

FACTORY OF FUTURE

2017
Activity Report





EDITED BY:

PRODNTEC

FACTORY OF FUTURE

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PRODNTEC

Activity Report 2017

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Letter from the Chairman

IGNACIO LÓPEZ ARANGUREN

1:

We have grown used to seeing the PRODINTEC logo associated with the slogan 'factory of the future'.

And one may ask 'how is the future manufactured?'

Over the last 13 years, PRODINTEC has been integrated into Asturias society, sometimes sliding silently and others with larger strides that create more noise.

Movement has been a constant in PRODINTEC's project, but not the only one. Emotion, feeling and the desire to continue progressing every day is what gives meaning to what our center represents today.

The presentation of the Annual Report is an exercise of objectivity: Far from falling into complacency, we consider that this has been a good year in which close relationship with collaborators leading working groups in aeronautics, capital goods, health and defence among other sectors, as well as participation in new European projects, have contributed to this.



'I LIKE TO THINK THAT PRODINTEC IS A FACTORY OF DREAMS, OF UTOPIAS THAT BECOME REALITIES, OF CREATING THE POSSIBLE FROM THE IMPOSSIBLE'

This path of continuous improvement must continue, adapting to new needs and assuming that innovation and the correct management of derived knowledge are a priority in companies' strategic approaches to building a differentiating character.

PRODINTEC's technology offers numerous opportunities to improve the service the center offers, to better manage resources and to understand the needs of Asturian companies.

We thank the Asturias Principality Government, the University of Oviedo, our Board of Trustees and all

our customers for their constant support and the trust they place in our daily work.

I like to think that PRODINTEC is a factory of dreams, of utopias that become realities, of creating the possible from the impossible. Of course, our base is technological but the motivation that moves us goes much further.

ÍÑIGO FEI GUEROSO FERNÁNDEZ-SAN JULIÁN

2:

From its origins, the Foundation has been continuously committed to the most advanced technologies for designing products and manufacturing processes, today strategically encompassed under the Industry 4.0 umbrella (which has contributed to promotion and raising awareness internationally in the industrial sector) allowing the Centre to maintain a prominent position in the technologies that have been defined as enabling. PRODINTEC's capacity to undertake R&D projects in which several of these technologies

converge (additive manufacturing, robotics, sensorial, virtual reality, etc.) offers companies comprehensive solutions with high added value.

PRODINTEC's distinguished presence in the main European technology forums and platforms of its specialisation areas continues to provide highly valuable relational capital for the Centre, translating into relevant mobilisation of European projects with a high success rate, enabling the Centre to remain at the forefront of the latest technologies, and exchanging knowledge with the main European research and innovation agents (companies, technology centres and universities).



"NOTEWORTHY IS THE SUCCESSFUL COMPLETION OF THE PROJECT FOR THE EUROPEAN DEFENCE AGENCY (FDA)"

Also noteworthy is the successful completion of the project for the European Defence Agency (EDA), which validated the use of additive manufacturing in hostile environments by designing, implementing and validating a transportable manufacturing system based on 3D printing technologies. The project highlighted the Centre's high degree of technological specialisation, the commitment, effort and good work of its professionals as well as the high degree of innovation that is imprinted in Prodintec's DNA.

It also continues to provide the Centre's laboratories with the latest available technologies, including the introduction in additive manufacturing of new materials (ceramics, concrete, printed electronics etc.).

The Centre's high visibility and its activities continue to stand out this year, having maintained intensive efforts in promoting to companies and especially to society about the latest technological trends that help to improve the competitiveness of the industrial sector.

I sincerely thank PRODINTEC's team of professionals for their effort, dedication and daily involvement, which makes it possible for us to continue advancing and contributing to building a better society to the best of our ability. Sincere thanks also to the trustees of the Foundation for their full support over these years and to our customers for their continued trust in the Centre.

3. Who we are

The Foundation

PRODINTEC is a private non-profit entity created in 2004 on the initiative of a group of firms in the Asturias region and the Regional Government. It forms part of the network of Technology Centres of the Principality of Asturias.

As the technology centre for industrial design and advanced production, our mission is "to foster the competitiveness of industrial firms by applying technological advances both to their products and to their manufacturing and management processes".

Our slogan, PRODINTEC Factory of Future, faithfully mirrors the course we have followed over the last few years as well as our clear commitment to the future, fully in line with European trends in this field, as reflected in our Strategic Plan.

We obtained AENOR's certification in 2005 in accordance with the UNE-EN ISO 9001:2008 standard (quality management systems) and the UNE 166002:2006 standard (R&D&I management system), being the first technology system in Spain to receive this integrated certification. Furthermore, since 27th March 2007, we are registered as an Innovation and Technology Centre (no. 99) by the Spanish Ministry of Industry, Energy and Tourism.



3:1



Facilities





PRODINTEC headquarters are situated in the INTRA area of Gijon Science and Technology

Park, in a building very representative of the valuable industrial heritage of Gijon and Asturias, the Old Tobacco Dryer of the Labor University.

These facilities, highly focused on improving the competitiveness of the manufacturing industry through technological innovation, boast the latest industrial innovation technologies for manufacturing products and processes.

These facilities occupy a parcel of about 1,600 sq m, with a usable area of almost 5,000 sq m, distributed in:

- Technical office area
- Laboratories equipped with advanced manufacturing technologies
- Facilities for technological innovation
- A space reserved for housing spin-offs, i.e. innovating companies that have arisen from R&D activities and projects developed in collaboration with PRODINTEC.

Moreover, PRODINTEC has an office in Madrid, established in 2011, and located in Madrid Science Park Building in Cantoblanco Campus.

3:2 Facilities









Governing Bodies

3:3

The Board of Trustees guarantees that the Foundation fulfils the aims and actions laid out in its Statutes.





- 1. Mr Adolfo García Guzmán 2. Mr Arturo Betegón Biempica
- 3. Mr Pedro Elías Prallong Álvarez 4. Mr Manuel Monterrey Meana
- 5. Mr Ignacio López Aranguren 6. Mr Íñigo Felgueroso Fernández-San Julián
- 7. Mr José Ramón Obeso Suárez 8. Mr Ángel de las Heras Castaño
- 9. Mr Ricardo Alonso Villemur 10. Mr Daniel Fernández González

3:3 Board of Trustees



CHAIRMAN:

Mr Ignacio López Aranguren MBA Incorporado, S.A.



VICE-CHAIRMAN:

Mr Ricardo Alonso Villemur Ingeniería y Suministros Asturias, S.A.



SECRETARY:

Mr Íñigo Felgueroso Fernández-San Julián

Managing Director of PRODINTEC Foundation



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Government of the Principality of Asturias



MEMBER OF THE BOARD:

Mr Manuel Monterrey Meana

Government of the Principality of Asturias



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Mr José Ramón Obeso Suárez

University of Oviedo



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MEMBER OF THE BOARD:

Mr Daniel Fernández González

Ascensores Tresa, S.A.



COLLABORATING PARTNER:

Mr Gustavo A. Rosal López

[Spokesman for Collaborating Partners] PrevenControL, S.A.



COLLABORATING PARTNER:

Mr Néstor Martínez García

PMG Asturias Powder Metal, S.A.

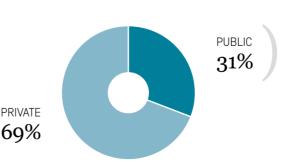


HONORARY TRUSTEE:

Caja Rural de Asturias

Breakdown of the board of trustees

Public-/private-sector participation on PRODINTEC's Board of Trustees



Human resources



As of 31st December 2017 there were 66 people working at PRODINTEC between staff and interns from University of Oviedo.

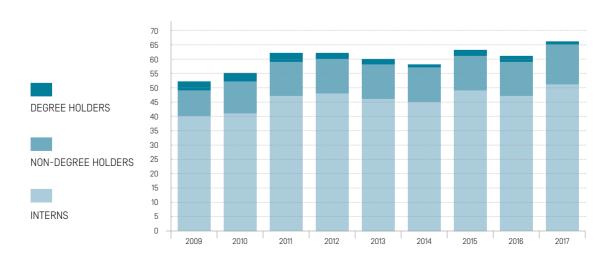
Employees are the greatest asset of PRODINTEC. Effort, flexibility, professionalism... are some words to describe our team, totally multidisciplinary, and with a wide range of backgrounds which that allows us to face with guarantees the achievement of projects and services. At PRODINTEC we have continuous training and professional development plans to increase the skills and encourage the motivation of our employees.

Staff as of 31st December 2017

QUALIFICATIONS	MEN WOMAN		TOTAL		
	n°	%	n°	%	n°
PhDs	4	8%	4	24%	8
5-year Degree Holders	26	53%	4	24%	30
3-year Degree Holders	10	20%	4	24%	14
Vocational Training	7	14%	4	24%	11
Baccalaureate or equivalent	2	4%	1	6%	3
TOTAL	49	100%	17	100%	66
	74%		26%		100%
Average age	34.57		39.18		36.87

Changes in staff qualification standards over time

Figures correspond to 31st December each year



Meet our team

3:5

Blas

PUERTO VALCARCE



Industrial engineer from the University of Oviedo and currently pursuing a Master's Degree in Advanced Manufacturing Engineering from UNED, has been working at PRODINTEC since 2013. He is currently dedicated to developing roll-to-roll manufacturing equipment, printed electronics processes, coatings and robotic component positioning, among others. He also manages and coordinates projects at national and European level.

Paula

SÁNCHEZ-**FRIERA SIMARRO**



PhD in Condensed Matter **Physics** from the University of York (United Kingdom) started at PRODINTEC in 2012, after working in several companies in Italy and England and has also been responsible for R&D in Module Technology for several years at the photovoltaic company Isofoton. She is currently Project Manager specialised in printed electronics, managing a diverse portfolio of Spanish and European projects.

Ángel

MARTÍNEZ. **PRIERES**

Graduated in Industrial and Automatic Electronic **Engineering** from the University of Oviedo, started his professional career at PRODINTEC in 2015 participating in different research projects, mainly in the field of bio-printing. He coordinates and works on the electronic development of personalised additive manufacturing machines for bio-printing and is also studying for a Master's Degree in Biomedical Engineering.



3:5 Meet out team

WHAT DID YOU SEE IN PRODINTEC TO DECIDE **TO WORK HERE?**

Ángel. I was attracted by the opportunity to work in a leading centre with lines of work that focus on research and cutting-edge technologies. In particular, I was very interested in bio-printing. I thought I could apply my engineering knowledge to this field. Blas. In my case, I was collaborating with the University of Oviedo Department of Continuous Media Mechanics and I saw a good opportunity with PRODINTEC to work on innovative topics and to manage projects with new solutions. Paula. In my case, I found two attractive points; firstly being able to work in a technological centre where the variety of R&D projects is much more extensive than in the manufacturing environment from which I came and secondly, the work/ life balance measures offered by the centre, which have enabled me to combine my career with raising my children.



WHAT IS YOUR DAY-**TO-DAY WORK AT** PRODINTEC?

Paula. My days fly by! Launching new ideas and projects, executing and coordinating ongoing projects, teleconferences with European partners... No time to be bored! Blas. Indeed, and every day is different! I can be designing elements for the roll-to-roll machine on one day and the next day I can be making moulds for optical guides. This is important to me because it encourages me to take on new challenges, new work

methodologies and new sectors where I always learn something new. **Ángel**. It is not a topic, no. Every day is different and requires constant adaptation. I begin by reviewing tasks, organising work with my colleagues and setting goals. The work within R&D+i projects requires addressing new problems and generating new ideas... it is far from being repetitive. Working with a good team and a good environment among colleagues also makes everything work.

WHAT WAS YOUR GREATEST CHALLENGE LAS YEAR?

Ángel. There were several critical projects and milestones that required significant involvement by the team, although I would highlight the electronic design work of the control system of a 3D bio-printing machine because of the complexity and variety of tasks involved: studying requirements, analysing possible solutions, hardware design, programming, validation



tests, etc. It was a complete development from scratch. **Blas.** My biggest challenge was redesigning a roll-to-roll manufacturing line to provide it with new functionalities, which led me to carrying out a detailed search for information, designing and calculating new elements and participating in developing and automating highly complex equipment. Paula. Last year was full of challenges... Fortunately all of them were successfully overcome... I feel satisfied for having contributed to a large number of projects coming to fruition and meeting the objectives on time.

OF ALL PROJECTS YOU HAVE WORKED ON, WHICH ONE IS YOUR FAVORITE?

Paula. My favourite projects were the INGRID project and the

WINNER project, which are both related to photovoltaics, a subject that I am passionate about. The latter is focused on designing and developing an intelligent window for generating energy in buildings. The product has photovoltaic cells and luminescent concentrators deposited using roll-to-roll printing techniques. Ángel. I don't doubt either, the modular 3D printing machine for bio-printing... is like a son! Work has been ongoing for years to provide an optimal response to the technical problems posed by this line of work, and bio-printing is a growing field that requires a modular machine that can adapt to new bio-tapes and printing techniques. The result of the work over these years is the know-how acquired as well as an ecosystem of tailored solutions for bioprinting, which has positioned the company in Spain and abroad, opening the door to cutting-edge research projects.

Blas. I would say the LIGHT-UP project with which very small components had to be assembled with very high precision on a printed circuit on a flexible polymer sheet, using high silver content electric conductive ink and anisotropic conductive adhesives. It was a challenge in the positioning and connection precision, in the search for materials, and in the search for new solutions, which led to a customised machine being developed.

WHAT IS THE MOST IMPORTANT THING YOU HAVE LEARN?

Blas. The most important thing I have learned is to face new challenges that may seem impossible and that require "thinking outside the box". When it goes ahead after much effort and dedication, the satisfaction of having achieved it makes it worth all the effort dedicated. **Ángel.** I like the concept of "thinking outside the box" because it is totally necessary and real. In my case, I have learned to learn. Regardless of each person's professional profile, active participation in research projects requires adapting to new trends, acquiring new knowledge, generating new ideas... Paula. In my case, I have learned how valuable and necessary it is to deal directly with customers, since this provides a broader perspective of my work and shows how the results can benefit others.



Corporate Social Responsibility

In 2017, PRODINTEC was working on designing its Social Responsibility strategy and it has taken two important actions:

- 1 / Reaffirmation and signing the United National Global Compact, supporting the ten principles covering human rights, labour rights, the environment and the fight against corruption.
- 2 / Participation in all activities and proposals of the Social Responsibility Institute of the Principality of Asturias, an initiative promoted by the Asturian Quality Club to Foster activities that lead to sustainability and responsibility.



COMMITMENT TO THE PROTECTION OF THE ENVIRONMENT AND EFFICIENCY

The efficient management of resources and respect for the environment are present in the day-to-day operations of PRODINTEC. We encourage all initiatives aimed at waste reduction and management: recycling paper, cardboard packaging and glass; improvements in the areas and procedures dedicated to the management and classification of waste whether generated in offices or laboratories; enabling users to process and subsequently management waste using their own resources or, in the case of hazardous waste, through authorised companies.

We work and encourage continuous improvements aimed at reducing energy consumption, optimizing the lighting and air conditioning of our facilities and the energy consumption of the equipment.



COMMITMENT TO HEALTH & SAFETY AND TO THE PROFESSIONAL AND PERSONAL DEVELOPMENT OF EMPLOYEES

At PRODINTEC, we continue to strive to develop measures that adapt to our employees' needs: flexible schedules, shorter working hours, subsidised catering services, in-situ language training, health insurance, etc.

We continue to work on continuous improvement of existing plans, such as the plan for equal opportunities between men and women within the company or ProConcilia, a programme of measures to facilitate the work-life balance, ProConcilia.

Training remains a priority at PRODINTEC. For year we worked with a Performance Evaluation tool and a Career Plan that allows us, in agreement with our employees, to identify and meet training needs in a personalised way. At the same time, as fostering the personal and professional development of our employees, this measure makes our organisation much more competent.

All of PRODINTEC's staff carries out an evaluation on an annual basis via a personal interview which, in addition to measuring personal and professional performance, allows us to come to an agreement regarding goals and to obtain feedback.

Regarding health & safety, we are implementing specific training programmes in the field of Occupational Risk Prevention, with a view to ensuring that all PRODINTEC employees are well-trained to perform their tasks. We also organise awareness events designed to promote healthy life-style habits among our employees in cooperation with our mutual insurance company.

PRODINTEC is proud to announce that it has been recognised with the Asturias Seal of Safe Corporate Mobility, highlighting the initiatives and commitment in the field of Road Safety.

As a result of work in the field of health prevention and personal development, this year PRODINTEC signed the Luxembourg Accord and joined the Asturias Healthy Companies Network, which is committed to integrating the principles of promoting health at work for managing workers' health.

3:6 Corporate Social Responsibility



At PRODINTEC we are committed to quality as a fundamental pillar of the services and projects we provide. Consequently, we operate a management system based on UNE 166002 and ISO 9001 standards, which ensures compliance with our customers' requirements and with applicable legal rules and regulations.



COMMITMENT TO THE DEVELOPMENT OF SOCIETY

PRODINTEC has also renewed its commitment to gender equality by participating in the 6th Directory of Companies and Entities of Gijon, which is committed to equality and that is promoted by the Equality Office of the City Council of Gijon.

During 2017 PRODINTEC has cooperated with various agencies to disseminate a culture of innovation through visits to our facilities, lectures, and the participation of our personnel at various forums, seminars, and events at regional, national, and international levels. We have also renewed our sponsorship of the Useful Patents and Models Contest of Asturias organised by BIC Asturias, which held its ninth edition this year.

We also continue, as in previous years, working closely with the University of Oviedo in training its students and graduates through internship agreements and end-of-master projects; a total of 12 students in 2016. We also continue to cooperate with various Vocational Training centres in Gijon, offering a total of 7 of their students work experience this year.

PRODINTEC collaborates on organising a "Mile of Knowledge" Charity Food Collection together with Gijon Impulsa, the Quality Club and CTIC Foundation, for the benefit of the Asturias Food Bank. More than four tonnes of food was collected in 2017 thanks to the collaboration of 25 companies and institutions located in the Gijón Mile of Knowledge.

A collaboration agreement has also been signed with the European Network for the Fight against Poverty and Social Exclusion in Asturias, whereby 13 computers were donated to different NGOs belonging to this platform (Asociación Gitana de Gijón, Asociación Mierense de la Cocina Solidaria, the Albergue Covadonga Foundation of Gijón and the ADSIS Foundation, among others). The purpose of this donation is to give a second life to the equipment that PRODINTEC renews, extending its useful life, reducing resource consumption and supporting institutions and organisations that work in the field of social action.



GOOD GOVERNANCE AND TRANSPARENCY

For the last three years, we have been using a tool to optimize governance, aimed at enhancing the dialogue between members of the Foundation's Board of Trustees and the centre's management.

We continue improving our transparency levels so that people can now consult data of interest about the foundation, such as its organisational chart, various indicators, and the assessment of our activities and our economic, budget, and statistical information in accordance with Law 19/2013 on transparency and access to public information and good governance.

4.
Our
Activities

Organizational Structure

PRODINTEC is now structured in six major areas:

Innovation management

In addition to coordinating the internal R&D&i management system, it also develops tools and services for companies to manage their innovation processes in an orderly manner, a key element in making a company competitive.

Technology

This area defines the technological and strategic business lines of the center. It is responsible for identifying and generating opportunities for R&D&i projects at the regional, national and international levels as well as for the search for innovative solutions as the main value. It is organised in three units: Innovative Manufacturing Technologies, Product Innovation and Digital Industry.

External Relations

It centralizes the interaction with the market through the search of business opportunities at regional, national and international level, identifying industrial needs. In addition, it coordinates the image, communication strategy and dissemination activities.

Engineering

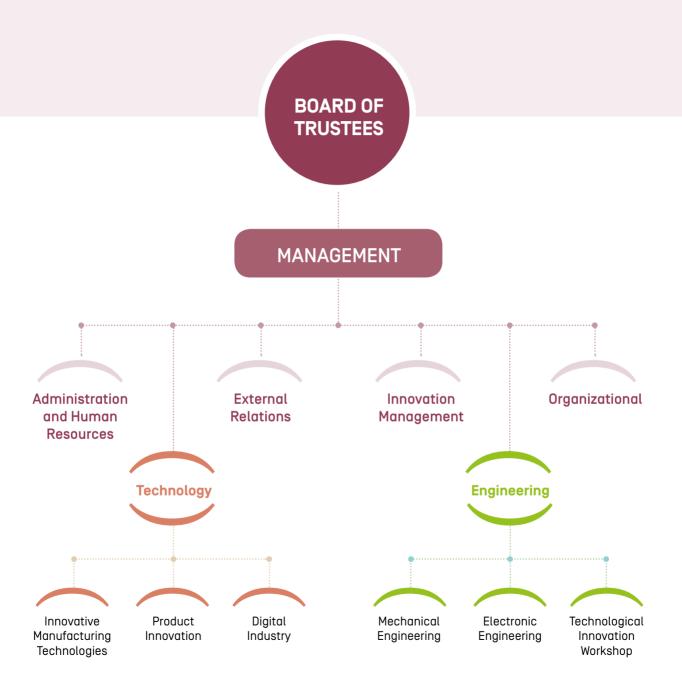
It covers engineering and product design from strategic definition to obtaining a prototype or a functional pre-series, including technical specifications, mechanical, electrical, electronic and pre-industrial design. It seeks to optimise efficiency, quality and cost. It also carries out the technological services for the centre. It is organised in three units: Mechanical Engineering, Electronic Engineering and Technological Innovation Workshop.

Organizational

The Organizational area is in charge of supporting the rest of the area. It coordinates the management and maintenance of information systems, telecommunications networks and access systems, as well as compliance with industrial health and safety protocols.

Administration and Human Resources

Its objective is the economic and financial control of the center, working, in coordination with Management, in the legal and tax Foundation's management and human resources.



Our capabilities

INDUSTRIAL DESIGN AND ENGINEERING

PRODINTEC has state-of-the-art technologies and methodologies to help companies during all stages of designing and developing new devices/ products (turnkey equipment, tools, structures, parts, pilot plants, special machines, etc.) including, if required, the integration of electronics or customised automation.

We can fully assume these tasks or support

companies as required in the stages they consider necessary, taking into account that variables such as mechanical strength, material, safety, manufacturability, cost and durability as well as the product's aesthetics and usability must be analysed, and all according to the target market or sector.

PRODINTEC can therefore collaborate in all stages of the product's life cycle:

- Strategic definition
- Technical and financial feasibility study
- Concept and detail design

- Technical office and product engineering
- Electronic development
- Validation tests
- Electromagnetic compatibility and electrical safety
- Industrialisation



ADVANCED MANUFACTURING

PRODINTEC offers companies cutting edge manufacturing technologies and specialised staff to provide advice for making the best choices for their needs. In addition, we address applied R&D and innovation projects focused on improving the quality and efficiency in production of parts through different technologies, implementing new materials, integrating new manufacturing processes with other conventional technologies and developing methodologies for obtaining process and/or material certification or standardisation in the sectors where this is required.



4:2 Our capabilities

DIGITAL INDUSTRY

PRODINTEC has expertise in helping companies to improve their productivity by applying tools, technologies and innovative solutions in the field of industry 4.0 that optimise processes and costs and generate new business models.

The Centre provides support in the fields of process automation, robot development, man/machine interaction, sensory, inspection and industrial maintenance, among others.

PRODINTEC thus works on:

- Collaborative robotics
- Artificial vision
- Virtual and augmented reality
- Optimised production control and planning
- Predictive systems/ process monitoring





INNOVATION MANAGEMENT

One of the key factors required for companies to be competitive is to ensure they manage innovation processes well. Although they are often not aware of these processes, all companies innovate in their daily operations to stay in the market: they improve products and processes, they introduce changes to their organisational methods and they look for new formulas to sell better. However, good innovation management makes a difference by minimising the associated risk and improving efficiency in the use of human and material resources.

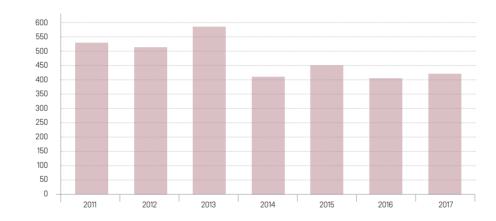
PRODINTEC offers tools and services to companies that require efficient management of their innovation processes:

- R&D+i project management
- Technology protection
- Technological surveillance and foresight
- R&D+i internationalisation

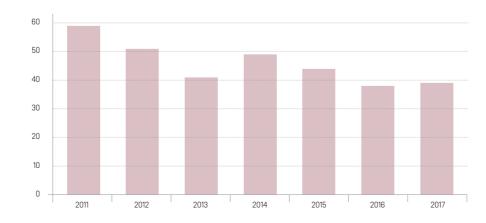
R&D&I Projects and Technology Services Portfolio

4:3

Number of technology services provided during each year



Number of **R&D&I** projects provided during each year



AM-motion: A strategic approach to increasing Europe's value proposition for Additive Manufacturing technologies and capabilities



The main objective of this strategic action is to contribute to the European market's rapid adoption of additive manufacturing technologies. A European roadmap is therefore being developed with the main stakeholders and initiatives in these technologies, including actions related to technological and non-technological requirements such as standardisation, IPRs and education.

Consortium: PRODINTEC (Spain - coordinator), TNO (Netherlands), CEA (France), ERRIN

(Belgium), TWI (United Kingdom), IDEA Consult (Belgium), Airbus Operations (Spain), Materialise (Belgium), Siemens (Germany), D'Appolonia (Italy), EPMA (Belgium), CECIMO (Belgium) and Brainport Development (Netherlands).

Funding programme: Horizon 2020 – European Commission (grant agreement no 723560)

Budget: 993,053 €

Duration: November 2015 - December 2018

SUPREME: Sustainable and flexible powder metallurgy processes optimization by a holistic reduction of raw material resources and energy consumption



The aim of the SUPREME project is to optimise metallurgic manufacturing processes to reduce the consumption of raw materials and energy and the CO_2 emissions and greenhouse effect gas associated with climate change. To do this, work will be carried out in all stages of the value chain: ore extraction, metal powder production and parts manufacture. The results will be validated through manufacturing demonstrators for different sectors: medical, automotive, aeronautical and cutting and moulding tools.

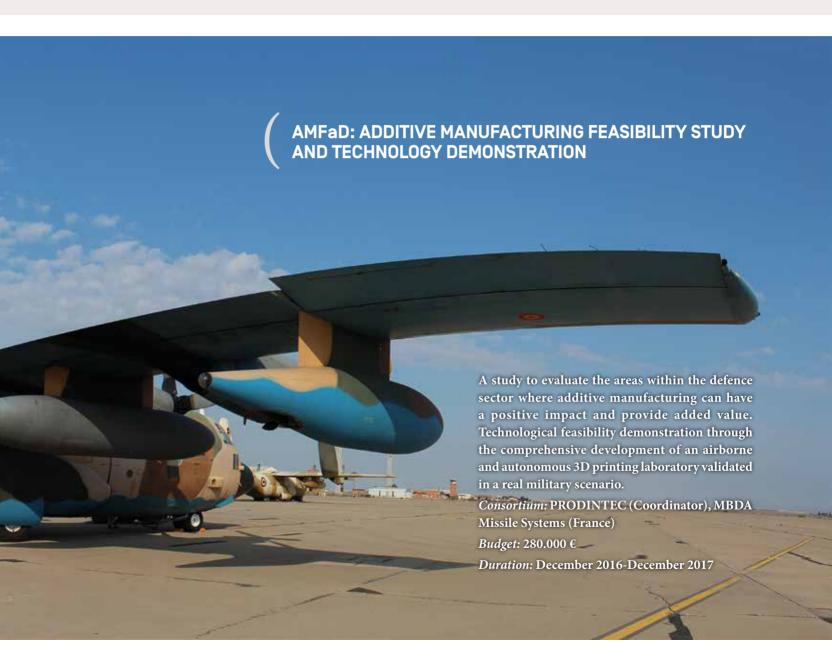
Consortium: CEA (coordinator, France), Outotec (Finland), MBN (Italy), Atomising Systems (UK), GKN (Germany), PRODINTEC, IPC (France), TWI (UK), RHP (Austria), Tecnalia (Spain), Renishaw (United Kingdom), IRIS (Spain), MBA (Spain), PRISMA (France), Dellas (Italy), Centro Ricerche Fiat (Italy) y EPMA (Belgium)

Funding programme: H2020 - European Commission (grant agreement no 768612)

Budget: 9.810.118,75 €

Duration: September 2017 – August 2020





REVOLVE: Radio Technologies for Broadband Connectivity in a Rapidly Evolving Space Ecosystem: Innovating Agility, Throughput, Power, Size and Cost

REVOLVE

The REVOLVE European project addresses the incipient need to improve performance and costs in satellite missions, focusing on new technologies and design methods for radio fronts and antennas. Together with a multidisciplinary, inter-sector and international team of partners, REVOLVE brings together seven researchers in the initial phase in the area of antennas, manufacturing, electronics and systems engineering in order to train new professionals for the European space sector.

Consortium: Heriot-Watt University (Coordinator, United Kingdom), CNRS (France), Thales Alenia Space (France), Large Space Structures (Germany), PRODINTEC (Spain) Funding programme: H2020-MSCA-ITN-2016

Budget: 1.694.895 €

Duration: January 2017 - December 2020

PRINTCR3DIT: Process Intensification through Adaptable Catalytic Reactors made by 3D Printing

PRINT CREDIT

This European project addresses adaptive design and development by additive manufacturing technologies, in metal, of new catalytic reactor models, with new advanced geometries that improve current processes in the chemical industry.

Consortium: STIFTELSEN SINTEF (Coordinator, Norway), ARKEMA France (France), YARA INTERNATIONAL (Norway), BIOSYNTHIS (France), JOHNSON MATTHEY (UK), SICAT SARL SIC (France), ACM GmbH (Germany), ADERA (France), LINDE Engineering (Germany), AMTECH GmBH (Germany), PRODINTEC (Spain), University of Porto (Portugal), Czech Academy of Sciences (Czech Republic)

Funding programme: H2020

Budget: 5.493.890 €

Duration: October 2015 – September 2018

SILENSE: (Ultra)Sound Interfaces and Low Energy iNtegrated SEnsors



The SILENSE project focuses on developing acoustic and ultrasonic technologies integrated into wearables and other electronic devices to enable gestural control. It includes developing new ultrasonic transducers, new assembly technologies and associated electronics and software for applications in the smart home or the automotive sector.

Consortium: 32 partners, NXP Belgium (Belgium – coordinator), Continental (Germany), Brno

University (Czech Republic), PRODINTEC (Spain), Speedo (United Kingdom), Linz Center of Mechatronics (Austria), Coventor SARL (France), SolMateS BV (Netherlands) AlphaSIP (Spain), Elliptic Laboratories (Norway), etc.

Funding programme: H2020 ECSEL

Budget: 29.300.000 €

Duration: May 2017 - April 2020

EPPN: European Network for Pilot Production Facilities and Innovation Hubs



The project's general objective is to boost European competitiveness by utilising European pilot line facilities in the area of nanotechnology and advanced materials by creating a network and a digital ecosystem that acts as an interactive market.

Consortium: INL (Portugal- Coordinator), Onvega (Sweden), CNT (United Kingdom), NANOfutures absl-(PRODINTEC, MBN,

LEITAT) (Belgium)

Programme: H2020 - European Commission

(agreement n. 768681) Budget: 976.812,63 €

Duration: June 2017-May 2020

Pilot lines





Our roll-to-roll manufacturing pilot line for the production of high-technology products on low cost flexible materials is the result of combining PRODINTEC's expertise in electronic design, equipment manufacturing and process automation.

Currently, we use this line to design tailored products and analyse the feasibility of their mass production. For this, we test different materials and substrates, and develop, manufacture and integrate new roll-to-roll operation

modules and quality control systems (visual and inspection).

Some types of products where the rollto-roll production is being implemented are lighting and signing products (LED, OLED, EL...), photovoltaics, electrochemical sensors, microfluidic systems, flexible optical systems, smart labeling, RFID, etc.

Bioprinting



3D Bio-printing is an applied research area that arises from adapting additive manufacturing technologies (3D printing) to tissue engineering.

PRODINTEC is committed to this new area based on personalisation as a work concept. A universal bio-printer does not exist and there is no universal bio-ink. which means that equipment requires individual design as a key element for the

success of the multidisciplinary work to be carried out.

PRODINTEC has the experience, the technology and the human team needed to address the design and modular development of customised 3D printing equipment that responds to the different biotape rheologies used, opening new technological development paths.

R&D centre for vertical transportation



Located at the Industrial Site of Porceyo (Gijón), the testing tower is the most emblematic feature of this R&D centre. It is 38 m high (equivalent to 12 floors) and with a 6 x 4 m internal shaft to test lifts of up to 4 tons.

Thanks to this laboratory, companies specialised in the vertical transport field can optimise the deadlines to validate their new developments by testing and checking the products before launching them onto the market, improving aspects such as the

design, equipment comfort, mechanic, electric or electronic systems or trial runs.

In this way, our product design and development and electronic engineering capabilities are complemented with advanced infrastructure to provide our customers with a holistic service to develop more competitive products.

Electromagnetic Compatibility Laboratory



Our Electromagnetic Compatibility Laboratory (CEMLab), located at the Campus of Gijón of the University of Oviedo, is the most powerful tool for the electromagnetic testing of electronic products according regulations, both during the development stages and during the commercialization process.

This evaluation allows us to get to know the electromagnetic disturbance caused by the equipment in normal operating conditions,

as well as subject it to certain radiations and disturbances to ensure its robustness.

Moreover, our specialised staff provides personalised guidance and counselling to our customers in terms of electromagnetic quality and CE marking, which, complemented with the capabilities of our electronic lab, allows us to guide the design of electric and electronic products to the final compliance with the applicable standards or their fast adaptation if the evaluation is negative.

In-house developed products

IDINFT



The project management methodology developed in-house by PRODINTEC enables the execution, monitoring and control of R&D&I projects with a guarantee of success, while at the same time allowing the user to know the value obtained through these projects.

Based on this methodology and in conjunction with Futuver Consulting, we have developed IDinet, an intuitive software tool to manage not only projects, but all the organization's activities and projects. The system enables us to plan the team's tasks, manage expenses and income, centralise documents, generate reports based on the information saved, manage contacts...

Simple use, fast implementation and high availability of centralised information from any spot by means of an agile and safe web environment have resulted in the presentation by Microsoft of IDinet® as one of the most innovative tools in the market. At the same time, AENOR has certified IDinet® as an R&D&I management system in organisations.



R3ALD



www.r3ald.com

R3ALD is the first Spanish additive manufacturing (3D printing) platform to target the industrial sector. It provides instant quotations and permits ordering online the manufacture of parts in different materials (metal, plastic, resin, plaster...) and finishes (painted, tinted, metallic...), from a file provided by the customer while preserving the strictest confidentiality.

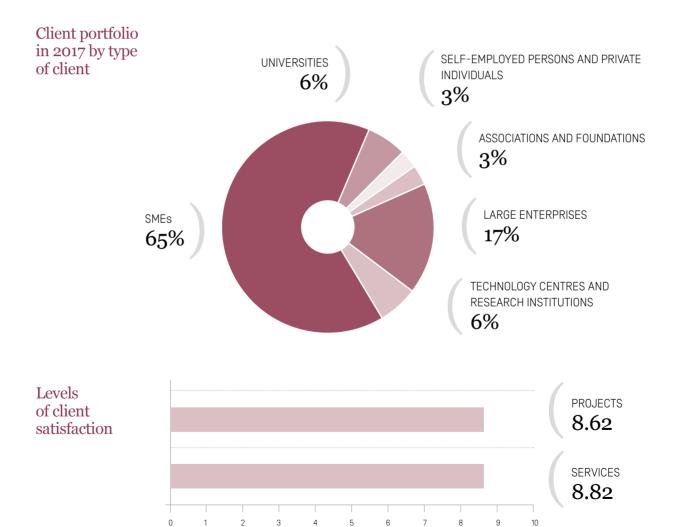
R3ALD ensures the purchase of competitive products, with very short

delivery times whilst adapting to the stringent requirements of the industrial sector (capital goods, aeronautics, automotive, mould and die sectors, energy, health, implantology...).

R3ALD's target audience are the engineering or R&D departments, designers, entrepreneurs, architects... In general, anyone who needs to manufacture a part based on a 3D file, either to validate its design or to use it as a final product.



Client Portfolio





Founded in Gijón (Asturias) as a manufacturer of aesthetic and professional equipment and treatment equipment, Leaseir has evolved over the years to incorporate complementary business lines by progressively diversifying into medical treatment. The company's objective is to provide the medical/aesthetic sector with a new generation of equipment to offer doctors and patients the highest quality levels. This idea continues to drive Leaseir's continued global success.



A solid R&D department supports Leaseir's technology with the ability to develop and innovate continuously.

The company has continuous training and awareness programmes that enable highly qualified staff to carry out the activities included in quality management and improve the performance of the processes that affect it. Moreover, it continuously monitors its suppliers and offers customers a solvent technical service to ensure the equipment is effective and safe once placed in the market.

WHAT TYPE OF WORK DO YOU DO WITH PRODINTEC?

PRODINTEC helps Leaseir with a wide range of activities. It helps with manufacturing prototypes and small series with a wide range of production techniques ranging from 3D printing on different materials and using different technologies and provides advice about suitability for each project. It also helps with its micromachining capabilities.

Leaseir uses its CEMLAB services extensively, where the equipment is pre-tested before being sent for official testing. Having an anechoic chamber in Gijón is a luxury.

We have recently started to collaborate on co-developing and assembling prototypes.

WHAT ARE, IN YOUR OPINION, PRODINTEC'S STRENGTHS?

Proximity, immediacy, resources and knowledge.



ArcelorMittal Asturias is the only comprehensive steel plant in Spain that produces steel from iron ore. With two factories in Gijón and Avilés, the ArcelorMittal Asturias plant has annual production capacity of close to five million tonnes of steel distributed flat (thick plate) and long (rail and wire) products.



ArcelorMittal has built a solid relationship with the PRODINTEC Foundation over time, thanks to the company's professionalism and commitment. It is a strategic partner that has enabled ArcelorMittal to grow thanks to the knowledge that it has acquired over all these years in the world of additive manufacturing. Mainly within this knowledge area, Prodintec has enabled ArcelorMittal to make prototypes that allow the company to improve the way it modifies its process machines, thereby reducing downtime and improving performance.

The collaboration has been based on a full commitment, with continued guidance from PRODINTEC throughout the essential learning process. PRODINTEC has always provided support for each requirement in designing new parts.

It explains the limitations of the different printing technologies available. It also provides advice on the printing process, enabling ArcelorMittal to learn part of the process so that it can more easily understand its advantages and limitations.

And it has helped ArcelorMittal to also be able to control the expectations that the new technologies can generate in some way, enabling it to create a solid knowledge base that is based on real capacities, which is being distributed internally in the group today.

The main strength is the ability to capitalise knowledge, and more so in the case of additive manufacturing. The company already has a decade of experience in this area and is widely known. Although the dynamism of the human team in PRODINTEC's facilities is also very important. PRODINTECcan adapt to the technical complexity of ArcelorMittal's steel processes, where the pieces vary every day and the conditions they have to endure are totally different and in many cases extreme.

And last but not least, the flexibility with which PRODINTEC works, quickly providing a group of colleagues in its facilities to give them an introduction to the world of additive manufacturing, explaining about the importance of the design and optimisation phases of the parts through to their post-processing phases.

PRODINTEC comes to our facilities to provide support almost immediately in order to carry out urgent projects to be able to support our facilities. Mainly these strengths define PRODINTEC and make it a partner in which ArcelorMittal has placed its trust for undertaking additive manufacturing projects.



With its headquarters in Leuven, Belgium, and branches worldwide, Materialise is a provider of Additive Manufacturing (AM) software solutions and sophisticated 3D printing services in a wide variety of industries, including healthcare, automotive, aerospace, art and design and consumer products. Materialise has been playing an active role in the field of AM since 1990, through its involvement in AM for industrial and medical applications, by providing biomedical and clinical solutions such as medical image processing and surgical simulations and by developing unique solutions for its customers' prototyping, production, and medical needs.

As of the start in 1990 their goal was to enable new uses for the extraordinary potential that 3D printing offers. Since then, Materialise has pursued its experience into a range of software solutions, engineering and 3D printing services,



which together form the backbone of the industry. The company has brought together the largest group of software developers in the industry and one of the largest 3D printing facilities in the world.

Materialise's open and flexible platforms enable players in various industries to build innovative 3D printing applications. Materialise also offers dedicated Design & Engineering solutions to support customers in all phases of the product development cycle with the objective to maximize the printability and maximize the advantages

Additive Manufacturing can bring. Ultimately, they empower their customers to transition towards a digital manufacturing process and to launch innovations that have the potential to change the face of their industry.

The company has been strongly involved in research projects since the very start, and has been a partner in numerous European and national research projects. The different business segments of Materialise (industrial, medical and software) have dedicated research teams with own infrastructure.

IN WHICH FIELDS OR PROJECTS ARE YOU COLLABORATING WITH PRODINTEC?

With Additive Manufacturing being the core business of Materialise, AM is also the main area in which we collaborate with PRODINTEC. After working together on a more informal basis in the past, the collaboration today is formalised in the European H2020 project AM-motion.

HOW WOULD YOU DESCRIBE THE COLLABORATION BETWEEN MATERIALISE AND PRODINTEC?

There are two main determining aspects describing the collaboration with PRODINTEC: effectiveness and efficiency.

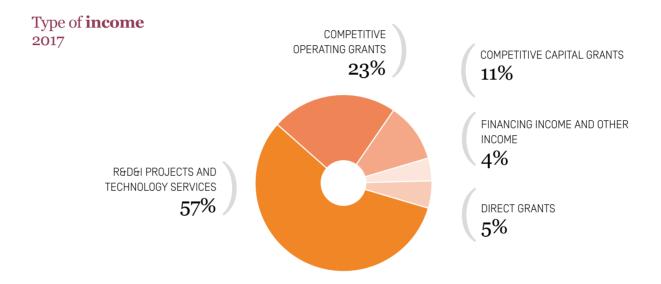
Backed-up with a technological understanding of AM, events and projects related to AM will be handled professionally.

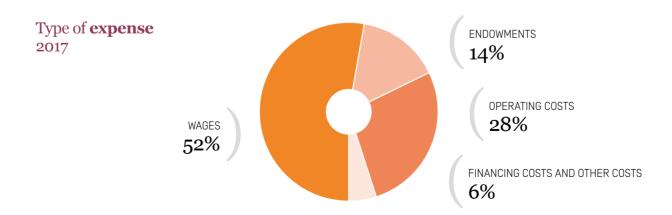
WHAT, IN YOUR OPINION, ARE THE STRENGTHS OF PRODINTEC?

The knowledge of the international (and national) research community as well as their local industrial network are the two most valuable strengths. Their practical knowledge of specific AM technologies is obviously an essential basis for all collaborations.

5. Financial Report

Income and expenses





Balance sheets

Profit and loss account

CONTINUING OPERATIONS	
Turnover due to the entity's own activity	4,064,163.25
Works undertaken by the entity on its assets	0.00
Wages	2,148,490.38
Other business expenses	1,301,185.30
Fixed asset depreciation	-594,038.73
Grants, donations and bequests of capital transferred to the profit/loss of the period	0.00
Deterioration and result due to disposals of fixed asset	0.00
One-off revenues	8,999.64
OPERATING PROFIT	29,448.48
Interest income	186.75
Financing costs	-23,589.51
Differences in exchange rates	-208.75
Deterioration and result due to disposals of financial instruments	-502.42
FINANCIAL STATEMENT	-24,133.93
PRE-TAX PROFIT	5,334.55
SURPLUS FOR THE PERIOD	5,334.55

Statement of assets and liabilities

ASSETS

TOTAL 11.2	294.413.00
Cash and other equivalent liquid assets	384,196.69
Short-term accruals	5,364.49
Short-term investments in group and associated companies	4,550.00
Trade and other receivables 4,	050,422.87
CURRENT ASSETS 4,4	108,534.05
Long-term financial investment	72,292.88
Investments in the Group companies and entities considered as long-term	1,000.00
Material fixed assets 6,	324,799.57
Intangible fixed assets	487,786.51
NON CURRENT ASSETS 6,8	385,878.96

NETE ASSETS AND LIABILITIES

NET ASSETS	9,718,141.89
Equity	1,444,422.64
Grants, donations and bequests received	8,273,719.25
NON CURRENT LIABILITIES	327,292.64
Long-term provisions	112,753.50
Long-term debt	214,539.14
CURRENT LIABILITIES	1,248,978.47
Short-term provisions	4.,791.63
Short-term debt	264.,763.33
Accounts payable and other payables	935,149.19
Short-term accruals	44,274.32
TOTAL	11,294,413.00

Audit report

On 26th April, the entity CENTIUM AUDITORES, S.L., registered under No. \$1315 at the Official Register of Auditors of Spain, certified the audit of the annual accounts corresponding to the financial year 2017 of the PRODINTEC Foundation.



INFORME DE AUDITORÍA DE CUENTAS ANUALES EMITIDO POR UN AUDITOR INDEPENDIENTE

Al Patronato de FUNDACIÓN PRODINTEC

Hemos auditado las cuentas anuales de FUNDACIÓN PRODINTEC, que comprenden el balance a 31 de diciembre de 2017, la cuenta de pérdidas y ganancias y la memoria correspondientes al ejercicio terminado en dicha fecha.

En nuestra opinión, las cuentas anuales adjuntas expresan, en todos los aspectos significativos, la imagen fiel del patrimonio y de la situación financiera de la FUNDACIÓN PRODINTEC a 31 de diciembre de 2017, así como de sus resultados y flujos de efectivo correspondientes al ejercicio anual terminado en dicha fecha, de conformidad con el marco normativo de información financiera que resulta de aplicación (que se identifica en la nota 2.1 de la memoria) y, en particular, con los principios y criterios contables contenidos en el mismo.

Fundamento de la opinión

Hemos llevado a cabo nuestra auditoría de conformidad con la normativa reguladora de auditoría de cuentas vigente en España. Nuestras responsabilidades de acuerdo con dichas normas se describen más adelante en la sección Responsabilidades del auditor en relación con la auditoría de las cuentas anuales de nuestro informe.

Somos independientes de la Fundación de conformidad con los requerimientos de ética, incluidos los de independencia, que son aplicables a nuestra auditoría de las cuentas anuales en España según lo exigido por la normativa reguladora de la actividad de auditoría de cuentas. En este sentido, no hemos prestado servicios distintos a los de la auditoría de cuentas ni han concurrido situaciones o circunstancias que, de acuerdo con lo establecido en la citada normativa reguladora, hayan afectado a la necesaria independencia de modo que se haya visto comprometida.

Consideramos que la evidencia de auditoría que hemos obtenido proporciona una base suficiente y adecuada para nuestra opinión.

Aspectos zuás relevantes de la auditoria

Los aspectos más relevantes de la auditoria son aquellos que, según muestro juicio profesional, han sido considerados como los riesgos de incorrección material más significativos en nuestra auditoria de las cuentas anuales del periodo actual. Estos riesgos han sido tratados en el contexto de muestra auditoria de las cuentas anuales en su conjunto, y en la formación de nuestra opinión sobre éstas, y no expresamos uma opinión por separado sobre estos riesgos.

Hemos determinado que no existen riesgos más significativos considerados en la auditoría que se deban comunicar en nuestro informe.

Responsabilidad del Presidente del Patronato en relación con las cuentas annales

El Presidente del Patronato es responsable de formular las cuentas anuales adjuntas, de forma que expresen la imagen fiel del patrimonio, de la situación financiera y de los resultados de la Fundación, de conformidad con el marco normativo de información financiera aplicable a la entidad en España, y del control interno que consideren necesario para permitir la preparación de cuentas anuales libres de incorrección material, debida a fraude o error.

En la preparación de las cuentas anuales, el Presidente del Patronato es el responsable de la valoración de la capacidad de la Fundación para continuar como empresa en funcionamiento, revelando, según corresponda, las cuestiones relacionadas con la empresa en funcionamiento y utilizando el principio contable de empresa en funcionamiento excepto si el Presidente del Patronato tiene intención de liquidar la Fundación o de cesar sus operaciones, o bien no exista orra alternativa realista.

Responsabilidades del auditor en relación con la auditoria de las cuentes anuales

Nuestros objetivos son obtener una seguridad razonable de que las cuentas anuales en su conjunto están libres de incorrección material, debida a fraude o error, y emitir un informe de auditoría que contiene muestra opinión. Seguridad razonable es un alto grado de seguridad pero no garantiza que una auditoría realizada de conformidad con la normativa reguladora de la actividad de auditoría vigente en España siempre detecte una incorrección material cuando existe. Las incorrecciones pueden deberse a fraude o error y se consideran materiales si, individualmente o de forma agregada, puede preverse razonablemente que influyan en las decisiones económicas que los usuarios tornan basándose en las cuentas amaales.

Como parte de una auditoria de conformidad con la normativa reguladora de la actividad de auditoria de cuentas en España, aplicamos nuestro juicio profesional y mantenemos una actitud de escepticismo profesional darante toda la auditoria. También:

Identificamos y valoramos los riesgos de incorrección material en las cuentas amuales, debida a fraude o error, diseñamos y aplicamos procedimientos de auditoría para responder a dichos riesgos y obtenemos evidencia de auditoría suficiente y adecuada para proporcionar una base para nuestra opinión. El riesgo de no detectar una incorrección material debida a fraude es más elevado que en el caso de una incorrección material debida a error, ya que el fraude puede implicar colusión, falsificación, omisiones deliberadas, manifestaciones intencionadamente erróneas, o la elasión del control interno.

CENTIUM

- Obtenemos conocimiento del control interno relevante para la auditoría con el fin de diseñar procedimientos de auditoría que sean adecuados en función de las circunstancias, y no con la finalidad de expresar una opinión sobre la eficacia del control interno de la entidad.
- Evaluamos si las políticas contables aplicadas son adecuadas y la razonabilidad de las estimaciones contables y la correspondiente información revelada por el Presidente del Patronato.
- Concluimos sobre si es adecuada la utilización, por el Presidente del Patronato, del principio contable de empresa en funcionamiento y, basándonos en la evidencia de auditoría obtenida, concluimos sobre si existe o no una incertidumbre material relacionada con hechos o con condiciones que pueden generar dudas significativas sobre la capacidad de la Fundación para continuar como empresa en funcionamiento. Si concluimos que existe una incertidumbre material, se requiere que llamemos la atención en nuestro informe de auditoría sobre la correspondiente información revelada en las cuentas anuales o, si dichas revelaciones no son adecuadas, que expresemos una opinión modificada. Nuestras conclusiones se basan en la evidencia de auditoría obtenida hasta la fecha de nuestro informe de auditoría. Sin embargo, los hechos o condiciones futuros pueden ser la causa de que la entidad deje de ser una empresa en funcionamiento.
- Evaluamos la presentación global, la estructura y el contenido de las cuentas anuales, incluida la información revelada, y si las cuentas anuales representan las transacciones y hechos subyacentes de un modo que logran expresar la imagen fiel.

Nos comunicamos con el Presidente del Patronato en relación con, entre otras cuestiones, el alcance y el momento de realización de la auditoría planificados y los hallargos significativos de la auditoría, así como cualquier deficiencia significativa del control interno que identificamos en el transcurso de la auditoría. Entre los riesgos significativos que han sido objeto de comunicación al Presidente del Patronato, determinamos los que han sido de la mayor significatividad en la auditoría de las cuentas amuales del periodo actual y que son, en consecuencia, los riesgos considerados más significativos.

Describimos esos riesgos en nuestro informe de auditoría salvo que las disposiciones legales o reglamentarias prohíban revelar públicamente la cuestión.

Oviedo, 26 de Abril de 2018

CENTIUM AUDITORES, S.L. R.O.A.C. q° S1315

Daniel Martinez Forpández Socio-Auditor de Cuentas R.O.A.C. 16 20457

Record of Events

January to april







January to april













January to april





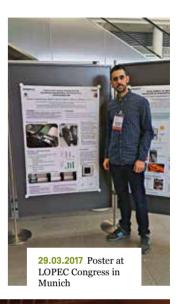


















May to august

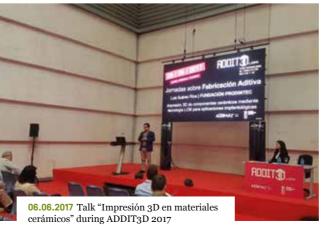














May to august





May to august











