MISSIONE 4
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Italiadomani
PIANO NAZIONALE DI RIPRESA E RESILIENZA

# Cosmob's activities within the WP3-Spoke 8

**Università degli Studi di Urbino**
**23 maggio 2024**

VITALITY

# What is Cosmob?

- **Technological Centre for the Manufacturing and Wood and Furniture sectors**, which operates at international level carrying out R&D activities involving partners from all over the world.
- Our aim is to provide **technological solutions and services for increasing the competitiveness** of manufacturing companies operating in Wood and Furniture sector.
- Since 1983, we support companies in **improving technical values and performances of their products**.

# Quality Tests Laboratory

- Our **Quality Tests Laboratory** is a recognized at national and international levels for Manufacturing and Wood and Furniture sectors.

- Our **Laboratory is accredited in line with the following standards:** UNI CEI EN ISO/IEC 17025 – Requirements for competences of testing and calibration laboratories and UNI CEI EN ISO IEC 17065 – Requirements for bodies certifying products, processes and services.

- Our **Laboratory conducts physical-mechanical and chemical-environmental tests**, with the aim of increasing quality and performances of products and for certifying the accomplishment with product standards.

# Certification Body


**SALUTE**

- Indoor Hi-Quality (LEED)
- Formadeide
- Emission A+
- Materassi Low Emission

**SOSTENIBILITÀ**

- Circolarità del prodotto
- CAM - Arredi

**CONFORMITÀ INTERNAZIONALE**

- U.S. Formaldehyde EPA TSCA Title VI e CARB P2
- Germania Formaldehyde E 1/2
- Brasile (InMetro)
- Emirati Arabi (SASO)
- Egitto (GOEIC)
- Nigeria (SONCAP)
- Eurasia (EAC)
- IKEA (IOS MAT)

**MADE IN ITALY**

- Origine italiana del mobile

**CONTROLLO FORNITORI**

- Supply chain

**CONTROLLO DI PROCESSO**

- Bordatura
- Verniciatura

**IGIENE**

- Surface Hi-Quality

**SICUREZZA**

- Origine italiana del mobile
- Cameretta sicura

# Training

- Development of **training paths** for young students and workers, with the aim of increasing **technical competences on trend topics within the Wood and Furniture sector**.

- Our internal vocational school, the **ITS «Product and Interior Design: industry 4.0 for the Wood and Furniture sector»**, has reached its 9° edition and it is carachterized by the **90% of occupational index** after the degree.

- Cosmob provides **national and international training activities** for **improving the know-how of human resources** operating within the Manifacturing and Wood and Furniture sector.

# R&D


COSMOB
Favorire l'evoluzione delle imprese
verso la DIGITAL TRANSFORMATION


COSMOB
La BIO-ECONOMY:
driver dell'innovazione di prodotto


COSMOB
La FORMAZIONE "GREEN and DIGITAL"
per la competitività del settore arredo


COSMOB
SMART MATERIALS
innovazione di prodotto per la valorizzazione
della creatività Made in Italy

Development of **procedural guidelines for realizing and certifying life-saving furniture** in case of earthquakes.

## Life-saving furniture

**Collaborative robotics and exoskeletons** for economic and social sustainability of production processes.

## Digital Technologies

- **Measurement of VOC** (Volatile Organic Compounds) emitted by furniture.
- Reserach **on materials with low VOC emissions**.

## Health in indoor environments

- **Development of biodegradable paints** with low VOC emissions.
- **Development of biobased materials** for industrial production.

## Biocompatible materials

Wearable sensors for **measurement of skin conductance Integrated approach with smart furniture**

## Active and Assisted Living

- **Circular furniture** and measurement of **circular economy index**
- **Research on Disassembly and Durability of furniture**

## Circular Economy

# FABLAB Pesaro

- **Digital Fabrication Laboratory** for prototyping and developing innovative products, since 2015.
- **3D printers, laser cutting machines, CNC pantograph**, **Vinyl cutting machine for promoting an interactive and intelligent experience of the object/product**.
- It works **in connection with companies and the Quality Tests Laboratory for developing prototypes and innovative products**.
- **Sharing competences, know-how and technologies** for carrying out **R&D** and training activities with a **high innovative potential**.

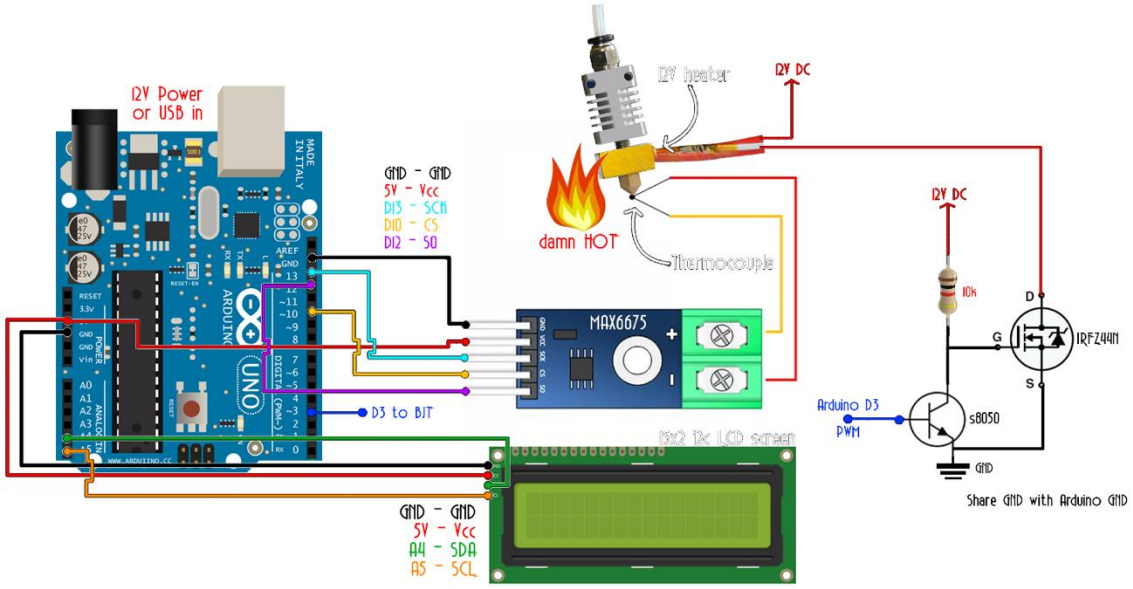
FABLAB PESARO
POWERED BY COSMOB

# Activities within the WP3

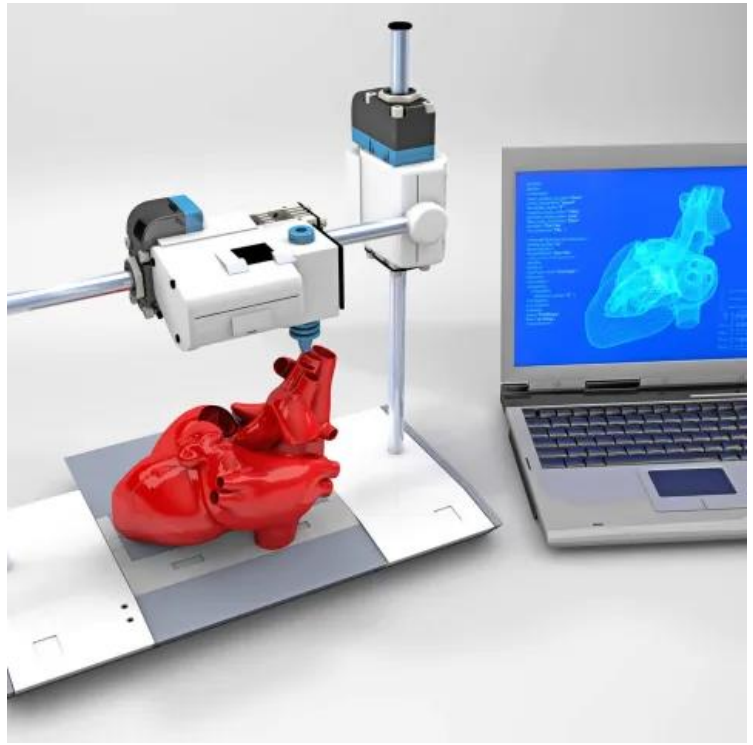

1. DEVELOPMENT OF A CLIMATIC CHAMBER
2. 3D PRINTING OF BIOMEDICAL COMPONENTS
3. REALIZATION OF A PASSIVE DRY BOX

# Development of an Advanced Climatic Chamber

- **Development of an Advanced Climatic Chamber** FOR 3D printing in a controlled environment.
- **High user-adjustable parameters** thanks to the usage of open hardware electronics (Arduino) and open-source programming languages.
- **Customization of code based on PID** (Proportional Integral Derivative Controller) **algorithm** , for its adoption for specific purposes.
- Guarantee the possibility of **integrating additional functions** to the Climatic Chamber (eg.: sterilization of the printing environment).



# 3D printing of biomedical components



- **Research on strategies and materials for the 3D printing of biomedical components**: Fraz cells, dissolvers and microfluidic chips;

- 3D printing with biomedical resins guarantees:

| | |
|---|---|
| **Transparency** | **Customization** |
| **Biocompatibility** | **Affordability** |
| **Precision** | **Strength** |

| | **COST** | **TIME** |
|---|---|---|
| **Market** | $73,75 | 2 months |
| **3D printing** | $8,55 | 4 hours |

# 3D printing of biomedical components

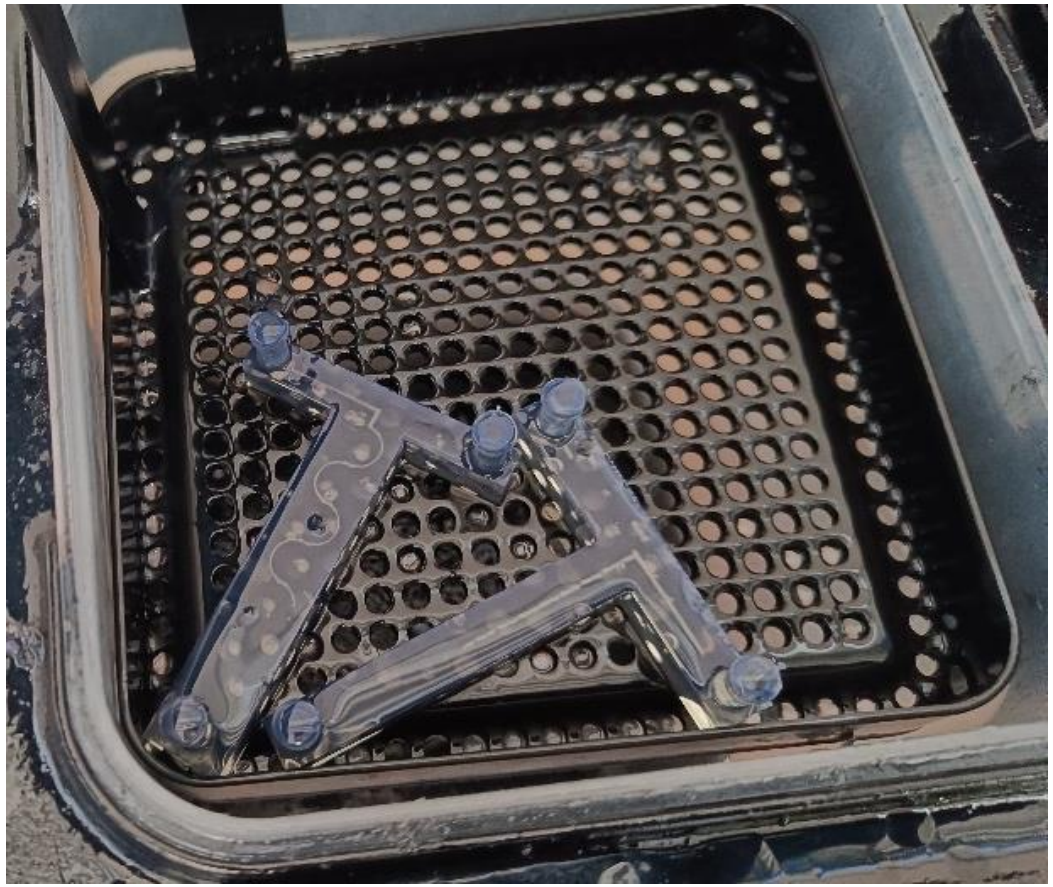
- Printer: **FORM 3+ SLA 3D** present in the FABLAB COSMOB;

- Analysis on suitable resins:

| Resins | Characteristics | Usage |
|---|---|---|
| BioMed Clear Resin | Biocompatible; resistant to consumption; low water absorption index during usage; sterilizable; transparent | Microfluidic chips |
| Though 2000 Resin | Suitable for printing strong, stiff and sturdy parts; high mechanical resistance; solvent compatibility; coloured in grey. | Dissolving units |

# 3D printing of biomedical components

- Print test of **microfluidic chip with Clear Resin**
- Clear Resin has been used for the test because it is cheaper than BioMed Clear
- Next task: validation of result through the verification of the channel's usability.

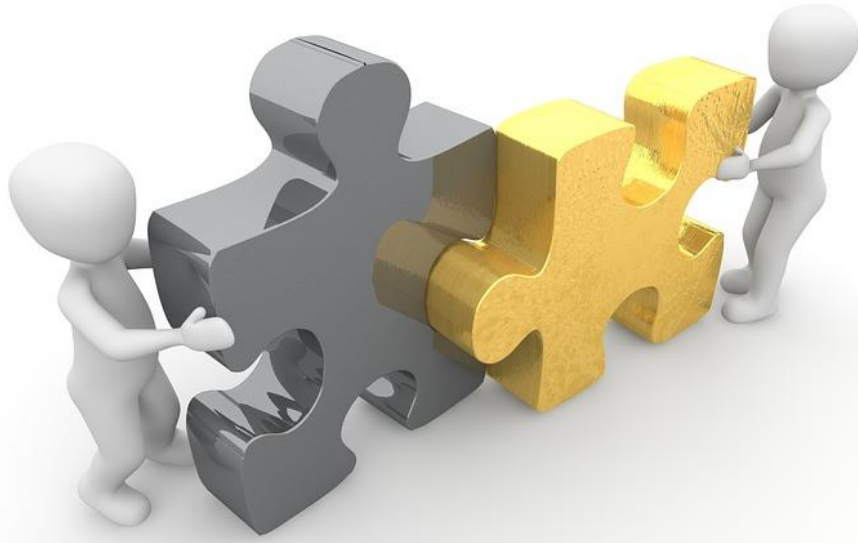


# Realization of a passive Dry Box for filaments

- **Filaments for 3D printing are hygroscopic**, they absorb moisture from the air, endangering the printing process and the result itself.
- Different materials have different hygroscoic properties.
- Need of realizing a passive Dry Box, realizing a hermetic environment in which filaments can be stored reducing the risk of moisture absorption, also using silica gel.

# Future opportunities

- **Sharing know-how, competences and technologies with biomedical and pharmaceutical sectors** for promoting and enhancing the **technological transfer**.
- **Enlarging Cosmob's competences in new sectors** such as pharmaceutical and biomedical ones.
- Acquiring new skills useful for health promotion in indoor living and working environments (measurement and reduction of VOC emissions).
- **Sharing technologies for quick prototyping and 3D printing of the COSMOB's FabLab**, as well as Lab machineries for fostering the realization of R&D activities with high innovative potential.



# Thank you!

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