315 FAX (075) 864-8312	http://nissin.jp/e/index.html	Kyoto, Ukyo-Ku, Umezu high ridge 47 Cho
NIITA CORPORATION	MATERIAL	PRODUCT		Rubber like materials for conveyer belts, tubing, various molded rubber products	E-Mail:information@nitta.co.jp, TEL: +81-6-6563-1211, FAX: +81-6-6563-1212	http://www.nitta.co.jp/en/	4-4-26 Sakuragawa, Naniwa-ku, Osaka, 556-0022
NTT Advanced Technology Corporation	PRODUCT	SERVICE		Products: Nanomaterials coatings, fiber optics, etc. Services: Environmental assessment, Semiconductor process service, nanofabrication, material analysis, technology transfer service etc.	Tel : 044-280-8811/fax: 044 - 520 - 1530	http://www.ntt-at.com	Muza Kawasaki Central Tower, 1310 Omiya-cho Saiwai-ku, Kawasaki-shi, Kanagawa, 212-0014, Japan
Onizuka Glass	R&D	SERVICE		Product: Field Emission X-ray Tube (World's first)	TEL: +81 428 31 4305, FAX: +81 428313392 Email:	http://www.onizuka.co.jp/top_ver2/english_top/index_eng.html	3-9-18 Imai Ome Tokyo, Japan

					oversea@onizca.co.jp		
Osaka Gas Co., Ltd	MATERIAL	R&D		Development of ZnO nanosheet - gas and various sensors. Titania nanotubes for electrodes.	TEL: +81-3-5722-0111, on website	http://www.osakagas.co.jp/en/index.html	1-5-20, Kaigan, Minato-ku, Tokyo 105-8527
Panasonic	PRODUCT	R&D		Product: Nanoe - nano-sized electrostatic atomized water particles that improve air quality. Own R&D facilities.	Tel. 81-6-6908-1121	www.panasonic.net	1006, Oaza Kadoma, Kadoma-shi, Osaka 571-8501, Japan
Philtech	PRODUCT	SERVICE	R&D	Product: Heat-beam CVD, Etching, Resist pattern wafer, etc. Services: consulting, planning, etc.	phone:+81-3-3868-9051 fax:+81-3-3868-9052	http://www.philtech.co.jp/index_e.html	7-3-1 Hongo, Bunkyo-ku, Tokyo 113-0033
PicoTherm	PRODUCT	SERVICE		Product: "NanoTR" and "PicoTR" thermal analysis systems for thin films (world's first analyzers to provide high precision measurements of thermo physical properties of metallic, oxide, organic and other films) Service: measurement and analysis services	TEL. +81-29-828-7540 / FAX. +81-29-828-7541, email: mail@pico-therm.com	http://www.pico-therm.com/english/index.html	2-1-6 Sengen, Tsukuba, Ibaraki 305-0047 Japan
PMT	EQUIPMENT			Product: Ultra precision components - cross roller guide stage, high precision air-slide x-y stage. (nano resolution stage)	Phone:81-92-933-3110 Fax:81-92-933-3115	http://www.pmt.com/english/index.html	1705-1 Satani, Sue, Kasuya, Fukuoka, Japan
PRIMIX	EQUIPMENT			Product: Mixer for Designing Nanometer-sized Particles (Thin-film spin system high speed mixer, Emulsifier, etc.	TEL: +81-6-6458-7531 FAX: +81-6-6458-7850	http://www.primix.jp/en/index.html	8-16-43, Ebie, Fukushima-ku, Osaka 553-0001, Japan

Quantum14 KK	R&D	PRODUCT		Development, Production and Sale of Nano crystalline silicon-based technology. Technological and knowledge transfer.	Tel/Fax +81-42-401-2691, 2692 Mail : info@quantum14.com	http://quantum14.com/english/index.html	2-24-16, Naka-cho, Koganei-shi, Tokyo, 184-0012 Japan
RESEARCH INSTITUTE OF BIOMOLECULE METROLOGY	SERVICE	R&D		BIO molecule measurement business, advanced measurement analysis, imaging, R&D	Tel: +81-29-839-4611 Fax: +81-29-839-4612	http://www.ribm.co.jp	807-133 Enokido, Tsukuba, Ibaraki 305-0853, Japan
Sakigake-Semiconductor	EQUIPMENT	SERVICE		Product: Vacuum plasma equipment, tube plasma, Powder plasma equipment, etching, etc. Services: Renting out equipment, consignment sales.	TEL : +81-75-204-9589 FAX : +81-50-3488-5883	http://www.sakigakes.co.jp/eng/index_eng.html	50, 600-8897, Shimogyo-ku, Kyoto, Japan
SAMCO	EQUIPMENT			Etching systems (RIE, ICP, DRIE, etc.), CVD systems (MO-CVD, Plasma, LS-CVD), etc.	Phone: 81-75-621-7841 Fax: 81-75-621-0936	http://www.samcointl.com	36 Waraya-cho, Takeda, Fushimi-ku Kyoto 612-8443 JAPAN
SANYU ELECTRON	EQUIPMENT			Product: Vacuum deposition equipment (sputtering, vacuum deposition, etc.), EB (electron beam) drawing equipment (test measurement, drawing, imaging).	Tel:03-3363-3551 FAX:03-3364-2892	http://www.sanyu-electron.co.jp/c/index.php	Hyakunin-Cho 1-22-6, Shinjuku, Tokyo 169-0073, Japan
Sapporo Nano-Ball Technology	MATERIAL	R&D		Product: Nano ball technology (alloy nano balls (Ni, Au, Si, Pt, etc.), catalyst ink, etc.	TEL 011-802-8030 FAX 011-802-8030 E-mail info@sapporo-nbt.com	http://www.sapporo-nbt.com/index.html	2-31 Higashi 2-Chome article 20 North, Higashi-Ku, Sapporo-Shi, Hokkaido
SCIVAX	PRODUCT	SERVICE		Product: Nanoimprinting: Lens, Nanoculture plate, Nanoimprinted film. Etching, deposition service.	nil-contact@scivax.com Phone:+81-44-599-5051	http://www.scivax.com/usa/nano_imprint_lithography.html	7-7 Shin-Kawasaki, Saiwai-ku, Kawasaki-Shi, KANAGAWA, JAPAN

SEIKA CORPORATION / Xanofi	MATERIAL	EQUIPMENT		Product: Coatings, etc. Chemical synthetic fiber manufacturing equipment, Non-woven fabric manufacturing equipment, etc.	TEL 81-3-5221-710, FAX 81-3-5221-7134	http://www.seika.com/en/	3-3-1 Marunouchi, Chiyoda-ku, Tokyo, Japan
SHIMADZU	EQUIPMENT	R&D		Scanning probe microscope, nano flow control, Particle size measurement equipment, Nano-particle diameter distribution measuring equipment, Automatic specific surface area and pore distribution analyzer.	TEL 075-823-1111	http://www.shimadzu.com	1 Nishinokyo Kuwabaracho Nakagyō-ku, Kyōto-shi, Kyōto-fu Japan
SHOWA DENKO K.K.	MATERIAL			Petrochemicals, Basic Chemicals, Functional Chemicals, Ceramics, Carbon, Aluminum, Electronics material, Advanced battery materials	TEL : 81-3-5470-3323, FAX : 81-3-3431-6215	http://www.sdk.co.jp/english/	13-9, Shiba Daimon 1-Chome, Minato-ku, Tokyo 105-8518 Japan
SIJTechnology	EQUIPMENT	R&D		Products: Super ink jet printer (0.1fl ~ 10pl), Plating primer ink, and Data generation system.	Tel:+81-29-855-7057 Fax:+81-29-855-7057 contact@sijtechnology.com	http://www.sijtechnology.com/index_e.html	AIST Tsukuba Central 5, 1-1-1, Higashi, Tsukuba, Ibaraki, 305-8565, Japan
Sketch	R&D			Development and manufacturing of nanotechnology coating using inorganic adhesive binder	Tel : 81-3-5825-6503 Fax : 81-3-5825-6504	http://www.sketch.co.jp/english/company.html	2-25-10 Asakusabashi, Taito-Ku, Tokyo 111-0053, Japan

SNT	R&D	MATERIAL	PRODUCT	<p>Special nano coatings & Thin films R&D in □Optical electronics</p> <p>Development of a flexible total-reflection mirror, Development of light-emitting devices using nano-particles, Development of organic-inorganic hybrid solar cells □ Building comfortable living environment,</p> <p>Development of a high-performance Air Filter, Development of high functional Water Filter,</p> <p>Development of active chemical sensor system,</p> <p>□easy building materials development</p> <p>Development of the electromagnetic shielding</p> <p>Development of a new sensibility chemical sensor</p> <p>□Nanotechnology</p> <p>Organic ultra-thin films and microstructure control</p> <p>Organic-inorganic composite membrane, New ultra-thin films</p>	TEL: 044-580-1566	www.snt.jp	2-7-2 Marunouchi, Chiyoda-ku, Tokyo (head office)
Soken Chemical & Engineering	PRODUCT	MATERIAL		Nanoimprinting molds, dyes, coatings, etc.	TEL +81-3-3983-3171 FAX +81-3-3988-9216	http://www.soken-ke.co.jp/en/index.html	3-29-5, Takada, Toshima-ku, Tokyo 171-8531 JAPAN
SUGINO MACHINE	EQUIPMENT	MATERIAL		Product: Biomass Nanofiber (produced by processing the material with unique ultrahigh-pressure water jet technology)	TEL: +81 765-24-5111 FAX: +81 765-24-5051	http://www.sugino.com/index-e.html	Address: 2410 Hongo, Uozu City, Toyama Prefecture 937-8511, Japan

				- cellulose nanofiber, Chitin nanofiber, Chitosan nanofiber.	Email:hq@sugino.com		
Sumika Chemical Analysis Service	SERVICE			Analytical solutions: Environmental Research Services, Electronics, Pharmaceuticals Testing and analysis, Registration application and safety assessment, material evaluation services etc.	Tel: 06-6202-1810 Fax: 06-6202-0115	http://www.scas.co.jp/english/company/index.html	Sumika Fudosan Yokobori Building, 6-17, Koraihashi 4-chome, Chuo-ku, Osaka, 541-0043, Japan
SUMITA Nanotechnologies	MATERIAL			Carbon nanotubes	TEL :06-6264-0248 FAX :06-6264-0719	www.nano-sumita.com	649-6339 Wakayama Philip West 674-20
Sumitomo Chemical	MATERIAL	R&D		Advanced organic materials, functional inorganic materials, polymer materials, basic chemicals. PLED technology, Polymer photovoltaic, energy materials	Tel: + 81-3-5543-5500 Fax: + 81-3-5543-5901	www.sumimoto-chem.co.jp/english/index.html	Tokyo Sumitomo Twin Building (East), 27-1, Shinkawa 2-chome, Chuo-ku, Tokyo 104-8260, Japan
SUMITOMO OSAKA CEMENT	MATERIAL	R&D		Advanced Materials: Nanoparticles (ZnO), Coating solutions, Functional films, Anti-bacterial agent. Optoelectronics: Ln Modulators	Optoelectronics:opto_sales@socnb.com Advanced Materials:materials_sales@socnb.com	www.socnb.com/index_e.html	6-28, Rokubancho, Chiyoda-ku, TOKYO, 102-8465, Japan
TAYCA CORPORATION	MATERIAL	R&D		Products : Titanium dioxide, Surfactants, Sulfuric acid, Micro titanium dioxide, Micro zinc oxide, Surface treatment business, Photocatalytic titanium dioxide, Titanium dioxide for shielding from infrared rays, Aluminium triphosphat, Electroconductive	TEL: +81-6-6208-6400, FAX: +81-6-6208-6420	www.tayca.co.jp/english/index.html	3-6-13 Kitahama, Chuo-ku, Osaka, 541-0041

				polymer oxidation polymerization agents, Electro- ceramic products			
Teijin	MATERIAL	R&D		Nano fiber sheets, antifoiling materials, Nano electronics, thin films etc.	Tel : 06-6268-2132	http://www.teijin.co.jp	〒541-0054 Osaka Prefecture, Osaka, Chuo Ward, Minamihonmachi, 1 Chome
TII TOKYO INSTRUMENTS	EQUIPMENT			Focuses on 3D Nanophotonis and 3D Micro/Nano-Machining. Products: Spectroscopy, Microscopy, Femtosecond laser Micro-nanomachining system etc.	TEL. +81-3-3686- 4711 FAX. +81-3-3686- 0831 E-Mail: sales@tokyoinst.co .jp	https://www.tokyoinst.co.jp/english/index.html	6-18-14 Nishi-Kasai, Edogawa-ku, Tokyo 134-0088 Japan
Tokuyama Corporation	MATERIAL	R&D		Products: Negative-type resist for electron beam lithography, Nano-filtration	On website.	http://www.tokuyama.co.jp	2-1, Kasumigaseki 3- chome, Chiyoda-ku, Tokyo 100-8983, Japan
TOKYO OHKA KOGYO TOPY INDUSTRIES	EQUIPMENT			Product: Photolithography, Photoresist, materials for nanoimprint. Coating machines, photoresist machines, vacuum hardening machines, developing machines. Etc.	TEL.+81-44-435- 3000 FAX.+81-44-435- 3020	http://www.tok.co.jp/eng	150 Nakamaruko, Nakahara-ku, Kawasaki- shi, Kanagawa, Japan map
TORAY	MATERIAL	R&D		Products: NANOALLOY® - innovative microstructure control technology (improvement of existing materials), Nanofiber - nylon nanofiber comprised of 1.4 million or more of single fibers, Nano-Laminated Film - for use	Tel: +81-3-3245- 5111 Fax: +81-3- 3245-5054	http://www.toray.com	1-1, Nihonbashi- Muromachi 2-chome, Chuo-ku, Tokyo 103-8666, Japan

				in the high-precision lamination of several different types of polymers at molecular order thickness of several nanometers.			
Toray Research Center	R&D			Morphological study, surface analysis. Structural analysis, Material Characterization, Organic analysis, Inorganic analysis, etc.	TEL : +81-3-3245-5665, FAX : +81-3-3245-5804	http://www.toray-research.co.jp/index.html	1-1-1, Nihonbashi-Honcho, Chuo-ku, Tokyo 103-0023
Toray Research Center	SERVICE			Commissioned Analysis and Research: Morphological Study, Surface Analysis, Structural Analysis, Materials Characterization, Organic Analysis, Inorganic Analysis, Environmental Analysis, Life Science, Pharmaceutical (Quantitative Microanalysis), Pharmaceutical (Stability Testing), Investigative Research.	TEL : +81-3-3245-5633 FAX : +81-3-3245-5789	http://www.toray-research.co.jp/en/	1-1-1, Nihonbashi-Honcho, Chuo-ku, Tokyo 103-0023
Tosei Electrobeam Company Limited	SERVICE			Processing technologies: electro beam and laser technologies. Welding, laser processing.	TEL: + 81-42-556-0611 (main switchboard) FAX: +81-42-556-0660	http://www.tosei.co.jp/english/index.html	651-6 Takane, Mizuho-machi, Nishitama-gun, Tokyo 190-1203
TOSHIBA MACHINE	EQUIPMENT			High Precision Aspheric, High Precision Vertical Machine, High Precision Dicing, Imprinting machines, etc.	TEL: 81-(0)55-926-5141 FAX: 81-(0)55-925-6501	http://www.toshibamachine.co.jp/en/index.html	2068, Ooka, 3, Numazu-shi, Shizuoka-ken, Japan

TECHNICAL FINE	PRODUCT			- Device development, manufacturing sales, and maintenance business that uses ESD technology - Manufacturing sales business of products that uses ESD method - Consultant business about ESD method - Manufacturing sales business of products that uses ESD method - Consultant business about ESD method	Tel +81-3-5732-1187 Fax +81-3-3758-0794 E-mail info@technicalfine.com	http://www.technicalfine.com/index.html	2-2-13 Yaguchi, Ohta-ku, Tokyo, Japan 146-0093
NANOCARRIER	PRODUCT	R&D		Drugs nanotechnology using micellar nanoparticles technology. Cancer drug deposition system. Many drugs in the pipeline.	TEL : +81-4-7197-7621 FAX : +81-4-7197-7624	http://www.nanocarrier.co.jp/en/index.html	Chuou 144-15, 226-39 Wakashiba, Kashiwa, Chiba, 277-0871, Japan
Tanaka Kikinzoku Kogyo	R&D			Precious metals company. Products: Precious metals nanoparticles for fuel cell catalysts, various colloids and other applications.	TEL:+81-3-6311-5511 FAX:+81-3-6311-5509	http://www.tanaka.co.jp/english/about/group/tkk.html	7-3, Marunouchi 2-chome, Chiyoda-ku, Tokyo (100-6422) Japan
TOSHIBA NANOANALYSIS CORP.	R&D	SERVICE		3d elemental analysis, shape observation, structure analysis, elemental analysis, micro-machining (fine particles, wafers, multilayer films) Services: Nano-structural analysis, Surface elemental analysis, Characterization of thin films, Failure analysis, Product analysis, Reliability evaluation, Ultra trace element analysis, Inorganic constituents	email: support@nanoanalysis.co.jp Phone: 045-770-3471	http://www.toshiba.co.jp/index_j3.htm	1 Komukaitoshibacho Saiwai Ward, Kawasaki, Kanagawa Prefecture 212-0001

				analysis, Analysis of organic constituents Environmental chemical analysis.			
TOSOH	MATERIAL	PRODUCT	R&D	Product: Battery materials, film deposition materials, etc.	TEL: +81-3-5427-5121 FAX: +81-3-5427-5200 sekiei@tosoh.co.jp	http://www.tosoh.co.jp	3-8-2, Shiba, Minato-ku, Tokyo 105-8623, Japan
TOYO HITEC	EQUIPMENT			Product: Steam jet mill (Lab scale), used for precision processing.	Phone:81-6-6312-4171 FAX:81-6-6312-5209	http://www.toyohi.co.jp/english/	Kita Osaka Building, 3-20 Banzai-cho, Kita-Ku, Osaka, Japan
UBE SCIENTIFIC ANALYSIS LABORATORY	SERVICE			Services offered: Organic, Polymer, Inorganic, surface analysis. Safety testing, morphology observation, physical properties.	Tel : 03-5419-6333 FAX : 03-5419-6334	http://www.ube-ind.co.jp/usal/	105-6791, Japan, Tokyo, Minato-ku, Shibaura 1-Chome 2-1
UNION	MATERIAL			Plastic products, eco-based raisin products	TEL + 81-44-755-1107 FAX + 81-44-755-6711	www.eco-pele.jp	2-3 Idasugiyama-cho, Nakahara-ku, Kawasaki City Kanagawa 211-0036, Japan
USHIO	EQUIPMENT			Product: Nano-imprint lithography technology - Allows Non-contact and Damage-free Removal of Photoresist Residue from Templates	Tel: +81 3-3242-1811 Fax: +81 3-3245-0589	http://www.ushio.co.jp/en/index.html	2-6-1 Otemachi, Chiyoda-ku, Tokyo 100-8150
Vitamin C60 BioResearch Corporation	PRODUCT	R&D		Cosmetic products containing fullerene. Company developed first fullerene-based cosmetic ingredient.	TEL:+81-3-3517-3251, on website	www.vc60.com	Tatsunuma Tatemono Bldg.9F, 1-3-19 Yaesu, Chuo-ku, Tokyo, Japan