



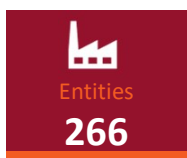


MONDRAGON CORPORATION



MONDRAGON is a business group which is divided into three areas: FINANCIAL, INDUSTRY and DISTRIBUTION.

MONDRAGON COMPONENTES is a Division of MONDRAGON.



financial area

industrial area

distribution area

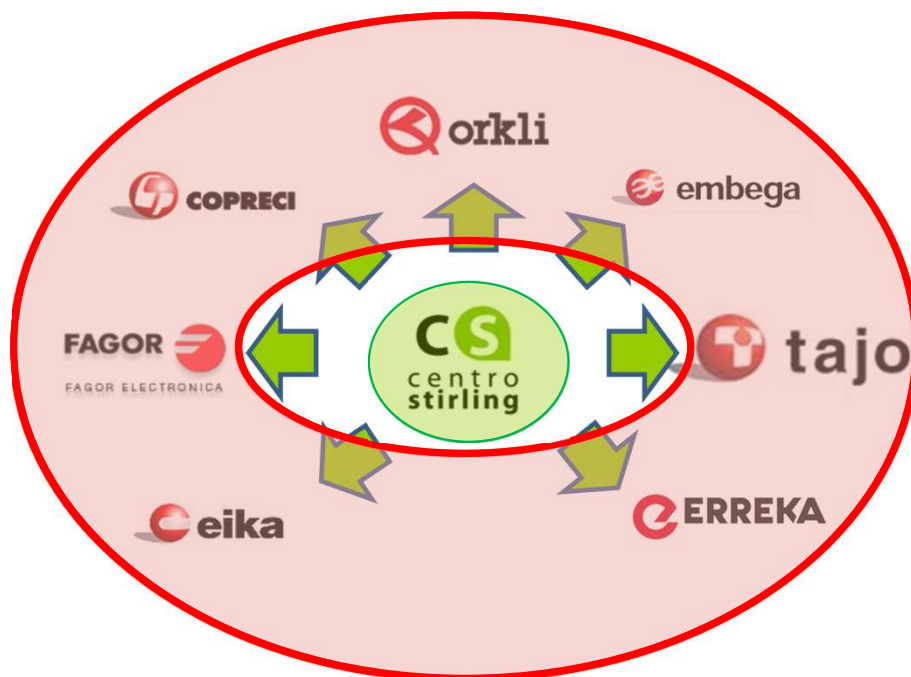
AUTOMOTIVE
INDUSTRIAL AUTOMATION
COACH BODYWORK AND SUPPLIES
COMPONENTS
CONSTRUCTION
LIFTS
EQUIPMENT
HOUSEHOLD GOODS
ENGINEERING AND SERVICES
MACHINE TOOLS
INDUSTRIAL SYSTEMS
TOOLING AND SYSTEMS



Centro Stirling



MONDRAGON COMPONENTES was founded with the **purpose of giving INTEGRAL SOLUTIONS** to the domestic appliance industry, that have been adapted to the market's most demanding needs.



Centro Stirling is the **technology research centre** of Mondragon Components and is specialized in energy efficient technologies for the residential and commercial sectors. Centro Stirling collaborates actively with the seven cooperatives of Mondragon Components Group in the development and optimization of the new products and services.



CS CENTRO STIRLING PROFILE



founded
2008



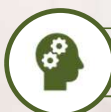
locations
2



employees
21



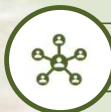
Headquarters at Aretxabaleta (Gipuzkoa); subsidiary at Villatuerta. (Navarra)



Mondragon Componentes' medium-long term R&D centre



Scope: efficient use and generation of energy at home scale



It is part of the R&D entities Basque Network



COLLABORATORS NETWORK

Research Centers

ikerlan

T
Tekniker
MEMBER OF BASQUE RESEARCH
& TECHNOLOGY ALLIANCE

IK4 LORTEK
Research Alliance

ceit
IK4 Research Alliance

CCP
Centre Català del
Plàstic

Universities

m
MONDRAGON
UNIBERTSITATEA

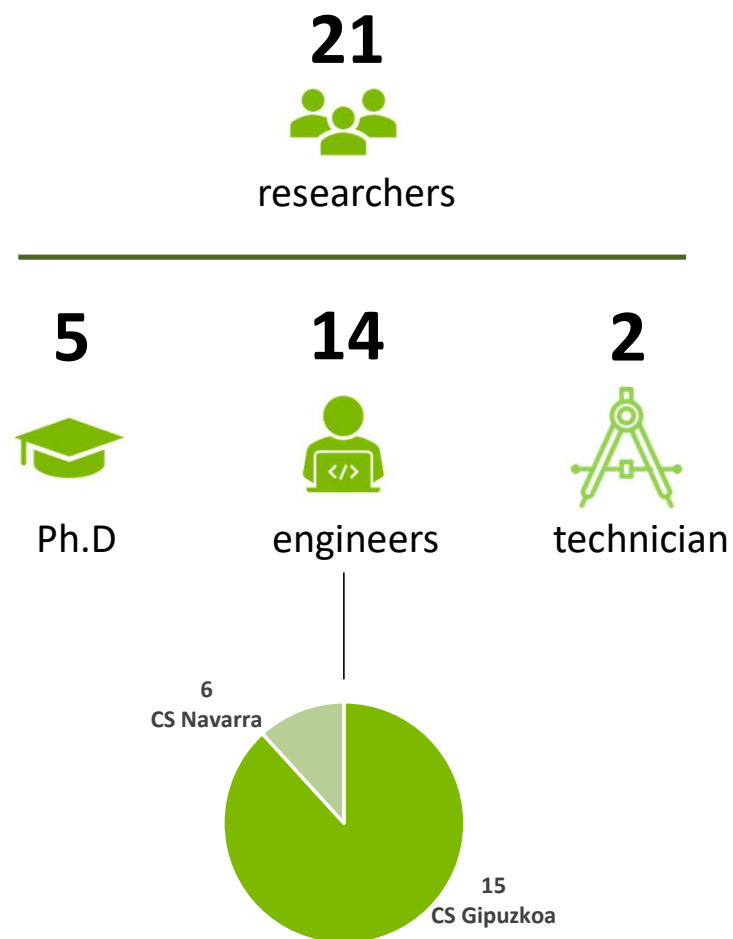
UNIVERSITAT DEL PAIS VASCO
Universidad
del Pais Vasco
Euskal Herriko
Unibertsitatea

Institutions





OUR TEAM





TECHNICAL RESOURCES

Designing, modeling & developing SW



NI Developer Suite



Electromagnetic & electronic designing SW



TECHNICAL RESOURCES

Test & measurement equipment

- Oscilloscopes (time & frequency domain, digital protocol analyzer)
- LCR Meter
- Waveform & Function generators
- Programmable power supplies
- DC Electronic Load
- NI Acquisition & processing HW (CompactRIO, CompactDAQ)



PCB assembly and reparation equipment

- Pick & place machine (SMT)
- Reflow oven
- Inspection station

Other resources

- Temperature: pyrometer, thermal imaging camera
- Misc. sensors (pressure, accelerometers, lasers)
- Energy meters (electrical, thermal)
- Climate chamber
- 3D printing





Functional Printing



PRINTED ELECTRONICS PRODUCTS

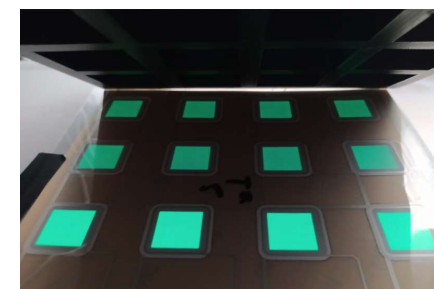
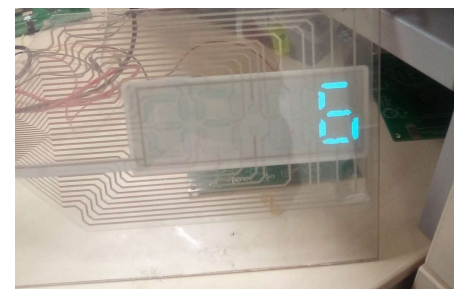
Printed sensors

- Capacitive sensors → **Human-Machine Interfaces**
- Resistive sensors
- Piezoelectric sensors
- Haptic feedback to the user



Light

- Printed electroluminescent
- LED light integration – hybrid electronics



Printed heaters

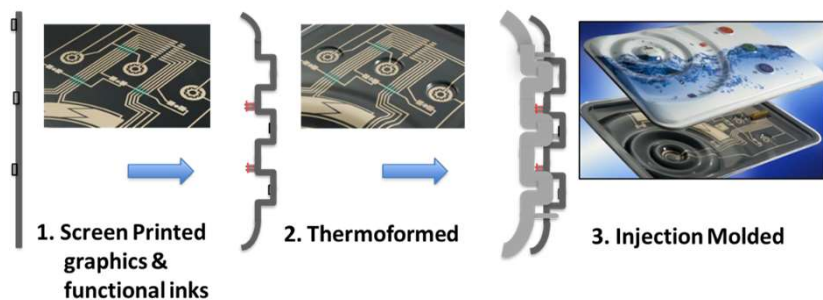
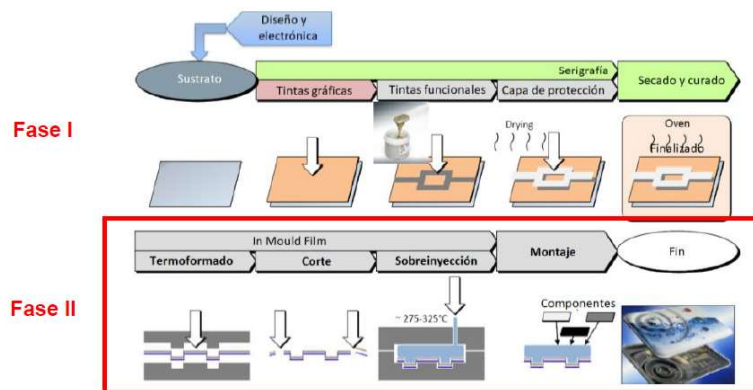
- Flexheaters integrated in many materials



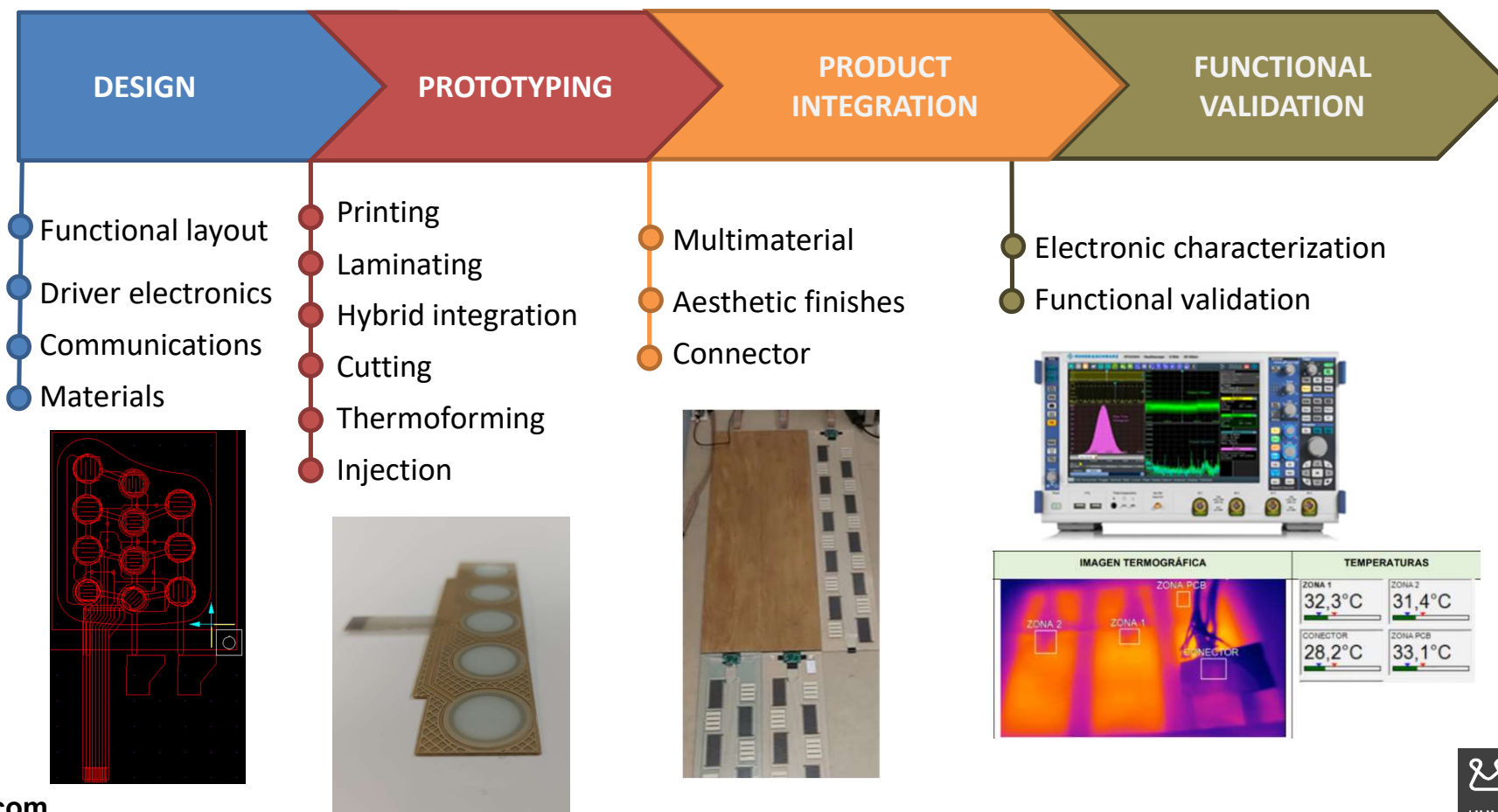
INMOLD THECNOLOGY

Inmold

- Printing
- Forming
- Injection



DESIGN & INTEGRATION

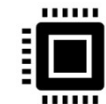




Electronics



ELECTRONIC DESIGN & EMBEDDED SYSTEMS

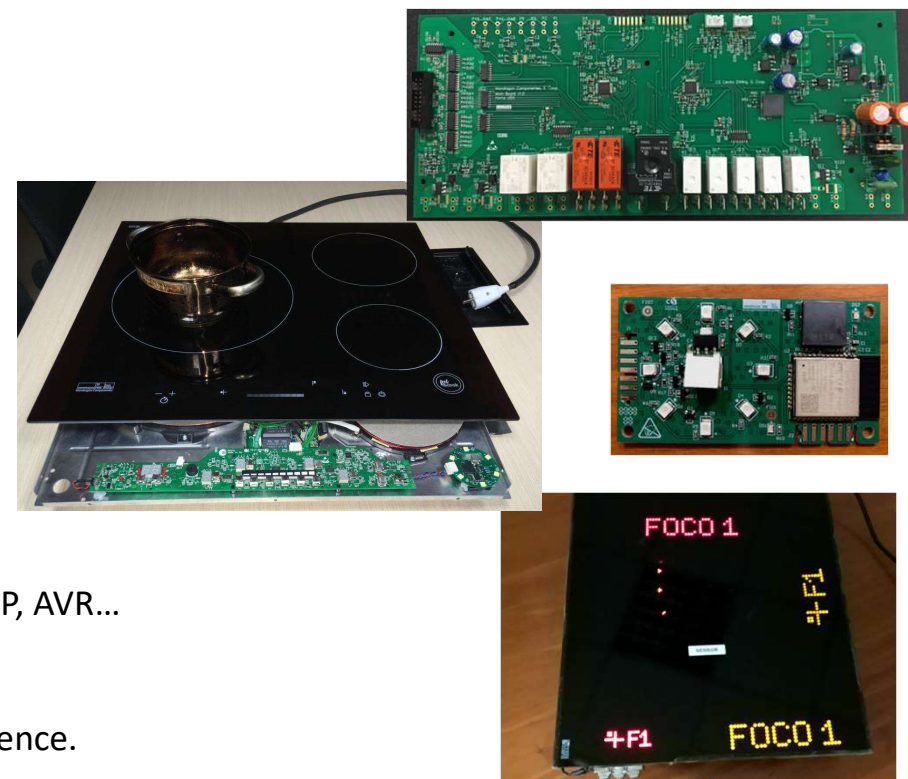


Electronic Design

- FR4 & Flex-PCB design
- Dual-processor architectures (functional & safety)
- Ultra-low-power oriented design
- CE & UL precertification testing
- CE & UL certification

Embedded systems

- Platform flexibility: Cypress, Renesas, Texas Instruments, Espressif, NXP, AVR...
- Wired communications (I2C, SPI, LIN, CAN)
- Wireless communications stacks implementations. WiFi & BLE coexistence.
- Over The Air (self and external update)



WIRELESS COMMUNICATIONS & IOT SYSTEMS

Wireless Communications

- BLE, BT 5.0
- Wi-Fi
- LoRaWAN
- 3G, 4G



IOT systems

- Over The Air development
- Provisioning, account linking
- Voice assistant solutions: Alexa skills, Google Assistant integration
- Cybersecurity assessment

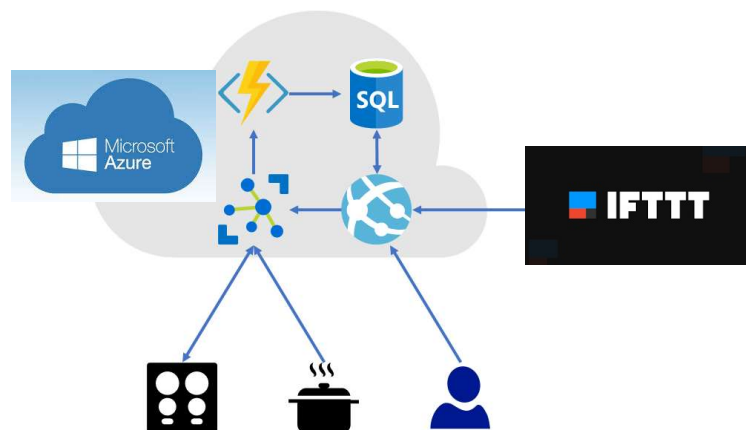


CLOUD-BASED & MOBILE SOLUTIONS

Cloud-based Solutions



- AWS (Amazon Web Services)
- Azure
- Databases:
 - Elasticsearch
 - Azure SQL
- Data analytics:
 - Kibana
 - Power BI
- IFTTT compatibility
- ERP integration



Mobile & Desktop Apps



iOS



Android



Windows



- Blind community solutions
- Screen reader compatibility:
 - Voice Over (iOS)
 - Talk back (Android)



Mechanical





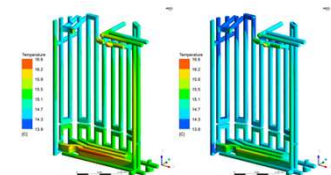
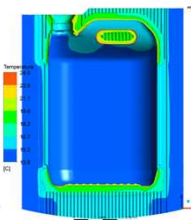
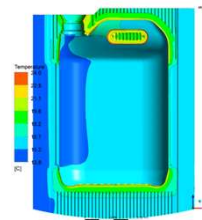
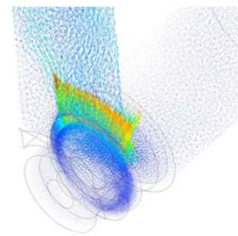
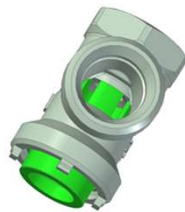
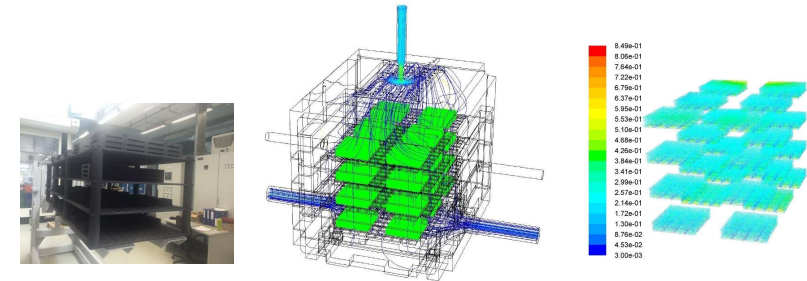
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FLUIDIC AND STRUCTURAL SIMULATIONS

Fluidic Simulations CFD



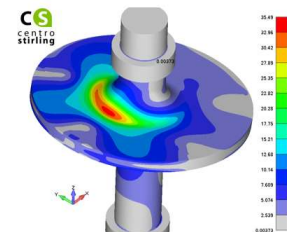
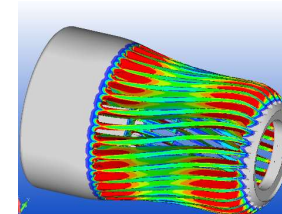
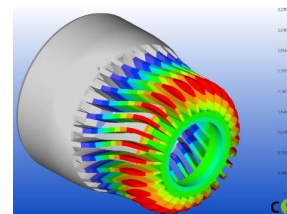
- Flow regulation simulation
- Thermofluidic Simulations



Structural Simulations



- Structural Stresses
- Structural deformations
- Optimized structural design

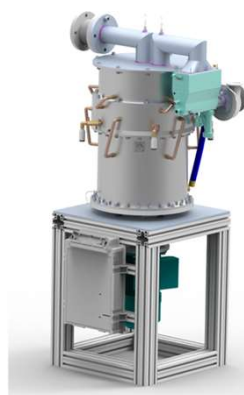


DESIGN AND PROTOTYPING

Design



- Mechanical design
- Design for manufacturing
- Product optimization



Current design



Aesthetic design



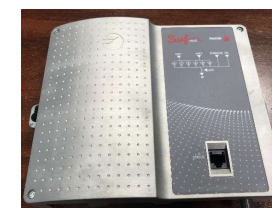
Prototyping

Prototyping (Additive manufacturing)

- Design for prototyping by additive manufacturing
- Design for additive manufacturing mass production
- Prototypes manufactured



Part manufactured by injection

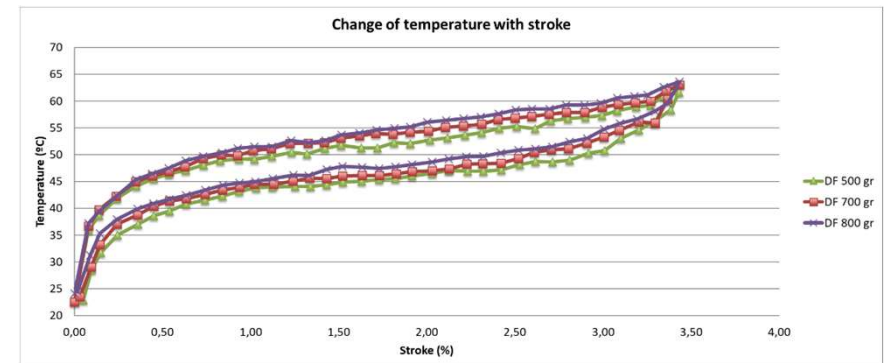
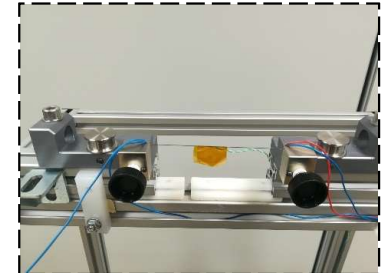
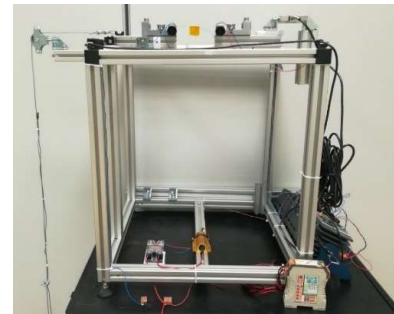


Final production

SMA TECHNOLOGY

SMA Materials

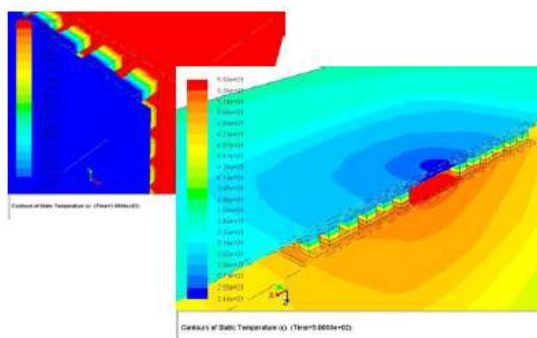
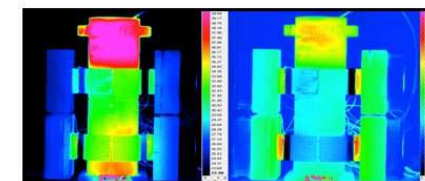
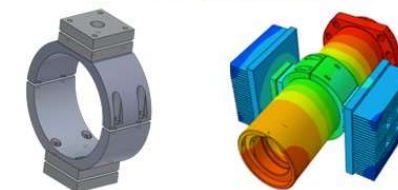
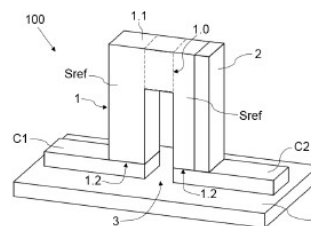
- SMA materials (Shape Memory Alloy) and explore new applications of these materials in other products and components
- SMA wires testing, NiTi wires characterisation, scientific paper in indexed journal.



THERMOELECTRICITY

Thermoelectric Projects

- Thermal control
- Cooling
- Energy harvesting
- Generation
- High Temperature Oxide Module Development





Thank you



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