
PROGRAMMA INTERREG V A Italia – Austria 2014-2020

Progetto ITAT1010 ICAP –

"Innovazione tramite applicazioni combinate delle tecnologie al plasma" -

"Innovation durch kombinierte Anwendungen von Plasmatechnologien"



WORKSHOP ON PVD :

State of play and challenges ahead

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delle tecnologie al plasma"**

**"Innovation durch kombinierte Anwendungen
von Plasmatechnologien"**

Interreg
Italia-Österreich
European Regional Development Fund



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- ***W3C - St. Veit:***
Wood Carinthian
Competence Center
**Surface Technology &
Logistics**



- ***Certottica – Longarone:***
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certification of optical
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Partner:



- **Consorzio Innova FVG**
Scientific and Technologic Park.



- **MCT – Material Center Tirol**
Dept. of Innsbruck University, Institute for Construction and Materials Technology

Plasma: many technologies for surface treatments



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Different plasma technologies

- **Plasma coating** is used to produce high-quality tools and construction materials and for the surface-finishing of plastics and textiles;
- **Plasma cleaning and etching** help to produce new generations of chips for high performance computers, to make energy-saving and environmentally friendly plasma lamps, to synthesise new materials with specially designed utility value, and to dispose of or recycle toxic substances and waste materials.

ICAP Project : scopes

- Identification of the SME's needs of the program area
- Perform experimentations
- Dissemination, information and advertising of studies and results.

Plasma technologies: we are still at the beginning of the story

- **The many degrees of freedom in a plasma**
- **the large choice of process gases**
- **the huge number of adjustable parameters**
- **the innumerable possible reactor geometries**

are the reason why product and process innovations cannot be achieved without a considerable effort in the form of research and development (R & D) work.

Importance of plasma technologies

- **Plasma technologies are technologies of the future, since can make an important contribution to sustainable growth, innovation, and new products.**
- **More and more products are appearing whose astonishing properties are born in plasma processes that selectively influence the molecular structure of the component material.**

Plasma technology

- **Plasma technology is reflected in applications that are today already making our daily lives more convenient and healthier.**



The importance of surface treatments

- **Surface treatments are important because enable to decorate, protect and give to the substrates the desired physical, chemical and mechanical properties:
plasma technologies allow to modify the surface characteristics with hi-tech and eco-friendly processes.**

Importance of surface

- **Surface is representative of product properties:
is content protection or protect from content.**



Surface can produce illusions or rejection

The appeal of an object is strongly conditioned by the appearance: a positive feeling brings us closer to the object while a repellent aspect leads us to refuse it.



- Functional applications are not so much in evidence for the end users, but PVD applications play a central role in the innovations. For example in the engine and transmission for vehicles plasma-hardened materials yield reduced friction in operation, thus improving the efficiency hence reducing fuel consumption.

Focus on PVD

- There are important applications of PVD technology surface treatments in the medical and health sector: coatings, some consisting of bone-like ceramics, can be deposited to improve the rooting of the implant in the bone tissue.



Focus on PVD

PVD can provide both functional and aesthetical properties but there are limits concerning brightening and corrosion resistance.





Scope of this workshop is monitoring the development of PVD applications to metal and plastic and to weigh up the situation.