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# research & innovation center

review



# Marc Vidal

Specialist in Digital Transformation and Industry 4.0, an economics analyst and a technology influencer

Winners of the 3rd AITEX business awards [Page 12]

Certifying the sun protection factor of your textiles with the UV STANDARD 801 label [Page 34]



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# _editorial

For four years now, AITEX has continued its drive to dynamise the business community. One of the ways we do this is through the AITEX Business Awards, which recognises the work of companies and contributes to their development and growth innovation and research.

The AITEX 2021 Business Awards were held in April and were awarded to four companies in the categories of Innovation and Sustainability: BIOINICIA, S.L., DESTINY DECOR, S.L., CARE APPLICATIONS, S.L.U. and CREACIONES EUROMODA, S.L. Two stood out for their development of innovative products during COVID-19 and the other two for their outstanding work in the development of sustainable and environmental management.

Our aim is to continue working into the future through the awards to encourage the competitiveness of the private sector and generate industrial growth in the textile sector and others.

Our commitment to collaboration on social projects has been clear in our continuing work with UNICEF since 2018 on their Child Friendly Schools programme supporting education projects.

Now, more than ever, with the intensification of hostilities in Ukraine and the immediate threat this poses to the lives and well-being of the 7.5 million children there, AITEX's commitment to responsible action in all its activities has led to the implementation of solidarity projects to minimise the impact of the drastic situation that Ukrainians are finding themselves in.




Do smart textiles offer immediate benefits?

The answer is a resounding yes! We want to emphasise these benefits to people and businesses. Smart Textiles are a new generation of materials and systems with fascinating multifunctional properties (e.g. camouflage, moisture management, electronics embedded in textiles).

These properties, together with the possibility of integrating the materials and systems into uniforms and weapons platforms, has resulted in collaboration between the European Defence Agency, AITEX, the Centro Tecnológico das Indústrias Têxtil e do Vestuário de Portugal (CITEVE) and the Instituto de Ciência e Inovaçao en Ingeniería Mecânica e Ingeniería Industrial (INEGI), to launch the STILE project in 2018. The project aims to lay the foundations for a European defence-based multifunctional smart textile industry.

On a different note, as long as appropriate precautions are taken to protect yourself against strong sunlight and exposure to UV, the sun gives us life and health. AITEX has an entire department dedicated to analysing and studying the problems of exposure of textiles to sunlight, and we certify garments with the UV Ultraviolet Label UV STANDARD 801, which determines the protection factor of a textile product against sunlight.

Manufacturers are now taking care to use textiles that bear the label to offer their customers a safe, high quality product.

Another field the Center is active in is the study of probiotics, more commonly associated with food and supplements containing live microorganisms that help our bodies stay healthy. However, we can go a step further and take advantage of their qualities in the world of textile and cosmetic research. This is the case of Industria Jabonera Lina, S.A.U. (LINASA), which has developed a new line of cleaning and cosmetic products based on probiotics, with enhanced effectiveness, providing beneficial properties to the skin and health of the user, improved moisturisation, reinforcing the protective barrier and regulating the pH of the skin.

In compliance with the objectives to stimulate innovation and promote the reuse of materials, as set out by the European Commission in their circular economy action plan, AITEX offers textile companies our laboratory facilities to promote the use of biodegradable materials within existing regulations. In this way we can further demonstrate our commitment to meeting the public demand for safe products, while remaining at the forefront of sustainability.

AITEX, Instituto Tecnológico Textil, is a private non-profit association, founded in 1985 on the initiative of textile entrepreneurs and the textile industry. Generalitat Valenciana through IVACE, Instituto Valenciano de Competitividad Empresarial (formerly IMPIVA), and is part of the REDIT network of institutes.

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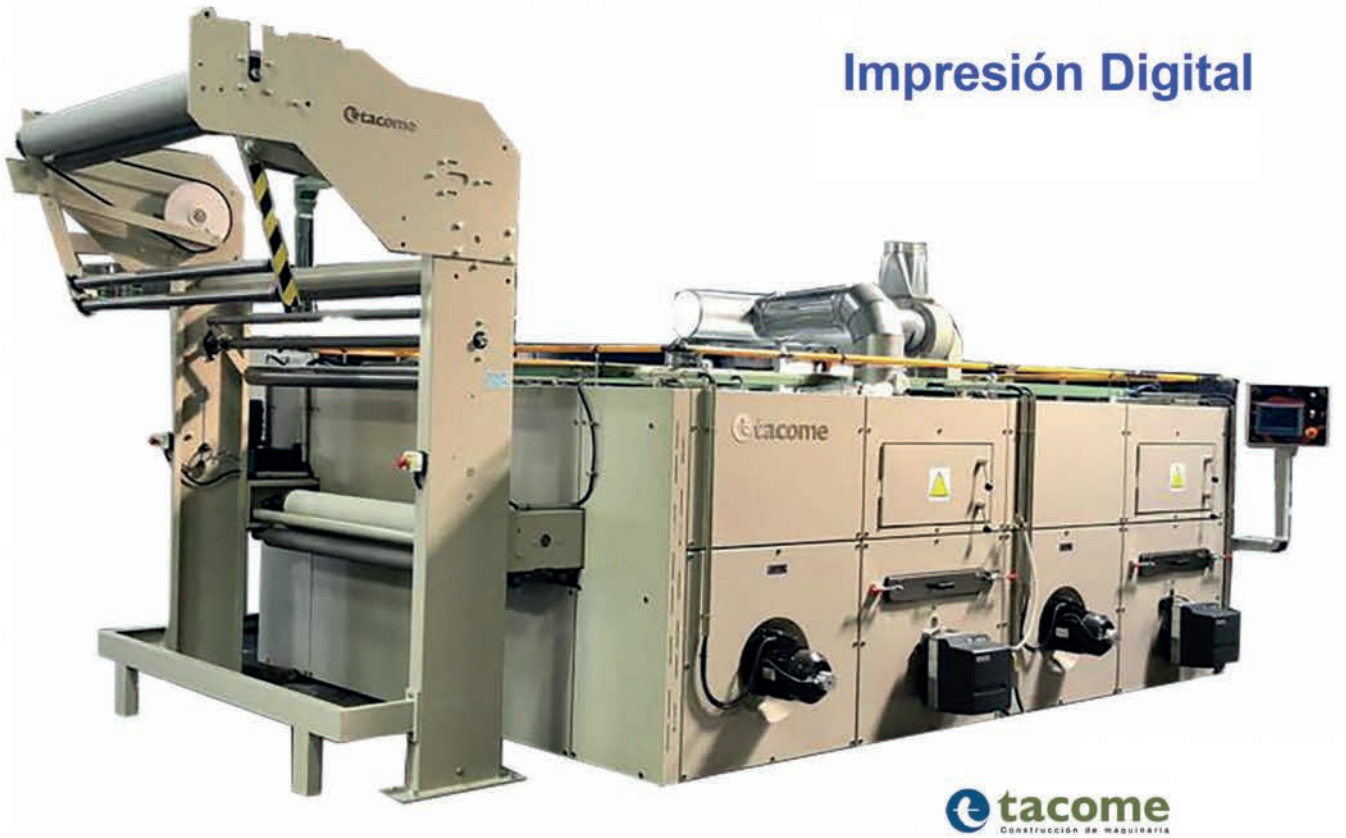


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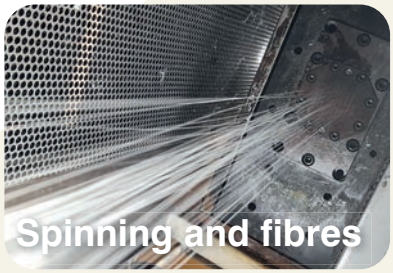
The following is a selection of some of the innovations and developments with applications in the textile industry, compiled from a range of scientific and technical sources that will be useful when identifying opportunities and innovation.




### Dimensional, breathable and thermal properties of a bilayer knitted fabric for sportswear

This study investigates the effect of fibre blend and structural factors on the dimensional, breathability and thermal properties of a two-layer knitted fabric for sportswear. In the study, 12 different interlocked bilayer fabrics were produced. Polyester filament yarn (120 denier) was used to form the back side of the fabric, and the front was varied with 30sNe cotton, modal, wool and soya yarns. Three different types of structural tightness factors; low, medium and high, were considered and taken for sample development. Evaluation of dimensional, handling, moisture management and thermal properties was carried out on all samples.

Authors: Soundri, GM.; Kavitha, S. and Kumar, BS.
References: RESEARCH JOURNAL OF TEXTILE AND APPAREL, March 2022




### Melt spinning and thermal decomposition of blended polymers containing polysilsesquioxane and polycarbosilane

Melt spinning and research into the compatibility and thermal decomposition of a blend comprising polysilsesquioxane and polycarbosilane was attempted to manufacture low-grade silicon carbide (SiC) fibres and silicon oxycarbide fibres. This fabrication method was selected to enhance the strength of the as-spun fibres, and enhance the performance of the long SiC fibres. Although the addition of polysilsesquioxane increased the viscosity of the polymer blend, it could be spun by incorporating a softener during the manufacturing process. Cross-linking between the polysilsesquioxane and polycarbosilane was achieved by heating them to 600 degrees C. As a result, the blended polymer demonstrated higher performance compared to the polycarbosilane. The as-spun fibres derived from the polymer had approximately 10 times the tensile strength of fibres derived from pure PCS using an identical approach. Therefore, it was confirmed that the polysilsesquioxane blend effectively enhanced the tensile strength of the as-spun fibres to create long SiC fibres.

Authors: Kita, K.; Fukushima, M. and Hotta, M.
References: JOURNAL OF MATERIALS SCIENCE, April 2022




### Influence of hydrogen peroxide on disinfection and soil removal during low-temperature domestic washing

The aim of the study is to determine whether the addition of hydrogen peroxide (HP) to liquid detergents in low-temperature domestic washing can disinfect laundry without affecting the properties of the fabrics, even after several cycles. Fabrics of different colours and different compositions were repeatedly washed in a domestic washing machine using a detergent with the addition of a 3% stabilised HP solution in the main wash, pre-wash or rinse. The results of antimicrobial activity, soil removal activity, colour change and tensile strength confirmed the excellent disinfection activity of 3% HP, but only if it was added in the main wash. Its presence did not discolour and did not affect the tensile strength of the garment, and the fabric maintained its overall appearance.

Authors: Tavcer, PF.; Brencic, K.; Fink, R. and Tomsic, B.
References: MOLECULES, January 2022




### Moisture-assisted photo-engineered textiles for self-adaptive dual visible and infrared camouflage

We present a moisture-assisted photo-engineered textile that visually camouflages objects within an environment in both the visible and infrared. In our solution, the moisture content in the interior has been made sensitive to variations in ambient temperature, which allows the textile to self-adaptively adjust its thermal emissivity over a wide range of 0.8 to 0.27°C with the temperature varying from 25.8 °C to 67.4 °C. Its visible appearance can also be adjusted by means of an interferometric structural colour filter to provide a wide colour range. The moisture-assisted photo-engineered textile presents a low-cost, biocompatible, flexible, lightweight and convenient approach to dual visible and infrared self-adaptive camouflage.

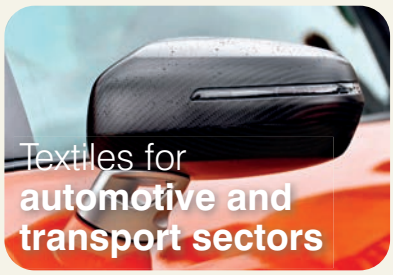
Authors: Huidong, L.; Chenyi, W.; Guorui, C. Yutian, L.; Mingram, M.; Ting, C.; Libaroni, A.; Xiao, X.; Xuejiao, H.; Kang, L. And Jun, C.
References: Nano Energy, Volume 93, March 2022, 106855




**Durably bonded cotton textiles decorated with a natural borneol based finishing agent**

In this work, an antimicrobial finishing agent (NCO-B) has been developed containing an isocyanate group, which can be covalently grafted onto the surface of cotton textiles by a simple one-pot method method. The resulting NCO-B finished CT(NCO-B-CT) showed broad-spectrum antimicrobial adhesion properties against bacteria (E. coli) including(E. coli), including superbugs (MRSA), and fungi (A. niger). Due to its unique antimicrobial mechanism of borneol stereochemistry, the NCO-B-CT is a non-releasing antimicrobial material that does not cause skin sensitisation and has no cytotoxicity. The mechanical properties of the CT also improved after this finishing process. In addition, it showed a durable wash fastness and antimicrobial adhesion properties by withstanding 50 wash cycles. Therefore, this material may have great application potential in multifunctional textiles, flexible leather electronics and medical protection.

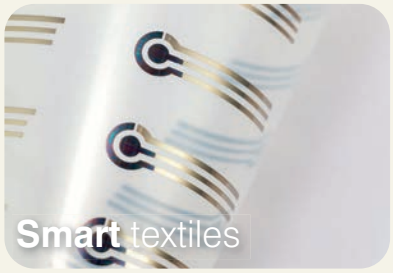
Authors: Xu, JQ.; Li, X.; Yu, WJ.; Wang, X. and Ma, JZ.
References: CELLULOSE, February 2022




**Research into the off-axis tensile properties of 3D braided composite materials considering void defects**

This paper presents a mesoscale finite element (FE) model containing void defects to investigate the off-axis tensile behaviour of 3D braided composites. Researchers verified the FE model and discuss the effects of porosity under on-axial tensile conditions, and then run tests to predict the mechanical response in general off-axial tensile cases. The strength properties of the 3D braided composites are analysed in detail, and more importantly, the progressive damage behaviour under typical off-axial loads. It was found that the off-axis tensile strength and corresponding failure mode of the 3D braided composites are mainly affected by the braiding angle of the sample. The proposed FE model provides a suitable reference for the numerical study of void defects and off-axis loading problems in other textile composite materials.

Authors: Zhang, C.; Li, A.; Gu, YF.; Mao, CJ. And Xu, XW.
References: JOURNAL OF INDUSTRIAL TEXTILES, January 2022




**Towards reliable smart textiles: Investigating the thermal characterisation of embedded electronics in E-Textiles using infrared thermography and mathematical modelling**

The field of smart textiles, which includes e-textiles, has undergone rapid development in recent years due to its wide market applications, such as wearable devices, architecture, energy and design. The electronic circuits of electronic textiles involve devices such as LEDs, sensors and batteries that are embedded within the yarns. Since temperature is a crucial element that causes profound problems to electronic devices when a certain threshold is exceeded, extensive research efforts have to be made to reduce its negative effect and improve the sustainability of such embedded devices. In this work, infrared thermographic imaging technology is used to experimentally study the thermal distribution profile of LEDs in their bare, encapsulated and integrated states in the manufacturing stages of electronic wires. Experimental results are compared with numerical analysis models carried out by solving the differential equations of the partial and time-dependent differential equations of the heat transfer process.

Authors: Lama Hamadeha and Amin Al-Habaibeh
References: Sensors and Actuators A: Physical, Volume 338, 1 May 2022, 113501




**Recent advances in the development of fire resistant biocomposites: a review**

Biocomposites reinforced with natural fibres represent an environmentally friendly and cost-effective alternative to conventional petroleum-based materials and are increasingly being used in a wide variety of industrial applications due to their numerous advantages, such as excellent mechanical properties, low production costs, their renewable character and biodegradability. The aim of this study is to present and discuss recent advances in the development of fire resistant biocomposites.The flammability of wood and natural fibres as material resources to produce biocomposites was investigated in order to build a holistic picture. Furthermore, the potential of lignin as an environmentally friendly and low-cost additive to produce high-performance biocomposites with improved technological and fire resistance properties was analysed in detail. The development of sustainable FR systems based on renewable raw materials represents a viable and promising approach for the manufacture of biocomposites with improved fire resistance, reduced environmental, reduced environmental footprint and improved health and safety performance.

Authors: Madyaratri, EW.; Ridho, MR.; Aristri, MA.; Lubis, MAR.; Iswanto, AH.; Nawawi, DS.; Antov, P.; Kristak, L.; Majlingova, A. And Fatriasari, W.
References: POLYMERS, February 2022




# Marc Vidal

Specialist in Digital Transformation and Industry 4.0, an economics analyst and a technology influencer

Marc Vidal is a specialist in Digital Transformation and Industry 4.0 and a prestigious speaker and has been chosen on several occasions in rankings such as the “TOP20 LinkedIn influencers”, the “TopVoices LinkedIn 2019”, the “Top World’s Economic Speakers” and the “Top100 Forbes Influencers 2020”.
Marc leads his own international consulting firm Allrework, which is backed by clients such as Oracle, Microsoft and IBM, among others. He is also an Advisor in the d-LAB of the Mobile World Capital, advisor of the digital business accelerator Conector, an economic analyst at the television company Atresmedia and a member of the Laboratoire Européen d’Anticipation Politique. Previously he founded the digital consultancy firm Cink, which was acquired by the multinational Llorente y Cuenca years later. He also created and directed the Postgraduate in Digital Strategy in Networks for the IL3 at the University of Barcelona, was a member of the New Economy Research Group at the Universidad Politécnica de Madrid and the first director of Westinghouse New Economy magazine.

**How did you become recognised as one of the most influential figures in the digital economy in Spain?**

By getting up every morning thinking that I have to learn something; basically that’s what it boils down to. Advance your knowledge and look for formulas to that will explain it easily to eager listeners.

Once you explain the things you know, you learn about the explanation itself and the more you know in that sense, especially as you go on explaining more things, I suppose that they give value to what you do. But what is particularly valuable in this whole journey are all the times I’ve been wrong, that I’ve made mistakes, and there are plenty of those, and which have surely shaped my personality and knowledge base.




**Could you highlight any relevant lesson from your professional career?**

The truth is that there are many, so it would be difficult to choose one in particular. In my case, to be honest, I have learned from two places. Firstly, the trips I've made, which have sometimes been experiences, and secondly, from day-to-day life, in the most everyday things, in the people who surround you who you may not have thought would become particularly important in your life, your work or in your professional space and you discover that prejudice is one of the worst things we can use. Honestly, there is nothing very special, but rather a set of circumstances that have accumulated.

**What would you say are the keys to successfully tackling the digital challenges that lay ahead for the sector, particularly in such a disruptive time as now?**

The first and most basic thing is to understand that the moment we're living in is nothing more than a technological revolution. We're going to hear the word crisis in the coming months, the word uncertainty, a lot of negatives. In fact, this is how we have gone through all our technological and industrial revolutions. They have always been seen as an industrial crisis and that is what we should really consider, rather than the keys. The first element that we have to put in place is the knowledge that what we are experiencing now is a revolution.

**Flexibility and uncertainty are characteristics of innovation. Do you think that in Spain we have an efficient innovation model?**

Spain's problem is that innovation is not often to be found. We do have very interesting innovation models that are bearing

The first thing to understand is that the moment we are experiencing now is nothing but a technological revolution.

fruit and producing results, but that's not the norm and, unfortunately, not where the country's economic engine is. Nor is it particularly prevalent in tourism, and the tourism industry is not sufficiently developed in this respect.

The value of the economic complexity of an economy is determined by the time it takes to replace the people who work within it. In Germany, this complexity is high because it takes a long time to replace people due to the skills of the workforce, while in Spain it is very low because we can quickly replace the workforce. And therein lies the problem. That's why it is so important that innovation goes hand in hand with economic complexity.

**Technology is the fundamental tool for managing flexibility and overcoming uncertainty and allows us to carry out research and achieve innovation. From your point of view, do Spanish companies have the necessary technology to innovate?**

In theory they should, thanks to the famous next-generation funds and all this concept that we have been hearing about recently, but it remains to be seen exactly it's the right way forward. At the moment, the only thing we know is that it's not,

In the end, it's all in our hands and in those of centers like AITEX which are capable of making this transfer of innovation - that has been researched, sought and financed - to the entire industrial sector.




and that's quite worrying because managing this uncertainty we are headed towards, if the last two years have shown us anything, it is that nothing can be programmed too far ahead. We must be flexible and companies today have a fantastic tool at their fingertips: technology, digital transformation to manage technology flexibly these uncertain times. Frankly, I am very concerned that this great opportunity for the Spanish economy to catch up with other economies that have surpassed us in innovation and technology until a while ago, instead of taking advantage of them, we seem to be losing them. Let's remember that Spain is the country that has fallen the most after the pandemic, and is the country that has grown the least once the funds arrived, so instead of taking advantage of the opportunity, we are moving further away.

**The "digital twins" is one of the technologies that is changing the dynamics of the industrial sector. Could you tell us about its importance and the advantages it brings compared to other more traditional technologies?**

This technology gives tremendous value to flexibility because it allows us to find out, before we put something into production, any change or any digital element. In fact, what a digital twin does is to represent digitally, something in the real world, allowing you to make modifications that you consider, before putting them in the analogue or physical sector. If something fails in the digital world, you don't need to make it real, so errors are free and if you discover that there is something that is going to go very well in the analogue world because the digital world is telling you that it will, then you do it and at almost zero cost in research and prototyping.

**What do you think of AITEX as a supplier of technology and knowledge for companies, in its role as a reference Center for the textile and cosmetics sector?**

The role of the technology centres, of the associations linked to clusters and the grassroots mechanism in the sense that it stems from a company itself and from the industrial and commercial sectors, is not only important, is fundamental.

The example can be found in other countries such as Germany and France, which have done very well with this model. I believe that the effort made, for example by AITEX, to bring innovation to all its associates, to all the people it involves is often not valued enough, because it is full of people who do things in good faith, often taking hours away from their family and perhaps taking hours away from their own job. This is something that should be highly valued. At the Business Awards I made a metaphorical mention of what it is to socialise, of what our work means. The collective is where intelligence resides, and that intelligence, when properly valued, is much more important, much more powerful and deeper than any artificial intelligence can provide. In the end, it's all in our hands and of centres like AITEX which are capable of making this transfer of innovation - that has been researched, sought and financed - to the entire industrial sector, in this case the productive sector of a specific area like Alcoy.

We must be flexible and companies today have a fantastic tool at their fingertips: technology, digital transformation to manage flexibly these uncertain times.

# Are you in time for the future?

On April 7th, Marc Vidal accompanied the presentation of the AITEX Business Awards with a substantial talk in which he unravelled the keys to the digital transformation process that governs today's society.
Right from the start, Marc captured the audience's attention with an anecdote in which he exemplified the vital role that technology plays today, and will increasingly play in our futures.

A few months ago, at the end of a conference, a woman in her 40s came up to me and said "Marc, after listening to your talk, one thing is clear to me, I'm going to lose my job in 2 or 3 years". My reply was, "What do you do and why do you come to that conclusion?" "Because I'm a cashier in a supermarket and it's obvious that I'll be replaced by a machine soon. I came to ask you what I should study to be able to face that future?" I answered with a question "Do you have any skills?" To which she replied "I'm great at playing Play Station with my son", and I said "Well, I can think of one thing. Take a drone piloting course and get a licence, and once it's a legal requirement, you'll get a job". The lady said to me "Great, then I'll have a job forever!" "Not forever, but for 5 or 6 more years until the drones fly themselves" Then she replied "Well, that's no good to me" To which I replied "I didn't give you that advice, what I said was that you should always be up to date, learning about technology. Technology is where we'll find all the good things that are going to happen to us. If we keep it at arms length, it will be much more difficult to manage the future which is bearing down on us".

Marc went on to talk about the huge technological impact we are currently experiencing and the whole process of transformation that we have been going through over the last few years and how it is affecting the new jobs that did not exist before and yet which today are essential and those that don't yet exist, but will in the future.

Everything is moving fast and we have to learn to navigate this new era in order not to be left behind. Every process of change (this has always been the case in all the great revolutions we have experienced), is inevitably accompanied by uncertainty. We must see this uncertainty as something positive, not negative. We must see uncertainty as something natural and embrace it as part of our path when incorporating new processes when it comes to incorporating new processes or automating aspects of our day-to-day work. Adapting and implementing technology on a day-to-day basis does not guarantee success, but what is clear is that if you don't, you will fall by the wayside. Digital transformation is not about having the latest technology. The process is within ourselves. In understanding that technology will take us further and it's vital to realise that one without the other is impossible. Technology alone can't achieve much, it needs the human element to make it work. A perfect tandem that will allow us to go where we never thought we could go before. Machines are no good at asking questions, but they are incredibly good at giving answers. So the better questions we ask, the better answers we get. There are purely human qualities that machines will not be able to replicate. Feelings, empathy, creativity and most importantly and the most important: machines cannot unlearn. A machine can erase, reset itself but they will never be able to apply the baggage that experience gives you to start a new learning process. That is a purely human characteristic.

Machines are no good at asking questions, but they are incredibly good at giving answers. So the better questions we ask, the better answers we get.








Rafael Climent González opening the AITEX Business Awards Ceremony.

## Winners of the 3rd AITEX business awards

On the 7th April, the AITEX Business Awards ceremony was held in the IVAM-CADA auditorium in Alcoy. The event was well attended, bringing together over 200 people, including finalists, entrepreneurs and dignitaries and included a talk by Marc Vidal, a specialist in digital transformation, economic influencer, presenter and director of programmes at TVE.

Attended by the Conseller d'Economia Sostenible, Sectors Productius, Comerç I Treball de la Generalitat Valenciana, Rafael Climent González handed out prizes totalling 60.000 euros to the winners in two different categories: the AITEX Innovation Award before the COVID-19 and the AITEX Sustainability Award.

The award ceremony was attended by the ten shortlisted finalists of the two categories, with four being chosen for the cash prizes.

The first of these, **the AITEX Innovation Award** prior to COVID-19, is awarded to companies that have boosted their business by introducing innovative product or service developments to help solve the pandemic.

The winners were:

- BIOINICIA S.L., first prize of 20.000€.
- DESTINY DECOR S.L., second prize of 10.000€.

**The AITEX Award for Sustainability** was awarded to companies that have excelled in eco-efficient management or that have developed a product, service or process that actively contributes to sustainable development and environmental protection.

The winners were:

- CARE APPLICATIONS S.L.U., first prize of 20.000€
- CREACIONES EUROMODA S.L., second prize of 10.000€.

The Business Awards are promoted by AITEX to dynamize the business community in the textile and in other sectors, encouraging the interaction between different audiences to make companies more competitive by finding solutions to new challenges and promote growth.

## 1st prize in the AITEX pre COVID 19 Innovation category

# BIOINICIA S.L.

Bioinicia is an engineering company dedicated to the design and manufacture of electro-hydrodynamic processing equipment, and the development and manufacture of nanomaterials using this technology. The company has ample experience in R&D and production in both electrospinning and electrospraying. Scientists, engineers, project managers and operators all work towards a common goal: to support its partners in all stages of their development. Bioinicia has extensive expertise in the development of membranes and coatings using micro and nanofibres (electrospinning), and in the encapsulation of functional and bioactive ingredients, natural extracts and biological materials (electrospraying).



Leon Grau, AITEX President presenting the award to Maria Pardo, Head of R&D at BIOINICIA

**Interview with María Pardo, R&D manager of BIOINICIA.**

**What does this recognition mean for BIOINICIA?**
For me, being the heart of the R&D team at Bioinicia, it is recognition of all the work that we have been involved in since the pandemic began and we launched ourselves into the world of filtration. Now we are seeing the fruits of that labour.

As a business, I think it's also a very important award as we have become recognised in filtration with our nanofiber material, and at the industrial level through the sale and fine-tuning of certifications for masks, etc. The work has been hard and I think this award recognises it.

**What was your motivation for starting this project?**
On the one hand, when we realised that, like all companies at that time, we were going through a period in which we were at a bit of a standstill due to the uncertainty around COVID-19 and, on the other hand, we saw that there was a lack of filtering material supply. All the available filtering material came mainly from Asia and there was no local supply.

It was at that time that we realised that our nanofibre technology had the extra function of being antiviral and antimicrobial combined with excellent filtering properties, so we went for it.

**What role does innovation play at BIOINICIA?**
Bioinicia is a company that if you blink, you'll miss it. We are constantly growing and innovating and a clear example of this is this award.

We knew very little about nanofibres in filtration and in two years we have built an industrial plant capable of manufacturing the filter and all the FFP2, hygienic masks, etc. but we don't stop there. Our team has a wide range of knowledge and we are always looking for more; always innovating in different fields.

## 2nd *prize in the AITEX pre COVID 19 Innovation category*

# Destiny Decor s.l.

DESTINY DECOR is part of the Aquaclean Group, a large international business group with more than 50 years of experience in textiles. The company strives to find the latest trends with the latest designs at premium quality. It is a young, multidisciplinary team, working side by side combining their knowledge of design, decoration and textile technology, and they have placed DESTINY DECOR at the forefront of the minds of consumers and professionals in the decoration and interior design sector, thanks to the quality and design of its products.

**Interview with Rafael Pascual, CEO of DESTINY DECOR.**

**What does this recognition mean for DESTINY DECOR?**

It means feeling appreciated in a sector in which, like many others, we have come through difficult times with the pandemic.

There is also a sense of gratitude for all the effort made by the company, which employs 60 people, and on behalf of them, I am very grateful.

**What motivated you to undertake the project?**

When the pandemic broke out in March/April, we could have stood still, but I think the company reacted very well. We worked from home via videoconference, discussing what we could do, and we saw that there was an opportunity.

The community was talking to us about what we could do, and they wanted answers so we decided to act. We had some filters and put our window and curtain cutting system to work, which worked out well for us and with the help of AITEX, we were able to certify our first masks that, while not particularly attractive, were functional. They were useful for the police force, fire brigade, council staff, etc. who would have something immediate at their disposal.

**What role does innovation play at DESTINY DECOR?**

For us, innovation is fundamental because we really see that there are only two ways to compete in Europe: if it's not by innovation, its price. In other words, innovation means differentiation, looking for other outlets, rethinking the issues and trying to change, and avoid staying still.

Innovation is part of our DNA, in our company and in the wider group, which is made up of other companies.




The President of ATEVAL, José Vicente Serna, presenting the award to Rafael Pascual, CEO of DESTINY DECOR.

## 1st prize in the AITEX Sustainability Award

# CARE APPLICATIONS S.L.U.

Founded at the beginning of 2015, CARE APPLICATIONS was created through a passion for a company that cares for the environment, cares for the product and cares for the customer. The CARE APPLICATIONS team has extensive and practical experience in garment processing: washing, dyeing, research and development in new finishes and machinery that enables us to improve, optimise and modernise our washing and dyeing machines and make them more versatile and efficient.

**Interview with Carmina Ferri, CEO of CARE APPLICATIONS.**

**What does this recognition mean for CARE APPLICATIONS?**

It was a very pleasant surprise because I know that a lot of projects have been submitted this year, all very good ones, and it means recognition for all the work we have been doing since we began.

We were delighted to receive it, because of what it means.

**What was your motivation for starting this project?**

Our company philosophy and mission is to try to make textile processes more sustainable. We are technicians who have been working in business for many years, not only in Europe, but all over the world and we have seen how many resources are wasted.

There are few real advances in our field, the world of garments, that manage to make truly sustainable processes. In 2015, we started the company to create mechanical devices using existing machines and them more environmentally friendly to save resources.

**What role does sustainability play at CARE APPLICATIONS?**

As I mentioned earlier, it is our mission. Not only through the accessories developed in the project, but also by training and collaborating. It is very important to us what we are able to do with these technologies and the processes reach the consumer so that they can really wear garments that pollute less.




Júlia Company, director of IVACE, presenting the sustainability award to Carmina Ferri, CEO of CARE APPLICATIONS.

## 2nd AITEX Award for Sustainability

# CREACIONES EUROMODA S.L.

CREACIONES EUROMODA was founded in 1987 and specialises in home textiles, manufacturing 90% of its production in-house. The company's own production is its competitive advantage over others in the sector, since it can control the entire manufacturing process, taking the utmost care in the production of their products, to guarantee maximum quality. Their know-how ranges from digital printing to the manufacture of duvet covers, sheets, Bouti, bedspreads, curtains, cushions and masks and in general, all kinds of textile articles.

**Interview with Antonio Beneito, manager of CREATIONS EUROMODA.**

**What does this recognition mean for CREACIONES EUROMODA?**

This recognition is more important than many people might think because companies are not used to receiving recognition. A company, at the end of the day, is a business. Every day you must move forward, and you don't usually get any recognition.

In this case, AITEX motivated us, but not just now in the third awards, but since the first awards, when our interest was piqued. It is also true that official bodies have helped us to have an R+D department and all this motivates us and makes us grow, research, and stay on our toes. In a company, when things are going well, we seem to fall asleep at the wheel and when things are not going so well, then we wake up.

I congratulate AITEX for this initiative, because what it does is to stimulate us with a pat on the back, and you go home full of gratitude. Thank you very much AITEX.

**What was your motivation to start this project?**

In our case, it was not motivation, but rather survival mode. Our company is in Bocairent, a small town with a very small wastewater treatment plant for the population we have is located in a key site; the "Moorish Caves", with direct discharge into the river and all the problems that represents.

From the first day that we set up the printing and finishing department we encountered many problems, and we knew had to be solved. This is where, as Marc Vidal explained, you have to sharpen your intelligence and look for a solution, so we looked for a solution that at that time did not exist. We have reached an achievement with which we can now boast of having an ecological wastewater treatment plant. The Bocairent wastewater treatment plant complies with regulations, and we are delighted to be doing something important: to be more ecological, working with nature and trying to leave a better world for the people who come after us.



Vicente Blanes, general director of AITEX, presenting the award to Antonio Beneito, manager of CREACIONES EUROMODA.

**What role does sustainability factor play at CREACIONES EUROMODA?**

Today we live in a very small world, in the sense that you sell in one country and another, and in the end, you realise there's a runaway train, the train of ecology. People are demanding more ecological, more sustainable things and then there are also countries which are not so strict, but it's like when you have a trainer who sets very high standards. You end up jumping higher and exceeding your own expectations.

There are countries that are ahead of us and that is our role model. We have to commit to ecology, the issue of wastewater, the reduction of water consumption and the increase in photovoltaic production, recycling, etc. These are the investments we have to make and we are finally realizing that this is how to improve our production, improve our prices improve quality for our customers.

As the saying goes "Kill two birds with one stone".

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ADDING PASSION
TO TEXTILES.

# The path towards innovation and technology transfer

Miguel Estruch Soler. Co-founder of Viromii

In 2020, public investment in R&D in Spain exceeded 15,000 million euros. The money for these comes from taxes, with the public purse financing a large part of the research activities carried out in institutions such as universities and technology centres. Through research projects, the institutions generate knowledge, which must be ploughed back and this is the context in which technology transfer exist, to ensure the commercial exploitation of knowledge, skills and technologies developed in the institutions, so that they benefit society.

## Basic vs. Applied Research

Technology transfer takes place through many mechanisms, from research contracts in which the research organisation acts as an external R&D centre for the private sector, to the licensing of industrial property rights (as patents), or the creation of technology-based spin-off companies to exploit the technologies. In the case of contract research, companies contract research institutions directly with research institutions to solve a specific need. In contrast, when commercialising industrial property rights or creating a spin-off, these technologies require maturity on the part of the companies through the process of technological development and innovation. It is important to understand that public R&D institutions develop technologies at different levels. Universities for example, tend to focus more on basic research, whose main objective is to broaden the knowledge base in each subject, without looking for a specific short or medium-term benefit. Other institutions, such as technological institutes, tend to have a closer relationship with the private sector, and their research tends to be more focused on solving specific problems facing the industry they serve.

Basic research leads to applied research, and after having created a body of knowledge, a way is sought to find a practical use. For example, if through basic research it is discovered that a certain gene is related to an increased resistance to salt stress in tomatoes, this knowledge can be used to develop more resistant tomato varieties.

In the case of COVID, basic research activities carried out over the years on coronavirus have enabled us to develop vaccines quickly, as there was already a body of knowledge available as

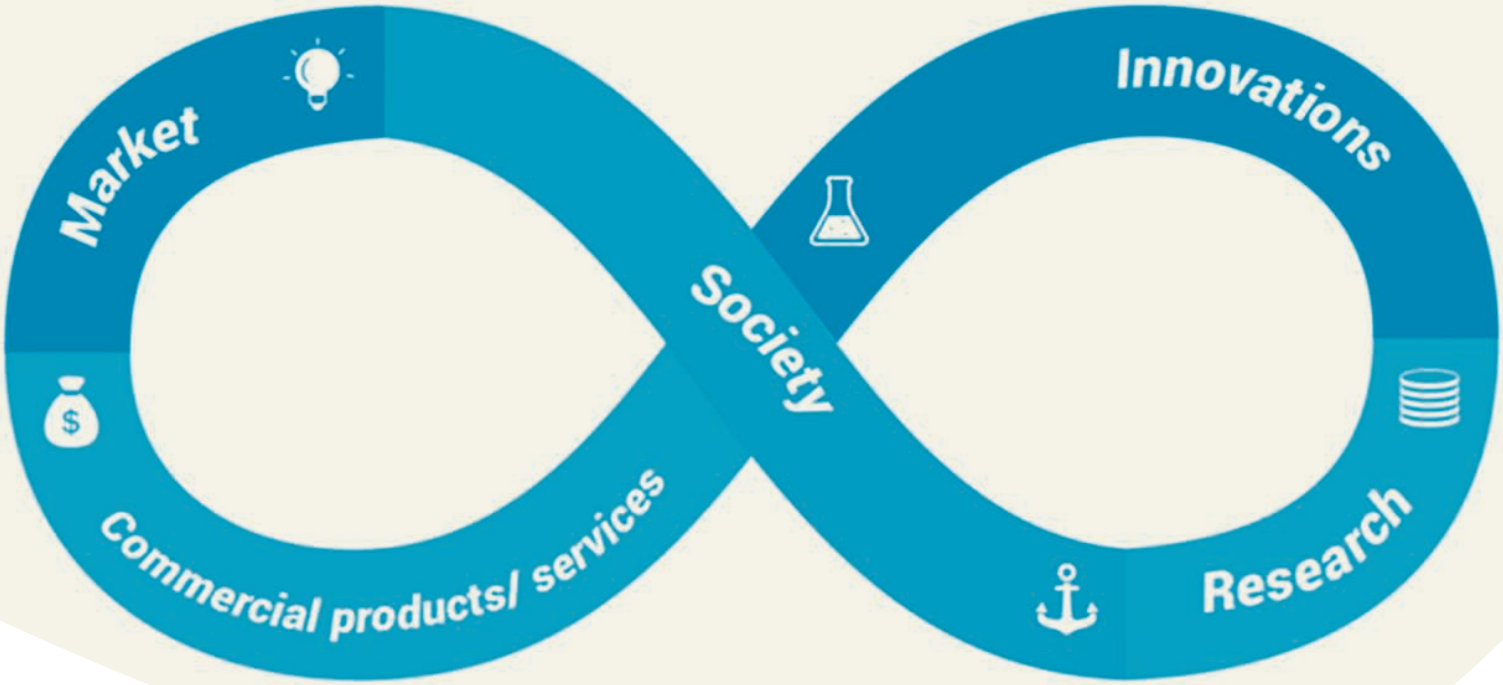





Figure 1. Definition, according to the European Union, of the "Technology Readiness Level" (TRL).

to the structure of the virus. Applied research, in turn involves many stages, as much development is needed before technologies and products can be developed that can be exploited and benefit us.

Following the example of the gene for resistance to salt stress in tomatoes, once it has been discovered, crossbreeding programmes must be developed to introduce the gene into the variety of interest to verify whether the new varieties can be cultivated in different conditions while maintaining good yields. The seed production of the varieties must also be optimised. In the case of COVID vaccines, after discovering the structure of COVID and having identified specific regions that can be used to grow antibodies by the human immune system, specific molecules needed to be designed including their efficacy and non-toxicity must be validated, in animals and then in humans. Then h large-scale production of the vaccine must be designed, optimised, and scaled up.

## Stages and actors in the transfer process

There are several actors involved in the different stages of technological development, in many cases it is the universities who carry out the first stages of basic research and the first applied developments in the laboratory. Once the technologies have been tested, technology institutes like AITEX, develop the technology so that it can be applied in pre-industrial and industrial environments. Finally, the private sector will optimise and industrialise the developments. To identify the developmental stage of a given technology, NASA developed the concept of "Technology Readiness Level" (TRL) in the 1970s. The scale has nine levels and is defined by the European Union as shown in Figure 1.

Depending on the technology, the development of the technologies and their passage through the different TRLs may vary and may require more or less investment. In the case of the pharmaceutical industry for example, huge investment and trials are required to make progress. In contrast, in many areas of engineering, developments are progressing faster, and the frontier between the different levels of TRL is a little more blurred. In the case of software, development can be much faster and the research institutions themselves can take developments almost to the commercial level, as development costs are affordable for the institutions.

As one progresses through the different TRLs, the degrees of freedom and flexibility to steer the development of software can be more limited, and it is essential that from the early stages of development, there is communication between the different actors - universities, technological institutes and private companies. Technology institutes, as can be seen in the figure, have to interact with universities, where knowledge is generated, and with the private sector, who will bring the technologies to the market. This is why these institutions are more successful in their technology transfer activities, as they adjust developments to the needs of the market. In contrast, researchers in universities are often more distant from the companies and start their developments without understanding the specific needs of the market or the specifications required by companies in order to market them. Consequently, in many cases, technology transfer from universities is more complicated and less successful than those carried out by technology institutes. Even so, on many occasions, patents spring from developments whose commercial interest has not been validated with companies, and whose transfer is complicated.

## The importance of synergy

Considering the above, the processes of developing new technologies are complex and the success of the transfer will be closely allied to the fact that these developments are carried out in conjunction with companies, implementing from the outset, market requirements. It is important that the different institutions establish an open culture that facilities dialogue with other actors. There is an increasing number of forums and initiatives to encourage the different actors to meet and foster communication, but it needs to be implemented internally in the organisations to create more efficient innovation systems, increasing the impact that they have on society.

# UNICEF responds to Ukraine's children

Marlene Perkins. Autonomous Coordinator of UNICEF Valencia Committee

The escalation of hostilities in Ukraine poses an immediate threat to the lives and well-being of the country's 7.5 million children, whose situation is desperate. Explosive weapons in populated areas and explosive remnants of war are a real and present danger to children in Ukraine, who are vulnerable to injury or death.

As of 4th April 2022, at least 112 children have been killed and 149 have been injured, according to reports that the UN has been able to verify, but it is likely the actual number of child casualties is much higher.

The situation is causing a massive population displacement that could soon become one of Europe's largest refugee crises since World War II. More than 1.5 million children have already fled Ukraine to neighbouring countries.

UNHCR estimates that more than four million people have crossed Ukraine's borders into Europe. Among the children fleeing, many are unaccompanied or have been separated from their parents or relatives. They are at increased risk of violence, abuse and exploitation, and when they cross borders, the risks increase.

Nor can we forget the children who cannot escape. Children with illness, tens of thousands of children in institutions, many with disabilities. Humanitarian corridors are essential and needed now.

## Essential services disrupted

Children's homes, orphanages and health centres have been damaged. Hundreds of thousands of people now lack access to safe drinking water. All schools have closed, affecting 5.7 million school-age children, many of whom are are deeply traumatised by the violence around them.

The terrible situation for children and families is further exacerbated by the COVID-19 pandemic, which puts the most vulnerable at risk. The health system is severely weakened and reluctance to vaccinate is significant, leaving the country with one of the lowest vaccination rates in Eastern Europe.

Although routine immunisation rates among children have improved in recent years, coverage is poor, which increases the risks of disease outbreaks. The country is rapidly running out of basic medical supplies and urgent efforts to curb a polio outbreak have had to be halted.

## UNICEF on the front line of the humanitarian response

UNICEF is working across the country to save children's lives in these uncertain times.

Together with other partners, UNICEF is on the frontline of the humanitarian response, aiming to reach the most vulnerable children and families with essential services such as health care, education, protection and access to water and sanitation. Since the escalation of the conflict, many families have sought refuge in isolation, cut off from basic services.

UNICEF has already dispatched more than 1,198 tonnes of emergency supplies for those affected by the war. Over a hundred trucks have been sent to Ukraine and neighbouring countries.

These shipments carry medical supplies, water, sanitation and hygiene supplies, medicines, neonatal and surgical kits, warm clothes, and blankets, etc. We also supply oxygen concentrators to the hospitals.

The needs are growing and UNICEF is increasing its humanitarian efforts to respond to them. The organization's 140 staff are working around the country.

UNICEF is also responding to the urgent needs of children and families crossing into neighbouring countries. Safe spaces called Blue Spots are being set up along the transit routes for children and mothers to access essential services.

UNICEF's work focuses primarily on these areas:

- Transport of safe water to affected areas and distribution of bottled water.
- Positioning of emergency supplies linked to health, hygiene and education.
- Coordination with municipalities in the area to ensure that aid reaches the children and families who need it most.

In addition, UNICEF-supported mobile units are providing psychosocial support to children traumatised by chronic by chronic insecurity.

## UNICEF Blue Points

Against this backdrop, the creation of the Blue Points, in border areas and other strategic locations, to provide emergency services to the most vulnerable families and information to families on the move, psychosocial support and referrals to social workers or health services when necessary.

UNICEF has extensive experience in setting up these spaces, which were first used during the 2015-2016 refugee crisis. At that time, 20 special centres were opened along the most frequented migration routes on the European continent as part of a coordinated response, after more than a million people flee-



ing conflict and injustice in Syria, Afghanistan and Iraq crossed the Mediterranean.

The Blue Points are organised in close coordination with national and local authorities in collaboration with UNHCR and other partners on the ground, and have the capacity to treat 3,000 to 5,000 people per day.

In these spaces, refugee and migrant children and their families can rest and play, and ultimately enjoy the protection that the centres offer and forget, for a moment, the dangers they have experienced on their journey there.

UNICEF is implementing 26 Blue Points in Moldova, Romania, Belarus, Belarus, Slovakia, Poland, Hungary and the Czech Republic.

In northern Romania, in Sighetu Marmatiei, child protection specialist VoicaTomus, tells us how families are being supported through the Blue Points that are already in place there. "As they arrive, they go through a registration process, which is essential to ensure that no child is exposed to violence, trafficking or abuse. From there, they are provided with transportation, as many have family, friends or accommodation in the country, and we have psychosocial support services."

These safe spaces are equipped with heated tents - temperatures are very low right now - where children and their families are offered food and drinking water.

UNICEF's offices in Ukraine's neighbouring countries are also expanding programmes to strengthen essential health services, including routine vaccinations, which many children have missed due to disruption in their country.

## Key spaces for children travelling alone

Blue Points play an important role in the case of unaccompanied children, facilitating family tracing and reunification efforts when they have been separated from their families during the journey.

Children who are on the move alone are at particular risk of trauma, disease, violence and exploitation. One of the objectives of these centres is to identify and protect these children and reunite them with their families where possible, always taking into account what is best for them.



The Blue Points are easily identifiable. Different organisations offer their services to refugees and migrants. However, let us not forget that the initiative does not replace the responsibility and obligation of all countries to do their utmost to do their utmost to protect children and their families.

Among the services offered at the Blue Points are family reunification, psychosocial support, legal counselling and first aid: in short, everything that refugees and their families may need after the traumatic experience they are going through.

## AITEX's commitment to UNICEF in the fight for the right to education

Since 2018, AITEX has been collaborating closely with UNICEF on initiatives such as Child-Friendly Schools, supporting education projects that UNICEF carries out in Bangladesh and Africa. The initiative provides access to quality education for millions of children, paying special attention to the most vulnerable, such as girls, children with disabilities, ethnic minorities, and children living in remote areas and in extreme poverty.

The partnership has become a key pillar in ensuring a better future for children, thanks to UNICEF's impetus and AITEX's commitment to act ethically and responsibly.

## AITEX initiatives during the Ukraine conflict

AITEX's commitment to act responsibly at every level has led to solidarity projects that help mitigate the impact of the situation that Ukraine is going through.

On the 8th March, the Centre collaborated with the Generalitat Valenciana and delivered 500 individual 120 x 220 cm blankets that went directly from Pavilion 3 of the Feria Valencia to prearranged areas in Ukraine.

## How can your company help?

Since the beginning of the emergency, we have been receiving requests from companies wishing to support UNICEF's response to the emergency.

UNICEF's response to the emergency. We certainly welcome this spirit of collaboration, as urgent support from the private sector is necessary to continue to help children, families and communities to continue to help affected children and families inside and outside Ukraine.

Here are the quickest and easiest ways your company can help:

- By making corporate donations through our **bank account (ES89-2100-2874-83-0210078532)** or at our donation website.
- Urging clients and employees to make donations.

In addition, companies and organisations that wish to collaborate with the humanitarian emergency can write to us at cpenades@unicef.es where we can define and advise how to add to and scale up the support directly and strategically.

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# Cosmetotextiles, an approach to their functionalities and the business opportunities they represent

AITEX Cosmetics Technical Unit

When we are asked to define a cosmetic, we would probably answer with things such as creams, gels, soap, or shampoo. Others may speak of hygiene products and include oral hygiene, but cosmetics are defined officially by EC regulation 1223/2009: "Any product intended to be placed in contact with the superficial parts of the human body (epidermis, hair and capillary system, nails, lips and external genital organs) or teeth and oral mucous membranes, for the sole or principal purpose of cleaning, perfuming, modifying their appearance, protecting, keeping them in good condition or to correct body odours". There is a range of products considered cosmetic although the consumer may not be aware of this. Indeed, a product may be cosmetic or not at the same time and this is due to its main purpose.

## What do we understand by cosmetotextiles?

A cosmetotextile is a cosmetic that needs a textile medium as a method of transport, such as hygienic wipes. It is any textile article containing a substance or preparation that is released over time on different surface parts of the human body, especially the skin, and which provides special functionalities such as cleaning, perfuming, changing the appearance, protecting, maintaining in good condition, or correcting body odours.

Other types of cosmetotextiles have also been developed that at first glance appear to be garments, but have been functionalised by giving them the characteristics of cosmetic products, such as garments that disperse perfumes or with microencapsulates with moisturising effect.

The difference between a cosmetotextile covered under EC 1223/2009, and a functionalised textile is the main function of the latter and depends on the function of the textile. If it is to release active compounds, it depends on the compound's function. If it releases pharmaceutical or medical assets or whether the primary function is to diagnose, prevent, treat, or control a disease, alleviate an impairment or injury or modify a physiological process, they are not considered to be cosmetotextiles, as well as the effect of the active ingredient of the textile. If the main function is that of a cosmetic, it is understood to be a cosmetotextile, although it may have secondary functions outside the cosmetic field.

## What are the advantages of cosmetotextiles?

Among the functions of cosmetotextiles regulated under EC 1223/2009 are functions such as slimming, moisturising, energising, fragrance, refreshing, relaxing, vitalising, UV protection and firming effect.

As cosmetotextiles are covered by cosmetics legislation, it is also possible to carry out toxicological and sensitisation tests on healthy volunteers in order to predict whether an irritant response will occur, the same as for cosmetics. These predictive or efficacy tests are designed to verify claimed functionalities and use the open test, patch test and use test.

The trials are conducted so that allergic sensitisation can be demonstrated in volunteers with suspected allergic contact dermatitis. They can be performed on cosmetotextiles to indicate that it has been dermatologically tested, that the product is non-irritant or that it has good skin compatibility and show that it has been dermatologically tested. Tests are also available for sensitive skin for children and toddlers.

Other tests include the Human Repeated Insult Patch Test (HRIPT), the purpose of which is to sensitise users to a product through controlled and repeated exposure. The advantage of this type of test is that it verifies hypoallergenic performance, but one disadvantage is the high drop-out rate due to the long duration of the trial.




Once it is known that the cosmetotextile is safe, which is the purpose of the toxicological and sensitisation tests, efficacy trials are conducted to attribute different claims to the cosmetotextile, such as its moisturising or firming effect.

These trials have to follow the same criteria as for the claims used in cosmetic products, since cosmetotextiles fall under the legislation applicable to cosmetics: legislation must be complied with, the principle of truthfulness must be followed, the claim must be supported by data, the principle of honesty and impartiality must be followed, and informed decisions must be made in full knowledge of the facts.

Cosmetotextiles release their impregnated, microencapsulated, or interwoven substances spontaneously, or by targeted delivery through friction, pH or temperature change, depending on how the active ingredient is encapsulated. One of the current problems with cosmetotextiles is that its functionality diminishes with washing, and is finite, although there are success stories where garments can be “reloaded” to re-functionalise them.

## AITEX is making a strategic proposal in R&D in the cosmetics sector

The textile and cosmetics sectors are growing closer due to a common need for different functionalities in everyday textiles, so as not to depend solely on cosmetics when it comes to skincare or the benefits of a particular asset. An example would be a bra impregnated with moisturising active ingredients, to avoid the need to moisturize the breasts from time to time with traditional cosmetics, or the case of textiles for childcare with impregnated fragrances that provide aromatherapy for relaxation.

These are just a few examples of the possibilities offered by the synergy of cosmetics and textiles, resulting in cosmetotextiles, a product yet to be exploited.

Successful cases have been developed at AITEX, such as self-tanning socks, textiles with aromatherapy and garments that release encapsulated active ingredients. Thanks to the know-how gained over the years, the Institute is fully capable of helping and guiding companies in developing different cosmetotextiles and to carry out tests, trials, and certification necessary before the product can be marketed.

In April, AITEX took part in the In-Cosmetics Global Fair with its own stand R-23 in the Spanish pavilion run by the Beauty Cluster. More than 1,800 suppliers of ingredients, laboratory equipment, perfume manufacturers and suppliers of testing and regulatory solutions attended, making it the world’s leading cosmetics event. The stand received more than 100 visitors who were interested in our laboratory and R&D services, providing a welcome boost to the Institute’s cosmetics department.

With the aim of reinforcing the AITEX's institutional dimension, the Institute undertakes projects designed to enhance our associates in the Valencian Region. The projects fall within the framework of institutional logic, complemented by the market logic of our other departments, with a single purpose: that companies band together with AITEX to create new solutions that help them to overcome growing challenges and boost growth. Here is a brief summary of the latest projects.

## ESIC provides training at AITEX

AITEX continues to support the development and progress of companies in the textile and cosmetics sectors. As further proof, the Institute will provide part financing for different ESIC training courses that will be given at its Alcoy headquarters, enabling companies to improve their managerial skills under the tutelage of this renowned business school.

The courses are fruit of collaboration between AITEX and ESIC to offer two university postgraduate courses in sales management and digital marketing.

The courses will be taught on-site at the AITEX facilities in Alcoy from 4th November 2022, on Fridays from 16:00 to 21:00 and Saturdays from 09:00 to 14:00.

### Postgraduate in Sales Management (120 hours)

Aimed at high-level sales managers who work in:

- A territory, area or region
- Direct or indirect channels
- Clients in consumer, service or industrial markets
- Key accounts, SMEs and residential markets
- After-sales services

### Postgraduate in Digital Marketing (180 hours)

Aimed at:

- Marketing, advertising, and communication professionals with experience, but who lack management and digital marketing skills.
- Professionals in the process of a career transition who need to understand the new dynamics of digital marketing more deeply or to confirm personal decisions on their future professional career path.

**ESIC will offer a 15% discount on course costs for anyone interested. In addition, AITEX will assume 25% of the costs for the employees of its associates.**

Full information is available on the AITEX website.

## Launch of the Fourth AITEX Business Awards

The AITEX business awards were created in 2018 to promote the textile business community and other sectors. The awards recognize the work of companies and contribute to their development and projection in sustainability, innovation and research.




After the success of last year's awards, AITEX launches the Business Awards 2022 broadening the categories.

This year, the AITEX Business Awards will have three categories:

- THE AITEX AWARD FOR SUSTAINABILITY / INNOVATION IN TEXTILE
- THE AITEX AWARD FOR SUSTAINABILITY / INNOVATION IN COSMETICS
- AITEX AWARD FOR THE BEST ENTREPRENEURIAL INITIATIVE

A first prize of 20.000€ and a second prize of 10.000€ will be awarded in each category and the deadline for submissions will be the 17th of October 2022. Full information is available on the AITEX website.

# Introducing textiles to the young

## AITEX-UPV chair

### Design Competition for home textiles

The AITEX-UPV Chair has launched the Seventh Home Textile Design Competition, to reward the best fabric designs for use in the industry. The competition has two categories: print and jacquard.




The aim of the initiative is to encourage students to take up careers in textiles with applications in home textiles, and the deadline for the presentation of work ended in May. The exhibition will be held in June in the Campus of the UPV in Alcoy.

Three prizes will be awarded in the printing category:

- First prize 1,000€.
- Second prize 500€.
- Third prize 250€.

In jacquard:

- First prize 1,500€.
- Second prize 1,000€.
- Third prize 500€.

The winners will be announced soon on the AITEX-UPV Chair Blog.

### Visit to the ECOALF and El Ganso facilities in Madrid

In March, fifteen Industrial Design Engineering students and those studying the Master's Degree in Textile Engineering of the UPV travelled to Madrid to see the work being done at ECOALF and El Ganso.

On Thursday afternoon, March 24th , El Ganso team opened their doors to the students to show the work carried out at ECOALF and El Ganso and explain the company's production processes. The students enjoyed a two-hour visit in which they were introduced to all of El Ganso departments: design, accounting, logistics and the showroom.



The visit culminated on Friday morning, when they learned about the importance of innovation and sustainability in the textile industry from Carol Blázquez, Head of Innovation and Sustainability at ECOALF. The students enjoyed a lecture by Carol, and had the opportunity to learn about new products and innovations that the brand is working on from its main shop in Madrid.




### Design lecture by Núria García

On 31 st March, Núria García, Head of Design at Mango Mujer, gave a lecture on the Fashion Industry.

Nuria explained the process of design and collection creation, purchase and post-purchase of one of the fastest and most changing sectors. In addition, she talked about the changes

and transformations that the industry is going through and how they are being faced.

The lecture was attended by more than 150 students from the Campus d'Alcoi of the UPV and the Escola d'Art i Superior de Disseny d'Alcoi.




**UPV-Alcoy Employment Forum**

AITEX was again present at the Employment Forum organized by the Polytechnic University of Valencia at its Alcoy campus, to present to the students the Institute's catalogue of training opportunities, the employment portal with a wide range of vacancies in the sector and activities organized by the AITEX-UPV Chair.

Visitors to our stand were able to gain first-hand experience of some of the tests we provide at AITEX with a virtual tour on VR headsets.

**Activities carried out in schools**

In order to promote the textile sector among children, the institutional department is sponsoring textile workshops organized by the Alcoy City Council.



The training is carried out monthly and aimed at primary students in Alcoy. The workshops held during April and May included:

- Traditional uses of plants: Natural dyes for clothes.

The workshop teaches students about the different dyeing processes using natural elements such as plants. Students were able to try their hand at dyeing with plant extracts.

- Reuse of textile waste: Crafts with scraps.

Students learn to value and reuse textile materials efficiently, incorporating textile materials efficiently using concepts of sustainability and the circular economy.

- Workshop on household waste management: wipes.

Students learn about the environmental problems associated with flushing wet wipes down the toilet. By carrying out an experiment with water and wet wipes, they become aware of the importance of managing waste correctly.





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# Demonstrate the biodegradability of your materials at AITEX

AITEX Physical, Geotextiles and Sports Surfaces Laboratory

The huge impact of textile waste on the environment is one of the industry's main problems. In March 2020, the European Commission adopted a new action plan for the circular economy that includes its strategy for the textile industry, which aims to stimulate innovation and boost reuse within the sector.

Any conversation around sustainability must include what happens to a product in the environment once it has reached the end of its projected life, and include manufacturing safety.

Once a textile has become obsolete, it can be put back into the cycle as a second-hand product, or it can be recycled. Otherwise, it will be disposed of in landfill.

## Biodegradability vs. compostability

The use of biodegradable textiles reduces the impact on the environment; but what is a biodegradable material? A biodegradable material can be broken down in nature into natural chemical elements by the action of biological agents such as plants, bacteria and animals, together with other physical agents such as the sun or water that transform these substances into compounds that serve as nutrients for the environment.

At this point, it is important to underline the differences between biodegradability and compostability. Compostability is when a material can be broken down by biological activity to produce carbon dioxide, water, inorganic compounds and biomass, over a controlled period of time and under certain conditions. Therefore, all compostable materials are biodegradable, but not all biodegradable materials are compostable.

There is an ever-growing number of initiatives by textile companies to use biodegradable materials, just as the consumer is beginning to look for clothes that are environmentally friendly.

Biopolymer offer an alternative to synthetic fibres. These materials are of natural origin and are obtained from starch from corn, soybean, seaweed, alginate, chitinate, chitosan from crustaceans or banana peel, coconut and nut shells. Polylactic






acid or PLA is one of the best known and most widely used biopolymers, as its properties are similar to those of polyester.

Determining biodegradability can be carried out in different media, as biodegradability differs depending on where the material ends up when it is discarded: soil (landfill), water (salt or fresh water), landfill (industrial or domestic composting) or sewage treatment plants (activated sludge). The biodegradation of a compound can occur in two ways:

- aerobic biodegradation, which is the degradation of an organic compound into carbon dioxide, water, mineral salts and new and new biomass by the action of micro-organisms in the presence of oxygen.

- Anaerobic biodegradation. Degradation of organic matter by the combined action of various micro-organisms in the absence of oxygen.

To ensure that a product is biodegradable and has no negative impact on the environment, different test methods have been developed to determine the biodegradability of textiles.

EN 13432 - Packaging. Requirements for packaging recoverable by composting and biodegradation. Test programme and evaluation criteria for packaging.

## The 4 phases of compostability process

The tests involved in EN 13432 reproduce an industrial compostability process, which can be applied to materials with a high organic content and defines four stages.

The first stage, material characterisation, assesses the hazardousness of the material, i.e. the content in heavy metals and harmful substances that the material may contain. A level of substances above the level marked by the current legislation could be a danger when the material is discarded.

Subsequently, in the biodegradation stage, the standard stipulates that the tests in ISO 14855-1 should be performed to reveal anaerobic biodegradability. The criteria for the material to pass the test is that the percentage of biodegradation should be at least 90% of the total product in a maximum period of 6 months.

Thirdly, the disintegration stage assesses the fragmentation of the product under industrial composting conditions by recovering the material after a 12-week test period and assessing the particle size. The product must be able to disintegrate into a maximum biological compost during 12 months on a sieve > 2 mm and must not retain more than 10% of the initial dry weight.

Finally, the quality phase of the compost is the phase in which the toxic effect of the compost produced during the composting process is observed on higher plants, both in germination and growth.



Figure 1. Introduction of the aerobic biodegradation test sample into the equipment.

In the case of seawater, the test method is based on UNE-EN ISO 19679 and determines the amount of CO2 generated to determine the percentage of aerobic biodegradability (in the presence of oxygen) of materials when they are deposited on marine sandy sediment at the interface between seawater and the ocean floor as far as sunlight reaches.

There are also standards for tests to determine the biodegradability of a material in fresh water (UNE-EN ISO 14852). In this case, biodegradation is determined using aerobic microorganisms, in an aqueous system, an activated sludge and in soil (UNE-EN ISO 17556).

Other biodegradability tests evaluate the degradation of textile products during a defined test period and by controlled burial in soil. The test is based on international standards which are used to determine the decomposition and degradation behaviour of materials. Some examples can be found in the following standards:



Figure 2. Material preparation process and trial set-up.

- EN ISO 11721-1: Textiles. Determination of the resistance of cellulose-containing textiles to micro-organisms. Soil burial test. Part 1: Evaluation of rot retardant finish.
- EN ISO 846: Plastics. Evaluation of the action of micro-organisms on plastics.

## Anaerobic biodegradation

Anaerobic biodegradation tests are covered by ISO 15985. The standard determines a method for the assessment of the ultimate anaerobic biodegradability of plastics based on organic compounds under anaerobic digestion conditions, with high solids content by measuring the biogas developed at the end of the test. The method is designed to simulate typical anaerobic digestion conditions of the organic content of mixed municipal solid waste.

The tests and the regulations in force are an opportunity for manufacturers to demonstrate the compostability or biodegradability of their materials and to show that they are at the forefront of sustainability, and responding to society's demands.

**AITEX has the capacity and infrastructure to carry out biodegradability tests to different standards. The Centre continues to invest in the development of new tests in the field of sustainability.**



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# Certifying the sun protection factor of your textiles with the UV STANDARD 801 label

AITEX Chemical Laboratory

Many textile products allow UV rays to pass through, to a greater or lesser extent. AITEX recommends wearing textiles that reduce exposure of the skin to UV rays, especially in cases of continuous exposure to sunlight.

## Not all textiles protect from the sun

When we talk about protecting our skin from the harmful radiation of sunlight, we usually think of using protective creams on exposed skin. This presupposes that a textile offers protection against sunlight, which is often not the case. Many textiles allow UV rays to pass through, to a greater or lesser extent.

A textile provides better protection against solar radiation the higher the ultraviolet protection factor (UPF) it has. A UV-protective fabric has a UPF of 20 or above, and this is measured by determining the UV permeability of the textile.

Some fabrics, due to their structure, colour or raw material, already offer protection. Other fabrics, however, require treatments to give them the desired protection. Treatments can be added in the finishing process, or to the extrusion polymer prior to the textile process.

AITEX offers a complete service to measure the degree of protection against ultraviolet rays provided by swimwear, caps, sportswear, and fabrics used to make parasols, sunshades, etc.

The products that pass the tests are certified with the ultraviolet label "UV STANDARD 801" which determines the protection factor of a textile product against sunlight.

## What is the UV STANDARD 801 label?

The UV STANDARD 801 label is an independent testing and certification system with which textiles can be tested, certified and labelled according to how well they protect against ultraviolet rays.

The certification process determines the UPF (Ultraviolet Protection Factor), which is used to specify the sun protection factor of textiles.

In contrast to other methods, UV STANDARD 801 measures the UPF of a textile taking into account the particular requirements it is subjected to during use, as UV protection can be affected by humidity, stretching, abrasion and washing.



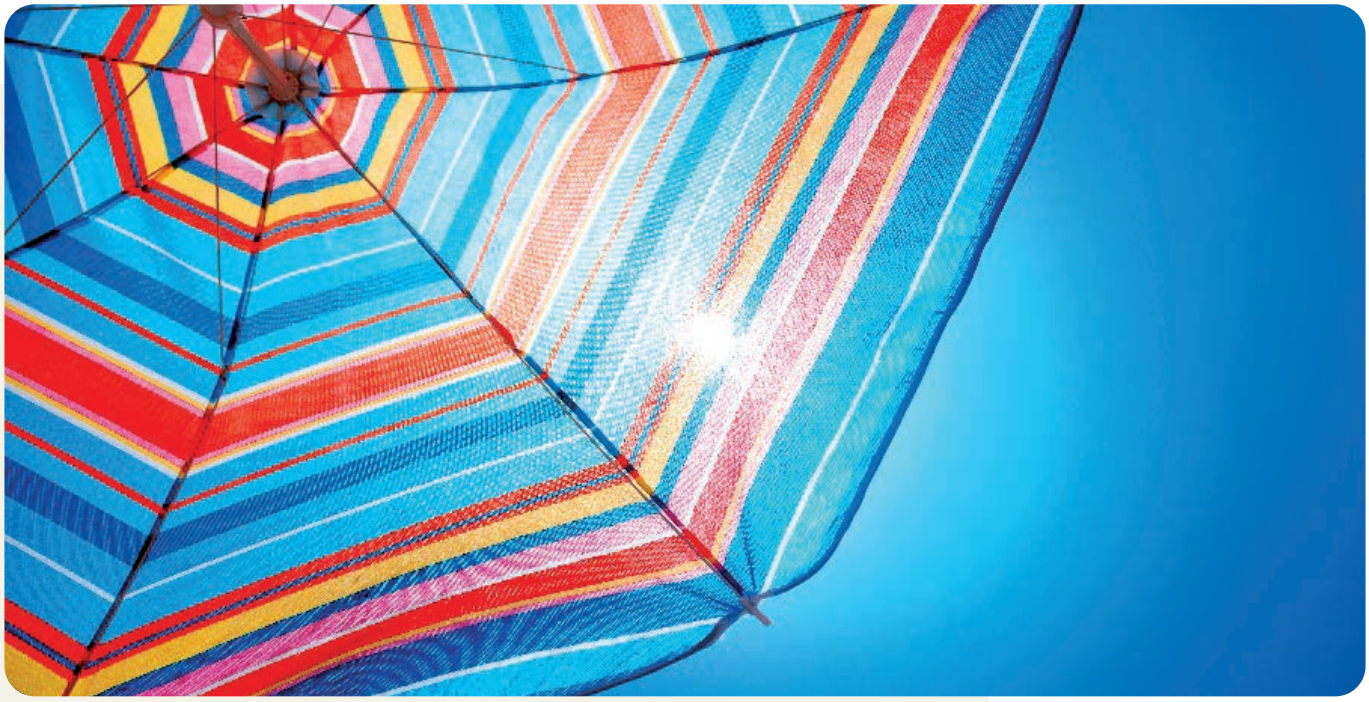

The International Testing Association for UV Protection 801 comprises seven institutes in Europe that follow the same certification standard. AITEX is the only member institute in Spain.

## What kind of products does the UV STANDARD LABEL certify?

UV STANDARD 801 can be applied to any kind of fabric, regardless of its composition, structure or colour, which is designed to be exposed to the sun for long periods: swimming costumes, sportswear, hats, shading articles, awnings and the like.

The articles that can be certified are divided into two classes depending on their use:

- Non-shading articles: Fabrics intended for clothing.
- Shading articles: Fabrics for sun shades.



## Which articles protect against overexposure to sunlight?

Ultraviolet radiation is mainly responsible for the harmful effects of solar radiation on the body, causing immediate injury from minor skin reddening to burns, or more serious results later on.

The best protection is ensured by choosing textiles that offer a high level of UV protection: depending on their composition, they can provide a UPF of up to 80.

## Why include the UV STANDARD 801 label on textiles?

There is no longer any doubt as to the dangers of prolonged exposure to the sun, and it is essential for consumers to take appropriate precautions to avoid the possible consequences, especially in children.

For this reason, the vast majority of textile companies are showing a great deal of interest in the dangers caused by exposure to sunlight, as consumers want to choose the right clothing that guarantees a high level of protection.

## What are the most common fabrics?

Clothing marked with UV STANDARD 801 include swimwear, beachwear, sportswear, outdoor clothing, outdoor and sportswear, leisure and hiking clothing, and headgear for children and adults.

In addition, shading textiles are tested and labelled, such as umbrellas, sunshades, beach shelters and film windows for bicycle trailers and pram awnings.

Certification is possible to UPF levels 10, 15, 20, 30, 40, 60 and 80, with the value achieved in the test being rounded down to the lower level.

## Why include UV STANDARD 801 label on fabrics?

More and more manufacturers are showing a keen interest in the dangers posed by the exposure of textiles to sunlight.

Contact us to find out what steps you need to take in order to include the UV STANDARD 801 label on fabrics and textile garments and give them added value for consumers and competitors.

**AITEX has a dedicated department to analyse and study fabrics to measure direct and diffuse spectral transmittance in the ultraviolet wavelength range. Normally, the wavelengths of the UV-A and UV-B spectral regions. When a product passes the test, and demonstrates a UPF 10, the Centre certifies the garment with the UV STANDARD 801 label.**

# Competitive solutions for companies in the cosmetics industry

The following article summarises the report carried out by AITEX into the results of the COSMETEC20 project.

**WHAT?**
Sustainable strategies for encapsulating cosmetic assets and essential oils using new natural or biodegradable materials to create functional encapsulation systems that are stable over time.

**WHY?**
The cosmetic sector has huge growth potential and is undergoing constant change. What attracted the consumer yesterday may well be out of favour today and worthless tomorrow. The market is dynamic and growing in all directions.

**HOW?**
Natural encapsulation systems, (micro-particles, cosmetic pearls, nanoparticles) for integration into cosmetic products. Natural/ biodegradable nanofibre veils for use as cosmetic patches

## Trends in the cosmetics sector

Cosmetic brands continue to undergo permanent change, due to the increasing demand from consumers for them to incorporate more natural, biodegradable and effective active ingredients in their formulations, that provide multiple benefits to the skin, such as anti- ageing, skin barrier repair, long-term relief and hydration. For this reason, the trend in the industry is towards the search for new, natural ingredients that impart unique characteristics to a product.

With regard to encapsulation systems for cosmetic active ingredients, there is also noticeable concern among consumers who are in search of a healthy lifestyle, as to the use of synthetic products in the development of the different encapsulation strategies. This makes the search for new solutions to replace synthetic polymers so important, enabling manufacturers to offer an image of safety, purity and quality. In this respect, and in view of future requirements, the encapsulation industry has to focus on producing encapsulants with natural, highly biodegradable materials.

The search for new biodegradable materials has become one of the main challenges for material science in recent years, due to the significant increase of synthetic polymeric waste (microplastics) in the environment. For this reason, COSMETEC20, In addition to the search for natural alternatives, which are generally more associated with the term biodegradability, has also been looking at the possibility of using a range of synthetic polymers, whose improved properties make them more appropriate for natural composting in the environment once they have become waste.

## Results

### *ENCAPSULANT SYSTEMS*

### New encapsulating systems in three different particle sizes to transport active ingredients to the skin

#### Millimetric cosmetic pearls (Skin caviar)

The appealing pearls are of natural origin and contain active ingredients of interest to the cosmetics industry for use in skin care and hair care products.

The encapsulation process of active ingredients, such as allantoin, has been improved, to produce much more spherical and stable particles. In addition, the ideal concentration of allantoin has been identified, as its stability in ambient and refrigerated storage conditions is appreciable.



Figure 1: natural based cosmetic beads (alginate) with allantoin and hyaluronic acid.

### Natural nanoparticles

Enhanced with active ingredients for use in different cosmetic formulations: facial cream, serum, etc.

With regard to retinol nanoparticles, the results obtained from in vitro analysis show that their use for 24 hours in Normal Human Dermal Fibroblasts (NHDF), increases the expression of the collagen gene by 66% which translates into an improvement in skin firming and anti-ageing effects.

The in vivo study using user panels of the grape seed oil day cream, concluded that the product has good compatibility on the skin, providing benefits such as increased moisturisation, improvement of trans-epidermal water loss (TEWL) and regulation of skin sebum.



Figure 2: cosmetic formulations with natural nanoparticle active ingredients: Left) O/W emulsion with encapsulated grape seed oil. Right) Day serum with encapsulated retinol.



Figure 3: encapsulation of essential oils in microcapsules by complex coacervation.

### Encapsulation of essential oils

Encapsulation using natural membranes to study their stability and efficiency after application on cosmetotextiles.

Different encapsulation technologies have been shown to be useful in achieving improved oxidative stability, thermostability and release of essential oils, but spray-drying and complex coacervation have been identified as the most suitable methods.

## *ELECTROSPINNING*

### Creating nanofibre fleeces U202130969

The spinning of biodegradable nanofibre veils with a biodegradable base and cosmetic active ingredients of interest, such as ascorbic acid (vitamin C), retinol and hyaluronic acid, for use as cosmetic patches or masks. The resulting veils were then characterised and validated to ensure that the product is stable over time and safe during its useful life. In addition, efficacy studies using in vitro and in vivo panel trials were undertaken to ensure its functionality and efficacy on the skin.



Figure 4: biodegradable nanofibre veils with cosmetic assets (Ascorbic acid/ Retinol).

After analysing the prototype nanofibre veils with ascorbic acid and retinol, it was concluded that they are stable in the different study conditions, maintaining their morphology and active ingredient concentration over time.

This project has the support of the Conselleria Economia Sostenible, Sectors Productius, Comerç i Treball de la Generalitat Valenciana, through IVACE, and is co-financed by EU ERDF funds, within the ERDF funds of the EU, within the ERDF Operational Programme of the Comunitat Valenciana 2014-2020.

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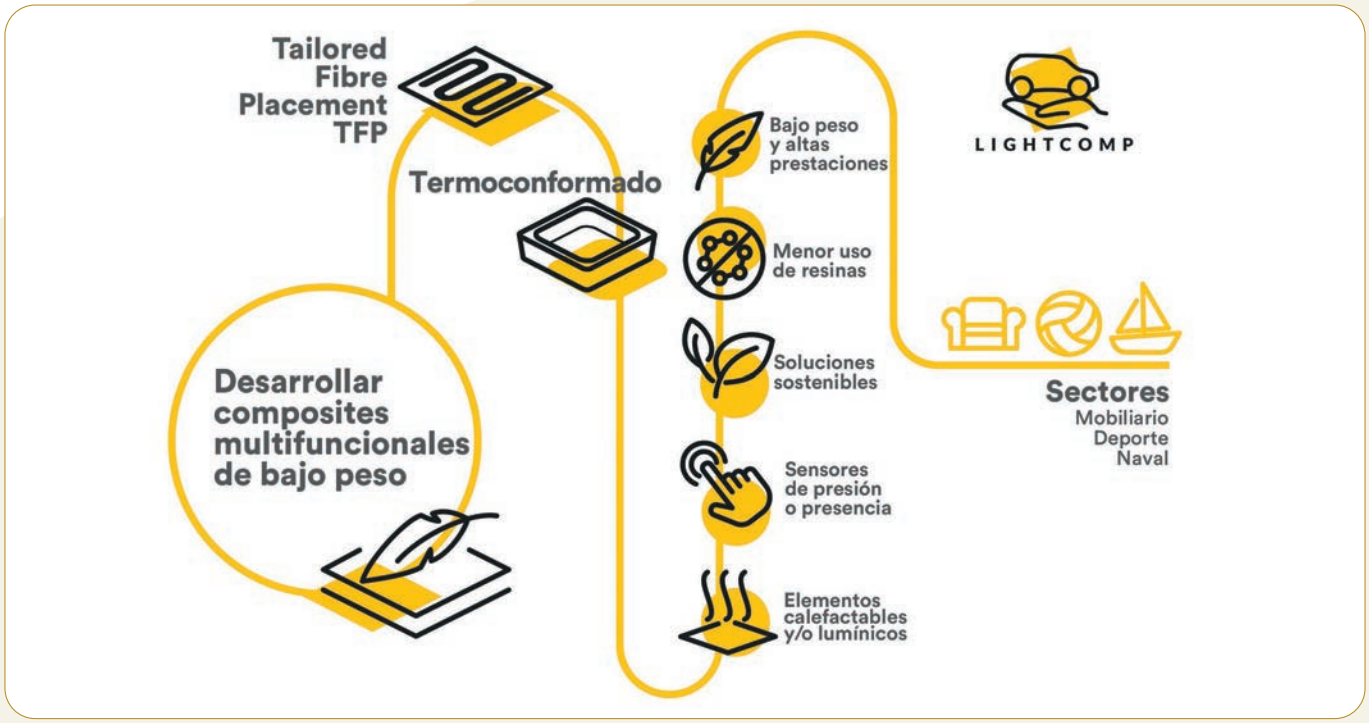
"Proyecto cofinanciado por los fondos FEDER, dentro del Programa Operativo FEDER de la Comunitat Valenciana 2014-2020"

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# Research and development of lightweight multifunctional composites using TFP embroidery technology

AITEX Smart Textiles and Digitalisation Research Group




The LIGHTCOMP 2021 project is focused on the development of lightweight composites with functional characteristics. The composites under development have application in various sectors such as naval, sports, furniture and automotive, in which lightweight components with excellent mechanical and structural properties are highly prized. The composites are developed using TFP (Tailored Fibre Placement) embroidery technology, which enables the reinforcement fibres to be aligned as required, automatically, thus maximising resistance to various stresses. Another strength of the project is the use of technical reinforcement fibres mixed with thermoplastic fibres which, when processed appropriately, allow the production of thermoplastic composites, negating the need for thermosetting resins, which are widely used in the sector, yet difficult to recycle.

## Background

In order to better understand the developments proposed in LIGHTCOMP 2021, it is necessary to recall beforehand what a composite material is.

Composite materials are made of two or more materials and are characterised by the fact that the properties of the final combined material are superior to those of the separate constituents. Composites are typically made up of two components: a reinforcement matrix on the one hand and a plastic matrix on the other.

The plastic matrix is the material that allows the cohesion of the final material and binds the reinforcing materials together to form the composite. Reinforcement is usually provided by one or more materials that provide mechanical properties to the final composite. Nowadays, openwork fabrics, unidirectional fabrics, multiaxial unidirectional fabrics, multiaxial fabrics, cores, and nonwovens are used as reinforcements, while the materials most commonly used as plastic matrix are thermosetting resins, such as epoxy resin. These resins are the most commonly used resins in most fields of application.

Composite materials are present in many sectors due to their versatility in comparison with other types of materials. Combining different materials forms a lighter product capable of maintaining the mechanical properties of the materials manufactured with traditional processes.

The upward trend in the use of composites in industry means that while LIGHTCOMP 2021 is focused on the naval, sports and furniture sectors, it can meet the requirements of many other sectors, such as automotive, orthopaedics and transport.

## Objectives

The core objective of LIGHTCOMP 2021 is to develop low weight, multifunctional composites using Tailored Fibre Placement (TFP) embroidery technology with thermoplastic and technical reinforcement fibres to create composite materials without the use of thermosetting resins, reducing material waste.

In other hand, the technical objectives the project aims to meet are, among other things, to develop composites that incorporate functional elements by means of embroidery technology to obtain functionalities such as heatable or ilumination composites, or even composites with sensory capabilities in different parameters, whether environmental or physical.

Similarly, work will be carried out on the development of sustainable solutions by substituting synthetic technical fibres with natural fibres which, together with the use of thermoforming, will make it possible to eliminate the use of resins, thus obtaining completely reusable composite materials.

In summary, the aim of this project is to develop composites using TFP embroidery with a thermoplastic matrix together with thermoforming, to obtain more sustainable components in a simple, automatic process.

## Development

Within the framework of the initiative, there are two distinct types of development; those focused on the manufacture of thermoplastic composites with tailor-made customised fibre deposition embroidery technology in combination (TFP) with the thermoforming process, and those concerned with functional composites with integrated sensors, lighting or heating elements.

Developments focusing on thermoplastic composites are based on the manufacture of heat-pressed composites from matrices using two-part moulds. In addition, the raw material are made from mixed fibre bobbins, composed of the plastic matrix and the reinforcement material. The TFP embroidery process enables the manufacture of 2D parts with all the layers and arrangements necessary for each type of component and application.

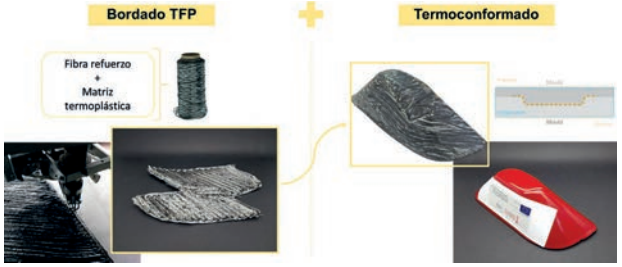
For this purpose, different combinations of reinforcement fibres were mixed with different thermoplastic matrices. The process consisted of embroidering the required component shape using the mixed fibres. The laminate was then thermoformed to give it its final shape and dimensional stability.

Functional composites have also been developed on the embroidery machine that allows sensorised threads and sequins to be arranged as required within the embroidery design itself.

## Results

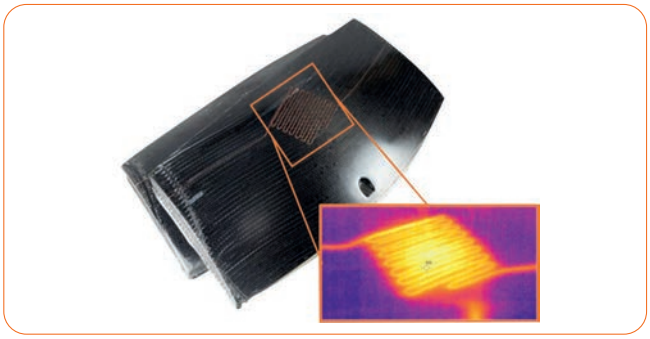
### Development of a thermoplastic rear-view mirror for racing

The design is for a rear-view mirror for a racing car. The prototype was developed by embroidery using TFP reinforcement fibres blended with different thermoplastic fibres, and then using the thermoforming process to mould the constituents into the required shape. By using these two technologies, we have developed an automated composite manufacturing process which is relatively fast compared to existing techniques and in which waste materials are virtually negligible.




### Development of a heated bonnet

Another of the developments during LIGHTCOMP was a heated bonnet of carbon fibre and a heating system, which incorporates an embroidered conductive thread directly into the carbon.



This project is supported by the Conselleria d'Economia Sostenible, Sectors Productius, Comerç i Treball de la Generalitat Valenciana, through IVACE, and is co-funded by the ERDF (European Regional Development Fund), within the ERDF Operational Programme for the Valencian Community.

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# Circular economy applied to thermoplastic textile waste

AITEX Technical Fibres and Textile Materials Research Group

## Background

Following Parliamentary approval of the new Law on Waste and Contaminated Soil for a Circular Economy on 1 April, textile companies in the Valencian Community are facing certain limitations stemming from the application of the principles of the circular economy and the efficient use of resources. This law repeals Law 22/2011, which has been in force for the last twenty years, and marks a substantial progression in the achievement of the new and more stringent waste management targets set by the EU for 2025, 2030 and 2035. Specifically, the Law creates a new tax on landfill, the incineration of waste and the co-incineration of waste (the latter with a harmonising character), which will be payable as of 1st January 2035.

MELTEX 2021 was created to support companies in the Valencian textile sector in the recycling and recovery of post-industrial waste by means of a study on the recyclability of thermoplastic textile waste to create new products with high added value.

## Objectives

The main objective of MELTEX 2021 is to create a circular system for the valorisation of post-industrial thermoplastic textile waste to create new products. To achieve this goal, the project involves the main Valencian actors of the value chain, including textile companies that, due to their production activity, generate a large amount of thermoplastic waste, as well as companies dedicated to mechanical recycling through melting and fibre-producing companies. Thus, MELTEX 2021 will be responsible for driving the development of new products with high performance and lower production costs, generating a low-carbon product footprint and significantly reducing the industry's environmental impact.

## Development

Despite the fact that the plastics industry has been searching for years for other resources, petroleum continues to be the main component of the different polymeric compounds. Currently, among the most widely used polymers, polypropylene stands out, as the most consumed resin (19.7%), low-density polyethylene (17.4%), high-density polyethylene (12.9%) and polyester (8.4%).

The price of polymers has fluctuated in recent years due to the variation in oil prices. In addition, the struggles between Europe, Asia and the United States for production and transport add to this volatility. Recycling is therefore postulated as a key solution to stabilise the volatility of the oil derivatives market. The possibility of obtaining raw material from recycling circumvents price fluctuations and international transport problems, reducing production and transport to the national and local level. This translates into independence from international markets, since the cycle of recycling-production-consumption-recycling, generates self-sufficiency of raw materials for production.

Within the recycling sector, polyolefins are the most recycled polymers in Europe, with a total recycling capacity of 1.7 million tonnes, and Spain has the fourth highest proportion (13%). However, polypropylene and polyethylene netting waste, although being mono-component products with low impurity content, are difficult to recycle due to the problems associated with the shredding process. Therefore, when these products reach the end of their useful life, they are classified as difficult to dispose of, ending up in landfills and incinerators. In contrast, major efforts are being made to recover and recycle




Figure 1: Proof of concept of mechanical recycling by melting different thermoplastic waste from companies in the Valencian Community. a) polyethylene sports nets, b) polyethylene greenhouse raffia, c) polyethylene masks and d) polyethylene tapes.

textile waste, and recycled fibres derived from polyesters and cellulose are now appearing on the market. Therefore, the unexplored market for the recycling of thermoplastic textile waste recycling opens up a new economic avenue based on the development of knowledge and oriented towards activities and sectors in which the Valencian Community is competitive, thus representing a great opportunity to position itself as a global leader.

In order to achieve the proposed circular economy system, MELTEX 2021 brings together the main actors of the textile value chain of the Valencian Region such as textile companies. In this sense, AITEX carried out an intensive study on the recycling of the waste generated by the participating textile companies to validate the process of recycling and obtaining 100% recycled fibres in a pilot project.

Subsequently, the results obtained from the recycling of nets were validated industrially.

## Results

The achievement of the objectives set out in the project involves:

### a) Valorisation of thermoplastic waste

The new model of circular economy proposed is based on the valorisation of waste to obtain recycled polymers, which will serve as raw material for the new products with high added value (upcycling). The implementation of this system is of vital importance to solving the growing problem of generation, accumulation and disposal of thermo-textile waste. Thanks to the recovery and reuse of this waste, maximising the efficiency of available resources will be achieved, thereby reducing the manufacture of new plastics and the consumption of raw materials of fossil origin, which means a more sustainable and efficient economic system.

### b) Reduction of the carbon footprint

Currently, landfill disposal and incineration are the most likely end-scenarios for plastic textile waste at the end of its life, so recovery implies a significant reduction in the carbon footprint. In 2019, the Spanish plastics recycling sector produced 893,793 tonnes of recycled raw material, which meant a saving in emissions of 1,896 million kg of $CO_2$ equivalent. Therefore, by correct recycling of waste, by repurposing it as a raw material, it will be possible to significantly reduce the CO2 emissions from its production and incineration.

### c) Added-value products

The use of recycled materials has been gaining importance in recent years, and it will be boosted by the European Commission's action plan for the Circular Economy. The optimisation of the textile waste management and recycling system leads to zero waste production, bringing textile waste back into the regional production chain. Furthermore, the proximity between the producer, recycler, processor and end-user reduces emissions from waste transport, as well as raw materials, and the costs of the final product. The fact of obtaining new sustainable materials that reduce the carbon footprint and cost less makes them even more attractive to consumers. In fact, according to data from the OCU[1], consumer habits are evolving towards a more ethical and sustainable model, with 73% of consumers taking ethical and ecological aspects into account in their purchasing decisions. On the other hand, the study reveals that consumers who are receptive to consuming more sustainably encounter barriers such as lack of information (60%), price (58%), accessibility (54%), or even the difficulty of finding responsible companies (52%). In terms of price, despite the fact that often the most ethical, organic or eco are less expensive than other products, 10% of those surveyed said they would be prepared to pay extra unconditionally. This percentage is slightly higher if the price premium is small (36%) or if it is for specific products which are issues to which they are particularly sensitive (24%).

### d) Anticipation of the new EU Directive 2018/851

According to the provisions of the new regulation introduced by European Directive 2018/851, Member States will be required to adopt measures to promote high quality recycling through separate waste collection. In this respect, the European Commission will consider setting targets for the reuse and recycling of non-hazardous industrial waste by 31 December 2024.

After this date, specific targets will be set for the recovery, reuse and recycling of non-hazardous industrial waste. This will have an impact on the entire value chain, obliging companies to design and manufacture their products including recycled material including recycled material, as well as facilitating subsequent recycling. The measures will come into force in Spain through the new Waste Law passed in Parliament on 1 April. In this Law, an Extended Responsibility Scheme (EPR) is established for all producers in the textile sector, obliging them to create a deposit, return and refund system. Furthermore, the destruction of unsold textile surpluses will be prohibited.

This project has the support of the Conselleria d'Economia d'Economia Sostenible, Sectors Productius, Comerç i Treball de la Generalitat Valenciana, through IVACE, and is co-funded by the ERDF (European Regional Development Fund), within the ERDF Operational Programme the Valencian Region 2021-2027.

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1 https://www.ocu.org/otro-consumo-futuro-mejor.

# AITEX presents the new R&D lines it is working on

AITEX R&D Division

AITEX has started to work on new lines of research that provide high added value solutions and tools for companies to become more competitive. The aim of the R&D projects is to generate knowledge and transfer it to companies in a wide range of sectors such as textiles and fashion, habitat, health and sport, automotive, construction and cosmetics.

The Institute encourages interested companies to take part in the new lines of research, as they represent excellent business opportunities to achieve a better market position.

## NEW HIGH PERFORMANCE AND FUNCTIONALISED MATERIALS

### THE CHEMISTRY OF THERMOPLASTIC POLYMERS (REACTIVE EXTRUSION)

**PLABITEX II** — **R&D TO ENHANCE THE MECHANICAL AND THERMAL PROPERTIES OF BIO-BASED POLYMERS AND THEIR APPLICATION IN TEXTILE STRUCTURES.**

- Obtaining high added value bio-composites through the use of natural fibres and bio-based thermoplastic resins.
- Manufacture of natural fibre and bio-polymer yarns from staple fibre spinning methods, using Open End technology and ring spinning.
- Application of biomaterials in staple fibre spinning processes and their introduction in composite manufacturing processes such as thermoforming and ring spinning.
- Obtaining 100% biodegradable thermoplastic composites.

### COMPOSITE MATERIALS (CARBON)

**rGENERA** — **RE-USE OF CARBON FIBRE IN THE MANUFACTURE OF TEXTILE PRODUCTS FOR THERMOPLASTIC COMPOSITES.**

- Start-up of the pilot line and optimisation of the carding and spinning process
- Optimisation of the hybridised yarns: increase in yarn strength, optimisation of the fibre/matrix fibre reinforcement ratio and structures.
- Development and production of openwork fabrics with innovative structures and bindings
- Development of unidirectional tapes (similar to TOW-SPREAD)

**honeytex** — **PROTOTYPING AND VALIDATION OF THE NEW GENERATION OF HONEYCOMBS ON A SEMI-INDUSTRIAL SCALE.**

- Optimisation of the process of developing honeycombs on a semi-industrial scale with the demonstrator team.
- Development of a new generation of semi-industrial scale honeycombs for their validation and application in sectors such as construction, automotive and marine architecture.
- An exploratory line of development of high-performance honeycombs for the aeronautics and aerospace sector is also envisaged.

# THE CIRCULAR ECONOMY AND SUSTAINABILITY

## GREEN CHEMISTRY

### Biomelt2 SUSTAINABILITY APPLIED TO CONTINUOUS LAMINATION PROCESSES.

- Improvement and development of new bio-based hot melt adhesives, focusing on adhesive and biodegradable properties.
- Application and adaptation of new bio-adhesives through continuous lamination technologies commonly used in the textile and packaging industry.
- Formulation and processing of new 100% bio-based hot-melt PSA adhesives. For this purpose, the formulation will be adapted to include a sustainable integrated component that fits within the framework of the project, as well as with the current technical-economic requirements.ado sostenible y que encaje en el marco del proyecto, así como con las exigencias técnico-económicas del momento actual.

## CHEMICAL RECYCLING

### CHEMUP II THE CHEMICAL RECYCLING OF TEXTILE WASTE.

- Study and optimisation of the chemical recycling of polyester, cotton and cotton-polyester blend textile waste.
- Obtaining fibres from chemically recycled polyester and cotton
- Obtaining everyday textile products from chemically recycled fibres

## MECHANICAL RECYCLING AND RECOVERY TECHNOLOGIES

### agroloop RESEARCH AND DEVELOPMENT OF CIRCULAR ECONOMY MODELS APPLIED TO AGRICULTURAL TEXTILE WASTE.

- Identification of textile waste generated by the agricultural industry and its characterisation to evaluate possible decontamination processes.
- Carrying out recycling tests on a semi-industrial scale
- Study and characterisation of the products obtained after the recycling process
- Introduction of recycled materials into processes appropriate to their characteristics

## BIOMATERIALS

### colour carpet 2022 THE DEVELOPMENT OF HIGH ADDED VALUE SOLUTIONS FOR THE CARPET SECTOR WITH REDUCED ENVIRONMENTAL IMPACT.

- Identification and selection of active dyes of interest that can be used in carpets and rugs
- Application of carpet backing using non-conventional impregnation technology
- Development of yarn prototypes using non-conventional dyeing technologies, for the development of functional carpets using tufting.
- Development of functional carpets using digital printing.
- Conducting a product environmental impact study.

### PHB@TEX OBTAINING TEXTILES FROM BIOPOLYMERS.

- Obtaining biopolymers with improved properties for use in new manufacturing processes
- Obtaining more sustainable fibres and textile products made from biopolymers, mainly PHB

## ECO-PROCESSES

### R&D OF THE SUSTAINABLE TEXTILE DYEING AND FINISHING PROCESS.

- Validation and implementation of technologies to develop eco-finishes for the textile industry, reducing the consumption of water, energy, chemicals, chemicals, etc.
- Study of the technical and economic feasibility of the use of dyes and auxiliary products of natural origin, and the functionalisation of textiles, avoiding chemical raw materials of non-renewable origin.
- Optimisation of sustainable finishing processes ensuring compliance with the technical requirements and specifications associated with the use of the final article.

# ADVANCED MANUFACTURING, SMART TEXTILES AND DIGITALISATION

## INDUSTRY 4.0 AND DIGITALISATION

### DIGIVAL DIGITALISATION IN THE TEXTILE INDUSTRY IN THE VALENCIAN COMMUNITY.

- Carrying out an analysis and diagnosis of the technological, political, social and economic environment surrounding digitisation.
- To learn about existing digital technologies in order to offer digitisation services to textile companies.

## SMART TEXTILES AND SENSORISATION

### STRETCH RESEARCH AND DEVELOPMENT OF STRETCHABLE ELECTRONIC SOLUTIONS ON TEXTILE SUBSTRATES.

- Design and development of stretchable electronic circuits for printing
- Validation of processes for embedding sensors and electronics into textiles
- Characterisation from the point of view of durability and resistance to wear and tear

### GAMIFY III DEVELOPMENT OF SMART TEXTILES FOR GAMIFICATION.

- Study of the state of the art: growth, demand and existing solutions
- Research into the possibilities for haptic textiles in gamification
- Development of performance-enhancing garments using gamification solutions. Improving the current training model through game-based artificial intelligence engineering and data science for data generation, machine learning and gamification.
- Development of motion study-dependent haptic wearables. Use of accelerometers combined with other sensing technologies.

# HIGH VALUE-ADDED SOLUTIONS FOR STRATEGIC MARKETS

## COSMETICS

### cellcare II R&D OF CELL CULTURES FOR THE STUDY OF PRODUCT EFFICACY TESTS.

- Validation of the three-dimensional human dermo-epidermal model to determine the irritant or corrosive capacity of a product.
- Standardisation of efficacy tests for validating cosmetic claims through the quantification of collagen and elastin.
- Development of a non-woven facial mask with functionalised hydrogels (cosmetotextile)
- Improvement of natural cosmetic formulations with plant stem cells

## COSMETICS

### R+D OF THE EXTRACTION AND STABILISATION OFNATURAL INGREDIENTS FOR USE INCOSMETIC FORMULATIONS.

- Optimisation of the extraction processes of raw materials from natural sources and the search for new sources based on upcycling.
- Development of new natural cosmetic formulations for the creation of a portfolio of stable emulsions compatible with the incorporation of cosmetic active ingredients.
- Stabilisation of active ingredients using controlled release biomimetic systems
- Characterisation of the extracts and the cosmetic textures developed to assess their value in the cosmetic sector.

## HEALTH AND BIOMEDICINE

### R&D OF NANOFIBRE VEILS FOR MEDICAL AND HYGIENIC APPLICATIONS.

- Optimisation of nanofibre solutions to obtain filtration membranes for respiratory protection masks.
- Manufacture, optimisation and validation of nanofibre veils for tissue regeneration
- Optimisation of superabsorbent nanofibre solutions for exudate and continence products

## FASHION AND CLOTHING

### NEW 3D KNITTING TECHNIQUES FOR THE DEVELOPMENT OF SUSTAINBLE TECHNICAL FABRICS FOR THE FOOTWEAR SECTOR.

- Development of functional and sustainable fabrics for use in the footwear sector by means of 3D Knitting technology, improving properties such as moisture management, thermal comfort, comfort and resistance with the use of sustainable, high-performance fibres

## HOME TEXTILES AND REST

### RESEARCHING QUALITATIVE AND QUANTITATIVE TRENDS BY FOSTERING STRATEGIC DESIGN IN HOME TEXTILES.

- To capture, analyse and segregate semi-annual quantitative data from the textile market. Data will be analysed for Autumn and Winter 2021 and Spring and Summer 2022, to gain knowledge of new markets and detect the obsolescence of targets, markets or products for strategic decision making.
- To produce and disseminate the HABITAT 22/23 TRENDS NOTEBOOK, by means of workshops with companies in the sector.
- Research, develop, present and disseminate the HOME TEXTILE TRENDS 2023.

## CONSTRUCTION, CIVIL ENGINEERING AND AGROTEXTILES

### RESEARCH AND DEVELOPMENT OF FUNCTIONAL RECYCLABLE COMPOSITES FOR THE CONSTRUCTION SECTOR.

- Research and development of advanced composite materials for the construction sector, based on two lines of knowledge: composites with specific functionalities, based on resin additivation and recyclable composites, with resins of different chemistry, and materials, using resins with reversible chemistry.

All these projects have the support of the Conselleria d'Economia Sostenible, Sectors Productius, Comerçi Treball of the Generalitat Valenciana, through IVACE.

Grant number: IMAMCA/2022/6.

# A new range of probiotic cleaning products

AITEX Eco-processes, Cosmetics and Health Research Group

Soap manufacturer Industria Jabonera Lina, S.A.U. (LINASA) collaborated with AITEX on the development of a new line of probiotic products for detergency, cleaning and cosmetics which offer enhanced cleaning and hygiene efficiency while providing functional properties for the skin and health of the user.

## Introduction

Consumers of this type of product are becoming more demanding and environmentally conscious and expect manufacturers to align with their values of sustainability and responsibility. In an increasingly competitive industry, the research and development of new technologies that give rise to more advanced products with greater functionalities and cleaner, more advanced, more functional, and environmentally friendlier products is fundamental. Companies must innovate more and more in products that provide added value and functionality and that are not just about getting cleaner clothes.

## Objectives of the project

The core objectives of the project developed by LINASA are the research and development of a new range of probiotic washing and cleaning products (liquid detergent, hand dishwasher, surface cleaners) and cosmetics, (shampoo and gel) with deep cleaning properties through the continuous activity of probiotics that break down organic surface dirt, to prevent the formation of biofilm. As well as this, functional properties for the skin and general health of the user can be transferred during skin contact with a garment that has been washed in the new detergent formula, or by using the probiotic gel and shampoo.

## Technical development

Firstly, the requirements that a probiotic has to meet to guarantee effectiveness and quality had to be identified. The study focused on symbiotic strains (probiotics and prebiotics) with specific antimicrobial properties against bacteria and fungi and anti-biofilm action to create a healthy microbiome that reduces the risk of infections. In addition, the efficacy of the formulations and their functional properties were studied by combining analytical techniques and user panels (under dermatological supervision).

The main technical challenges of the project were:

- To determine the compatibility of the strains in the formulations
- To identify the recommended dose that provides the desired effects
- To evaluate the stability of the probiotic in the formulation of the product to ensure that the strains remain alive for at least two years.
- To maintain the efficacy of the symbiotic strains in the pH ranges that this type of product requires.
- To validate the functionality of the new formulations

## Results obtained

- The formulation of Detergent + Symbiotic Mixture and the effectiveness of the transfer of the probiotic properties to the garments were validated after five wash cycles, to obtain fabrics with enhanced skin moisturisation capabilities. The results were tested on volunteers, and a 7% improvement was recorded in 8 out of 10 participants.



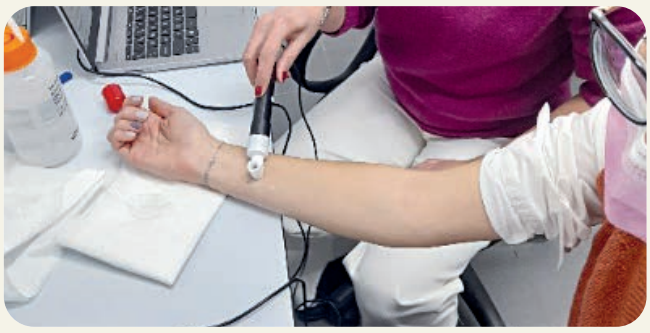


Figure 1: user trials with Detergent + Symbiotic blend.

Below are the results of surface moisturisation trials obtained with the Detergent + Symbiotic blend:

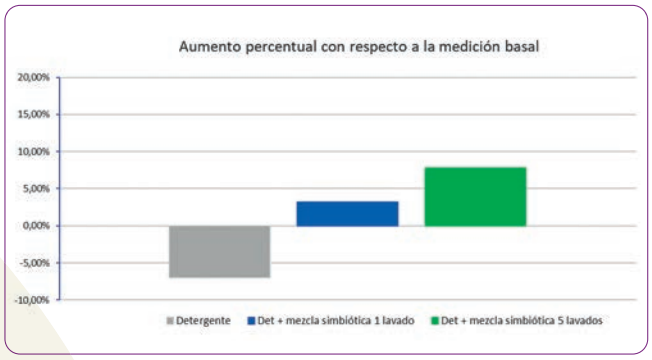



Figure 2: results of the surface moisturisation using the Detergent + Symbiotic blend.

As can be seen in Figure 2, fabrics washed with conventional detergents reduce surface moisturisation by 7%, while fabrics washed with the Detergent + Symbiotic Blend after one wash cycle and five wash cycles increase surface hydration by 3.2% and 7.8% respectively.

- The Dishwasher + Symbiotic blend was validated and found to improve skin moisturisation by more than 14% in 7 out of 10 study participants.

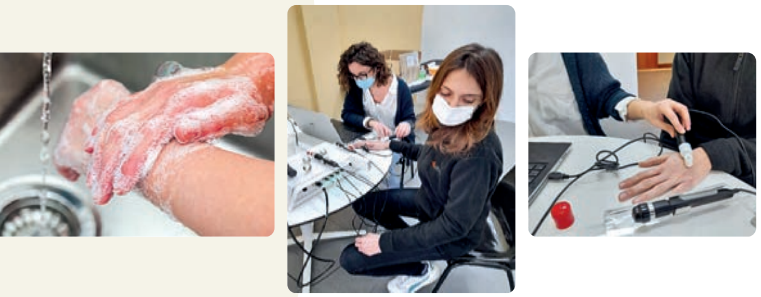


Figure 3: user trials with dishwasher detergent + symbiotic blend.

In addition, the formulation of Dishwasher detergent + Symbiotic Blend improved the skin barrier effect by 30.5% in 7 out of 10 study participants.

- The formulation of the Bath Gel + Symbiotic Mixture was validated and found to improve moisturisation in the upper layers of the skin and to protect the trans epidermal barrier, even after a single use, known as the "flash effect", which protects the user's trans epidermal barrier and regulates skin pH.

As can be seen in Figure 4, the Bath Gel + Symbiotic Blend produces an 11.9% increase in skin moisturisation after 20 days of use. In addition, after completing a subjective questionnaire, a final average score of 4.20 out of 5 was obtained, with 8 out of 10 participants giving it a favourable to very favourable opinion.




Figure 4: surface moisturisation results for the Bath gel + Symbiotic blend.

- The formulations of the Surface cleaners + symbiotic blend were validated and found to produce a displacement of the growth of Staphylococcus aureus on glass, crystal and ceramic surfaces, producing a deep cleaning effect and reducing the population of Staphylococcus aureas by up to 93.7 %.

- It was also possible to verify the anti-biofilm capacity of the Detergent + Symbiotic blend, which eliminated the microorganisms that form biofilm on washing machine rubber and plumbing.

## Conclusions

The general conclusion is that the project has successfully developed probiotic detergents, perfumes, dishwasher detergents and cosmetics and cosmetics such as gel and shampoo that provide the following properties to the user: improved skin moisturisation to reinforce the skin's protective barrier, protection against trans epidermal water loss while maintaining and regulating skin pH.

The project developed surface cleaners that can displace S. aureus growth on different surfaces.



**Industria Jabonera Lina, S.A.U. (Murcia).**

In line with our ongoing commitment to innovation and diversification in new products for laundry, household cleaning and personal care, the results of this collaborative project with AITEX could not have been better: the products improve skin surface moisturisation, strengthen the skin's protective barrier, protect against trans epidermal water loss, and maintain and regulate skin pH. We are delighted with the overall results and extend our heartfelt thanks to AITEX for their collaboration and help.

# Smart textiles in defence. Looking towards the soldiers of the future

AITEX Smart Textiles and Digitalisation Research Group

Smart textiles are a new generation of materials and systems with extremely promising multifunctional properties (camouflage, moisture management and embedded electronics). It is these properties, together with the possibility of integrating the materials and systems into uniforms and platforms that have attracted the attention of different defence stakeholders.

In this context, the European Defence Agency (EDA) has included smart textiles in its Strategic Research Agenda (SRA) of the CapTech Materials and Structures and has dedicated a Technology Building Block (TBB) to this area. In addition, other EDA CapTechs such as the CapTech CBRN and Human Factors and the CapTech Land Systems, have carried out research into smart textiles.

In 2018, The European Defence Agency launched the STILE project, assigned to a consortium led by the Textile Research and Innovation Institute (AITEX), in collaboration with the Centro Tecnológico das Indústrias Têxtil e do Vestuário de Portugal (CITEVE) and the Instituto de Ciência e Inovaçao em Engenharia Mecânica e Engenharia Industrial (INEGI).

STILE was designed to lay out the foundations for a European multifunctional smart textiles industry focused on the defence sector, in particular addressing aspects of functionality, integration, comfort, and light weight.

## First phase

The first phase of the project focused on two main objectives: the development of a roadmap, with the ultimate goal of establishing how to move from the current state of the art to a complete system capable of integrating various functionalities on a textile substrate and secondly, the production of a proof of concept integrating several functionalities into a single multifunctional combat system based on smart textiles.

Specifically, the STILE model integrates the following functionalities:

- **Camouflage.** A textile with specific properties was developed using thermochromic formulations, colour fastness studies and colour matching measures to provide a multispectral camouflage, with special attention to the visible and near-infrared spectra to reduce the visibility of the soldier in combat, both in static and moving positions.
- **Monitoring environmental parameters and NBC risks.** Several specific sensors were integrated into the battle dress to detect the presence of hazardous agents in the immediate surroundings.
- **Improved mobility.** STILE was designed and manufactured by optimising the parameters for ergonomics, homogeneous weight distribution, wearer comfort, modularity, freedom of movement and functional properties using body mapping to define the specific functionalities of each area of the body (flexibility, compression, and ventilation zones). As for the electronic components, the most flexible, lightest, and smallest elements were selected.
- **Flame retardant, water and dirt repellent and anti-mosquito solution.** Textile fibres and materials with flame-retardant properties were selected, and components were housed in specially-designed compartments to avoid exposure to heat and flame. Other functionalities, such as water and dirt repellence and an anti-mosquito solution, were incorporated using the most innovative functional finishing technologies, combined with thermochromic formulations and colour fastness testing.
- **Physiological monitoring.** Monitoring the soldiers' physiological parameters is achieved through the incorporation of heart rate sensors located on the inner surface of the battle dress, in contact with the soldier's skin, integrated into the textile substrate using conductive textiles and printed electronics techniques. The special stretching capabilities and flexibility of the electrodes provided a comfortable solution without the need for rigid and uncomfortable elements.
- **Self-regulating temperature.** A system capable of regulating the soldier's thermal comfort, was designed, adapting it to the meteorological conditions and considering the physical activity being undertaken. This solution included both heating and cooling systems using active and passive mechanisms.
- **Wireless communication and data exchange.** The information provided by sensors integrated into the combat system can be sent over wireless networks, allowing the monitoring of different parameters related to the soldier's status on the battlefield. The different parameters can be adjusted, activated, or deactivated from a mobile app which displays data clearly and intuitively.

## Simulation

Two simulation models were developed to evaluate the main concepts associated with the uniform's thermal protection and thermal camouflage in different environmental conditions.

A Finite Element Method (FEM) was developed to study the system's thermal capability.

Three exposure scenarios were defined and simulated in order to evaluate the fire protection capability by analysing the degree of skin burn expected and three exposure scenarios were defined and simulated to analyse the thermal camouflage of the combat system under different body metabolism rates.

The added value is particularly evident when the textile material integrates highly complex systems, implying the need to move on now to the manufacturing stage with a high degree of confidence in the expected results of thermal camouflage management to optimise the experimental cost associated with the design and manufacturing processes.

## Second phase

In order to make the best use of the results obtained during the first phase of the project, the design of the proof-of-concept was improved during the second phase, considering aspects such as data encryption. In addition, the way in which electronic components and wiring are integrated into the system was revised, along with improving the modularity of batteries and the controller.

The simulation developed during the first phase was also refined and the results obtained were compared with experimental results, considering the skin and different areas of the uniform.

An intensive battery of tests was carried out on the proof-of-concept, considering different parameters in controlled laboratory conditions and field trials.

On 15 and 16 June 2021, the online International Forum on Advanced and Digitalised Smart Textiles (IFAST) took place to evaluate the development of advanced smart textiles in the European defence sector and to disseminate the results of the STILE project to a wider audience.

The event showcased two important aspects of multifunctional smart textiles: their added value in responding to capability development needs and their dual-use properties, turning the technology into a relevant example of "dual-use by design", which is expected to be an advanced technology transfer mechanism with increasing relevance in the future EU dual-use ecosystem.

The STILE project is supported by the European Defence Agency (EDA).

Grant number:
EDA-18.ESI.OP.002



Figure 1: Proof of concept developed in the STILE project.

# Winners of the CRE@CTIVE call for proposals for innovative, sustainable, and inclusive business models in the textile, footwear, and leather sector

AITEX Eco-processes, Cosmetics and Health Research Group

Textile, footwear, and leather are traditional employment sectors employing 2.7 million people, mainly in SMEs (90% of the industry) in the Mediterranean basin with an estimated annual turnover of more than 280,000 million Euros. In recent decades, these three sectors have been hit hard by the economic downturn and strong competition from Asia. Mediterranean companies in these traditional sectors will have to overhaul their business models if they are to cope with this threat. Unable to fight back on price or volume, the main challenges they face are product and process innovation, the establishment of new business models and the creation of sustainable business partnerships to strengthen value chains.

## The CRE@CTIVE Project

This is the context for the CRE@CTIVE project (funded through the ENI CBC Mediterranean Sea Programme) whose goal is to foster value business value chains and alliances between MSMEs in the textile, footwear, and leather (TCC) sectors in the Mediterranean, by building bridges between these sectors and the creative industry. As a result, CRE@CTIVE seeks to:

- Strengthen networks, clusters, and transnational innovation value chains
- Create new jobs
- Boost the efficient use of resources
- Accelerate the process of generation, diffusion and application of innovative ideas, concepts, and business models.
- Provide tangible solutions for the target groups, in particular for young people and women, but also wider society.

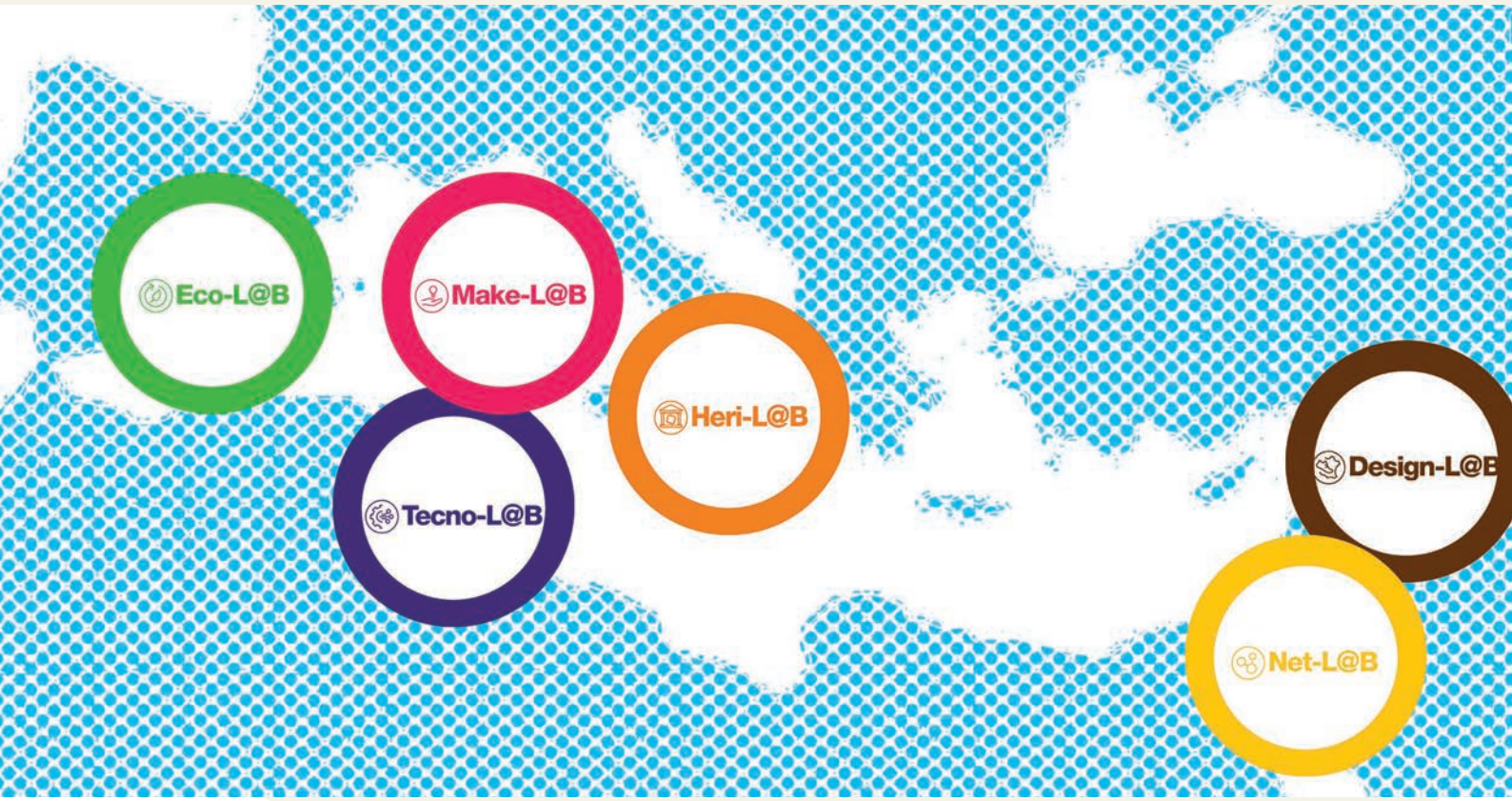



Figure 1: the location of the different co-creation areas (L@BS) around the Mediterranean

| | |
|---|---|
| Design-L@B | Providing support for designers in the leather and footwear industries combining traditional and modern practices to help inclusion |
| Eco-L@B | Focusing on studying new eco processes through the use of innovative sustainable technologies in textiles, leather and footwear |
| Net-L@B | Bringing its members together with business sustainability tools and providing technical assistance to access them |
| Tecno-L@B | Focusing on Smart, innovative, and creative textiles that enable these new companies to be competitive |
| Heri-L@B | Promoting innovation in the local textile industry by reusing and exploiting heritage and knowledge acquired historically in the Tuscany textile industry. |
| Make-L@B | Acting as a business incubator supporting the birth and growth of new creative companies. |

Table 1: the different co-creation areas (L@Bs)

Specifically, CRE@CTIVE will directly support sixteen new business partnerships to establish new market opportunities and at least twenty-four new direct long-term jobs will be created in the long term through direct involvement in the implementation of pilot projects through grants that will provide the opportunity to create new enterprises based on innovative approaches.

## Achievements

By surveying the manufacturing sectors to identify their strengths and weaknesses, co-creation spaces were defined (L@Bs) to offer new services and resources to strengthen the CCL sector in the Mediterranean area. The L@Bs defined in Spain, Italy, Palestine, Egypt and Tunisia are based on the business model defined in previous European projects, such as TCBL and INTERREG MED CREATIVEWEAR and are described in Table 1 which shows the location of the different L@BS across the Mediterranean basin.

The CRE@CTIVE project, which ended on 15 March 2022, launched a call for proposals from artists, designers and technology-based companies to select sixteen projects that propose innovative business models with a creative, sustainable and inclusive value proposition for the TCC. The main objectives of the call were:

- To form competitive transnational alliances between the manufacturing, design and technology companies to develop innovative and creative business models with high added value and high market potential to foster industry in the Mediterranean.
- To catalyse process development through L@Bs: six L@Bs will provide access to state-of-the-art technologies, networks, and knowledge to accelerate the development of selected projects.
- To create and empower cross-border networks of manufacturing sectors through awareness-raising, transfer of best practices, and by engaging stakeholders in a user-driven open innovation community.

The selected projects were chosen using the following criteria:

- Whose proposals were creative
- Demonstrated knowledge transfer from the L@Bs to MSMEs in the TCC sectors
- CRE@CTIVE is looking for cooperation, so it is important that the proposal conveyed North-South cooperation between different actors such as MSMEs and artists.

The selected projects which are currently in the process of formalizing grants will receive the following benefits:

- Financial support of 12.000 €
- Training programme and personalised follow-up of each project through the different L@Bs
- Market positioning
- Networking activities
- Seven months to carry out the project

It is important to point out that the promotional campaign had great impact, reaching some 80,000 people through social networks. In the end, 250 entities registered through the project's platform. Through matchmaking activities, eighty-two proposals were submitted to the call with twenty-nine being shortlisted. On 12 May, the meeting of the evaluation committee selected the sixteen winners for each of the L@Bs as below:

- **Design-L@B (Ramallah, Palestine)**

1. **"Modernization of Palestinian craftmanship in RTW fashion"** by Sara Jayyusi (Jordan) and Meera Albaba (Palestine). Local embroidery and leather craftsmanship converge to create a sustainable collection.

2. **"Exchange Knowledge in Marketing leather products"** by Saad Ghanem (Palestine) and Julian Sanudo (Spain). Development of new handcrafted leather products from the exchange of knowledge, ideas, and techniques.

3. **"Nadia"** by Sireen Nijeem (Palestine). Hand-woven scarves and foulards, a blend of tradition and sustainable technologies.

- **Eco-L@B (Alicante, Spain)**

1. **"From Waste to Color"** by Almudena Cerezo Araujo (Spain) and Sté Mongi (Tunisia). Would you buy clothes made with vegetable waste?

2. **"And then what?"** by María Llinares Torregrosa (Spain) and Brada Jlassi (Tunisia). "Buy less, buy better". Contribute to the fashion industry by reusing garments that cannot be recycled.

3. **"Trasmuta"** by Andrea Coderch Valor (Spain) and Hernan Gonzalo Villa (Spain). Sustainable garments that can be transformed into a Tote bag.

- **Net-L@B (Alexandria, Egypt)**

1. **"Using agriculture waste to produce natural fabric alternatives"** by Moushira Alamarawy (Egypt). Agricultural waste and Egyptian fibres converge to create biodegradable clothing.

2. **"Moda-ty virtual try on"** by Mahmoud Soliman (Egypt). Choose and try on clothes without leaving home, using your smart phone.

- **Techno-L@B (Monastir, Tunisia)**

1. **"Educational clothing and accessories"** by Mhenni Farouk (Tunisia). Vegetable waste, raw materials for the production of natural dyes.

2. **"Vest go"** by Oumaima Dhaouadi (Tunisia). Multi-purpose waistcoat (heating, GPS remote control and portable charging) with smart connection.

3. **"TCFL Digitalization and Collaboration Platform"** by Mohamed Kharrat (Tunisia). Automatic 3D scanning software.

- **Heri-L@B (Prato, Italy)**

1. **"LOTTOZERO: Heritage design studio"** by Tessa Moroder (Italy). Heritage design at the service of new collections.

2. **"A sustainable history repeating, the new Prato Carded Fabric"** by Francesca Nardi (Italy). Renewed and updated heritage textile resources.

3. **"Waste to Wear-Hacking Traditiuon"** by Fabio Molinas (Italy). Waste from cork production and recycled textile fibres converge to create new, more sustainable fashion thanks to local know-how.

- **Make-L@B (Sicily, Italy)**

1. **"Ama Re."** by Mattia Piazza (Italy). Sicilian sea lovers create a sustainable "genderless" capsule collection.

2. **"Wind scraps"** by Ilaria Maria Sposito (Italy). Goodbye to the iron! Accessories created from discarded lightweight nylon sails.

These sixteen projects will validate the different business models transferred in the project as co-creation centres. Adding to the series of good practices transferred between the countries of the Mediterranean basin covered by the CRE@CTIVE project, such as the transfer of governance models. The models involve the public authorities and the respective decision makers in the different activities carried out, to ensure a deep impact on policies. In addition, the involvement of several relevant public authorities will ensure that the results and actions of CRE@CTIVE are compatible with the latest and forthcoming development policies. When the project draws to a close, the authorities will be able to consider the bridges it has built between traditional sectors and the creative industries as an indispensable criterion for their regional or national financial support schemes.

CRE@CTIVE is a unique opportunity to put creativity at the heart of policy making in the three traditional sectors.

**More information on the projects can be found at https://www.enicbcmed.eu/projects/creactive**

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The contents of this document are the sole responsibility of AITEX and can under no circumstances be regarded as reflecting the position of the European Union or the management structures of the Programme.

ENI CBCMED Cooperating across borders in the Mediterranean

Project funded by the EUROPEAN UNION

REGIONE AUTÒNOMA DE SARDIGNA
REGIONE AUTONOMA DELLA SARDEGNA

CRE@CTIVE

# Formación AITEX

## CURSOS GRATUITOS

### Diseño y desarrollo de productos textiles sostenibles



**150h.**
**Del 15/06/2022 al 27/07/2022**
**Horario:** De 09:00 a 14:00h. **Fecha de selección:** 01/06/2022. **Lugar:** AITEX - Alcoy

### Herramientas digitales en diseño y desarrollo de productos



**360h.**
**Del 28/06/2022 al 10/11/2022**
**Horario:** De 09:30 a 14:30h. **Fecha de selección:** 08/06/2022. **Lugar:** AITEX - Paterna

### Herramientas de diseño y desarrollo para la estampación textil



**200h.**
**Del 12/09/2022 al 09/11/2022**
**Horario:** De 15:30 a 20:30h. **Fecha de selección:** 25/07/2022. **Lugar:** AITEX - Alcoy

### Diseño e impresión de prototipos en 3D



**90h.**
**Del 26/09/2022 al 27/10/2022**
**Horario:** De 09:30 a 13:30h. **Fecha de selección:** 12/09/2022. **Lugar:** AITEX - Paterna

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## AITEX sponsors the 47th AEQCT Symposium

The 47th Symposium “Following the thread: energies, eco-design and new technologies” took place in Barcelona on 28th March. After two years of virtual meetings, the Spanish Association of Chemists and Colourists (AEQCT) organised a public event once again, where it took the opportunity to change the format, holding three debates and keeping the virtual rooms.

This year, the Institute sponsored the 33rd award for the best textile or textile chemical in the industry, with the award being presented by the director of R&D projects of the G.I. in Eco-processes, Cosmetics and Health, Luca Cappelli, as representative of AITEX.






## AITEX in Frankfurt at the TECHTEXTIL fair

The Institute was once again at the leading international trade fair for technical textiles and nonwovens with its own stand. The event took place in Frankfurt over the 21st to the 24th of June, where the latest technological innovations in the field of textiles for functional garments and technical textiles were displayed.

The last edition of TECHTEXTIL welcomed more than 47.000 visitors from 116 different countries who visited the 1,818 exhibitors.

## Successful webinar on circular economy of composites and plastic materials

On 11th May, the OSIRIS Network and RETEMA organised a free webinar on the opportunities in the circular economy for composites and complex high value-added plastics materials. The event was attended by more than 150 users.

The Network, which forms an alliance between the GAIKER Foundation (coordinator), the Association for Research in Plastics and Related Materials - AIMPLAS, the Textile Industry Research Institute - AITEX, and the Foundation for Research and Development in Transport and Energy - CIDAUT, aims to achieve a new model of production and consumption that minimises waste and makes the best possible use of any waste which cannot be avoided.



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## Objetivos

Que las empresas industriales del sector textil valenciano sean más **competitivas** a través de acciones concretas y medidas por parte de la administración.

Fomentar la **planificación estratégica.**

**Incentivos** para las empresas participantes.

## Cómo funciona

La empresa se registra en una plataforma online y contesta el **cuestionario** con la ventaja de hacerlo en cualquier momento. **Sin plazos**.

## ¿Que obtiene la empresa?

UN DIAGNÓSTICO DE SU SITUACIÓN ACTUAL QUE ANALIZA 6 AREAS DE LA EMPRESA MEDIANTE LA AUTOREFLEXIÓN Y LA PLANIFICACIÓN ESTRATÉGICA

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