



Recycling and Repurposing of Plastic Waste for Advanced 3D
Printing Applications

Repair3D Exploitation & Dissemination Open Day Workshop

www.repair3d.eu

Preliminary Agenda

V2.0

Date: 30 May 2023

Time: 09:00 – 17:00 (CET)

Location: DoubleTree by Hilton Brussels City
Rue Gineste 3,
1210 Brussels,
Belgium

(Hybrid)



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Repair3D Project

The Second Open Day Exploitation and Dissemination Workshop is a great opportunity to hear about the results of the project, meet the project partners and learn about technologies they have established related to the development of innovative reclamation and repurposing routes for end-of-life plastic and carbon fibre reinforced polymer (CFRP) components, by employing advanced nanotechnology solutions, Additive Manufacturing (AM) and recycled resources, for the production of high added value 3D printed products with advanced functionalities.

The aim of the project was to address all aspects and stages of thermoplastic and CF reinforced thermoplastic 3D printing material development from recycled resources, starting with the selection of suitable waste streams, strategies for material repair, compatibilization and upgrade towards AM processing, compatibility between different thermoplastic matrices and the reinforcing fibres and nanoparticles, comparative assessment of various AM thermoplastic processing technologies and closed-loop material optimisation in terms of processability and performance.

This project has had the participation of 18 partners coming from leading industrial and academia sectors, these are: The Warrant Hub S.p.A. (Project Coordinator), National Technical University of Athens (NTUA), Ghent University, FundacióEurecat, Instituto Tecnológico del Embalaje, Transporte y Logística (ITENE), Centro Tecnológico LEITAT, Institut de RechercheTechnologique Jules Verne, SigmateX Ltd, Adamant Composites, Cambridge Nanomaterials Technology Ltd (CNT), Techedge S.p.a., Calzaturificio Dal Bello Srl, Centre Scientifique & Technique de L'industrie Textile Belge, Maier Scoop, BioG3D- New 3D Printing Technologies, Innovation in Research and Engineering Solutions (IRES), Yiotis Anonimos Emporiki & Viomixaniki Etaireia and Lavrion Technological and Cultural Park (LTCP)





Repair3D Open Day 2023 Workshop - Preliminary Agenda

Please take notice that all times shown in the agenda are CET

08:30 *Arrival, Registration and Refreshments*

08:50 *Joining for online participants*

09:00 Introduction to the Repair3D Open Day 2023

Bojan Boskovic, Cambridge Nanomaterials Technology Ltd (CNT), UK
Repair3D Project Exploitation Manager & Open Day 2023 Organiser

Isella Vicini, Warrant Hub S.p.A. (WH), Italy
Repair3D Project Coordinator

Costas Charitidis, National Technical University of Athens (NTUA), Greece
Repair3D Project Technical Coordinator

09:10 **Welcome words from the Project Officer**

Dr Achilles STALIOS, Programme Officer, European Commission

09:30 **Costas Charitidis**, Project Technical Coordination, National Technical University of Athens (NTUA), Greece

Title: Repair3D concept and main achievements

The EU-funded Repair3D project developed new reclamation and repurposing routes for carbon-fibre reinforced polymers enabling additive manufacturing technologies. The project aims at the development of innovative reclamation and repurposing routes for end-of-life plastic and carbon fibre reinforced polymer (CFRP) components. This will be achieved by employing advanced nanotechnology solutions, Additive Manufacturing (AM) and recycled resources, for the production of high added value 3D printed products with advanced functionalities. In this way, the combination of AM, polymer processing and recycling technologies could constitute a new paradigm of a distributed recycling process, easily implemented at local scale in collaboration with the industrial sector and collection facilities, in order to create competitive, highly customisable products at lower production costs, in a flexible digital environment that fully unravels the potential of eco-design and allows for integration of smart intrinsic self-sensing, self-repairing and recycling options.

The project investigated all aspects and stages of thermoplastic and CF reinforced thermoplastic 3D printing material development from recycled resources, starting with the selection of suitable waste streams, strategies for material repair, compatibilization and upgrade towards AM processing, compatibility between different thermoplastic matrices and the reinforcing fibres and nanoparticles, comparative assessment of various AM thermoplastic processing technologies and closed-loop material



optimisation in terms of processability and performance. Advanced nanotechnology solutions, additive manufacturing and recycled resources for the production of high-added-value 3D-printed products have been investigated. By harnessing the potential of eco-design and allowing the integration of smart intrinsic self-sensing, self-repairing and recycling options, the project created a distributed recycling process that can be implemented at local scale. The potential impacts of Repair3D can be summarized in the following:

- Meeting the EU's circular economy and environmental targets while demonstrating a clear benefit for CFRP recycling
 - Creating new technologies and business opportunities for the recycling industry across Europe, especially in the area of composites and plastics where the challenge is high.
 - Demonstrating a potential reduction in landfill waste volume
 - Assessing the full life cycle of Repair3D demonstrators

10:00 Kate Trompeta, National Technical University of Athens (NTUA), Greece

Title: NTUA achievements within Repair3D Project

Within Repair3D project NTUA has worked in the whole value chain of the composites recycling, from the waste stream analysis, selection, shredding and materials processing. Detailed aspects of the used nanomaterials, the synthetic processes and the polymer matrix modifications for self-healing and self-sensing properties have been addressed. Several different strategies for CF functionalization have been developed with magnetic nanoparticles for debonding the CFs from the polymer matrix and adding healing functionalities in the 3D printed composites. Nanocomposite filaments have been fabricated with Ag nanoparticles, magnetic nanoparticles and carbon nanotubes through extrusion process, which were used in the demonstrators, fabricated by consortium partners through different additive manufacturing technologies. Within WP5 the 2nd life recycling was achieved by investigating the properties of the materials after several recycling cycles and developing end-of-life separation technologies for the magnetic nanomaterials and carbon fibres included in the 3D printed composites.

10:20 Sophie Martin, IRT Jules Verne, France

Title: Recycling carbon: a novel approach for unpolymerized prepreg recycling using supercritical CO2 extraction

For the first time, supercritical CO2 extraction, already an industrial process, was used to remove some components from uncured prepreg, allowing to produce a new type of secondary raw material useful for composite applications (TP or TS) without any damage on the fibers and removing the stacking behaviour of the prepreg.

IMA/M21E (UD) from Hexcel uncured prepreg, available in large quantity in aeronautic industry was chosen as model. Firstly, uncured prepreg is cut at desired length. Then supercritical CO2 extraction is performed under 40°C and 29 MPa in a semi-continuous equipment for ten hours to remove partially some components of uncured prepreg (bisphenol A and F, and aminophenol in this case). Recycled carbon fibers rCF still



embedded inside prepreg components (32wt% of matrix) ready to be used are so recovered. Depending on the cutting size at the beginning, several application examples will be presented.

10:40 Sara Cavinato, Techedge, Italy

Title: Digital tracing in plastics recycling

While approaching circular economy we shall consider that companies are linear by nature, their process from supply to production and sale is linear. As single entities, companies have not the attitude to circularity. Circularity comes when companies become part of an ecosystem where all stakeholders come into play and collaborate. We will describe the role of different technologies, considered as enabling factor, in the circular economy process.

11:00 Coffee Break - Online exhibition (www.repair3d.net/EXPO)

11:30 Sofie Huysman, Centexbel, Belgium

Title: Towards more sustainable materials for composite and 3D-printing applications – research and development at Centexbel

During this presentation, a couple of ongoing regional and European research projects will be briefly discussed, all fully in line with the theme of Repair3D.

The objective of the PET2Value project is the upcycling of a post-industrial PET waste stream through micro-reinforcements for use in high value applications, such as 3D-printed bicycle parts and tennis racket strings.

The TEX2CE project explores ways to move from linear to circular textiles. Synthetic textile waste streams such as PES, PA and PP undergo thermomechanical recycling processes to be reusable for various applications.

In the Horizon Europe project SUSPENS, sustainable composites are being developed by improving the properties of bio-based and recycled fibers on the one hand, and by increasing the bio-content of thermoset resins on the other hand. In addition, the involved composite manufacturing and recycling processes will be fully optimized to further reduce the overall carbon footprint.

11:50 Marah Baddour, Ghent University, Belgium

Title: Improving the 3D printing process for continuous carbon fiber prepreg filament.

Additive Manufacturing (AM) is a production technique that creates a part layer-by-layer. This technique has been successfully used in the production of polymer and polymer composite parts to produce lightweight components with improved tensile strength, flexural properties, and impact toughness.

In this research, we used AM to manufacture continuous carbon-fiber-reinforced thermoplastic composites. We utilized the pre-impregnation technique to create



filaments from a bundle of continuous carbon fiber with a polyamide 12 as a polymer matrix. We systematically varied the pre-impregnation parameters to investigate their effects on the material properties. The resulting filaments were used to print test specimens using the Fused Filament Fabrication (FFF) method. In FFF, the polymer filament is melted in the extrusion orifice or nozzle on a moving bed to create the final product layer by layer. We also analyzed the impact of printing parameters, including the nozzle temperature, layer thickness, and inter-path distance, on the part's properties manufactured from the composite. The results showed that by decreasing the printing temperature and layer thickness and increasing the inter-path distance, we could significantly improve the flexural strength and flexural modulus of the printed composites. Eventually, we were able to obtain cCF-impregnated composites with superior flexural properties by optimizing the printing parameters.

12:10 Riccardo Bonaiti, Dalbello SRL, Italy

Title: Technology evolution on ski boot equipment, from leather to additive manufacturing

Brief presentation of Dalbello SRL and description of how the manufacturing process has evolved in the last 50 years, going from traditional handcrafted shoes to industrial high-tech products.

12:40 Xavier Tutó Cabedo, Leitat Technological Center, Spain

Title: How can additive manufacturing help companies become more innovative and sustainable?

In today's environmentally conscious era, sustainability has become a top priority for many industries. Additive manufacturing (AM), commonly known as 3D printing, has emerged as a promising solution for sustainable manufacturing.

To address the challenges faced by AM, it is crucial to design for sustainability. By applying Design for Additive Manufacturing (DfAM) strategies, companies can create more innovative and sustainable products that follow lean manufacturing principles.

Designing sustainably in AM has the potential to enhance product performance, reduce transportation costs, and enable customization. By reducing the weight of parts, products can become more lightweight, durable, and efficient, which, in turn, can reduce transportation costs and carbon emissions. Additionally, AM enables customization, allowing for the creation of unique and personalized products tailored to individual needs.

In summary, designing for sustainability in AM through DfAM strategies can help companies overcome the main obstacles to AM adoption and implementation. Creating more innovative and sustainable products that follow lean manufacturing principles can improve product performance, reduce costs, and contribute to a more sustainable future.



13:00 *Lunch break and networking*
Online exhibition (www.repair3d.net/EXPO)

14:00 **Helena Prima**, ITENE, Spain

Title: Assessment of release and exposure at procedures of developing and manufacturing to produce high added value 3D printed products with advanced functionalities

The main objective of the talk is to explain the identification the exposure scenarios, assess releases from the thermal, physicochemical and mechanical processes and assess the exposure levels at both the pilot and production line settings. This is achieved by:

- Identification of different processes and tasks and definition of exposure scenarios in the pilot, production and application settings
 - Airborne impurity measurements: potential release of the processes, background levels, and personal exposure of the workers, and
 - Characterization of the emissions: particle size distribution, elemental chemical content, number concentration, surface area and/or shape of the particles.
- ITEJE performed exposure campaigns at his own premises monitoring the release of particles during an extrusion process with materials from WP3.

14:20 **Katerina Pissaridi**, YIOTIS S.A., Greece

Title: Plastic packaging in the food industry

Food packaging protects the food from chemical, biological and physical alterations, thus making it one of the most important aspects among the processes involved in the food industry. Regulation (EU) 10/2011 sets out safety requirements for plastic materials and articles intended to come into contact with food. One of the most common tests regarding the chemical safety of packaging materials are migration tests. Overall and specific migration methodologies were presented, as well as the results that occurred from the Repair 3D thermoplastic materials. The results of the specific migration were evaluated according to the Regulation (EC) No 1907/2006 - Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH). Additionally, to ensure the biological safety, antibacterial additives are commonly used in plastics in order to suppress the growth of bacteria on the surfaces of products, when conditions exist, where growth can occur. The determination of the antimicrobial activity is performed with various methods. ISO 22196:2011 protocol and Agar Diffusion method (inhibition zone) are 2 of them. These methods were applied in order to evaluate possible antimicrobial properties of thermoplastics materials (medical assistive devices) developed within the Repair3D project.



14:40 **Stratos Saliakas**, Innovation in Research and Engineering Solutions – IRES, Belgium

Title: Nanosafety standards: Application of hazard banding and voluntary labelling of products

Nanomaterials offer advanced properties leading to their implementation in many products. At the same time, their unique intrinsic characteristics make applying traditional risk assessment approaches challenging. Several approaches are being developed and refined in order to address these challenges and enable the thorough risk evaluation of nanomaterials and nanocomposites. These include the control banding approach described in ISO 12901-2:2014 (Nanotechnologies - Occupational risk management applied to engineered nanomaterials — Part 2: Use of the control banding approach) and the tiered exposure assessment framework developed by OECD (OECD ENV/JM/MONO(2015)19).

In this presentation, the current status of nanosafety standardization will be discussed. Following the introduction to the principles of nanosafety, the application of the methodologies described in the standards will be presented. The implantation of control banding (ISO 12901-2:2014) will be outlined through an example of a nano enabled process. An additional example will be provided, demonstrating the use of voluntary labelling based on ISO/TR 22293:2021 (Evaluation of methods for assessing the release of nanomaterials from commercial, nanomaterial-containing polymer composites) and ISO/TS 13830 (Nanotechnologies - Guidance on voluntary labelling for consumer products containing manufactured nano-objects).

15:00 **Vasileios T. Protonotarios**, Lavrion Technology & Cultural Park (LTCP), Greece

Title: Summer School and other Training Sessions for Consumer Best Practices and Societal impact for circularity of materials use activities

Brief presentation of LTCP status and activities as a REPAIR3D partner.

Presentation of the activities hosted in LTCP regarding dissemination and educational activities, namely, webinar and Summer School. Also, brief presentation of other activities performed by LTCP with regard to REPAIR3D project (second phase materials shredding, air quality etc.)

15:20 *Coffee break – Online exhibition (www.repair3d.net/EXPO)*

15:35 **Bojan Boskovic**, Cambridge Nanomaterials Technology Ltd (CNT), UK

Title: Development of Circular Economy Eco-system and Innovation Management Strategy

European competitiveness, strategic autonomy and jobs depend on development of advanced materials circular economy. Steps towards the creation of the necessary environment needed for successful innovation management strategy, related to circular economy of advanced materials, will be discussed.



15:55 Isella Vicini, Warrant Hub S.p.A. (WH), Italy

Title: Funding opportunities in the new framework programme for research and innovation, Horizon Europe (2021 – 2027).

Horizon Europe is the 9th framework programme that will bring new inputs and will give new perspectives to innovation in the Advanced Materials and Recycling fields, opening new opportunities of funding thanks to specific instruments such as the Innovation Fund and the EIC accelerator. Moreover, the next 7 years of Horizon Europe will be focused on environment and sustainability and new opportunities will open inside the European Green Deal and LIFE Programme.

16:15 Tanja Kosanovic Milickovic, National Technical University of Athens (NTUA), Greece

Title: Plastics Recycling from and for home appliances, toys and textile (PRecycling)

PRecycling aims to produce high-quality recyclates from plastics waste streams by developing an easy-to-use methodology for sorting, sampling, tracing, recycling techniques, and analysis procedures of both plastic waste streams (PWS) and recyclates, and to assess the environmental and financial viability of them in selected waste management processes for plastics waste and secondary raw materials, in order to change the current paradigm of low cost non-environmentally friendly actions such as landfilling.

The project will tackle the actual challenges for the management of the EoL (End-of-life) TP (thermoplastic) materials and their recycling and design novel schemes to enhance the circularity of future products made of these materials. The target is to ensure recyclate consistent quality and safe use in products for home appliances, toys, and textiles, showing that high-quality, unique materials made from such waste can be reused, both within the same and new supply chains and products. The proposed methodology and process chain of PRecycling are expected to have a significant societal impact apart from commercial and industry interest and it could be adapted by many other sectors such as packaging and automotive.

16:35 Ine De Vilder, DECOAT Project, Centexbel, Belgium (*Guest speaker*)

Title: DECOAT: How to boost circularity? By removing coatings and paints from textiles and plastics!

To date, painted plastics and coated textiles are based on a linear economic model where raw materials are used to make products which are discarded as waste after use ('take-make-waste'), as these coatings and paints hinder the recycling process at end-of-life.

In the European H2020 project DECOAT research is being done on how to remove these coatings and paints from the bulk material at end-of-life, and so enabling circularity. A first strategy which is explored is the incorporation of specially designed triggers into



the adhesive layers. At end-of-life, these additives are activated, leading to debonding of the coating. The envisaged triggering actions are microwave radiation, heat and moist. Secondly, removal of the coatings can also be achieved via a solvation process, which is also being assessed.

17:00 End of session

Note It is planned that all presentations would be followed by Q&A discussion. The organisers reserve the right to change the programme or speakers should circumstances require. For any further enquires please do not hesitate to contact directly the **Repair3D Open Day 2023** organiser Dr Bojan Boskovic from Cambridge Nanomaterials Technology Ltd on info@cnt-ltd.co.uk or Bojan.Boskovic@CNT-Ltd.co.uk or on his mobile phone +447780874335.

Repair3D Open Day 2023 – Speakers



Dr Achilleas STALIOS
Programme Officer
European Commission
DG Research & Innovation
Advanced Materials and Nanotechnologies
Brussels, Belgium

Dr Achilleas STALIOS is a Policy Officer at the European Commission, DG Research & Innovation, D3 Advanced Materials and Nanotechnologies. He studied Physics Engineering at the University of Thessaloniki, Greece. He got his PhD in Physics, from the University of Antwerp, with Great Distinction. He has over 20 years' experience in materials (glass –ceramics and metal alloys) research and characterisation, laboratories in Belgium, SCK/CEN, in Greece (Demokritos Institute--NCSR in Athens), Germany, ITU (Institute for Transuranium Elements – JRC Karlsruhe-European Commission). He is the author of 40 scientific papers.



Dr Bojan Boskovic (*Repair3D Partner & Organiser*)
Cambridge Nanomaterials Technology Ltd
14 Orchard Way, Lower Cambourne
Cambridge CB23 5BN -UK

Dr Bojan Boskovic is the Founder, Managing Director, and Principal Consultant of the company. He has more than 20 years of hands-on experience with carbon nanomaterials and composites from industry and academia in the UK and Europe. Previously, he worked as a R&D Manager at Nanocyl, one of leading carbon nanotube manufacturing companies in Europe. He also worked on carbon nanotube synthesis and applications as a Principal Engineer-Carbon Scientist at Meggitt Aircraft Braking Systems, as a Research Associate at the University of Cambridge, and as a Senior Specialist at Morgan Advanced Materials. During his PhD studies at the University of Surrey he invented low temperature synthesis method for production of carbon nanomaterials that has been used as a foundation patent for the start-up company Surrey Nanosystems. He was a member of the Steering and Review Group for the Mini-IGT in



Nanotechnology that advised the UK Government on the first nanotechnology strategy policy document. Dr Boskovic was working as an advisor for the European Commission (EC) on Engineering and Upscaling Clustering and on setting up of the European Pilot Production Network (EPPN) and European Materials Characterisation Cluster (EMCC). He has experience in exploitation and dissemination management on a number of FP7 and H2020 European projects, including UltraWire, NanoLeap, OYSTER, M3DLoC, Genesis, nTRACK, Repair3D, Carbo4Power, nanoMECommons, DOME-4.0, TRIankle and AM4BAT. Also, in UK Government InnovateUK funded projects, such as UltraMAT, GRAPHOSITE and HiBarFilm. He is also a leader of two private membership-based consortiums: Nano-Carbon Enhanced Materials (NCEM) and Advanced Materials for Additive Manufacturing (AMAM).



Prof. Costas A. Charitidis (*Repair3D Partner*)
National Technical University of Athens,
9 Heroon Polytechniou str., Zographou
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Prof. Constantinos Charitidis is Professor in the School of Chemical Engineering of the National Technical University of Athens and Director of the Laboratory of Advanced, Composite, Nano Materials & Nanotechnology. Prof. Charitidis is member of the General Assembly of the Hellenic Foundation for Research and Innovation and since 2018 President of the Body. From 2010 to 2016 he has been Director of Section III: Materials Science & Engineering of the School, while from 2011 he is Director of the Interdisciplinary Postgraduate (MSc) Program: Materials Science & Technology (NTUA). He has more than 25 years of experience in the fields of Materials Science & Nanotechnology, Carbon-based materials and Safety impacts of Nanotechnology. He has extensive R&D experience through collaborations with international research centers since he has participated in more than 70 European and National funded projects, in many of them as Scientific Coordinator (most recent are: Nanotechnologies, Advanced Materials, Advanced Manufacturing and Processing, Resource Efficient Economy with a Sustainable Supply of Raw Materials NMP FP7, Horizon 2020). He is a referee in 85 International scientific journals. He is the author of several scientific books, chapters in international text books and more than 300 scientific publications in peer reviewed international journals and conference proceedings and cited ~4700 by other researchers (h-index 44).



Kate Trompeta (*Repair3D Partner*)
National Technical University of Athens,
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Athens, Greece, GR-15780

Kate Trompeta is a Chemical Engineer, graduated from the National Technical University of Athens. She has accomplished her Master studies on Material Science and Technology, funded by the IKY Fellowship of Excellence for Postgraduate Studies in Greece – Siemens Program and she was awarded for her excellence by the Limmat Stiftung Institute. Her research interest focuses on organic coatings, especially in industrial and marine paints, reinforced with nanoparticles (carbon nanotubes, metal oxide nanocontainers, etc). Her work experience is related with EU Funded Research Projects, which are dealing with advanced composites



reinforced with carbon fibres, as well as their recycling aspects. Her research work has been presented in national and international conferences and several related publications in peer reviewed journals have been published the last years; some of them have been also awarded.



Dr Sophie Martin (*Repair3D Partner*)

IRT Jules Verne,
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France

Dr Sophie Martin has a PhD in nanosciences, and worked on silver nanoparticles for antimicrobial properties in polymer resin for industrial applications. She is working in Jules Verne institute (France), an industrial research center dedicated to manufacturing. As an R&D engineer for the REPAIR3D project, her works are about recycling composites made of prepregs (epoxy and carbon fibers) with supercritical fluid chemistry, and more globally, the recycling aspects in composite industry.



Sara Cavinato (*Repair3D Partner*)

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Milano 20153
Italy

Sara Cavinato is an Energy Engineer who is working as functional analyst and Project Manager for Techedge since 2016. Her area of expertise is mainly on Real time, Industrial IoT and Smart City Projects

Dr Sofie Huysman (*Repair3D Partner*)

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Sofie Huysman graduated as master in Material Science & Engineering at Ghent University in 2012. Afterwards, she completed a PhD in Sustainable Materials Management. Since 2016, she has been working at Centexbel as a research engineer on regional and European projects related to polymer recycling, biomaterials, composites and 3D printing.



Marah Baddour (*Repair3D Partner*)

Ghent University
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9000 Gent,
Belgium

Marah Baddour is a doctoral researcher at Ghent University focusing on development of equipment and process design for composite additive manufacturing with filaments and pellets. She got her



Master's degree in the management engineering department of industrial and information engineering and economics, at L'Aquila University/Italy, and she did her Bachelor's degree in the mechanical and electrical engineering department of design and production engineering, at Tishreen University/Syria.



Riccardo Bonaiti (*Repair3D Partner*)

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Riccardo Bonaiti is a Product Line Manager for Dalbello SRL. He is a ski instructor in Cortina d'Ampezzo and has a Master Degree in Mechanical Engineering from Università degli Studi di Padova.



Xavier Tutó Cabedo (*Repair3D Partner*)

Leitat Technological Center

Spain

In 2018, **Xavier Tutó Cabedo** joins as Senior Researcher in R&D at LEITAT Technology Centre. Currently, he is Principal Researcher, as the head of the Design and Engineering team of the Additive Manufacturing and 3D Printing area of the Digital Industry department and the IAM3DHUB (International Advanced Manufacturing 3D Hub). Since 2009 he is professor at the Faculty of Design and Engineering ELISAVA in Barcelona. In 2004, he co-founded the multidisciplinary studio KXdesigners and in 2009, he co-created Growthobjects, a group for the development of biomimetic engineering solutions and custom design through additive manufacturing.

During his professional career, he has been collaborating with architects, designers, and relevant companies from different disciplines. With a career spanning more than 20 years, he has experience in multiple areas of design, as a designer-engineer, project manager, researcher, teacher, lecturer, and entrepreneur. Since 2007 he has focused his activity on research and innovation in additive manufacturing and 3D printing.

He received his academic training at the Faculty of Design and Engineering ELISAVA in Barcelona, with studies validated by the University of Southampton. Subsequently, he has complemented his training with a Postgraduate Degree in Design Research and Management at the TGRAF centre of ISEC in Lisbon.



Dr Helena Prima (*Repair3D Partner*)

ITENE

Spain

Dr Helena Prima has a PhD in Solid State Physics and Project Manager in the area of Safety, Health and Environmental Monitoring



Dr Katerina Pissaridi (*Repair3D Partner*)
YIOTIS S.A
Greece

Katerina Pissaridi (female), PhD. Research Project Supervisor. She holds a diploma on Chemical Engineering from the National Technical University of Athens (NTUA). She obtained her PhD on the field of Biomaterials and Biospectroscopy in 2012 from the School of Chemical Engineering, NTUA. Her Postdoctoral studies were at the Laboratory of Food Chemistry and Biotechnology (Department of Chemistry, University of Patras). Before joining YIOTIS S.A she was working as an R&D Coordinator in “Megara Resins”. She has published more than 15 scientific papers in International Journals and Books and she has presented her work in many National and International conferences. Four of her presentations were chosen as best papers and were awarded distinctions.



Stratos Saliakas (*Repair3D Partner*)
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Belgium

Stratos Saliakas holds a BSc degree on applied mathematical and physical sciences. He has been a part of the Risk and (nano)Safety group of IRES for four years, performing risk evaluation of innovative manufacturing processes. His work is mainly focused on the occupational exposure to nanoparticles, both engineered and incidental.



Dr. Vasileios T. Protonotarios (*Repair3D Partner*)
Lavrion Technology & Cultural Park (LTCP)
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Greece

Dr. Vasileios Protonotarios, MSc is an active researcher/engineer/consultant for the last 23 years in the field of Environmental Technology, Waste Management and Chemical Engineering with special experience and skills in the field of solid waste management (including C&D and Hazardous Waste), recycling, soil remediation, brownfield site/quarries reclamation and risk assessment. He has conducted over 200 Environmental Impact Assessments (EIA), Life Cycle Assessments (LCA) and other Technical Essays for the Industrial Sector, Technical Companies, Public Authorities and individuals. He has 29 publications in peer – reviewed journals and international conferences and some 600 citations. Dr. Protonotarios has participated in more than 20 research projects as main researcher, most of them in the field of waste management, recycling and brownfields restoration. Finally, he possesses a significant experience in laboratory analyses and handling of Special Chemical Laboratory Equipment.



Isella Vicini (*Repair3D Partner*)
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Isella Vicini is the Director of the European Funding Development of Warrant Hub S.p.A and the CEO and founder of beWarrant, a Belgian consultancy company that provides support on European Funding opportunities. She has a wide experience in the EC Research and Innovation programmes, like Horizon 2020 and LIFE Programme. Since the First Framework Program (1985), she works in the European Project Design field, taking care of the complete cycle of a project: from the analysis of the sectorial policies to the conclusion of the research and innovation project. She currently manages a team of 24 people and her European Funding Development provides around 100 services per year, it has participated in more than 70 projects and it manages more than 200 million euros Horizon 2020 and Horizon Europe grants. Isella is the Project Coordinator of the EU funded project Repair3D.



Dr Tatjana Kosanovic (*Repair3D Partner*)
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9 Heroon Polytechniou str., Zographou
Athens, Greece, GR-15780

Dr Tatjana Kosanovic Milickovic is a Chemist (University of Belgrade) with Ph.D. in Chemical Sciences (NTUA). She has been involved in the scientific and technical implementation and project management of >20 EU and national R&D projects. She's research interests cover a wide range of topics in the fields of electrochemistry, advanced materials, and nanotechnology: electrochemistry of materials and crystal growth – controlled preparation and characterization of specific material microstructures and heterostructures featuring adjusted properties for technological applications; electrodeposition of functionality graded metallic coatings and alloys; development and characterization of nanomaterials, nanostructures and nanocomposites; electrosynthesis of binary and ternary selenide and telluride compounds and evaluation of the produced configurations (photovoltaic device components, electrodes in PECs and photocatalytic applications); characterization of materials by solid-state methods, optical and electrochemical techniques; environmental chemistry (analysis of water, wastewater, soils, sediments and compost, pollution monitoring, wastewater treatments) and technical interpretation and implementation of standards specifications, development of analysis methods and quality control. She has published > 50 scientific and technical papers in peer reviewed journals and/or presented at national and international conferences.



Dr Ine De Vilder (*Guest Speaker*)

Centexbel

CENTEXBEL - VKC |

Etienne Sabbelaan 49

BE 8500 KORTRIJK

Belgium

After finishing her studies as industrial engineer, and subsequent PhD in organic chemistry at the university of Ghent, **Dr Ine De Vilder** started at Centexbel more than 12 years ago. She joined the research group on 'textile functionalisation and surface modification'. She has been involved in many private, national and international projects with a variety of topics. The last years, multiple of her projects are dealing with recycling and circularity.

Repair3D Open Day 2023 Workshop – Partner Organisations

The Warrant Hub S.p.A. (*Project Coordinator*)



Web: <http://warranthub.it>

Warrant Hub S.p.A. is a privately held consultancy services company that provides full-spectrum consulting in business finance. Warrant Hub, formerly Warrant Group, joined Tinexta Group at the end of 2017. Warrant Hub S.p.A. has been active since 1995, growing over the years to become a leader in its sector today. Warrant Hub Business Units work in synergy with its Innovation Lab to give their clients the best support tools for the success of their business initiatives and to assist them in the preparation and management of strategic projects: business projects, research projects, training and technology transfer activities, under National and International support frameworks. The European Funding Division (EFD) team provides consultancy, training and support on European Funding opportunities, and in the preparation, negotiation and management of European Proposals, particularly on H2020 calls. EFD offers also support for communication and dissemination activities, and periodically participates into and organizes sectional seminars and networking events with/for industrial associations, SMEs, policy makers, etc. thus having the opportunity to disseminate the project results to relevant audiences. EFD also collaborates with the Innovation Lab of Warrant Hub S.p.A., that has a long experience in market surveys and studies, technological audits and scouting, IP management, market penetration studies (especially for new materials and processes). Warrant Hub is the Project Coordinator for administrative and legal management, consortium management, project monitoring, periodic reporting as well as risk management. Warrant Hub will collaborate to exploitation activities, and will support dissemination and communication activities.



National Technical University of Athens

Web: <https://www.ntua.gr/en/>



The **National Technical University of Athens (NTUA)**, is among the oldest higher education institutions of Greece and the most prestigious among engineering schools. It is named Metsovio in honor of its benefactors Nikolaos Stournaris, Eleni Tositsa, Michail Tositsas and Georgios Averoff, whose origin is from the town of Metsovo in Epirus. It was founded in 1837 as a part-time vocational school named Royal School of Arts which, as its role in the technical development of the fledgling state grew, developed into Greece's sole institution providing engineering degrees up until the 1950s, when polytechnics were established outside Athens. The "Research Lab of Advanced, Composite, Nano Materials & Nanotechnology", R-Nano Lab is situated at the School of Chemical Engineering (Department of Materials Science and Engineering) of NTUA. It is established since 2007; its research group has extensive experience in Designing, Production and Characterization of Advanced-, Composite- and Nano- Materials.

Ghent University

Web: <https://www.ugent.be/en>



Ghent University is one of the major Belgian universities counting over 42,000 students and 9,000 employees. Ghent University is ranked 61st in the International Shanghai ranking. The 11 faculties are composed of 117 faculty departments. These departments offer more than 230 high-quality courses in every one of their scientific disciplines, each inspired by innovative research. Following the spirit of Leo Baekeland, polymer science and engineering is still one of the major research directions at Ghent University. The University has participated in more than 200 research projects in the EU's Sixth Framework Programme (2002-2006) and in 260 projects in the Seventh Framework Programme, of which 27 ERC grants and 26 Marie Curie Fellowships. Ghent University coordinated 42 collaborative projects in FP7. Up till now, Ghent University is under H2020 (the new Framework Programme (2014-2020)) involved in more than 100 projects, and coordinates 9 of them. Within the **Faculty of Engineering and Architecture (FEA)**, the complementary research groups **Centre for Polymer and Material Technologies (CPMT)** and **Centre for Textile Science and Engineering (CTSE)** will fully support this research. The project proposal appeals to the complementary expertise of the material science research within these research groups in the scope of polymer science and engineering. CPMT has more than twenty years of experience in research on characterization, design and (re-)processing of polymers and composites, including 3D printing. They study the relation between processing parameters during (3D) production of polymer-based materials, and their resulting characteristics (mechanical and physical- chemical) and applications. Currently, research focuses on advanced processing technologies such i) recycling and sustainable use of polymers and composites, (ii) the advanced processing of polymers and composites/compounds, (iii) the development and/or adaptation of moulds and polymer processing machines in order to improve the behaviour of polymer/composite materials, (iv) the integration of the knowledge of polymer/composite technology in additive manufacturing technologies with focus on 3D (composites) extrusion based technologies.



FundacióEurecat



Web: <https://eurecat.org/en/>



Eurecat is the leading Technology Centre of Catalonia. It provides the industrial and business sector with differential technology and advanced expertise, offers solutions to their innovation needs and boosts their competitiveness in a fast-paced environment. With a vast expertise in additive manufacturing technologies, Eurecat will lead the Work Package 3 as well as the Task 4.2, providing its deep knowledge and expertise on additive manufacturing of structures and products as well as on advanced design techniques such as generative design at multi-scale level or topology optimization.

Instituto Tecnológico del Embalaje, Transporte y Logística - ITENE



Web: <http://itene.com/en>

ITENE is a market-oriented research center specialized in packaging, transport, and logistics. Located in Valencia (Spain), its mission is to generate scientific and technological knowledge and to add value to companies through the implementation of R+D+I and through the transfer of knowledge. ITENE provides business solutions with an integrated view of the supply chain, from raw materials to the design and development of packaging, optimization of logistics and distribution of goods until the products reach consumers and are ultimately managed as waste, all within a framework of sustainable performance. ITENE collaborates with research centers and companies around the world, encouraging cooperation and technology transfer. The centre has a multidisciplinary team of researchers and technicians with proven experience and constantly evolving skills. ITENE uses 3,500 square metres of its installations as laboratories and experimentation facilities, equipped with the latest technology for research and testing activities.

Centro Tecnológico LEITAT

Web: <https://www.leitat.org/english/>



LEITAT is a private technical institute with more than 110 years of experience in industrial innovation processes. We transform technological and scientific results into economic and competitive value for our clients and collaborating entities. Over 1500 customers benefit from our talent, creativity and strong commitment. We bring knowledge and innovation to our customers through applied research and technical testing in the fields of chemistry, energy, environment, materials, engineering and life sciences. We rely upon our 240 highly skilled team members who deliver flexible solutions to face any industrial challenge.



Institut de Recherche Technologique Jules Verne

Web: www.irt-jules-verne.fr/



IRT JULES VERNE is a French RTO dedicated to advanced manufacturing since 2012. JULES develops solutions for the design, processing, and manufacturing of parts and structures for the aeronautic, shipbuilding, automotive and energy sector (composites, metals and hybrid structures). It develops industrial technologies for its partners in the industry from TRL 3 to 7. It enables them to increase their competitiveness on their respective markets by innovating on three axes: Integrated product/process design, Innovative processes, Adaptive and smart manufacturing systems.

Sigmatex Ltd

Web: <https://www.sigmatex.com/>



Global Carbon Composite Solutions -

Sigmatex is one of the world's leading independent converters of carbon fibre. With the widest range of textile technologies and proprietary manufacturing equipment, Sigmatex supplies a wide spectrum of advanced composite materials to the Automotive, Aerospace, Marine, Wind Energy, Sports and Leisure markets from its global locations.

Designed for Performance

Sigmatex has a proven track record, converting large quantities of carbon fibre each year for major projects that require high levels of quality and reliability. Sigmatex offers:

- Innovative research and development
- Dedicated technical support ensures optimal solution for our customers
- Market leading conversion technology
- Global Manufacturing locations
- Independence – optimal fibre selection

Adamant Composites

Web: <http://www.adamant-composites.gr/>



Adamant Composites (ADCO) is a Greek technology company providing high-added-value quality products and services in the field of Advanced materials and Structures. ADCO was founded in 2012 by experienced Mechanical and Aerospace Engineers with competence in nanotechnology, composites processing and design & analysis of composite structures. The know-how of the company focuses on the area of nanotechnology, composite materials, mechanical design and analysis of aerospace, automotive and sporting systems. As of April 2016, ADAMANT has moved to new facilities of 1100m²; where are hosted company's activities in both the directions of Materials & Processes (Hall 1 – 800m²) and the Space Systems branch with emphasis on AIT (Hall 2 – 300m²). ADCO currently has 15 employees,



including engineering, R&D, quality assurance, production and newly formed commercial team. ADAMANT has been certified by EUROCERT under EN ISO 9001:2008 (Certificate number 1869/Δ). The department of Materials & Processes will be mainly involved in the realization of REPAIR3D project.

Cambridge Nanomaterials Technology Ltd



Web: <https://www.cnt-ltd.co.uk/>

Cambridge Nanomaterials Technology Ltd (CNT) is an innovation management and nanotechnology consulting company based in Cambridge, UK. The CNT Ltd helps companies, academic and government institutions to develop world-class innovative solutions for nanomaterials related R&D and IPR strategy, partnership, products, technologies, funding and markets. CNT Ltd is specialised in carbon nanomaterials R&D consulting and collaborative R&D project management, including exploitation and dissemination management, consortium and supply chain building. CNT has done a number of patent landscaping and market research analysis studies regarding production and use of various nanomaterials helping to link inventors and technology developers with end-users and investors.

The CNT is leading the exploitation and dissemination activities in the project.

Techedge S.p.a.



Web: <http://www.techedgegroup.com/en/>

Founded in 2004, **Techedge** today holds more than 20 offices spread throughout EMEA, NAFTA and LATAM. The countries where we have a local presence include: United States, Mexico, Brazil, Chile, Peru, Colombia, Spain, Portugal, Italy, Germany, United Kingdom and Saudi Arabia. We service a broad range of industries with value-add solutions and services specifically tailored to meet their diverse needs as organizations. Our average customer belongs to the midmarket or Fortune 500 categories and chooses to keep us on board as a strategic partner - as indicated by our 100% client retention. Growing tremendously year over year, Techedge has sustained a Calculated Average Growth Rate of more than 25% since our foundation. Today, we stand proud with over 1,800 professionals with numerous certifications who aim to become a part of our customers competitive advantage through the invention, design and engineering of world-class solutions and services

Calzaturificio Dal Bello Srl



Web: <https://www.dalbello.it/en/>

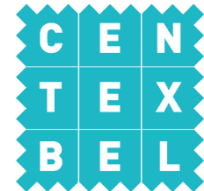
Dalbello is an Italian ski boot specialist founded in 1974 by Alessandro Dal Bello, a true shoemaker. Being located next to the mountains in Asolo (TV), Dalbello is the only manufacturer that still produces every single boot in its own factory in Italy. Italian sensitivity for unique and advanced design, technological solutions and the passion for the boot made Dalbello a top performing brand, winning 10 Olympic medals in 2014 and supporting top



athletes in freeriding and world cup racing. Behind the victories is a team of outstanding athletes who have a lot of influence on the product and its performance. Their experience and daily use lead to a permanent progression and continuous improvements. The team works very close with our inhouse engineers and designers and is a true member of the global Dalbello family.

Centre Scientifique & Technique de L'industrie Textile Belge

Web: <https://www.centexbel.be/fr>



Centexbel is a non-profit organisation supporting textile manufactures and plastic converters in the development and introduction of novel materials, innovative products and technological processes.

Our key activities include:

- Research and development in fields with a high added value, and more in particular in the melt processing of polymers, 3D printing, recycling, composites, coating and surface modification, smart textiles and material characterisation. Polymers, their additives and their processing are the common theme throughout our research activities.
- Product certification and finding adequate solutions in an independent manner, within the regulatory boundaries, but in full understanding of the challenges with which companies are faced
- Assisting companies in analysing, characterising and testing of products by means of the most advanced instruments and based on our excellent knowledge of products and processes.
- Dissemination of knowledge, in particular by allowing companies to make use of research results in their specific business context.

Within the Repair3D project, Centexbel will focus on material characterisation, compounding, filament extrusion, 3D-printing directly from pellets with the Arburg Freeformer technology and direct 3D printing onto textiles for smart applications.

Maier Scoop

Web: <http://www.maier.es/>



MAIER is one of the leading decorated plastic component supplier with up to 3.000 employees in 8 countries with global sales around 361 M€ in 2017, being part of the biggest co-operative group in the world (global sales above 13,200 M€ and a workforce above 82,000 employees). MAIER manufactures components for the automotive industry. In Europe, MAIER heads the development and manufacture of body colour painted front grilles, chromed caps, wheel-trims, wheelcaps and petrol cap lids, as well as producing a wide array of other automotive components and body modules (mudguards, consoles, air vents, fascia, door trims, handles...).



MAIER owns plants in Spain, the United Kingdom and Czech Republic, joint ventures in Turkey, China and Japan, and offices in France, Germany and Japan, being supplier of plastic components for the most important automotive OEMs (Renault, Toyota, Honda, Ford, Opel, Seat, PSA, Jaguar-Land Rover, Mercedes, Rover, Suzuki, Volvo, Nissan, Bentley, Skoda, Audi, etc.). Besides its production facilities, its technical center (MTC) has more than 110 employees that carry out R&D projects and support the developments for OEMs and equippers. MAIER is an experienced company in the design and the development of components (injection, finishing/decoration and assembly); designing and manufacturing of prototype and production moulds; analysis and implementation of industrial facilities; and research, development and innovation. MAIER innovation procedure is always based on quality and accuracy methodologies, which have led to more than 20 patents, from 1993, in automotive components and related processes.

BioG3D- New 3D Printing Technologies

Web: <http://www.biog3d.gr/>



BioG3D, is an R&D company, headquartered in Technological Cultural Park of Lavrion (Athens) and is dedicated to new and innovative bio-nanotechnology solutions and products for personalised treatment. Additionally, BioG3D is providing specialized services in the fields of biomaterials synthesis and characterization, Additive Manufacturing techniques (3D printing) and pre-clinical studies. It aims at the development of innovative technologies and the optimization of products for both Tissue Engineering and Drug Delivery applications.

Innovation in Research and Engineering Solutions

Web: <http://innovation-res.eu/>



IRES, an R&D consulting company founded in 2015, is dedicated to new and innovative nanotechnology solutions. Headquartered in Brussels (Belgium), IRES is a team of key collaborators that provide supporting services such as IP, market research, environmental solutions and marketing advice. Our mission is to deliver to our customers world-class innovative solutions for development of materials-based products. Customised and tailored solutions on demand, often in tool form, successfully identify possible business risks and provide sustainable directions. For this, the whole lifecycle of products is considered, through a holistic evaluation of social, environmental and economic aspects based on EU standards and regulations. IRES in collaboration with external bodies and related initiatives, is part of new technological events, arising innovative technologies and strategic research trends.

Yiotis Anonimos Emporiki & Viomixaniki Etaireia

Web: <http://www.jotis.gr/en/>



YIOTIS S.A. was founded in 1930 as the first infant and baby food producer in Greece. Today, the company remains 100% Greek and employs 377 employees developing a wide range of



products including, baby food and infant formula, fortified products, confectionary and cooking mixes, baking products, chocolates, refrigerated RtE products, low Glycaemic Index desserts, powder mixes for instant desserts, syrups, glazes, toppings, dessert kits and many more. YIOTIS S.A. has played an integral role in the history and evolution of the Greek diet, and still continues to innovate. The company meets the needs of the whole family, with a rich variety of innovative products that make them the homemaker's "right hand" when it comes to cooking and baking at home. In addition to this, it has been steadily playing its part in strengthening the Greek economy by consistently implementing its investment plans. In 2012, the company invested in acquiring a new warehouse in Mandra, Attica, with a total area of 10,000 sq. m. and capacity for 9,000 pallet stacks. In 2015, YIOTIS S.A. continued its steady investment plan in Greece and completed the construction of its new factory in Agrinio, with a total area of 10,000 sq. m. In 2017 the construction of new company facilities was completed. These 1,350 sq. m. facilities house the "Hellenic Research and Innovation Center" (HRIC), which is a state-of-the-art Institute of food safety accredited according to ISO/IEC 17025 that offers high quality chemical, microbiological, molecular and consultation services to the food industry. At the same time, the company is dynamically strengthening its presence in foreign markets in all five continents. Since 1990 YIOTIS S.A. has participated in more than 20 research projects funded by the Greek Ministry for Development and the EU regarding new product development and food safety, environmental actions and development of industrial & analytical technologies.

Lavrion Technological and Cultural Park (LTCP)



Web: http://www.ltp.ntua.gr/home_en

Lavrion Technological and Cultural Park (LTCP), is a body of scientific research, education, business and culture. Founded in place of the old French Mining Company of Lavrion (Compagnie Francaise des Mines du Laurium) in 1992, as a result of the initiative undertaken from the National Technical University of Athens. LTCP aims at linking scientific and technological research conducted in Athens with the needs and interests of the business world to the realization of cultural events related to the promotion of the history and culture of the wider area of Lavreotiki and the emergence of the history of activities in the past had developed in the maintenance of premises. The LTCP area is a unique monument of industrial architecture and archaeology and placed him in a series of housing facilities for business and research excellence. The services provided by LTCP as well as its renovated facilities, continue to support research, education and technology. Today, LTCP is essentially the only Technology Park in Attica, which specializes in areas – keys of modern applied technology, such as information technology, electronics technology, telecommunications, robotics, technology laser, environmental technology, energy, shipbuilding, Marine technology, etc.

Repair3D Open Day 2023 Workshop – Guests participating projects

Precycling

Web: www.precycling-project.eu/





Pre-cycling aims to produce high-quality recyclates from plastics waste streams by developing an easy-to-use methodology for sorting, sampling, tracing, recycling techniques, and analysis procedures of both plastic waste streams (PWS) and recyclates, and to assess the environmental and financial viability of them in selected waste management processes for plastics waste and secondary raw materials, in order to change the current paradigm of low cost non-environmentally friendly actions such as landfilling.

DeCOAT Project



Web: <http://decoat.eu/project/>

The main goal of DECOAT is to enable circular use of textiles and plastic parts with (multilayer) ‘coatings’, which are typically not recyclable yet. These ‘coatings’ comprise functional and performance coatings and paints as well as adhesion layers. Therefore, novel triggerable smart polymer material systems and the corresponding recycling processes will be developed. The triggerable solutions will be based on smart additives (like microcapsules or microwave triggered additives) for the ‘coating’ formulations that will be activated by a specific trigger (heat, humidity, microwave, chemical).

A continuous recycling pilot plant will demonstrate the novel DECOAT principle that allows upgrading existing mechanical recycling by adding tools for sorting by and activation of the trigger. The optimal use of the Creasolv® process for recycling of coated parts will be assessed. The focus is on recycling of the bulk material, but re-use of the coatings materials themselves will also be tackled. Using these recycling processes, circular use of demo cases for outdoor gear, household electronics and automotive parts will be validated.

Repair3D Open Day 2023 Workshop – Participating Organisations

European Health and Digital Executive Agency (HaDEA)



Web: https://hadea.ec.europa.eu/index_en

The **European Health and Digital Executive Agency (HaDEA)** implements European programmes and initiatives for health, food safety, digital, industry and space. HaDEA's vision: Boosting Europe by building, from earth to space, a healthy society, a competitive industry and a digital economy.

Avanzare Innovación Tecnológica



Web: www.avanzarematerials.com

Avanzare Innovacion Tecnologica SL is a Spanish SME specialized in the production of nanomaterials, nanomaterials dispersions and nanotechnology-based solutions. The company



is specialized in the development & commercialization of special additives, mainly for different matrices and industrial sectors: plastics, rubber, paints, paper, etc., with international presence in the automotive, aeronautic, fabric, plastic, rubber, paint and building industries, the wire & cable sector and manufacturers of household appliances and packaging wood, paper, among others. AVANZARE is the European leader in graphene and other artificial 2D nano-materials such as n-Mg(OH)₂, n-Zn(OH)₂ and LDHs (double layered hydroxide) among other materials. With 6,000 m² of facilities and more than 300 Tm of nanomaterials produced in 2018, AVAN has become one of the top 3 producers of nanomaterials in last decade.

National Composites Centre - (NCC)



Web: www.nccuk.com

As an integral part of the High Value Manufacturing Catapult, the **National Composites Centre (NCC)** is a world-class research centre, where companies of any size and across industry sectors, can access cutting-edge technology and specialist engineers (over 200), to drive innovation in the design and manufacture of composites. The NCC accelerates product development, stimulates innovative collaborative R&D and drives digital transformation in engineering and manufacturing. It develops solutions for highly complex problems working with the most strategic and advanced end-user sectors, including Aerospace, Defence & Space, Energy and Automotive

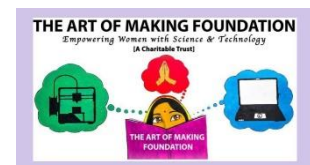
Megara Resins



Web: www.megararesins.com

Megara Resins is a diversified manufacturer and supplier of raw materials for industrial and architectural coatings as well as rosin based and other synthetic resins for the paint, adhesive, paper and construction industry. For over 50 years, Megara Resins has been a pioneer in creating innovative technologies to help coatings formulators meet their customers' most demanding applications.

The Art of Making Foundation



Web: www.theartofmakingfoundation.org

The Art of Making Foundation is a global non-profit organization driven to empower women & girls with a valuable STEAM skillset by utilizing 3D Design & Printing as a tool for the future of cottage industry. We are focused on providing a space for hands-on learning using Advanced Manufacturing, a community to foster growth, collaboration & sharing to drive Innovation & Workforce Development.



Research Center in Industrial Technologies (CRTI)

Web: www.crti.dz



The CRTI, ex-CSC, has a human potential of 750 officials, including 300 permanent researchers, 200 technical staff, and 150 experts and engineers of the subsidiary CSC expertise Spa. Moreover, the centre includes several valorization structures throughout the national territory.

The CRTI, ex-CSC, has an overall responsibility for implementing necessary research programs for the development of welding, destructive and nondestructive testing technologies.

At the African level, the centre is occupying a leading position, very particularly in the field of nondestructive testing (NDT).

ELVEZ



Web: www.elvez.si

Elvez is an advanced manufacturing company specialised in providing clients worldwide with plastic injection components, metallised parts and cable harness solutions.

The company provides a wide range of low to high volume multi-use injection moulding services, PVD metallised parts and complex made-to-measure cable harness solutions.

From concept to production and assembly, we deliver quality components to a wide range of challenging global industries such as automotive manufacturers, general consumer products, industrial and technical, white goods and more.

Our world-renowned references speak for themselves: BMW, Mercedes, Volvo, Scania, Hella, ZKW, John Deere, PSA, Renault, Kärcher, Mahle, McLaren, to name but a few.

For 30 years we have prided ourselves by offering complete turn key solutions in which our expertise, quality assurance and ingenuity guarantee our philosophy of constant “manufactured excellence delivered”.

Located in Slovenia, a member of the EU in the green heart of Central Europe, we have been entrusted to supply the very best quality-price ratio supply chain components to many of the world’s leading companies and brands.

Prysmian Group



Web: www.prysmiangroup.com

Prysmian Group is world leader in the energy and telecom cables and systems industry. With nearly 140 years of experience, sales of over €7.5 billion in 2016, 21,000 employees across 50 countries and 82 plants, the Group is strongly positioned in high-tech markets and offers the widest possible range of products, services, technologies and know-how. It operates in the businesses of underground and submarine cables and systems for power transmission and distribution, of special cables for applications in many different industries and of medium and low voltage cables for the construction and infrastructure sectors. For the telecommunications industry, the Group manufactures cables and accessories for voice, video and data



transmission, offering a comprehensive range of optical fibres, optical and copper cables and connectivity systems. Prysmian is a public company, listed on the Italian Stock Exchange in the FTSE MIB index.

HTWK-Leipzig



Web: www.htwk-leipzig.de/startseite

Leipzig University of Applied Sciences (HTWK Leipzig) offers a combination of practice-oriented teaching and application-driven research. The university stands out among the higher education institutions in the region on account of its exceptionally broad spectrum of engineering and technical disciplines. Along with the fields of Economics, Social Science and Culture, HTWK Leipzig is engaged in a diverse range of teaching and research activities. More than 40 degree courses provide both sound academic knowledge and practical training. There are currently about 6,300 students enrolled at HTWK Leipzig. Long-term and wide-ranging partnerships with companies not only in the region but throughout Germany and Europe, as well as numerous externally funded research projects, demonstrate the university's high standard of research excellence. With third-party funding amounting to more than 10 million Euro per year, HTWK Leipzig is one of the top-ranking universities of applied sciences in Germany.

UP Catalyst



Web: <https://upcatalyst.com/>

UP Catalyst is leading the world to sustainable carbon! We are a green technology startup, which focuses on turning the harmful greenhouse gas CO₂ into valuable carbon nanomaterials and graphite. These have a vast range of applications from electric car batteries to concrete and biomedicine. The no 1 aim of UP Catalyst is to revolutionize the global electric car battery industry by increasing the battery properties like energy density, charge rate and lifetime through sustainable products.

AIJU Technological Center



Web: www.aiju.es/en/

AIJU is the leading Spanish technological institute in Europe, specialized in the creation and development of products for children and leisure. With more than 30 years of experience, we work with companies of all sizes and sectors, to guarantee the success of their products in the market. We improve the quality of products and business competitiveness, by carrying out R+D+I projects, promoting research, development and innovation of companies, adapting them to legislative, technological and market requirements.

Companies can find a wide range of technological services for the children's product sectors, among which are other sectors such as plastic and metal. We offer a value proposition and a differentiated offer for each market segment, with a global positioning that responds to the real needs of companies for innovation and knowledge.



Vrije Universiteit Brussel

Web: www.vub.be/en



VUB is an Urban Engaged University in Brussels, the heart of Europe. 20,000 students, nearly a quarter of them from abroad, are engaged in building their future and that of the world. With top-quality scientific research and customised education, VUB makes an active and engaged contribution to a better and more sustainable society.

European Plastics Converters

Web: www.plasticsconverters.eu



Plastics converters are the heart of the plastics industry. They manufacture plastic products ranging from toothbrushes to building pipes, from fruit boxes to car interiors - Plastic products can be found in virtually every industry. Their adaptability, durability and light weight making them a favourite in the Construction, Packaging and Automotive industries.

The European plastics industry makes a significant contribution to the welfare in Europe by enabling innovation, facilitating resource efficiency and creating jobs.

More than 1.6 million people are working in around 50,000 small and medium sized companies of the converting sector, creating a turnover of 260 billion € annually.

EuPC is the professional representative body of plastics converters in Europe, whose activity embraces all sectors of the plastics converting industry, including recycling.

Technical University of Crete

Web: www.tuc.gr



The Technical University of Crete is a small, young, dynamic university with a clear mission: to expand knowledge and benefit society through research integrated with education. In this endeavor, the pursuit of excellence is the driving force. TUC was founded in 1977 and admitted its first students in 1984. The Institution provides undergraduate and graduate studies in modern engineering fields. More than 60 laboratories with prime equipment, high technology infrastructure and eminently qualified personnel, as well as faculty and staff members with international academic background attest to the level of excellence in education and research conducted at the University. The most recent external evaluation ranks the Technical University of Crete amongst the most prominent research institutions in Greece. The Technical University of Crete comprises 5 academic engineering Schools