

FOCUS ON PLASMA TECHNOLOGY



GER

BRA

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Plasma Technology and BalticNet-PlasmaTec



In addition to the fundamental importance as the so called “fourth state of matter,” plasma offers a multitude of technological applications. Plasma technology embraces a large potential of current and promising fields of application so that it has become a key technology. This technology plays an important role in e.g.:

- the automotive industry (engines with plasma based hard and low friction coatings),
- electronics (semiconductors etched by plasma),
- medicine (implants with plasma produced functional coatings) and
- the development of new materials (micro- and nano-particles modified by plasma).

Germany is one of the market leader of plasma technology alongside Japan and the United States.

The international network **BalticNet-PlasmaTec** is one of the most important European clusters in the field of plasma technology. BalticNet-PlasmaTec became an attractive platform for users and researchers during the last years. The network has reliable contacts with scientific and public facilities, as well as numerous relations to industrial partners particularly in all countries bordering the Baltic Sea, but also in Italy, Netherlands, India and Brazil. BNPT aims to open up new business fields, foster company spin-offs, and intense common marketing and research and development activities.





German Federal Ministry of Education and Research Campaign

„Scientific and technological cooperation“

Germany and Brazil have been partners in science and research for more than 40 years. Brazil is Germany's most important partner in South America, so maintaining cooperative relations between the two countries is a special priority.

Both countries will break new ground in their scientific cooperation, particularly in promising fields of the natural sciences and technology. The areas of sustainability research, environmental research and technology, production technology, biotechnology, renewable energy and energy efficiency have already been chosen as the top priorities on the joint agenda. The Brazilian side has also expressed a strong interest in strengthening cooperation in the areas of space research, nanotechnology, engineering and science communication.

The two countries plan to intensify their relations primarily through new bilateral projects and an increased number of student and researcher exchanges.

This will strengthen the international competitiveness of both Brazil and Germany and enhance the potential of both research locations.

A large number of science, education and research organizations in Germany and Brazil are partners in the German-Brazilian Year. They will organize numerous conferences, workshops and exhibitions. These measures are designed to appeal to a broader general public.

(Source:www.bmbf.de)



Germany + Brazil 2013-2014 – Where Ideas Connect

On 13 May 2013 German President Joachim Gauck officially opened “Germany + Brazil 2013-2014 – Where Ideas Connect” in São Paulo, Brazil. The “Research and University System” programme, launched on 15 May 2013 by President Gauck together with the Brazilian Minister of Science, Technology and Innovation, Marco Antônio Raupp.

With the motto “Where Ideas Connect”, Germany + Brazil 2013-2014 will strengthen German-Brazilian relations, which have a long tradition in research as well as in other areas. The initiative also seeks to raise the profile of the partnership between the two countries and provide impetus for new economic and research cooperation. Over the course of the year, the DFG and other German funding organisations are organising six events in different Brazilian cities to promote the “Research in Germany” initiative and provide information about study and research opportunities in Germany. There will also be three workshops on actual research networks and projects. “Germany + Brazil 2013-2014” is an initiative of the German Foreign Office.

(Source: www.dfg.de)

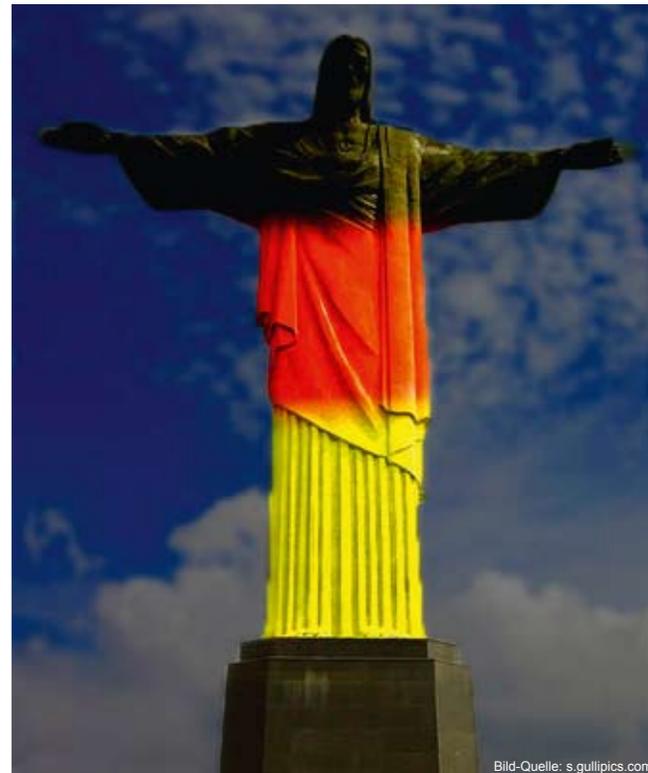


Bild-Quelle: s.gullipics.com



Workgroup Plasma and Coating

In many technical products which we encounter in everyday life, thin layers are applied during production processes and the surfaces are modified according to the requirements. Plasma processes provide new and better solutions for many questions related to materials.

Plasma processes are used as a key technology in semiconductor processing. In general, plasma allows cleaning, etching, activating, coating, or functionalising almost every kind of surfaces. The vast majority of plasma selectively changes only the top surface layer and therefore takes influence on the characteristics only in the nanometer range. In today's and future-oriented research fields, plasma technology will be a key technology and is already at a prominent place. The enormous potential of this technology is reflected in an extremely wide range of applications.

Ever greater importance is being attached to the properties of surfaces in almost all industrial branches. For the surfaces of many materials, different properties are frequently required

than the material possesses in bulk. Surfaces can be modified with various objectives using plasma processes – at the same time preserving the bulk properties of the material:

- Surfaces can be cleaned and activated
- Surfaces can be coated in order to provide new functions such as scratch-resistance, dirt-repelling or corrosion protection, or additional optical and electrical functions
- Surfaces are given chemical functions that can react chemically with other substances



Workgroup Plasma and Food

Contamination by microorganisms is a critical problem in many sectors of the food industry. Pathogenic microorganisms such as *Escherichia coli* (e.g. EHEC), salmonella, listeria, and mold and the spread of multi-resistant strains pose a substantial health risk to the consumer. One example of this is the massive EHEC epidemic in the year 2001 with 3800 cases and 53 deaths nationwide in Germany, caused by contaminated fenugreek seeds [BfR 2011].

The application of innovative plasma technology may facilitate the efficient disinfection of surfaces and thus an increase in microbiological safety.

Plasmas are ionized gases which are used in the medical, pharmaceutical, and food industries for the quick disinfection of materials and packaging. Plasma-based processes, by means of nonthermal inactivation of microorganisms, also have the potential to make foodstuffs safer and thus to reduce the risk of disease outbreaks.

Since plasma's microbicidal effects are caused by a

multitude of components, it is effective against a broad spectrum of microorganisms and, as opposed to chemical and thermal processes, products are treated gently and no residue is left behind.

Through the application of plasma sources in production processes, economic losses can be reduced or even avoided altogether. Thus, product safety and consumer confidence are increased. The corresponding lengthening of the minimum shelf-life brings economic benefits for production and handling.

(Source: www.plasma4food.de)

Workgroup Plasma and Environment

For more than a century, industrialisation has been the driving force for increased living standards. Smoking stacks of factories were the sign of the progress but the improvements in living standards due to industrialisation have not come without cost. Industry has a strong environmental impact with effects on our health and nature. As a result the negative aspects of industrialisation have started to counteract the positive aspects of living standards.

The pollution control is a transnational request of all countries. This is also reflected in the increasing tightening of the exhaust emission standards. We would like to raise wide awareness about the practical applications of plasma technology for environment protection.

Plasmas (both thermal and non-thermal) are known to be utilized for various environmental applications. These applications mostly include fields of air pollutant treatment, wastewater and drinking water decontamination, and thermal disposal of solid waste.

The non-thermal plasmas used for environmental applications are mainly high-pressure discharges, such as DBDs, pulsed corona discharges, microwave plasmas, electron beams and dielectric packed bed reactors. An increasing number of investigations are devoted to the decomposition of nitrogen and sulfur oxides in flue gases, and of volatile organic compounds (VOC) emitted from various industrial processes.

Thermal plasmas offer some unique advantages for the destruction of hazardous wastes compared to classical combustion. Thermal plasmas can easily be integrated into a manufacturing process which generates hazardous wastes, thus permitting the destruction of the wastes at the source.





BalticNet-PlasmaTec e.V.

The international network BalticNet-PlasmaTec stands for a technology and market oriented cooperation of science, research and economy in the field of plasma technology. The network supports existing and initiates new cooperations between the academic world, public facilities, private companies and individuals. BalticNet-PlasmaTec aims to increase the perception of plasma technology in the society. The network takes over coordinating tasks and realises common, in particular cross-border activities.

Technology

- Preparation and coordination of projects and cooperations
- Search for and procurement of partners from Research and Development and industry

Personnel/Organisation

- on-the-job training (learning by doing)
- Postgraduate education
- Placement for PhD students, staff exchange and traineeships

Marketing

- Technology marketing for new procedures and products
- Preparation of market and feasibility studies
- Event management and company representation at fairs

Some facts about BalticNet-PlasmaTec

- established since March 2006
- number of members: 60 (December 2013)
- members from 13 different countries
- Industry: 65%; R&D: 35%

BalticNet-PlasmaTec e.V.
Brandteichstr. 20
17489 Greifswald, Germany

Phone: +49 3834 550 102
Fax: +49 3834 550 110
bnpt@balticnet-plasmatec.org
www.balticnet-plasmatec.org



CemeCon AG

Coating Solutions for High-Performance Products

With round about 240 employees, 150 of them based in Würselen, Germany, CemeCon is one of the most successful companies globally specializing in state-of-the-art coating solutions for cutting tools and components. CemeCon is offering a comprehensive variety of services at highest level.

At the Würselen location, CemeCon operates one of the largest coating service centres in Europe and apart from that runs production sites and has licenced partners in the USA, China and the Czech Republic.

In one of the world's largest job coating service centres, CemeCon is designing and producing your coating solutions. CemeCon provides the technology required for your in-house coating solutions, including systems technology, peripheral devices and a coating plant ready for production.

Hi-tech coating solutions for precision tools and components

are the result of adapting substrate, geometry and coating material to the application and subsequent production process.

The use of PVD sputter technology and diamond coating technology in our production lines results in extremely hard, smooth and adhesive coating solutions. The result is increased performance of tools and components for almost every application. Furthermore, economic processing of modern materials is made possible.

CemeCon AG
Adenauerstraße 20 A4
52146 Würselen, Germany

Phone: +49 2405 44 70 100
Fax: +49 2405 44 70 399
info@cemecon.de
www.cemecon.de



Fraunhofer Institute for Process Engineering and Packaging

Fraunhofer Institute for Process Engineering and Packaging (Fraunhofer IVV) is a competent and professional organization that carries out contract research and development work for industry. The activities are partly supported by publicly-funded investigative applied research projects as well as by the participation in scientific, standardization and industrial bodies. We develop and optimize products and processes in the area of:

- Biogenic Raw Materials
- Functional Ingredients
- Food Processes and Products
- Food Quality and Sensory Acceptance
- Compliance of Packaging Materials
- Functional Materials
- Processing and Packaging Machinery
- Recycled Plastics

In our business units we offer our customers the use of our own patents/protection rights and provide attractive preliminary

results for new products, processes and applications. We also offer a high quality range of services based on self-developed internationally recognized methods.

Decontamination

We investigate and develop decontamination and aseptic units for their efficiency and commercial suitability as well as decontamination and quality of food.

- Microbiological investigation of packaging materials and packagings
- Microbiological investigation of food , feed, cosmetics and pharmaceuticals
- Microbiological investigation and hygiene assessment of food production and processing and filling technology
- Efficiency of antimicrobial surfaces
- Evaluation of food quality
- Evaluation of packaging quality
- etc.



Fraunhofer Institute for Process
Engineering and Packaging
Joachim Wunderlich
Giggenhauser Str. 35
85354 Freising, Germany

Phone: +49 8161 491 624
joachim.wunderlich@ivv.fraunhofer.de
www.ivv.fraunhofer.de



Fricke and Mallah Microwave Technology GmbH

We speed up your Drying and Heating Process!

Fricke und Mallah Microwave Technology GmbH was founded in 1995 by Dr.-Ing. Dirk-H. Fricke and Dipl.-Ing. Marcel Mallah.

Dr. Dirk-H. Fricke studied Electrical and High Frequency Engineering at the University of Hannover. Dipl.-Ing. Marcel Mallah studied High Frequency and Microwave Engineering at the Technical University of Brunswick. After that he worked for three years in the German oven industry, where he developed several innovative microwave oven concepts.

Fricke and Mallah GmbH is with 24 employees one of the leading German suppliers of microwave ovens for industry and research.

Microwave tunnels and chamber ovens have been built with a total microwave power up to 1 MW. The main applications for the ovens are found in the ceramic, casting, wood, food, pharmaceutical and chemical industries. To make the microwave application very effective, the development and

test of the ovens are accompanied by a close dialogue with the customer. The design of our customer specific microwave heating systems is based on the many years of experience of our development team and realistic computer simulations. The microwave generators and antennas used are from own production. A further big activity is the development of High Voltage Power Supplies, mainly Switch Mode Power Supplies for magnetrons of frequencies 915 MHz, 2.45 GHz and 5.8 GHz as well as microwave measurement equipment such as bidirectional couplers. The name Fricke and Mallah Microwave Technology GmbH stands for need-based, contemporary and sustainable solutions in microwave heating.

Main Applications:

- Drying of ceramics, casting forms and pharmaceuticals
- Microwave vacuum drying
- Plasma cleaning and coating
- Pasteurization and Defrosting of food
- Preheating of resins and wood and in pultrusion



Fricke und Mallah
Microwave Technology GmbH
Werner-Nordmeyer-Str. 25
31226 Peine, Germany

Phone: +49 5171 5457 0
Fax: +49 5171 5457 26
info@microwaveheating.net
www.microwaveheating.net



H.C. Starck GmbH
Im Schleeke 78 - 91
38642 Goslar, Germany

Phone: +49 5321 751 3753
Fax: +49 5321 751 4753
info@hcstarck.com
www.hcstarck.com

H.C. Starck

Converting knowledge into successful products and applications requires the right materials. With almost 100 years of experience, H.C. Starck is a leading premium supplier of the technology metals tungsten, molybdenum, tantalum, niobium, and rhenium, high-performance ceramics, and thermal spray powders. With innovativeness, a clear commitment to quality, and extensive technological expertise we work side by side with our customers along the entire value chain, supporting them as an expert partner in development and solution creation.

H.C. Starck's AMPERIT® powders for thermal spraying are prime examples of the high standards we set for our products. In order to meet customers' needs in coating and coating processes, we pay particular attention to the specific requirements of controlled chemistry, precisely defined grain forms and morphologies, and adjusted particle size distribution. Our brand **AMPERIT®** is known for reliable high quality and over forty years experience in the thermal

spray market. Customer-specific product solutions from H.C. Starck's unique product range are becoming increasingly indispensable for innovative applications and new markets including e.g.:

- Power Generation
- Oil & Gas
- Aviation
- Industrial applications
- Automotive
- Hard-chrome replacement

H.C. Starck's experts provide customers with technical assistance and support, and a wealth of knowledge in materials and coating technology.



INNOVENT e.V. Technology Development Jena

Surface engineering, Biomaterials and magnetic and optical systems

INNOVENT is a non-profit, industrial research association founded in 1994 in Jena, a rapidly growing high-tech area in the eastern part of Germany. With its about 160 employees, INNOVENT is one of the largest private research institutes in Germany.

Based on a profound basic research INNOVENT conducts application-oriented research and development projects, mostly in close co-operation with small and medium-sized enterprises but also with large, internationally active companies. The major research areas of INNOVENT are surface engineering, biomaterials and magnetic and optical systems. The competences and long-term experiences of our interdisciplinary and highly qualified team are bundled in 5 research departments: Surface engineering, Primer and chemical surface treatment, Magnetic and optical systems, Biomaterials, and Analytics and material testing.

Surface engineering

Focus of the department is the development of processes and equipment for the modification, coating or sterilization of various materials like metal, glass, textiles, ceramics or plastic under industrial conditions. A special attention is given to the development of CCVD, r-CCVD and plasma CVD technologies. Furthermore the classical low pressure coating processes are in the field of engagement.

The aim of our developments are

- Adhesion promotion
- Improvement of the corrosion resistance
- Increase of the aging resistance of materials and coatings
- Surface functionalization (hydrophilic, oleophobic)
- Functional optical layers (transmission increase or anti-reflex, switchable layers, photocatalysis)
- Wear and scratch resistant layers
- Barrier layers
- Tribological layers

Innovent e.V.
Pruessingstrasse 27 B
07745 Jena, Germany

Phone: +49 3641 28 2510
Fax: +49 3641 28 2530
innovent@innovent-jena.de
www.innovent-jena.de





Kiel University

The Kiel University (German name „Christian-Albrechts-Universität zu Kiel“) was founded in 1665.

Famous scientists worked in Kiel, for example Heinrich Hertz (pioneer of electromagnetism), Max Planck (originator of quantum theory), and Albrecht Unsöld (spectroscopy of stellar atmospheres).

Today, physics in Kiel is not less vivid and internationally recognized than in the past.

The department of physics is divided into the Institute of Experimental and Applied Physics and the Institute of Theoretical Physics and Astrophysics, where up-to-date and attractive research is carried out.

In the plasma groups, besides basic research, e.g. fundamentals of complex plasmas, many aspects which are important for industrial process plasmas, especially plasma-wall interactions in low-pressure plasmas, are investigated. Atmospheric pressure plasmas (‘plasma jets’) are studied, too, with respect to diagnostics and applications.

The plasma technology group applies some non-conventional diagnostics, for example calorimetric methods for measurements of the power influx from plasma on substrates, which is an important parameter for the optimization of etching and coating processes.

Recently, the group is developing techniques for the measurement of the momentum transfer to surfaces by plasmas and ion beams.

Christian-Albrechts-University of Kiel
Institute of Experimental and Applied
Physics
Leibnizstraße 11-19
24098 Kiel, Germany
Phone: +49 431 880 3872
Fax: +49 431 880 1685
kersten@physik.uni-kiel.de
www.ieap.uni-kiel.de/plasma/ag-kersten



Leibniz Institute for Agricultural Engineering Potsdam-Bornim

We develop sustainable technologies for a resource-efficient utilization of biological systems to produce food, raw materials, and energy to meet the challenges of the changing climate and global requirements. To achieve our goals we combine high quality basic research with practical applications. Our tasks include the development of processes for sustainable land management as well as innovative technical solutions for agriculture and industry.

Furthermore, we evaluate techniques and technologies in terms of functionality and impact on resource efficiency. Special focus is given to the interactions between biomass production and climate.

Our technologies developed in the context of biorefinery concepts and cascade utilization contribute to the establishment of a sustainable bio-based material and energy economy.

Founded in 1992, ATB today is one of Europe's leading research institutes in the area of agricultural engineering. With its scientific expertise in the fields of biomass, emissions, soil and water in agriculture, among others, ATB provides support for decision makers in policy, industry, and agriculture.

Our research is organized within four programs. This reflects the interdisciplinary nature and the systems approach in our research objectives.

- Precision farming and precision livestock production
- Quality and safety of food and feed
- Material and energetic use of biomass
- Technology assessment in agriculture

Leibniz Institute for Agricultural
Engineering Potsdam-Bornim
Max-Eyth-Allee 100
14469 Potsdam, Germany

Phone: +49 331 5699 0
Fax: +49 331 5699 849
atb@atb-potsdam.de
www.atb-potsdam.de



Leibniz Institute for Plasma Science and Technology

The Leibniz Institute for Plasma Science and Technology (INP Greifswald) is the largest non-university institute in the area of low temperature plasmas in Europe, including their basic research and technical applications. On the one hand, INP aims to carry out application-oriented basic research while on the other hand it aims to optimize and further develop established plasma-assisted procedures and plasma products. INP is capable of adapting plasmas to specific customer needs including services and consultations, completed by preliminary and feasibility studies. INP launches research projects starting with the concept right through to building prototypes with market needs. Current top priorities are environmental and energy engineering, surfaces and materials as well as interdisciplinary topics in biology and medicine, specially-designed plasma sources, plasma modelling and diagnostics.

INP has not only 3 700 sqm main floor space, but also 41 laboratories, a classified clean room and a microbiological

laboratory. In 2010 a new building with additional 540 sqm and 8 new laboratories was opened for interdisciplinary research. INP is organized as a non-profit organization employing 181 co-workers. Its total annual budget is approximately 13.9 million €. About 7.5 million € of total annual budget are competitively acquired third-party funds from the industry, German Research Foundation (DFG), Federal Ministry of Education and Research (BMBF) or European Union.

INP Greifswald is one out of over 86 non-university institutes of the Leibniz Association. While working strategically and oriented towards the subject, the Leibniz Association carries out research of interregional relevance which is important for the whole society. All institutes of the Leibniz Association employ about 16 800 co-workers (7 800 scientists) and have a total budget of approximately 1.4 billion €. They are jointly financed by the federal government and the federal state.

Leibniz Institute for Plasma Science
and Technology
Felix-Hausdorff-Str. 2
17489 Greifswald, Germany

Phone: +49 3834 554 300
Fax: +49 3834 554 301
welcome@inp-greifswald.de
www.inp-greifswald.de



neoplas GmbH

From science – for science – into the market

neoplas puts its emphasis on utilization and valorization of research results for industrial applications with the objective of economic success. Our clients are public research institutions and high technology companies. This is our origin and our basis of authentic experience:

- Expedient technology development
- Efficient technology management
- Effective technology marketing

Technology development

Our researchers and engineers develop prototypes and small series that will help to convince your pilot customers or investors. CE-certification, supply chain management, cost efficient construction and material selection are just a few essential aspects of early product development and pre-series production. Furthermore, we offer contract research like plasma process development (coating, decontamination etc.) or surface modification (activation, enzyme

immobilization, functionalization etc). Self-evidently, we design, develop and build individual complex plasma systems perfectly tailored according to your individual needs for low or atmospheric pressure.

Technology management

Our goal is to identify, qualify and utilize scientific knowledge and technologies to optimize the economic and scientific success of your research. We select from a broad range of possible technology transfer potentials to find the best fit for your individual purposes, covering the entire value chain from lab to end user. We involve the experts who are familiar with your target markets and suitable methods or processes such as: pre-project coordination, public funding, contract research, patent and contract management, entrepreneurship & coaching - whatever is required, we will provide it. The services neoplas provides, will guide our clients through a smooth transfer process. Our experience will enable you to concentrate on your core interests, avoiding the many pitfalls one encounters during the process.

neoplas GmbH
Walther-Rathenau-Str. 49a
17489 Greifswald, Germany

Phone: +49 3834 515 210
Fax: +49 3834 515 209
contact@neoplas.eu
www.neoplas.eu



PlaTeG GmbH

Gear wheels of wind turbines, forging dies, tools and wear parts are subjected different conditions in daily use which make high demands on wear resistance, corrosion resistance and temperature stability of the components. Without a proper heat- and surface-treatment these components would not survive such complex loads for a longer time. The PlaTeG's PulsPlasma®-treatment for such devices , as an energy-and resource effective surface heat treatment process for increasing the wear and corrosion resistance, is getting always more importance as an alternative to case hardening.

Based on more than 25 years of experience the PlaTeG GmbH produces equipment for PulsPlasma® -surface treatment of components made of steel, cast iron and sintered iron as market leader in this field . By means of the special PulsPlasma®-technology surfaces of components can be hardened and refined in a way, that wear and corrosion is reduced and the component life time can be extended.

PlaTeG's Low-pressure plasma plants with medium frequency-, radio frequency- or microwave stimulation can be used to activate and clean plastic, metal and textile surfaces to improve the adhesion of paintings, printings or the connection by adhesion between surfaces.

PlaTeG - Be equipped for tomorrow's Plasma Surface Technology!

- Plants for PulsPlasma®-Nitriding/-Nitrocarburising, PulsPlasma®-Oxidation for wear and corrosion protection,
- Plants for Plasma Activation of polymer and metal surfaces for surface degreasing and improvement of wettability, varnishability and bondability,
- Plants for Plasma Sterilisation of medical components.

PlaTeG GmbH
Industriestrasse 13
57076 Siegen, Germany

Phone: +49 271 772 410
Fax: +49 271 772 4133
service@plateg.de
www.plateg.de





RAFFLENBEUL ANLAGENBAU GMBH

Profile

Since 1986 the engineers and technicians of Rafflenbeul develop cheap and sustainable solutions for waste air purification, odour abatement and energy efficiency improvement of production processes. With several research projects it was possible to extend Rafflenbeul's lead in purification technologies that outrun the state of the art.

Non-Thermal Plasma Plants

After 15 years of research and continuous improvement the plasma systems of Rafflenbeul are applied especially for odour abatement for instance in the food industry and in the factories of flavour fabricators. The plasma units eliminate the smell of cat food production as well as Chanel No. 5 but non-thermal plasma also can be used for dispelling pollutants like formaldehyde and hydrogen sulphide.

Molecular Sieve Buffers

Molecular sieves are incombustible minerals which can buffer solvent emissions in their microstructure.

This natural characteristic of the molecular sieves was improved by Rafflenbeul by hydrophobizing and pelletizing. Today the molecular sieve buffers of Rafflenbeul are applied in the printing and coating industry as well as in the factories of car and plain manufacturers, rubber fabricators and adhesive processors worldwide.

Duplex Systems

A duplex system is a combination of molecular sieve buffer, rotary concentrator and combustion plant. The buffer is used for ensuring that the rotary concentrator is always fed with the same solvent emission for avoiding fires and explosions. The rotary concentrator increases the solvent concentration of the emission up to an exactly defined maximum. This high concentrated waste air is passed to the combustion unit connected downstream. In the course of combustion so much surplus energy (heat) is generated that this extra energy can be used for running production machines or for heating the factory or even for cooling the factory by applying an absorption chiller in addition.



RAFFLENBEUL ANLAGENBAU GmbH
Voltastraße 5
63225 Langen, Germany

Phone: +49 6103 300 978
Fax: +49 6103 280 665
rafflenbeul@envisolve.com
www.envisolve.com



Roth & Rau AG

Innovative products and technologies for future orientated applications

The company was found under the name of Roth & Rau Oberflächentechnik GmbH in 1990 and was formed into a stock corporation – the Roth & Rau AG – In 2001. It was the goal of the founders Dr. Dietmar Roth, Dr. Bernd Rau and Dr. Silvia Roth to turn the knowledge on plasma technologies that was gained during their academic studies at the Technical University of Chemnitz into saleable products. During the 90s Roth & Rau developed customer tailored equipment for plasma and ion beam enhanced thin film deposition and surface treatment for the semiconductor and optical industry and manufactured then for research and dedicated industrial applications.

It's been going on for more than 10 years that Roth & Rau is focused on development and manufacturing of plasma process systems for photovoltaics industry and belongs to the worldwide leading providers in this area.

Roth & Rau and his subsidiaries employ around 800 employees worldwide. Furthermore since 2011 Roth & Rau belongs to Swiss Meyer Burger Group. Meyer Burger is also acting in business area of manufacturing equipment for photovoltaics industry and employs around 2000 employees overall.

The core competence of Roth & Rau consists in the area of creation and utilization of plasmas for the coating, structuring or modification of surfaces where the systems engineering and the process know-how are continuously further developed in the own technology center as well as in close cooperation with national and international research institutions.

Roth & Rau AG
An der Baumschule 6-8
09337 Hohenstein-Ernstthal, Germany

Phone: +49 3723 671 234
Fax: +49 3723 671 1000
info@roth-rau.com
www.roth-rau.com



Schaeffler AG
Industriestraße 1-3
91074 Herzogenaurach, Germany

Phone: +49 9132 820
Fax: +49 9132 824 950
info@schaeffler.com
www.schaeffler.com

Schaeffler AG

Together we move the world

Schaeffler is a leading manufacturer of bearings worldwide, as well as a renowned supplier to the automotive industry. The globally active group of companies generated sales of approximately 11.1 billion euros in 2012.

Schaeffler has about 78 000 employees and is present at 180 locations in over 50 countries. Schaeffler has been present in South America for 55 years and owns a plant in Sorocaba in the State of São Paulo. It is an important factory site, where Schaeffler brings together engineering, development, production, sales, aftermarket operations and the corporate functions of the INA, FAG and LuK brands. In addition to its Brazilian plant, Schaeffler South America also has sales offices in Argentina, Chile, Colombia and Peru.

Approximately 6 000 employees at 40 R&D locations, including 16 R&D centers, develop new products, technologies, processes, and methods for solutions that are

tailored to the market. Schaeffler is among the innovation leaders in industry with more than 1 850 patent registrations annually, and currently over 18 500 effective patents.

Schaeffler is a recognized development partner to the automotive industry, with systems expertise for the entire drive train – this includes the engine, transmission, and chassis. The Industrial Division supplies rolling bearing and plain bearing solutions, and linear and direct drive technology under the INA and FAG brands for around 60 different industrial sectors via its worldwide organization with market proximity and application support service.



University of Greifswald, Institute of Physics

The University has a strong background with respect to the Baltic sea region, in life sciences and in plasma physics. The Institute of Physics presently provides a diploma degree (Diplom-Physiker) in physics that, in the context of the Bologna process, is replaced by a bachelor/master programme in physics beginning at the end of 2006. It closely cooperates, e.g., with the Institute of Low Temperature Plasma Physics Greifswald (INP) and with the Max-Planck-Institute for Plasmaphysik Greifswald/Garching (IPP), with the Gesellschaft für Schwerionenforschung in Darmstadt (GSI), with the University of Kiel, with the European Centre for Nuclear Research in Geneva (CERN), and with the European Space Agency (ESA).

The Institute of Physics is involved in two major national research activities – so-called Sonderforschungsbereiche funded by the German Research Council (DFG). SFB/TR 24 together with the University of Kiel and with INP Greifswald and IPP Greifswald is devoted to “Fundamentals of Complex Plasmas”, while SFB 652 together with the University of

Rostock is focused on „Strong correlations and collective effects in radiation fields: Coulomb systems, clusters and particles“.

Major fields of research:

Applied Physics

- Soft matter
- Signal processing

Experimental Physics

- Low temperature plasma physics
- Thin film deposition and deposition of nano-size clusters
- Fundamentals and applications of dusty plasmas
- Ion cluster traps and precision mass spectrometry

Theoretical and Computational Physics

- Solid state theory
- Complex quantum systems
- Dense plasmas
- Computational materials science



University of Greifswald
Institute of Physics
Felix-Hausdorff Str. 6
17489 Greifswald, Germany

Phone: +49 3834 86 4780
Fax: +49 3834 86 4701
hippler@physik.uni-greifswald.de
www.physik.uni-greifswald.de



CLARANOR

Since 2004, Claranor has established itself as an international leader of clean sterilization technologies.

Claranor, a young innovative and regularly awarded company, has gathered the necessary skills to bring pulsed light technology to an industrial level: microbiology, optics, electronics, engineering.

We work for beverage and dairy products manufacturers, to provide them efficient and cost effective solutions for inline packaging sterilization (closure, cup, preform neck). Using no water nor chemical disinfectants, pulsed light by Claranor is a clean and valuable alternative to chemical or irradiation technologies.

Our customers are food manufacturers, and equipment suppliers, able to integrate the Claranor technology into a complete production line. Claranor machines can, thanks to their compactness, can be integrated on new lines or in retrofit on existing lines.

We have established partnerships with renown experts in our fields of competence, who accompany and advise us in specific pulsed light applications developments. Among these, INRA in microbiology, and CNRS in optics and electronics are privileged partners. Both are reference research centers in France.

Research and development constitutes a large part of our activity; two PhD thesis have been led from 2008 to 2011 (with INRA and Rouen University).

Every validation and qualification trials is realized by independent laboratories, specialists in the assessment of decontamination technologies (Fraunhofer Institut IVV, Germany).

CLARANOR
Chemin de la Rollande
Agroparc, BP 21531
84916 Avignon cedex 9, France

Phone: +33 4 86 40 84 60

info@claranor.com
www.claranor.com



BoostGreen

“BoostGreen” is a startup project aimed at developing renewable energy production in Brazil through the cooperation with Germany. Main focus of our project is bringing new technologies to boost use of solar energy in Brazil and offer German companies an access to a new and fast growing market. Main aims of our project are following:

- Reduction of CO2 emission through development of e-mobility and increase of industrial use of solar energy;
- Implementing a mobile system “pay-as-you-go” for off-grid use of solar energy for low-income families;
- Achieve increase in use of solar panels in new houses to boost energy efficiency;
- Support continues development of solar panels technologies through synergy of German and Brazilian know-how;
- Make accessible use of solar energy for most households;
- Boost service sector to enable increase in consumption of solar energy

Mission

- To promote the use of green technology in Brazil and to provide low cost energy, lowering energy costs to both consumers and business;
- To provide a gateway to German Green Technology manufacturers into the Brazilian energy market;
- To liaise with research bodies in Brazil and Germany to facilitate cooperative research in the development of green energy solutions;
- To promote the use of clean innovative transportation technologies such as solar vehicles (E-Mobility).

Vision

To develop joint low cost solar panels production in Brazil and provide electricity in every home.

BoostGreen
Alina GILMANOVA
Rua vera cruz 164 - Jd. Nova Europa
Campinas-SP 13040125, Brazil

Phone: +55 19 98259 1016

alina.gilmanova@boostgreen.com
<http://boostgreen.com>

Centro de Referência em Informação Ambiental

The Reference Center on Environmental Information, CRIA, has as its mission the dissemination of scientific and technological information and the promotion of education with a view of contributing towards a more sustainable use of Brazil's natural resources. CRIA's activities are focused on the development of software tools and information systems to support the open access dissemination of Brazilian biodiversity data and information. Working in collaboration with more than 300 networked scientific collections/data providers from distributed institutions in the country and abroad, CRIA is contributing to the use of informatics to enable the biodiversity science-policy interface in Brazil.

CRIA's target users include:

- Scientific community
- Educators
- Policy and decision makers

CRIA's staff has been involved with structuring biodiversity/environmental information online since 2000.

Main on-line information systems, computational tools and webservices include:

- speciesLink, the Brazilian network of biological collections
- openModeller, an ecological niche modelling platform
- BioGeo, for the analysis of plant species biogeography
- Lacunas, gap analysis reports
- Flora brasiliensis on-line
- Bioline International Publications



Centro de Referência em Informação
Ambiental CRIA
Av. Romeu Tórtima, 388, Barão Geraldo
13084-791 Campinas SP, Brazil

Phone: +55 19 3288 0466

Fax: +55 19 3249 0960

www.cria.org.br



PALICUREA



Fraunhofer Project Center

The Fraunhofer Project Center for Innovation in Food and Bioresources at ITAL (FPC) in Campinas-SP/Brazil, founded in December 2013 was created in the frame of the cooperation between the Fraunhofer Institute for Process Engineering and Packaging - IVV in Germany and the Instituto de Tecnologia de Alimentos do Estado de São Paulo (ITAL), located in Campinas-SP /Brazil.

Researchers of both institutes and other R&D institutions will promote scientific collaboration in the following research fields:

- Energy and Materials from Renewable Resources
- Innovation in Packaging Systems
- Funtionality, health and nutricional aspects of food
- Quality and sensory aspects of food.

The main focus of the FPC is to establish a culture of applied research and development that is driven by innovation with

the aim to increase the value added across integrated food and bioenergy production chains. To reach this aim, new partnerships and functional networks between Brazilian and German research institutes, universities and industrial partners have been created.



Instituto de Tecnologia de Alimentos
Fraunhofer Project Center
Eng. Alexandre Martins Moreira
Avenida Brasil, 2880 Jardim Chapadão
Caixa Postal 139, CEP: 13070-178
Campinas-SP, Brazil

Phone: +55 19 3743 1800 - ITAL
Phone: +55 19 3743 1896 - office



Instituto Tecnológico de Aeronáutica

ITA is a federal government institution dedicated to provide high level education and research in Science and Technology areas of interest to the aerospace sector in general, and especially to the Aeronautical Command.

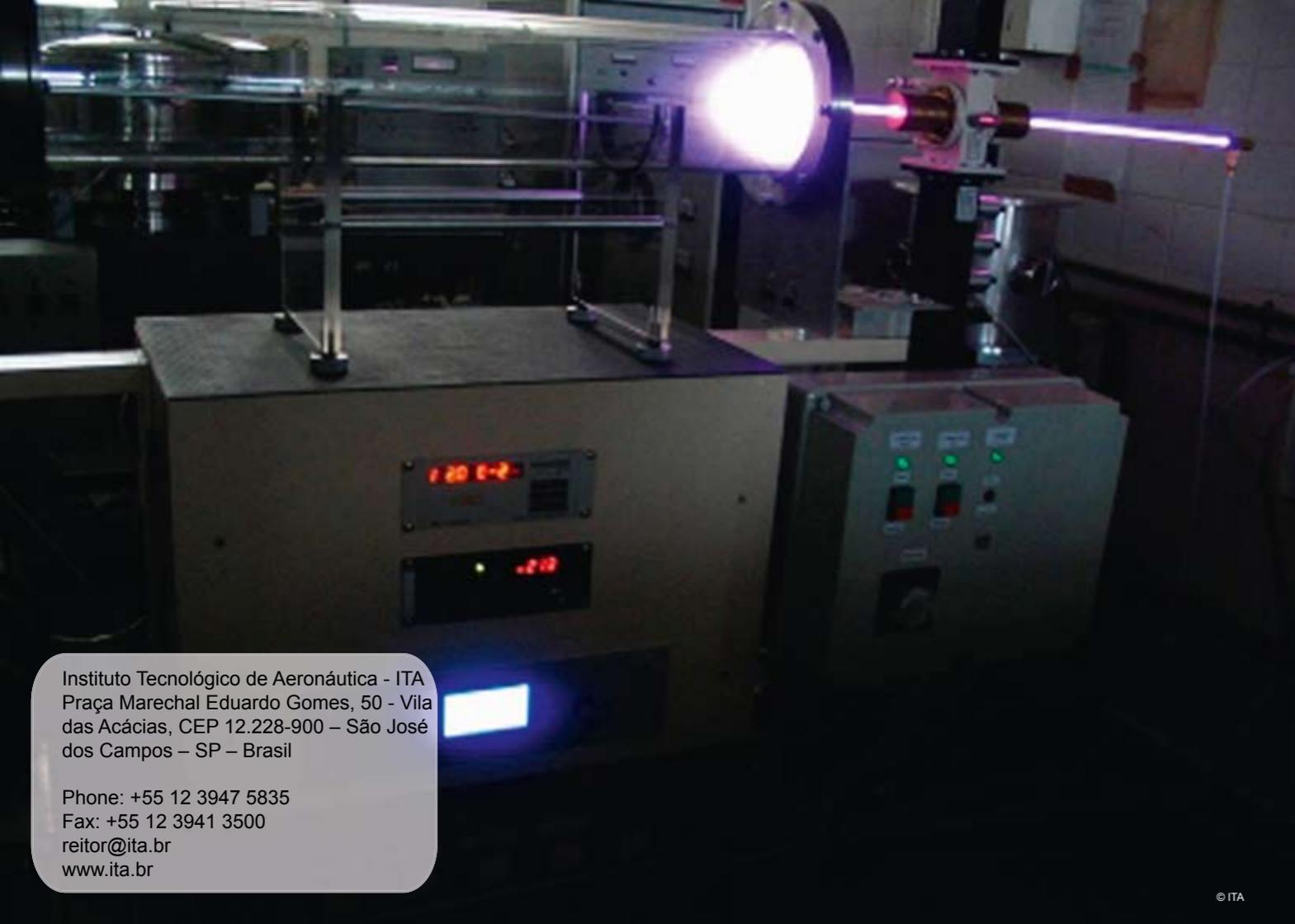
Created in 1950, by inspiration of Air Force hero Casimiro Montenegro Filho and intense international cooperation, ITA has a tradition in pioneering experiences in engineering-related education in Brazil.

Rated one of the best academic institutions in Brazil in engineering and related fields, ITA offers regular undergraduate courses in engineering, and graduate programs leading to the degrees of Master and Doctor. Extension and specialization courses are also offered according to market demands.

Main Research Areas

- Aero & Mechanical Engineering
- Air Infrastructure Engineering
- Computer & Electronic Engineering
- Physics (Atomic & Molecular, Nuclear, Plasma)

Established as the first Institute of the Aerospace Technical Center (CTA), ITA is considered to be the cradle of the modern Brazilian aerospace industry. Located in São José dos Campos, in the State of São Paulo, the CTA campus composes four institutes and spreads over a large area including teaching and R&D laboratories as well as a complete residential facilities for students, professors, researchers, and other professionals.



Instituto Tecnológico de Aeronáutica - ITA
Praça Marechal Eduardo Gomes, 50 - Vila
das Acácias, CEP 12.228-900 – São José
dos Campos – SP – Brasil

Phone: +55 12 3947 5835
Fax: +55 12 3941 3500
reitor@ita.br
www.ita.br



Laboratório Associado de Plasma - LAP

The Associated Plasma Laboratory (LAP) of the Special Technologies Center (CTE) of the National Space Research Institute (INPE), is devoted to investigating plasma and its many applications.

The Plasma Laboratory was established in 1978, becoming the first Associated Laboratory of the INPE in 1986. During the past two decades LAP has been recognized by the quality of various experiments and activities carried out in such diverse areas as: 1) simulation in the laboratory of space plasma phenomena; 2) development of plasma technologies for ion propulsion, isotopic enrichment and surface processing of materials; 3) fusion plasma research, including the development of a spherical torus for magnetic confinement studies and high-power microwave sources for plasma heating experiments, as well as the implementation of plasma diagnostic techniques.

Three major areas of research and development: **Basic Plasma Physics, Plasma Technology** and **Fusion Plasmas**.

Plasma technologies have fundamental importance in the modern electronics, aerospace, metallurgical, biomedical and waste treatment industries. Many of the plasma processing applications were developed in recent decades, with new industrial results that can only be achieved using plasma-related methods. Plasma applications are also becoming increasingly important because, in many cases, they reduce waste production and energy consumption in major industrial processes.

Technological oriented experiments at LAP

LAP is concerned with research and development of plasma, radiation and ion sources for several applications:

- Isotope Separation
- High Power Microwave Sources
- Electrostatic Propulsion
- Plasma Processing

Laboratório Associado de Plasma
Av. dos Astronautas, 1758 - Jardim da
Granja, 12227-010 São José dos Campos,
SP, Brazil

Phone: + 55 12 3945 6695
Fax: + 55 12 3945 6710
ueda@plasma.inpe.br
www.plasma.inpe.br



SURFACE – LTDA

Innovative business with smart solutions

Who we are

A spin off company founded to bring innovative spirit in Brazilian industries with plasma technology solving problems as surface activation, organic contamination removal, improving coating process (bonding, printing, protective, etc).

Innovation is the DNA of the company being pioneer in plasma surface treatment in Brazil offering efficient and simple solutions.

What we do too

As a research-friendly company we produce science in different areas developing plasma application in the follow fields:

- Medical
- Photovoltaic
- Dental

- Biopolymers
- Automotive
- Metallic corrosion

Products that we have

We are able to understand industrial difficulties process, evaluate a solution and build it. Using cold atmospheric plasmas as our platform, we work with: Argon plasma jets to laboratory investigation, air plasma nozzle to surface activation, parallel plate to sheet or gas processing and big linear air plasma systems for continuous production.

Business model

Created the industrial application, we prove the technology concept in our application lab and build a personalized equipment to each need.



Surface LTDA
Rua Lauro Vannucci, 1020 Jardim Sta.
Cândida - Campinas, SP, Brasil

Phone: +55 19 3756 5433

contato@surfacebrasil.com.br
www.surfacebrasil.com.br





Universidade do Vale do Paraíba

The University of Paraíba Valley (Universidade do Vale do Paraíba - Univap) is a major university, recognized by the Ministry of Education, located in São José dos Campos in the state of São Paulo. Univap is a benchmark of excellence in education / teaching.

In 40 years, Univap has involved from a small, local law school into a major, multifaceted university of quality and renown.

The history of Univap begins with the establishment of the Valeparaibana Teaching Foundation (FVE). The initiative came from prominent community leaders who were concerned not only about with creating a trained labor force but with improving the local educational and cultural life and contributing to the city's progress.

Later, other courses were added to the curriculum and, in 1982, the FVE was restructured to become the Faculdades Integradas de São José dos Campos. Ten years later, in April 1992, the expanded educational facility was given "university" status and rechristened as Univap.

With regard to higher education, the following colleges were created: Faculty of Economics and Administrative Sciences of the Paraíba Valley (1961), Faculty of Philosophy, Sciences and Letters (1966), the Faculty of Engineering of São José dos Campos (1967), Faculty of Architecture and Urbanism (1969) and School of Social Work (1969).

Mission Univap

- education, in all areas of knowledge, and in all levels of education;
- research, science and technology, development and scientific and technological innovation, including in productive and social environment, seeking to transform knowledge into national wealth;
- area of extension, interacting with society, private and public initiative to meet social demands and to bring knowledge to society as a whole.

Universidade do Vale do Paraíba
Pç. Cândido Dias Castejón, 116 – Centro
CEP: 12245-720
São José dos Campos – SP Brasil

Phone: +55 12 3928 9800

www.univap.br



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BalticNet-PlasmaTec Contact



Alexander Schwock
BalticNet-PlasmaTec e.V.
Brandteichstrasse 20
17489 Greifswald, Germany

Phone: +49 3834 550 102
Fax: +49 3834 550 110

bnpt@balticnet-plasmatec.org
www.balticnet-plasmatec.org

Skype: [schwock_bnpt](#)



Katherina Ulrich
BalticNet-PlasmaTec e.V.
Brandteichstrasse 20
17489 Greifswald, Germany

Phone: +49 3834 550 105
Fax: +49 3834 550 110

ku@balticnet-plasmatec.org
www.balticnet-plasmatec.org

Skype: [ulrich_bnpt](#)



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BRA