PLASMA PROMETEO

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UNIVERSITÀ DEGLI STUDI DI MILANO BICOCCA

PLASMA PROMETEO

Creating Know-How, developing new technologies for materials, environment and energy

PlasmaPrometeo

Center of Excellence for the research & development and technological transfer of in the field of Plasmas

PLASMA PROMETEO

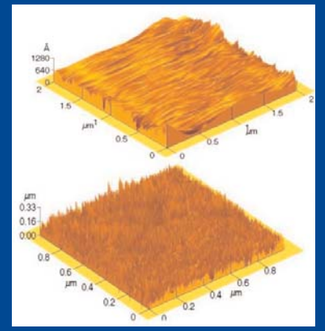
To create know-how and increase value of scientific research by developing new technologies in the field of plasmas.
To sustain the scientific progress by promoting the technological transfer of new processes and novel methodologies to industry. To build up the synergy between university and industry to support the competitiveness of companies and technological advance of the country. To form qualified staff for the highly specialized technology sector and transfer new expertise to industrial companies.

Plasma Prometeo

The Centre of Excellence PLASMAPROMETEO was established on February 12 th 2004 on the basis of an agreement between the University of Milano-Bicocca and the Regione Lombardia and with the contribution of Fondazione Cariplo. The aim of PlasmaPrometeo is to direct the institutional research in support of companies by providing them with the knowledge and the most advanced results of the Plasma Physics Research Group of the Physics Departement at University of Milano-Bicocca.
PlasmaPrometeo disposes of the most advanced equipment:

- Plasma reactors working both at low pressure and atmospheric pressure
- Process control systems
- Plasma diagnostic systems
- Instruments for the chemical and physical analysis of materials and gases (NMR, IR, EPR, contact angle, surface energy, AFM, GC).
- Ionic implantation system and nanoscale surface manipulation (Dual Beam Device FIB/SEM)
- Theoretical models for deposition and plasma discharges simulations.

PlasmaPrometeo provides an information system for enterprises and technological transfer and an interactive web portal with a complete database (www.plasmaprometeo.unimib.it). PlasmaPrometeo activities of research, technological transfer and demonstration projects are presently financed by European, national and regional fundings, and a self-financing status, supplemented by co-fundings from industry, is envisaged for the near future.



Materials

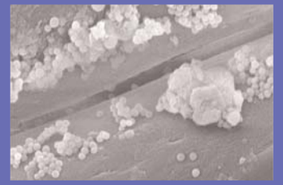
Plasma processes can be successfully applied for surface modifications within scales ranging from nanometers to microns.
The modified materials, while keeping their original bulk properties (such as mechanical resistance, flexibility, hardness, dielectric properties, etc.) can be employed in novel technological applications that can work far beyond the limitations of the original substances.



Plasma processes

- Thin film deposition of organic (similar to conventional polymers) or inorganic (metal oxides and semiconductors) origin.
- Grafting of functional groups. Surfaces can selectively react to specific environment conditions.
- Etching of surface layers of organic or inorganic substrates, composite materials and semiconductors (microelectronics).
- Activation and cross-linking of the substrate for specific reactivity to environment.

Several surface properties can be achieved: hydrophobic or hydrophilic characters, oil repellency, adhesion, gas barrier, aromatic compound barrier, UV barrier, surface roughness and acid-base properties.




Plasma technologies

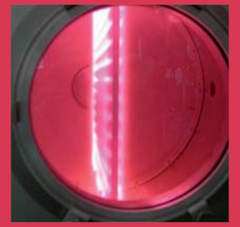
The applications of plasmas have a great technological impact for the development of new materials, for the energy and environment.
Plasma technologies are highly innovative, they generate new products and represent also an alternative to other methods which employ large amount of water and chemical products which are harmful for the environment.
Plasma applications include several fields as: textile, packaging, paper industry, pharmaceuticals, food, cultural heritage, environment and energy.

Technological transfer

One of the main goals of PlasmaPrometeo is to promote the technological transfer to industry and medium/small-size enterprises. The activities of Center are oriented towards the problematics of a company and its needs. It becomes therefore a 'partner' in the research and development of new technologies and of their actual implementation for the market.

Services

- Services for companies and medium/small-size enterprises: collaborations and research contracts for feasibility studies, technology developments, chemical and physical analysis of materials and technology transfer support.
- Access to the patent portfolio of PlasmaPrometeo (www.plasmaprometeo.unimib.it)
- The University of Milano-Bicocca is an organization authorized by the Regione Lombardia to provide technological vouchers: Medium/small companies can therefore resort to the center services for Research and Technological Innovation (patent applications, research positions, etc.)




Environment and Energy

The Center PlasmaPrometeo is at the forefront of plasma applications for the treatments of hazardous volatile compounds derived from industrial processes and for development of new energy production methods with low environmental impact.
In plasmas complex hazardous molecules can be treated and reduced into simpler and inert elements. PlasmaPrometeo also carries on research activity for hydrogen production with plasma treatments of natural gases.

Cultural heritage

Plasma technology finds quite innovative applications within the realm of cultural heritage for the conservation of perishable materials, such as wood or paper, of particular historic and artistic importance. The plasma treatment provides the object surface with an increased water and bacterium repellency, thus reducing in this way the possibility of material degradation due to chemicals, such as acids, and atmospheric and bacteriological pollution, such as fungi and bacteria.