



B&T Composites SA



Φλώρινα  
Συννεφιά κυρίως

-9°

Τρίτη ΣΗΜΕΡΑ -3 -11

2 μμ	3 μμ	4 μμ	5 μμ	5:23 μμ	6 μμ
90%	90%	80%	90%	90%	90%
❄️	❄️	❄️	❄️	☀️	❄️
-1°	-1°	-1°	-1°	Δύση	-2°

Τετάρτη ❄️ 0 -4  
 Πέμπτη ❄️ 1 -7  
 Παρασκευή ☁️ 2 -11  
 Σάββατο ☀️ -1 -14  
 Κυριακή ☀️ 1 -10  
 Δευτέρα ❄️ 3 -7  
 Τρίτη ❄️ 2 -11

Μόσχα  
Νεφελώδης

-9°

Τρίτη ΣΗΜΕΡΑ -8 -14

Τώρα	11 μμ	12 πμ	1 πμ	2 πμ	3 πμ
☁️	☁️	☁️	☁️	☁️	☁️
-9°	-9°	-10°	-11°	-11°	-12°

Τετάρτη ☁️ -13 -14  
 Πέμπτη ☁️ -8 -13  
 Παρασκευή ☁️ -11 -13  
 Σάββατο ❄️ -9 -9  
 Κυριακή ☁️ -3 -4  
 Δευτέρα ❄️ -2 -6  
 Τρίτη ❄️ -4 -9

# Fields of application



**Industrial**

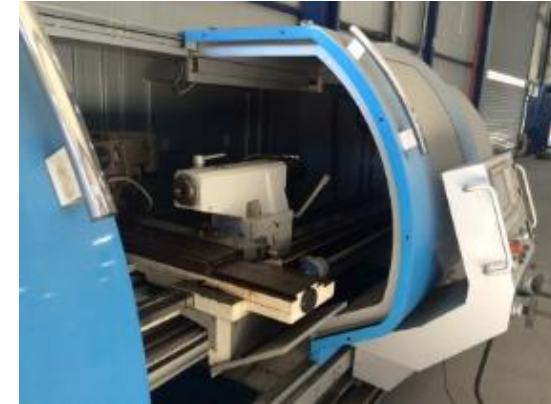
**Wind energy**

**Marine**

**Infrastructure**

**LNG**

# Our equipment



-Three production lines - two curing ovens - extractor – a variety of mandrels - CNC machines

# Research projects

University of Ioannina  
Department of Materials Science & Engineering  
**Composites and Smart Materials Laboratory**  
http://ioannina.met.ntua.gr

**Hierarchical multifunctional composites with thermoelectrically powered autonomous structural health monitoring for the aviation industry** — 'HARVEST' (H2020 EU Project)

Materials and RZR set-up with different units for coating fiber tows & fabrics and prepreg manufacturing

**Carbon fiber textiles, Nanomaterials and inks**

Carbon fiber textile, Nanomaterials and inks, MWNTs/UVI697, Ag, Cu, ZnO, TiO<sub>2</sub>

**RZR coating for TEG-enabled CF reinforcements**

Carbon fiber, Urethane resin, Dryer, Corona Plasma Unit, Winder, Drying, Trier, Coating by evaporation and spin-coating, Coating with MWNTs, CF covered with MWNTs/UVI697, CF covered with MWNTs/UVI697

**TEG-enabled CRPs for autonomous structural health monitoring (SHM)**

TEG-enabled CRPs for autonomous structural health monitoring (SHM), n-type lamina, metallic contact, p-type lamina, Innovative TEG-enabled hierarchical structures

**HARVEST**

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 762190.

**FORTH**  
RESEARCH CENTER FOR ADVANCED MATERIALS

**BT & COMPOSITES**

**Optical Fiber Bragg Grating Sensors for Torque Induced Strain Monitoring in Filament Wound Composite Shafts**  
M. Antonietti<sup>1</sup>, G. Vlastakis<sup>1</sup>, I. Giannopoulos<sup>1</sup>, N. Korayem<sup>1</sup>, K. Tsakalidis<sup>1</sup>, Th. Zisis<sup>1</sup>, K. Tsakalidis<sup>1</sup>, M. Tsiropoulos<sup>2</sup>, F. Bourghignon<sup>3</sup>, S. Pitsoukidis<sup>4</sup>  
<sup>1</sup>Institute of Electronic Structure and Laser (ESL), Foundation for Research and Technology - Hellas (FORTH), Heraklion, Crete, Greece  
<sup>2</sup>Vrije Universiteit Brussel, Brussels, Belgium  
<sup>3</sup>BT Composites S.A., Heraklion, Greece  
<sup>4</sup>Herndon-Milne, Leuven, Belgium

**Abstract**  
Optical fiber Bragg grating sensors are embedded in composite shafts during filament winding to provide information on potential buckling under torque. We report strain measurement results for different orientations of the sensors with respect to the axis of the shaft and comparison with results from gratings attached to the shaft surface. Experimental data are correlated with results of finite element structural simulations of the composite shafts under torque.

**Introduction**  
Helical cylindrical carbon composite structures manufactured by filament winding are used extensively in torque transmission shafts, process pipes and pressure-bearing cylinders in automotive, marine and industrial applications. A unique advantage of composite materials is their ability to host sensors, such as optical fiber sensors, for monitoring vital mechanical parameters [1]. Placing an intermediate torque composite shafts, such as tubes, can experience buckling during operation which may lead to mechanical failure. To monitor the loads during torque transmission we have incorporated fiber Bragg gratings (FBG) during on-site filament winding of composite shafts aiming in the development of buckling sensors.

**Study outline**  
Composite shafts were manufactured with embedded FBGs of specific orientation with respect to the shaft axis: longitudinal, circumferential and helical (parallel to the carbon fibers). FBG sensors were also attached externally for comparison. The smart composite shafts were subjected to increasing levels of quasi-static torque up to 900 Nm and the sensor response was studied. Finite element structural simulations made in COMSOL 3 Multiphysics using the Solid Mechanics Module are compared with experimental data.

**Smart composite shafts**  
The filament winding method involves a robotic arm that applies a number of resin-impregnated carbon fibers onto a metal spinning mandrel at a specific inclination angle and a dedicated layer. The result is then thermally cured and the mandrel is extracted, leaving the hollow final product. FBGs of 2 mm length were inscribed in Nultra QFBs optical fiber using a standard phase mask setup, with a 230 nm excimer laser [2]. To allow for multiplexed interrogations of the grating sensors, different grating widths were used.

**Fiber Bragg grating sensors**  
A carbon composite shaft was fabricated with a 60° helical-winding pattern, a wall thickness of 3.00 mm and external diameter of 48.0 mm with embedded FBG of specific orientation. The shaft was then dimensioned to produce two separate shafts. Additionally, gratings were surface-mounted at specific locations along the shafts to allow for comparison of the response of embedded and external gratings.

**Strain under torque**  
A torque wrench was attached at one end of the shaft with a pre-defined value that was then manually applied to the shaft. The max torque value was increased with consecutive steps up to 900 Nm.

**Simulations**  
Total displacement (absolute value) under first buckling mode shows periodic pattern along circumference and small values at the oval faces. Circumferential strain (per change actual circumferential displacement) shows values at the oval faces. Longitudinal strain (per change along the shaft) and helical strain (per change along the shaft) show values at the oval faces.

**Shaft A (89 cm long)**  
Two FBG (A1 and A2) were embedded with a helical orientation parallel to the carbon fiber along the shaft. A 1930 FBG (A3) was attached externally at the same location as A1.

**Shaft B (174 cm long)**  
One FBG (B1) was embedded longitudinally and a second FBG (B2) was embedded with a circumferential orientation. A 1930 circumferential FBG (B3) was attached externally at the same axial location as B2.

**Further study on the orientation dependent FBG wavelength shift, due to the thermal resin curing process, can be used to extract information and subsequently predict the inevitable shrinkage of the composite structure during curing.**

FBG orientation	FBG shift after curing
Longitudinal	0.30 nm
Helical	0.07nm / 0.70 nm
Circumferential	0.32

**References**  
1. M. Antonietti, G. Vlastakis, I. Giannopoulos, N. Korayem, K. Tsakalidis, Th. Zisis, K. Tsakalidis, M. Tsiropoulos, F. Bourghignon, S. Pitsoukidis, "Optical Fiber Bragg Grating Sensors for Torque Induced Strain Monitoring in Filament Wound Composite Shafts", *Journal of Composite Materials*, 2020.

**Financing acknowledgement**  
Funded from the European Union's Horizon 2020 research and innovation programme under grant agreement No 762190.

**Contact email**  
m.antonietti@fORTH.gr

Presented at Optical Fiber Sensors (OFS) which will be held at the SwissTech Convention Center, EPFL Campus, Lausanne, Vaud Switzerland



**SINGLE RTDI STATE AID ACTION RESEARCH - CREATE - INNOVATE**

**IMPLEMENTATION OF NOVEL CARBON-FIBER COMPOSITE VESSELS FOR GAS STORAGE (CAVESGA)**

University of Western Macedonia  
B&T Composites

Special Managing and Implementation Service in the areas of Research, Technological Development and Innovative RTDI

www.eyde-etak.gr

European Union  
Competitive and Innovative Growth

EPANAK 2014-2020  
OPERATIONAL PROGRAM  
COMPETITIVENESS, ENTREPRENEURSHIP AND INNOVATION

ESPA  
2014-2020

Co-financed by Greece and the European Union

Implementation of novel carbon fiber composite vessels for gas storage

**SINGLE RTDI STATE AID ACTION RESEARCH - CREATE - INNOVATE**

**ADVANCED THERMOELECTRIC ENERGY HARVESTING BY HIERARCHICAL COMPOSITES FOR SELF-POWERED & AUTONOMOUSLY DRIVEN STRUCTURAL HEALTH MONITORING (ATHENA)**

1. University of Ioannina  
2. B&T Composites  
3. TELETEL

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European Union  
Competitive and Innovative Growth

EPANAK 2014-2020  
OPERATIONAL PROGRAM  
COMPETITIVENESS, ENTREPRENEURSHIP AND INNOVATION

ESPA  
2014-2020

Co-financed by Greece and the European Union

Advanced thermoelectric energy harvesting by hierarchical composites for self powered and autonomously driven structural health monitoring

Hierarchical multifunctional composites with thermoelectrically powered autonomous structural health monitoring for the aviation industry 'HARVEST' (H2020 EU Project)

Optical Fiber Bragg Grating Sensors for Torque Induced Strain Monitoring in Filament Wound Composite Shafts

**BOOST**  
PERFORMANCE  
**SMART**  
WITH  
**BUSINESS**  
TRANSFORMATION

**Blockchain**



[info@blockchain.gr](mailto:info@blockchain.gr) | [www.blockchain.gr](http://www.blockchain.gr)

# Our solutions

---

Project, Process, Business: We deliver

# 1

## Custom software

Short-term projects

Quick turnaround

A standalone solution or a supplement to a dedicated team

# 2

## Custom IT services

Expertise in web, mobile, cloud & database areas;  
Efficient and flexible synch with existing infrastructure

# 3

## Own development team

Highly skilled professionals to eliminate discrepancies for both on and off site staff

# 4

## Quality Assurance

Proven testing techniques and state-of-the-art tools and methodologies

# 5

## Consultancy & Training

Objective advice on project scoping & planning, business process and system design

Project management

# Were we excel at

---

## Technologies



### Web

HTML5 - CSS - JavaScript - php - asp.net - JSF, JSP, Servlet - Bootstrap - Angular - Node.js - Drupal - Joomla - WordPress- Liferay - Dot Net Nuke



### Mobile & Tablet

iOS - Android - Windows Phone - J2ME



### Cloud Computing

Amazon Web Services - Microsoft Azure - Open-Stack - Ubuntu elastic cloud



### Programming languages

C# - Java – Swift - Objective C - C & C++, Python



### Database Systems

Oracle - Microsoft SQL – MySQL\MariaDB – PostgreSQL - NoSQL Mongo



### Application Servers

Oracle - IBM WebSphere - GlassFish – Tomcat - JBoss - .Net Framework

# Innovation lab

R&D projects

## EU funded R&D projects

- Big Data
- mHealth
- News aggregation & verification
- Smart Cities & e-Government
- Blockchain technology, Smart Contracts, DLT Communities



## Commercializing R&D





ECC is an Greek company expert in customized high performance energy systems.

We provide eco-friendly and top efficiency energy systems for large public and residential buildings and for industries. We take care of our clients every step of the way, from energy consumption analysis and consultancy on the optimum solution, through dimensioning, design and construction of a customized energy system, to its testing, installation, and maintenance

### ***Solar Cooling***



Useful Solar Energy 365 Days Per Year

### ***Biomass***



Heat, Power & Fuels From Waste Biomass

### ***Cogeneration - CHP***



Decentralised & Efficient Heat, Power & Cooling

## What we do

---

### Energy Audits & Efficiency Measures

---

Buildings in the residential and service sector are large energy consumers with long operating hours. They need electric energy for their electric equipment, as well as for lighting, heating and air conditioning.

---

### Renewable Energy & Cleaner Technologies

---

We provide a wide variety of tailor-made energy solutions which generate energy in the most efficient way possible for the particular consumer.

---

### Power Generation & Distribution

Potential to cut energy consumption, and respectively energy costs, by up to 30% thanks to our customized approach to engineering design, construction, installation, performance monitoring and maintenance.

## Certifications

- **ISO 9001 : 2015**, Quality Management
- **ISO 14001 : 2015**, Environmental Management
- **ISO 50001 : 2011**, Energy Management
- **Certified ESCO** (Energy Services Company) *Greek Ministry of Energy*



**Complete solutions for Engineering, Procurement and Construction.**

We go through the stages of construction, delivery, installation, and testing, to reach the stage of top maintenance from our in-house team of qualified technicians

# Indicative Reference

## SOLAR COOLING

We implemented the largest solar cooling project in Europe.

The first solar thermal cooling application in the hospital sector allowed us to expand our technical solutions to innovative technologies. Through our solar cooling projects we demonstrated our strategic ability & flexibility and we are considered pioneers .

**PROJECT:** «Installation of solar vacuum collectors for the full coverage of hot water needs, solar cooling with an absorption chiller and support of heating with the remaining thermal energy» in the Thematic Area Renewable Energy -PROGRAMME GR-03

**YEAR::** 2017

**COST:** 1.753.000€

**Funded by :** 



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**EURO**  **trade**

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Since 1979



Design, Manufacture & Trade

# Tailor-made Housing Solutions

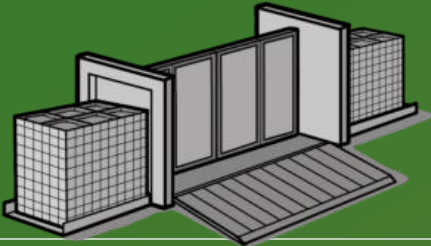
Bulletproof  
Constructions



Modular  
Buildings



Perimeter  
Protection



# Our constructions may be:

Permanent

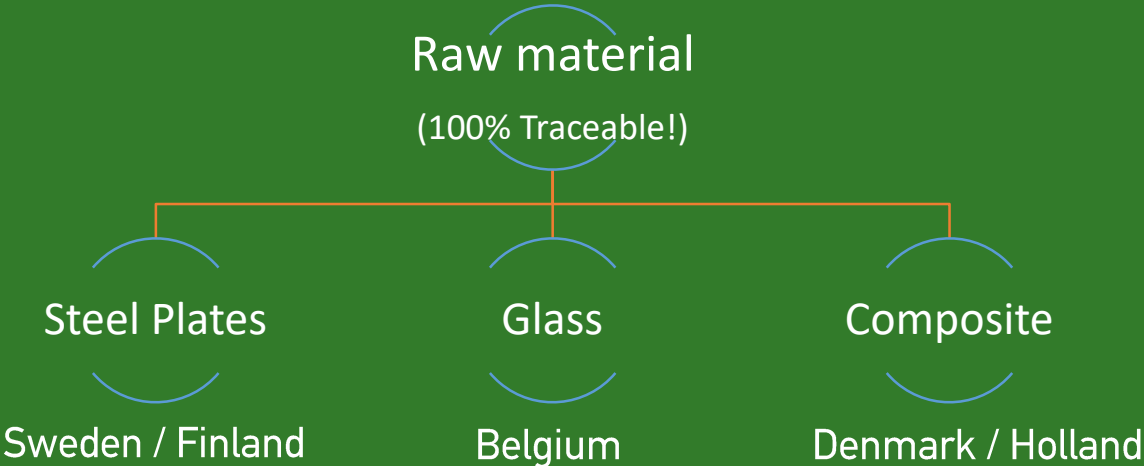
Relocatable

On Wheels



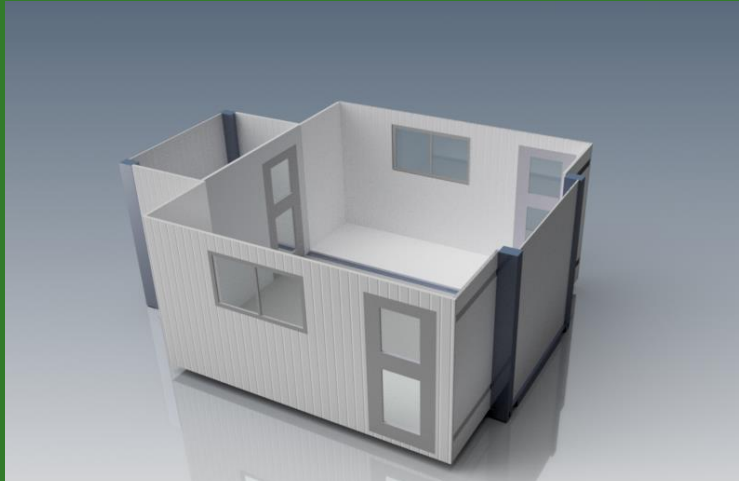


# Bulletproof Constructions



NATO Maintenance & Supply Agency  
Approved Manufacturer N.CAGE Code: G2071









# Our Certifications:



HELLENIC DEFENSE  
SYSTEMS  
EBO-PYRKAL  
Workshop of Ballistic Tests



Occupational Health  
& Safety  
Management System



Quality  
Management  
System



Environmental  
Management  
System



Factory  
Production  
Control



**NATO Maintenance &  
Supply Agency**  
**Approved Manufacturer**  
N.CAGE Code: G2071

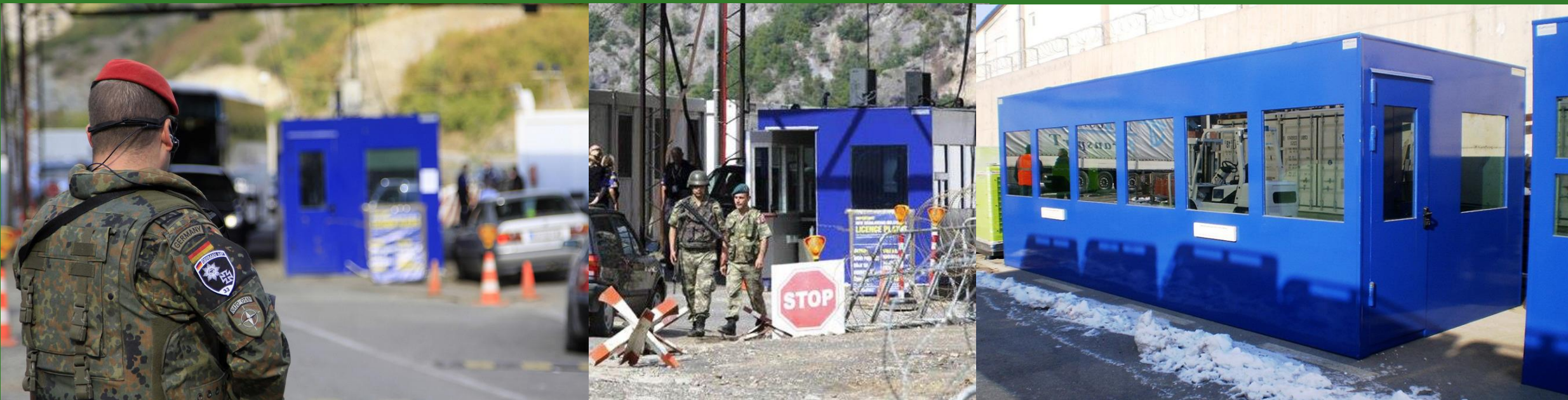
# Bulletproof Guard Post / Aspisp Mirror



SNFCC / Stavros Niarchos Foundation Cultural Center.

Securing the garden gates of the new Opera House of Athens.





Eulex Kosovo Bulletproof Check point Tailor made Aspisp series.



Ramstein US Air force Base / Germany!



Thank you!!

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# Fieldscale



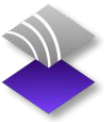
Diverse team  
20+  
MSc and  
PhD engineers



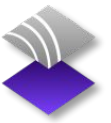
Global  
customers  
Europe, USA, Asia

George Bouzianas, Co-founder & CTO  
[bouzias@fieldscale.com](mailto:bouzias@fieldscale.com)

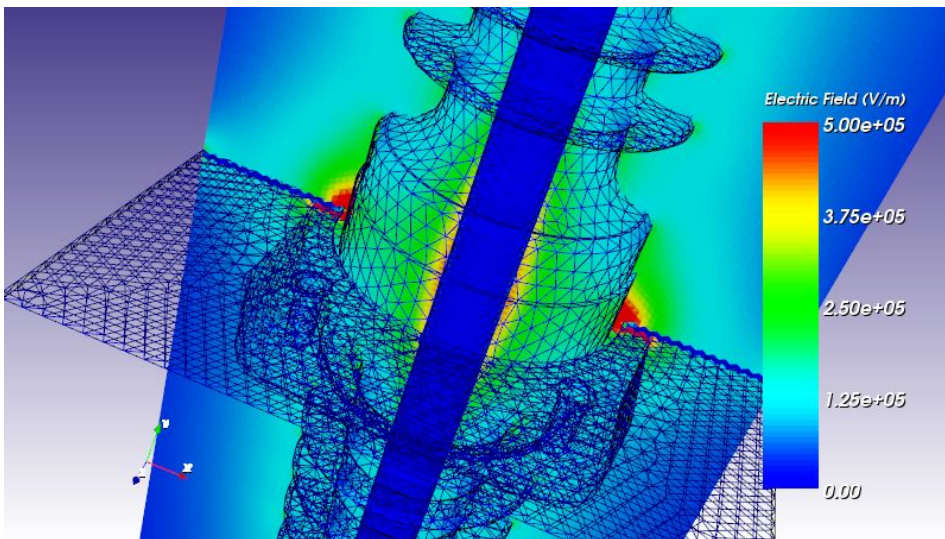
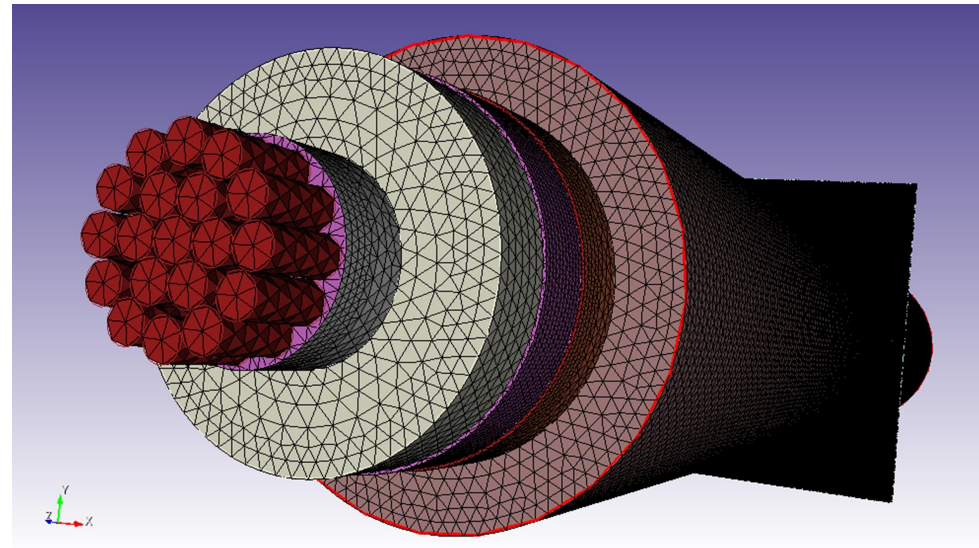




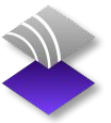
- Fieldscale is a Computer Aided Engineering (CAE) company
- We build simulation software
- Electromagnetic effects (Maxwell's equations)



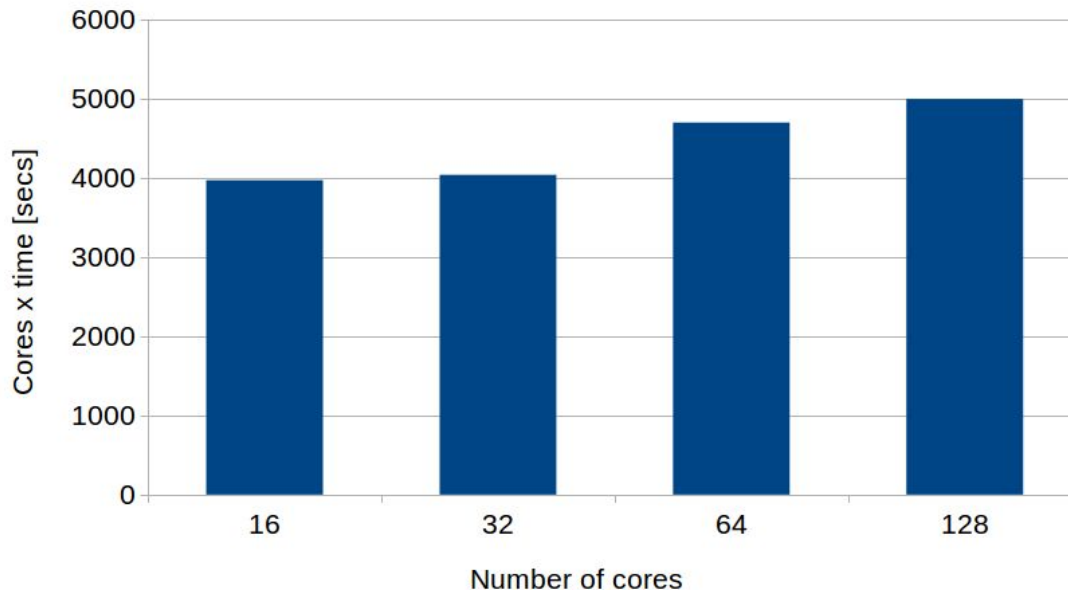
We build software for  
**all** simulation stages



- Pre-processing
- Solving
- Post-Processing



- We focus in the Boundary Element Method (BEM)
- Commercially available
  - Electrostatics (**Capacitance**)
  - Static currents (**Resistance**)
- Under development
  - non-linear magnetostatics
  - eddy currents effects
  - high frequency effects



Distributed memory system  
(MPI)  
Efficiency > 80%  
Acceleration > 100x



- SENSE
  - capacitive touch sensor design and simulation
  - targeted to non-expert users
- Web platform
  - large simulations on the cloud
  - collaboration between various departments
- Consulting services
- Build a new product

THANK YOU

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www.fieldscale.com  
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*We reply within 24 hours.*



**isomat**

building quality

BUILDING CHEMICALS & MORTARS

BUILDING QUALITY  
**BUILDING EXCELLENCE**

- WATERPROOFING MATERIALS
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- TILE ADHESIVES & GROUTS
- REPAIRING MATERIALS
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- FLOORINGS

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**isomat**  
building quality



# PRODUCTION UNITS IN 3 COUNTRIES

Since 1980, production of high quality, innovative,  
value-for-money & environmental-friendly products





# RESEARCH & DEVELOPMENT (R&D)

The Research & Development Department consists of 5 different laboratories with the main task:

- Research and development of innovative products
- Continuous improvement of existing products



# QUALITY CONTROL

Before ISOMAT launches a product, it undergoes continuous & rigorous tests to ensure consistently high quality.

When entering the market the products must meet excellence, they should:

- offer a radical solution
- be easy-to-apply
- be value-for-money
- endure in time
- provide a highly aesthetic result



## CERTIFIED COMPANY



# WORLDWIDE PRESENCE



ISOMAT products are exported currently to more than **50** countries worldwide

# Thank You For Your Attention!



- *Established 1986*
- *International Transports within Europe*
- *Expertise in Italy*
- *Integrated Logistics Services*
- *Transports by own fleet*
- *Groupage loads*
- *Tailor made solutions*

- ✓ *Sustainability*
- ✓ *Customer-Centric philosophy*
- ✓ *Reliability*
- ✓ *Express Service*
- ✓ *Quality Oriented Approach*

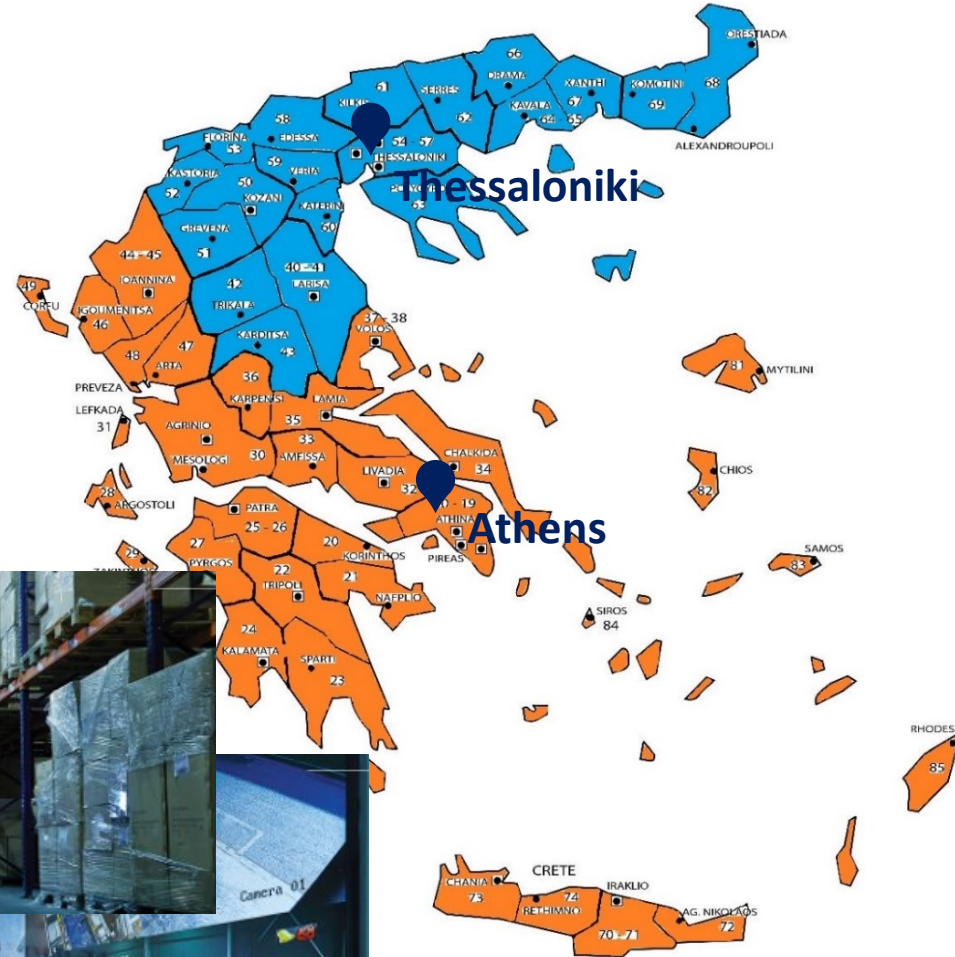


# ILT Network - Greece

Services All over Greece

through our Hubs:

- ✓ Athens  
GR 19300 Aspropirgos
- ✓ Thessaloniki  
GR 57009 Kalochori



Integrated Logistics Services

- ❖ Warehousing
- ❖ Stock Optimization
- ❖ Order Picking
- ❖ Packing
- ❖ Delivery / Collection



- ✓ Daily Departures
- ✓ 11 Hubs - Terminals





- ✓ UK
- ✓ Spain
- ✓ France
- ✓ Poland
- ✓ Belgium
- ✓ Netherlands
- ✓ Switzerland
- ✓ Austria
- ✓ Germany





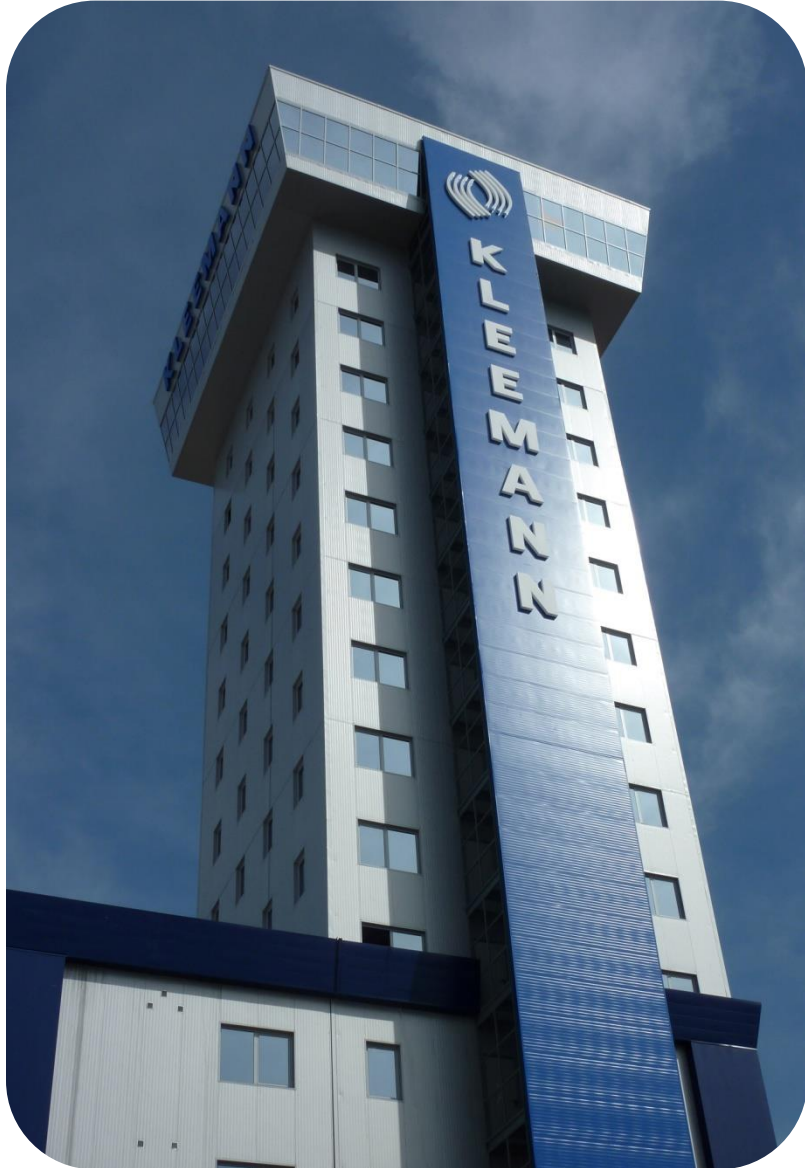
**KLEEMANN**

Your 1<sup>st</sup> Choice in Lifts

**10 & 11/1/2019**



Presentation: Dr. Ioanna Sfampa , KLEEMANN Innovation Department



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KLEEMANN is a Greek global manufacturer of Complete Lift Systems, escalators and moving walks.

# KLEEMANN Facilities

3 Production Units & 2 Assembly Lines



// Greece



// China



// Russia



// Serbia



// Turkey

// Buildings:  
Land:

100.000 m<sup>2</sup>  
180.000 m<sup>2</sup>

// Group Buildings:  
Group Land:

140.000 m<sup>2</sup>  
255.000 m<sup>2</sup>

# KLEEMANN New Investment

New Facilities & Testing Tower in China



// Production, Logistics, Testing tower & Offices 19.300 sq.m.

// Investment of 15.000.000 \$

# KLEEMANN Worldwide presence

Local presence in 15 countries/ International sales in more than 100 countries



**90%**

International sales



Sales network in more  
than **100** countries



KLEEMANN



# Always Growing

Great Place to Grow

// 2X GPTW Award winner  
// 95% of employees trained every year

# KLEEMANN People

One company, one team, one family



**Group**

**1300**

(+100 the last 2 years)

**Headquarters**

**1000**

**Production**

**530**

**Engineers**

**311**







**We are a global lift supplier with the best product range in the world**



Passenger lifts



Freight lifts



Escalators &  
Moving Walks



Parking systems



Modernisation  
solutions



Marine  
Solutions



# Experts in special projects

// Antivandal lifts

// Fire fighting lifts

// Oil rigs

// Marine solutions

// Earthquake resistant lifts

// Supplier of multinational companies

# KLEEMANN in Special Projects

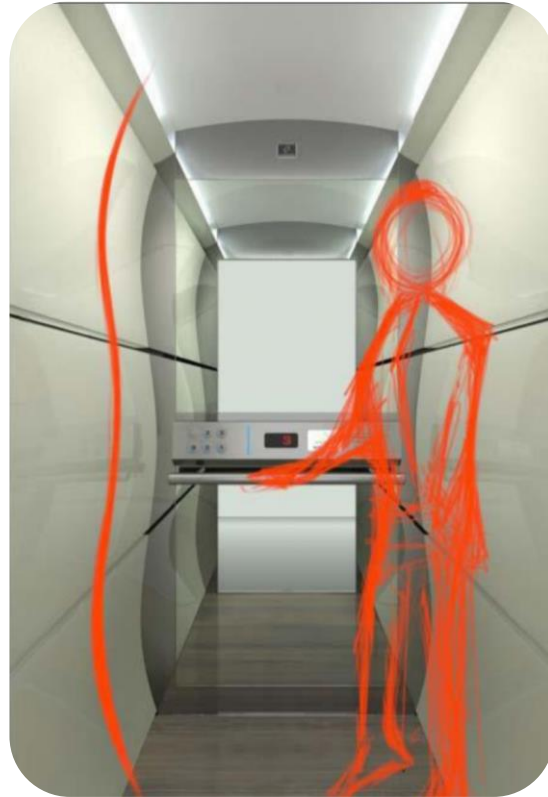
Earthquake resistant lifts



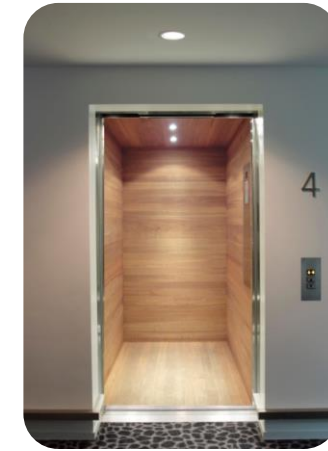
- The KLEEMANN Earthquake resistant lift is considered to be necessary not only for the public buildings but for every building, especially in countries which are known to have high seismic activity.
- Such an application, the first in Europe, assures that any lift hydraulic or traction can be turned to an earthquake resistant lift just by adding a few extra features.
- The earthquake resistant lift, is equipped with the technology to detect the earthquake before its actual manifestation and transfer passengers safely to the next floor.

# KLEEMANN Design

World class design



// Unique design solutions



// We transformed the cabin design

- Curves
- Vibrant modern colours
- Hidden lighting
- Exceptional atmosphere



// Record fast delivery for standard products

Lean Production scheme  
Straightforward procedures



# Commercial buildings



Porsche Showroom // Chile



Auchan // Paris, France



Nobu restaurant // Doha, Qatar

# Residential / Office buildings



Georgia King David Residences & Business Centre // Georgia



// Amsterdam, Netherland



// St. Margrethen, Switzerland



// Shanghai, China



# Public buildings



**Jussieu Campus**  
// Paris, France



**Hospital**  
// Belgrade, Serbia



**Wooridul Spine Centre**  
// Dubai, UAE



# | Hotels



**Rochestone Park Hotel**  
// Limerick, Ireland



**Double Tree by Hilton**  
// Zagreb, Croatia



**Hypnos Hotel**  
// Istanbul, Turkey

# Marine solutions



// Oil Rig Cat D  
Songa Offshore, Norway



// Anek Lines

# Special projects



El Kureimat // Egypt



Kremlin // Russia



AVIVA Stadium // Ireland



Mary Rose Museum //  
United Kingdom





# Livemedia Live Streaming Congresses | Meetings | Webinars



- Livemedia is a global web channel specialising in video journalism and livestreaming of live events and conferences globally based on high tech online proprietary platforms and applications
- Unlimited number of simultaneous viewers
- Sponsors' logo or video spot display during the live broadcast and on the archived video album


# Livemedia Congress Media coverage





- Media coverage of the congress by professional journalists (reportage / interviews)
- Interviews prior to the event
- Event's highlights video recording & Post Production
- Video & Press Releases to the Media
- Social Media Marketing (Facebook / Twitter / LinkedIn)
- Email / Newsletter Distribution and Mailing Services

# Livemedia Online Tools

## Registration | Chat | Poll

 Please submit the username and password that has been sent to you to access this event or live broadcast

 PLEASE ENTER YOUR USERNAME AND PASSWORD TO ACCESS THE LIVE WEBCAST

 You can login if you are a user. If you can't remember your password you can click 'Forgot your Password?' link.

Username  Required field

Password  Required field

[Forgot your password?](#)

**Chat**

**A. Hadjikypry** 11/06 14:37  
Professor Chambers, Thank you for the very insightful lecture. You have mentioned the case of a patient with prosthetic thrombosis. My question is, as a post-traumatic condition; when was rTPA administered?

**LIVEMEDIA** 08/06 14:37  
In this field you can send us your questions or quotes about the lectures.

Your name...

Your message here...

**Question**

Answer 1.

Answer 2.

Answer 3.

Answer 4.

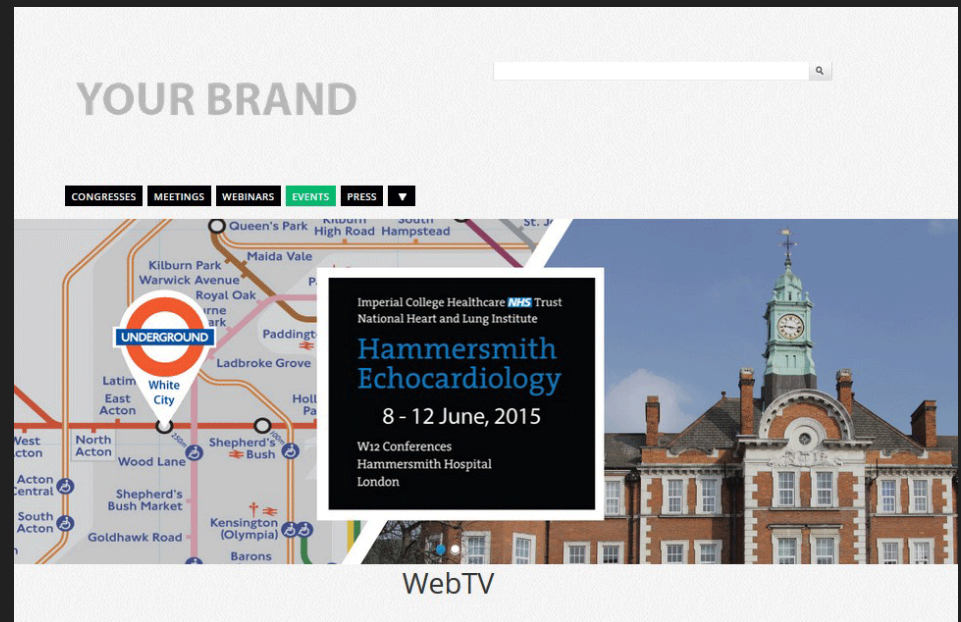
Answer 5.

Answer 6.

- User registration form and login credentials to view the webcast online
- Option to pay via Paypal or credit card, in case of fee registration for access
- Online viewers and on site participants send questions to the speakers during the webcast
- Questions are being answered by the speakers live in real time.
- Online multiple choice poll questions
- Audience answers in real time using mobile phones or web browsers
- Multiple polls per event

# Your Brand Livemedia Style Web Channel

- Livemedia web channel design
- Videos / Photos / Info Memos per event
- Social Media sharing widgets
- Search function
- Advertising tools for banners and videos
- Statistics for videos / photos / events
- Mass upload / mass edit per album
- Full administrative privileges



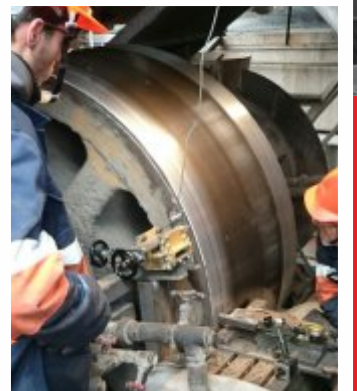




# SuperAlloys

ENGINEERING

Innovative  
Mechanical  
Solutions



[www.superalloys-eng.com](http://www.superalloys-eng.com)



# SuperAlloys ENGINEERING

SuperAlloys Engineering is an innovative company that offers integrated industrial services with top of the line solutions. The company operates more than 38 years a fully equipped -certificated with ISO 9001:2015-mechanical workshop and it is specialized in manufacturing customized, high tech, industrial spare parts with protective coatings & advanced materials for every requirement for Power Generation Plants, Cement Plants and Refineries. Innovation and after sales customer support is our philosophy in order to increase operating production performance, by reducing production or/and maintenance cost.

SuperAlloys Engineering is also focusing on urgent maintenance conditions & "in situ" machining processes. By developing & manufacturing customized portable manipulators and high precision machine tools and provides the most reliable solutions

for "in-situ" hardfacing and machining projects. Using the above-mentioned techniques, serious maintenance and reliability costs can be improved significantly, in terms of increasing the production operation performance and down time of Heavy Industry sector.

Manufacturing of spare parts with special mechanical and thermal properties using wear & heat resistant alloys, carbides (WC, TiC, SiC) & ceramics (ZrO<sub>2</sub>-Y<sub>2</sub>O<sub>3</sub>, Cr<sub>2</sub>O<sub>3</sub>, SiO<sub>2</sub>, Al<sub>2</sub>O<sub>3</sub>-TiO<sub>2</sub>).



## Sectors:

Metallic Constructions with advanced materials

Machining tools and electromechanical devices

Metallurgy (Steel-Aluminium)

R & D Institutes

Geotechnical products/Excavations

Cement Industry

Chemicals/Refineries

Power Plants

Pottery and brick industry

Mining/Ore

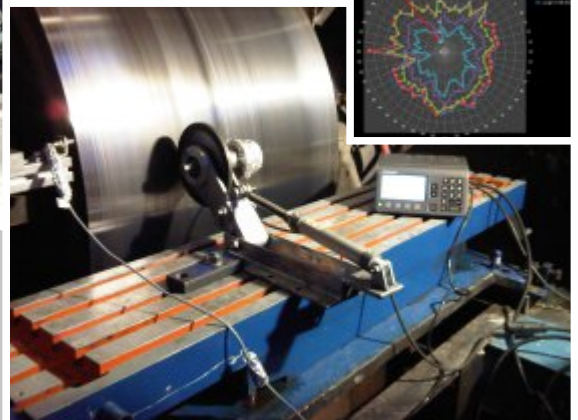
Moulds

Medical tools

Manufacturing of custom made mechanical spare parts using low friction Zn-Al and Cu-Ni based superalloys with particulate physical properties.



Accurate "in-situ" machining & "real-time" dimensional measurements of any rotating cylindrical parts, shafts, rollers and chambers.





## Products & Services:

▪ Robotic systems and manipulators for special machining and welding applications, smart processes and medical applications. Combined "in-situ" precision machining, cladding & hardfacing.

▪ Manufacturing of high efficiency spare parts like valves, plungers, seats, mechanical seals, shafts, sleeves and impellers for pumps, compressors, turbine rotor, crank shafts with superalloys like Stellite, Hastelloy, Incolloy, Inconel and Monel.

▪ Mechanical engineering services in the field of repair, maintenance and lifetime prolongation of spare parts and equipment, using advanced manufacturing methods and improved material performance.

▪ High quality industrial measurement services, "in-situ" and "real-time" to provide cost effective services. Pro-active maintenance services in terms of high precision laser technics in combination with vibration analysis and dynamic balancing.

▪ Hardfacing regeneration of rollers, grinding tables and high-pressure rolls for vertical mills and crushers, in the workshop or "in-situ" where customer's equipment is installed & operates.

▪ Medical devices, implants and surgery smart tools with Ti and Co based alloys.

▪ Plasma Spray and Powder Metallurgy coatings with superalloys, composite materials, ceramics and carbides for aerospace and power generation industry.

▪ Corrosion and oxidation protection of metal constructions, wind generators parts, tanks, vessels, heat exchangers, vacuum chambers and natural gas pipes with cladding.

▪ Manufacturing of high efficiency trimetallic bearing systems for every type of turbines & engines, standard and undersized. Rebabbing/machining of any kind of bearings.

▪ Thermal Barrier coatings for valves and cylinder heads in Internal combustion engines, gas turbines exhausts and steam turbines elements.

▪ Surface hardening and manufacturing with ceramic coatings of steel milling bars, guide & printing rollers.

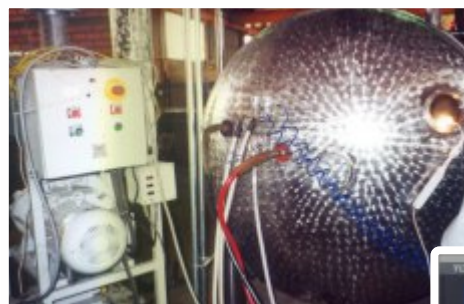
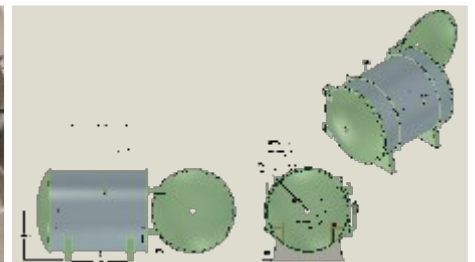
▪ Electrical and semiconductor coatings & spare parts with superalloys and ceramics.



High precision metal constructions & machinery for R&D applications



Production of various size cladding plates of ultrahigh hardness for chambers and pipelines with antiexplosion & antiballistic properties.



Design & manufacturing of ultra vacuum chambers for chemical processing and reactors.



# GLOBAL PRESENCE



**Plant 1: MECHANICAL WORKSHOP**  
10 Stadiou str.  
P.O.Box 1337, Kalochoi  
57009 Thessaloniki, Greece



**Plant 2: METALLURGY**  
O.T. 56 - Sindos main road  
Sindos Industrial Area  
57022 Thessaloniki, Greece



**SuperAlloys**  
ENGINEERING

Tel./Fax: +30 2310 789125, Mob.: +30 6973 321031 - 2  
ksa@superalloys-eng.com | www.superalloys-eng.com

## About TETTIX

Since 2009, TETTIX designs and manufactures industrial automation systems, acting mainly as a robot integrator. The innovative technological solutions, the reliability and the simplicity of use and safety, are characteristics that make our company a reliable partner for every kind of automation.

TETTIX, by using modular components, can offer a wide range of automated robotic solutions, which comply with the specifications of the industry and assure to be a valid choice all the time. The flexibility of the systems enables the integration with 3D vision systems, and sophisticated grippers from composites and fibers.

Always trying to be in the avant-garde, the company closely works with several partners, specialized in the field of innovative materials, providing lightweight, but sturdy solutions. Tailor made solutions for optimized performance to specific needs, tuned by nanotechnology, can be provided, in order to reach the challenges of the future.

TETTIX is a one-stop shop when it comes to developing and creating complete solutions for state of art technology. From concept development, to electrical and mechanical construction, to robot programming, production and commissioning, you have a reliable partner!

[www.tettix.info](http://www.tettix.info)

## Applications for your assembly line:

Pick & place | Assembly | Quality inspection | CNC | Machine tending

High quality and precision for: engine foundries, laser-cutting rigs, forming presses, molding machines and laboratory equipment.

Robotic arms can be used in screw driving, assembling, labelling, handling and quality control scenarios.

Automating repetitive pick & place tasks

Reprogrammable quickly and used with different machines

Quality inspection with a camera and a robot arm

Improve speed while reducing the risk of accident injury

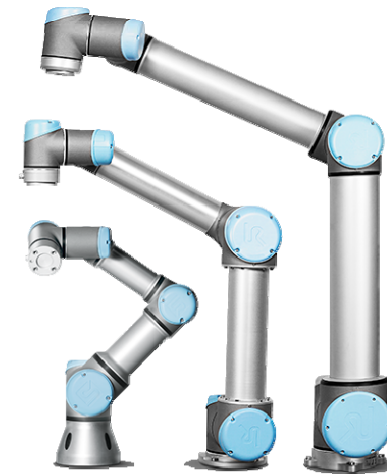
Release time from machine tending, which adds value to your business




**TETTIX** 

## Competitive advantages:

- ✓ Flexibility: Lightweight, space-saving, easy to re-deploy to multiple applications
- ✓ Safety: Reduce the risk of employee injury
- ✓ Accuracy: Increase precision for complex tasks and sensitive machinery



**TETTIX** 



**Reduce costs! Improve performance! Optimize production! Increase quality! Increase revenue!**

- Increase precision while reducing costs
- Quickly adapt production lines to new products with UR's fast, flexible deployment
- Full integration into existing production environments in the aerospace and electronics industry

**TETTIX** 

