

» Smilab: Research & Technology Transfer Center

SMILAB was founded in San Giovanni Bianco (Bergamo) in 2008 as spin-off of Smigroup Research and Technology Department. SMILAB is a Research and Technology Transfer Center (CRTT) recognized by Lombardia region and entitled to award grants. SMILAB is associated with AIRI (Italian Association for Industrial Research), Eupolis Lombardia (Higher research, statistics and training institute), QuESTIO (Quality Evaluation in Science and Technology for Innovation Opportunity) and Nanotec IT (Italian Institute of Nanotechnology). SMILAB aims at strengthening the cooperation between the research and the industrial fields through the transfer of technologies developed by its own laboratories and the achievement of combined projects. SMILAB activities involve the PMI sector above all and cover three main areas:

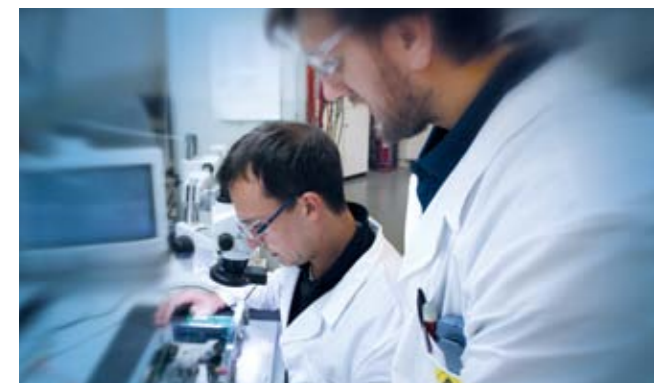
- Applied Research & Technological Innovation
- Facilitated Financing & Business Services
- HR Training & Events.

SMILAB commits itself to the research, the design and realization of advanced solutions in the fields of:

- Modeling and simulation of products and processes
- Mechanical and kinematics design
- Feasibility studies and design specifications
- Structural analyses with explicit and implicit methods
- Static and dynamic measuring of complex structures
- Prototype experimentation with pilot plants for testing new machinery
- Static and dynamic characterization of synthetic materials and metallic composites
- Introduction of new systems and products on the market
- Environmental control and home automation systems
- Photovoltaic systems and renewable energies
- IT, automation softwares and HMI
- Data collection and supervision softwares
- Integration softwares between systems and communication networks
- WEB, WEB 2.0 solutions and integration between management softwares
- Software testing
- Electronic systems for industrial automation
- Field-bus interface firmwares
- Pre-compliance emissions and disturbance immunity testing (EMC) for small devices



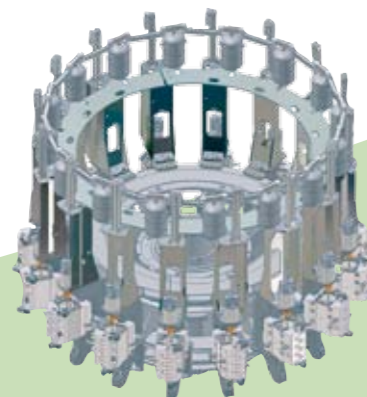
Most research and innovation projects SMILAB undertakes on behalf of its customers benefit from huge public fundings allocated by Lombardia region, CESTEC (Centre for technological development, energy and competitiveness), MIUR (Ministry of Education, University and Research), the Ministry of Economic Development and various UE corporations and organizations. SMILAB closely cooperates with universities, Italian and European research centres (CNR, Polibrixia, Fraunhofer Institute), trade associations, public corporations and private enterprises.



SMILAB laboratories are provided with high-tech equipment, tools and devices which enable the realization of studies, analyses and tests in the fields of applied research and development of advanced products.



SMILAB undertakes multidisciplinary projects in various fields with the aim of developing an innovation culture and a top-level technology.



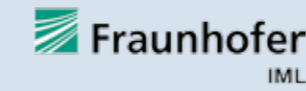
smilab partnerships



UNIVERSITA' DEGLI STUDI DI BERGAMO



CONSIGLIO NAZIONALE RICERCHE



Fraunhofer IML



UNIVERSITA' DEGLI STUDI DI BRESCIA



POLITECNICO DI MILANO



CSMT GESTIONE

smilab associations



Airi ASSOCIAZIONE ITALIANA PER LA RICERCA INDUSTRIALE



nanotec IT



BERGAMOSCIENZA



Eupolis Lombardia



poliBrixia

ASSORICERCA

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Research & Technology Transfer Center

Laboratories accredited by:



Regione Lombardia



QuESTIO



Research & Technology Transfer Center

Laboratories accredited by:



Regione Lombardia



QuESTIO

- » Research & Innovation
- » Green Solutions, Biopolymers & Packaging
- » Subsidized Financing & Business Services
- » Training, Exhibitions & Events



Green Solutions

» Renewable Energies

Renewable energies (windpower, hydropower, solar and geothermal energies) have been assuming a crucial role in the production of home and industrial electricity. Besides being inexhaustible, renewable energies respect the environment as they don't produce greenhouse gases nor waste to be dumped. Recently European companies have been developing an outstanding



know-how in the field of green technologies thanks to the several research and innovation activities carried out in close cooperation with universities and research centres. The green economy grants a series of advantages to the industrial sector, such as the cutbacks in the energy supply costs, the environmental protection and the reduction in air pollution.

Hydroelectric power station

SMIENERGIA is a fully operating industrial project which runs a hydroelectric power station fed by the river Brembo in the town of San Giovanni Bianco (Bergamo). The installation, equipped with state-of-the-art turbines, has a full capacity of 1 MW and supplies green energy to local and national distribution networks.

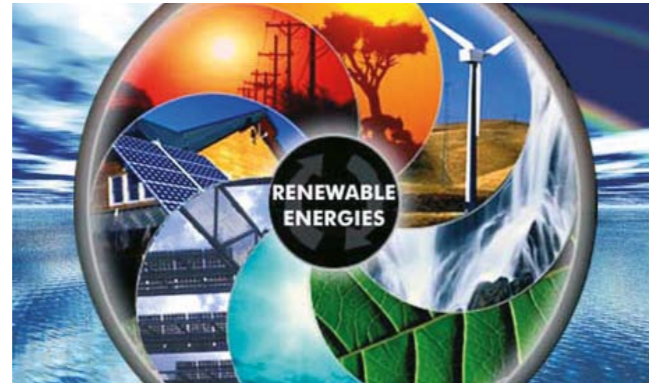
C-SUN

At Expo Shanghai 2010 SMILAB presented the "C-Sun" project, a photovoltaic panel which concentrates solar rays in a unique point to increase the amount of electric power produced. Compared to traditional solar panels, the innovative "C-Sun" concentration system allows to make use of smaller panels and reduce the production costs with equal energy supply.



Automation solar system

One of the most promising technologies is the sun-tracker photovoltaic panel. SMILAB engagement in the field of solar energy led to the realization of the control system which rules the motion of each sun-tracker of the Photovoltaic Solar Park in the town of Spirano (Bergamo). This photovoltaic system is composed of many little groups of solar panels which orient themselves toward the sun and follow its trajectory instead of being fixed in one direction. This type of system grants an increase in the annual return by 30-40% compared to the fixed solar panels.



» Energy Saving

LED street lights

LED lights have been replacing traditional ones in lighting systems ensuring a series of remarkable advantages: high reliability, long duration, high efficiency and low consumption. SMILAB laboratories have designed a high efficiency LED light to be used in street lamps. These lights are managed by a computerized telecontrol system which activates lighting only when required thanks to sophisticated sensors which detect pedestrians and vehicles in transit. This kind of system ensures considerable energy saving and a cutback in the costs of public facilities.

SACS project

The "SACS" (Stella Alpina Cost Saving) project is the outcome of the joint venture between some companies of the packaging sector (SMI, SIAD, PE Labellers and Fonte Acqua Minerale Stella Alpina) which, with the support of SMILAB researchers, have realized a complete bottling line of still and carbonated water. The plant has been devised to allow the machines to be highly integrated, considerably reduce production costs and obtain remarkable energy savings compared to the pre-existing bottling plant at that spring.

Energy recovery systems

Smilab engineers have developed energy recovery solutions like the high-pressure air recovery system installed on the production process of plastic bottles. The outcome in terms of energy conservation is remarkable, with a 40% reduction in compressed air consumption and a 20% reduction in electrical consumption.



Methane heated shrink tunnel

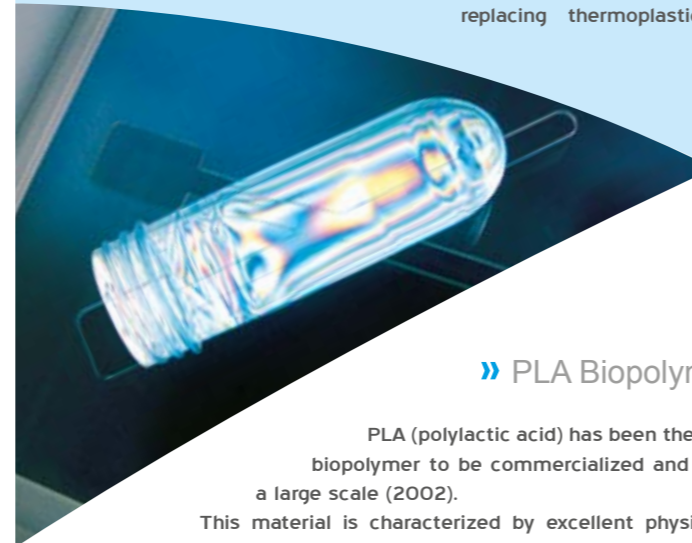
SMILAB engineers have devised an innovative shrink system for packaging machines composed of a methane heated shrink tunnel which replaces electric resistances. In Italy this type of tunnel means a 70% energy saving.

Biopolymers & Packaging

With the increasing concern for environmental protection, plastics manufacturers have been reassessing raw materials, technologies and procedures for the production of polymers, with promising results in the field of biopolymers and nanotech polymers.

SMILAB laboratories are equipped with advanced instruments for the study of innovative materials, capable of both enhancing the physical and mechanical features of polymers and creating new combinations for many industrial fields involved in the technological research, such as aeronautics, aerospace, transport, traditional and renewable energies, food and packaging.

SMILAB recently developed a project in the packaging sector with the feasibility study and the prototyping of a 1.5 L bottle in PLA, a vegetable biopolymer replacing thermoplastic polymers like PET.



» PLA Biopolymers

PLA (polylactic acid) has been the second biopolymer to be commercialized and sold on a large scale (2002).

This material is characterized by excellent physical and mechanical features which let it be the best alternative to thermoplastic polymers.

PLA and PET share features like hardness, stiffness, shock resistance and elasticity. These features, together with flexibility and high transparency, make the PLA film a material to be used like cellophane. About the 70% of PLA is produced and used in the packaging field for the following products:

- Bread and food in general: it is suitable thanks to its transparency, the mechanical features and better moisture resistance compared to polymeric amides.
- Juices and milk: it is not suitable due to its low moisture barrier, even though it may be enhanced thanks to the aluminium-oxide deposition process (with the resulting increase in costs).
- Water: it is suitable for still water containers.
- Fats and oils: it is suitable for its chemical resistance to these types of products.
- Non-food: Panasonic exploited this material for the rigid packaging of batteries.
- Perfumes: this type of application may be developed thanks to PLA alcohol resistance.
- Detergents: the application on this kind of products requires a solution to the low stress cracking through the use of PLA modified with anti-shock agents.



Information & Communication Technology



Information & Communication Technology or ICT gathers methods and technologies for the realization of transmission systems, information reception and processing (digital technology included). The use of technology in the information management and processing is getting more and more significant in the modern society as hardwares, softwares and telecommunications are nowadays the pillars of communication. SMILAB expertise ranges from the hardware and software design for industrial automation systems to state-of-the-art data communication networks, the realization of information systems and advanced management solutions based on web 2.0 platforms.

» Subsidized Financing & Business Services

Financing involves a series of Community, national and regional public funds for businesses to support the development of research and innovation projects, seeking to cover their financial requirements.



Financing includes any tool (subsidized funds, grants, tax abatement etc.) the legislator makes available to businesses to offer financial support.

SMILAB operates as interface with Regions, Ministries and UE bodies to access the funds available and provide businesses with assistance and consulting on financing, the evaluation of eligibility and prototyping of projects and support in the application procedure.

Fundings are allocated by the following organizations:

- Lombardia region
- CESTEC
- MIUR (Ministry of Education, University and Research)
- Ministry of Economic Development
- UE.

» Exhibitions & Events

SMILAB, in cooperation with private and public corporations, universities and research centres, organizes meetings, conferences and workshops centered upon scientific, technical, economic and social topics.



These events, known as "Smilab Days", are dedicated to schools, universities, private businesses, public administration, research centres, nonprofit organizations etc. with the aim of promoting know-how and innovation culture, sharing knowledge and experiences with the community. So far SMILAB has organized a series of well-attended meetings, such as: Nano Day, Export Day, E-paper Day, Energy Day and Mobility Forum.

SMILAB promotes its expertise through the participation to national and international exhibitions of innovation, renewable energies and technologies, among which it is worth mentioning: Solarexpo, Ecopolis, Fiera campionaria della fiducia.

» Training: Smilab Campus



SMILAB aims to create a fertile ground for growing ideas, projects and know-how. Shared experiences and working methods merge into a growing legacy of scientific, technical and cultural intelligence, made

available to the community through a wide array of training and knowledge transfer programs. SMILAB commits itself to a very busy schedule of trainings such as:

- Training and refresher courses, applied both to SMI workforce and to external operators interested in sharing knowledge and training experiences.

So far, training sessions have covered the topics of: Autocad 2D - Mechanical design; Welding - Basic course; Leadership & Communication; Complexity Management; Sales negotiation; International terms of payment; Safety, health and welfare in the workplace; Foreign languages - intermediate and advanced courses.

- Mechatronics courses, taught by SMILAB project managers and applied to high school students with the aim of providing a specific technical knowledge in the design and management of complex mechatronic systems.

• Training programs - "School-Business Partnership", developed in cooperation with high schools specializing in technical and scientific education and aim to research, innovation and technology transfer.

Students, tutored by SMILAB engineers, take active part in the production process step by step, with special attention to sales&marketing, engineering&design, manufacturing stages.

