



RESET Final Conference



# Covitec4Life

June 2020- February 2021

January 19, 2020

Augusta Silva



# Covitec4Life | Consortium

T I N T E X NATURALLY  
ADVANCED

'Best in class' manufacturer of quality jersey  
fabrics including water based coating process



Leading in innovative coating and  
lamination hotmelt processes



Expertise in technical  
clothing



COVID hospital





citeve

# Covitec4Life | Context



In the COVID-19 pandemic the hospitals are stretched beyond capacity.

The **World Health Organization** recognizes a general **lack in Medical Devices (MD)** and **Personal Protection Equipment (PPE)** fundamentals to protect the frontline healthcare professionals to minimize the spread of the virus.

**Europe is not specialized** in the production of **raw materials** or in the **current DM/ PPE (nonwoven)**, and there is no culture and knowledge of their production process.

Nowadays mostly **DM/ PPE are disposable**, representing a serious **environmental impact** in view of their high consumption.

Comfort, ergonomics, breathability are a big issue for the current disposable equipments.



**Develop** and **reinvent** urgently in Europe alternatives to current disposable DM/PPEs, avoiding almost exclusive dependence on Asian countries.

Develop new DM/PPEs **reusable**, **resistant** to **industrial washing** at **75°C** with **high pH** **around 11-12** and industrial drying.

Improving the breathability, sustainability, ergonomics aspects, in a way to increase the **mobility** and **comfort** of healthcare professionals, essential conditions for the good performance of their activities.

The knowledge the DM and PPE textile based will also be an **economic** and **strategic leverage** to a **traditional sector** in Portugal and Europe as textiles and clothing.

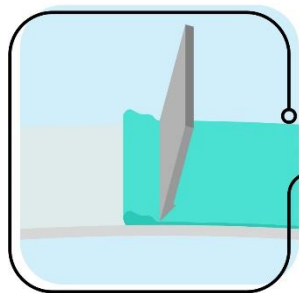
Textile - based DM and PPE reusable and washable

Develop an innovative line of textile-based **DM/ PPEs**, reusable and washable, for the protection of healthcare professionals exposed to infectious agents, allowing at **least 20 uses**, keeping their properties unchanged.

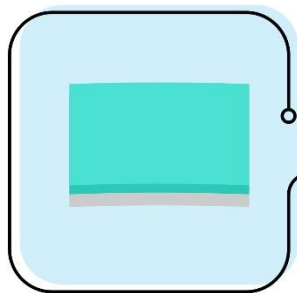
Approach two R&D technologies, regarding the waterproofness of textile in the context of protection against liquid and infective agents, outstanding by improved comfort, sustainability and lower environmental impact.

# Concept and R&D methodology

R&D of additives, formulations and water-based polymeric (foam) textile coating



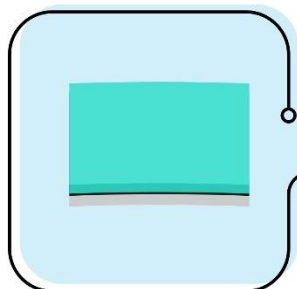
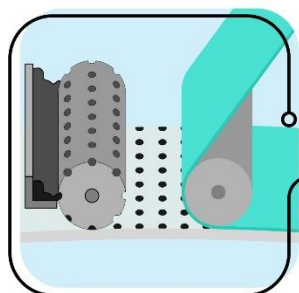
Textile coated



DM/ PPE must keep their properties unchanged during their life cycle

According to standard EN 13795-1: 2019 and EN 13795-2: 2019 under the scope of Directive 93/42 / EEC Medical Devices, EN 14605: 2005 + A1 and EN 14126: 2016

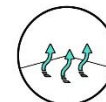
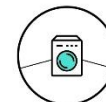
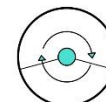
Textile laminated



Regarding the penetration resistance by contaminated liquids under pressure, mechanical resistance and bacteria penetration resistance.



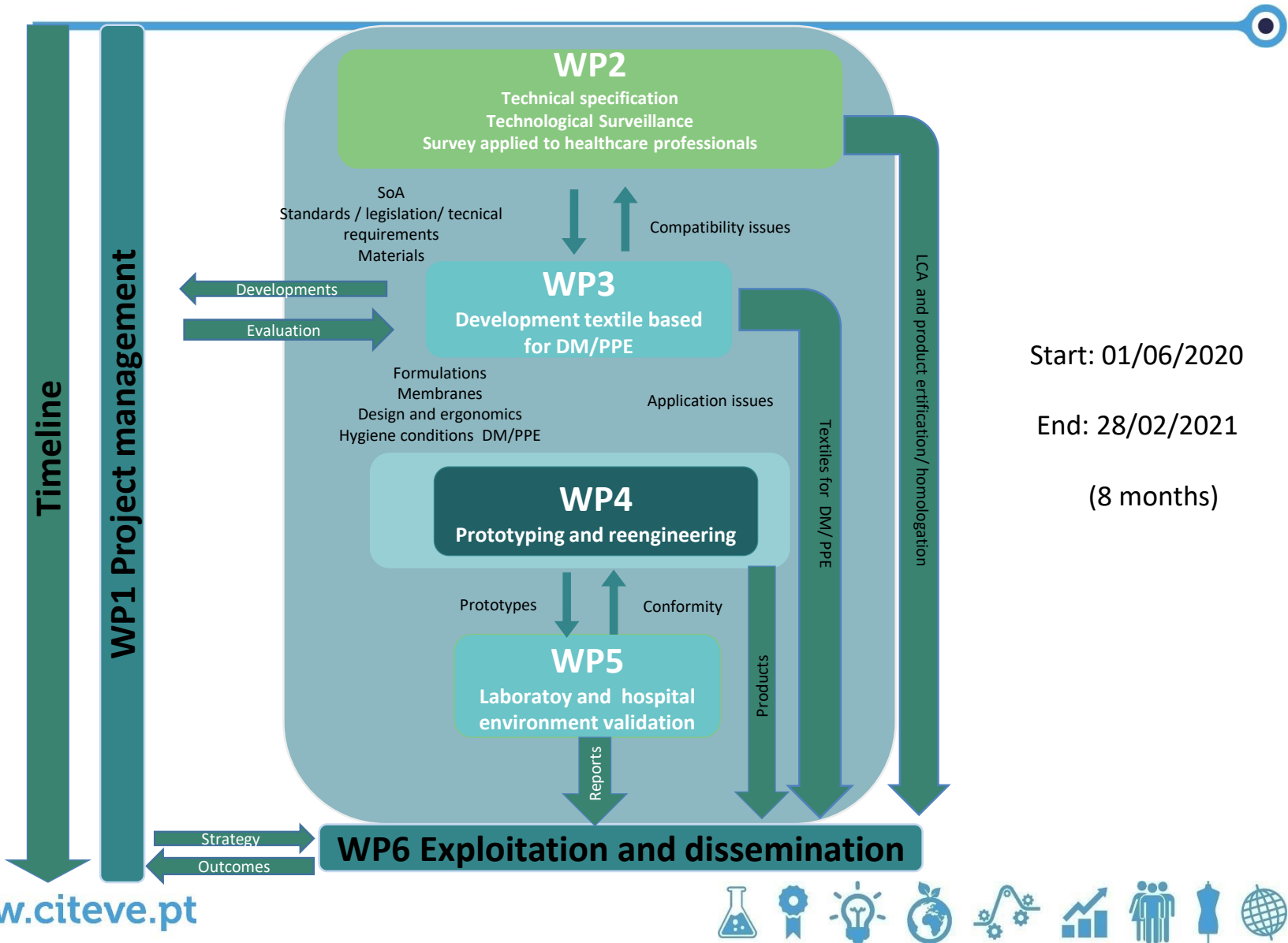
Textile based DM\PPE reusable



Product Life Cycle Assessment (LCA)

R&D of waterproof and breathable membranes by hotmelt coating and lamination process







# Covitec4Life | Characteristics and Requirements

EN 13795-1 Surgical gowns	EN 13795-2 Clean air suits	Parameters	Standards	Units	Requirements 13795-1	Requirements EN 13795-2
<b>X</b>	<b>X</b>	Microbial penetration - Dry	EN ISO 22612:2015	CFU	Standard ≤ 300a High ≤ 300a	Standard ≤ 100a High ≤ 50a
<b>X</b>		Microbial penetration - Wet	EN ISO 22610:2006	IB	Standard ≥ 2.8b High 6,0bc	
<b>X</b>		Liquid penetration	ISO 811:2018	cmH2O	Standard ≥ 20	
<b>X</b>	<b>X</b>	Cleanliness microbial/ Bioburden	ISO 11737-1:2018	CFU/100c m2	≤ 300)	≤ 100
<b>X</b>	<b>X</b>	Particles release	ISO 9073-10	(log10 – lint count)	≤ 4,0	≤ 4,0
<b>X</b>	<b>X</b>	Bursting strength -Dry	ISO 13938-1	Kpa	≥ 40	≥ 40
<b>X</b>		Bursting strength-Wet	ISO 13938-1	Kpa	≥ 40	≥ 40
<b>X</b>	<b>X</b>	Tensile strength - Dry	EN 29073 - 3	N	≥ 20	≥ 20
<b>X</b>		Tensile strength - wet	EN 29073 - 3	N	≥ 20	

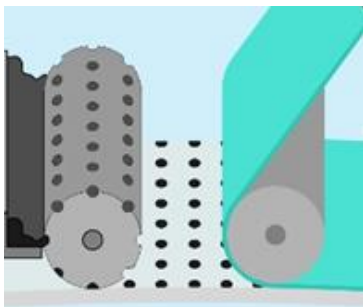
**Reusable DM/ PPEs performance validation** should be done **before and after Industrial washing and drying**:  
ISO 15797:2018: Washing cycle 2 (temperature 75 °C), in an industrial machine and drum drying.



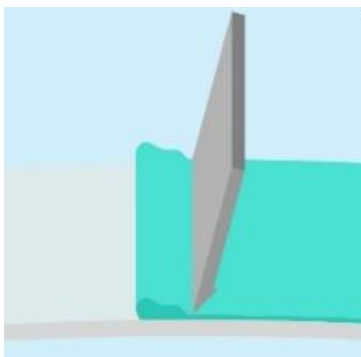
- 61 responses



- Screening and selection of breathable membranes for healthcare applications

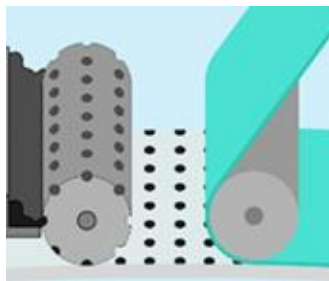


- Water-based coating formulations

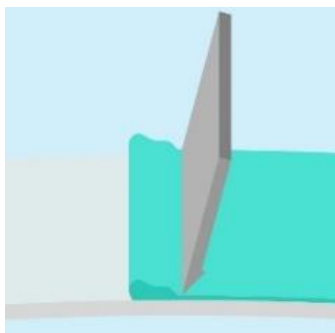


The most promising waterproof and breathable membranes and water based coatings are from PU.

- Screening, selection of textile materials for lamination with breathable membranes



- Screening, selection of textile materials for water-based coating by knife coating

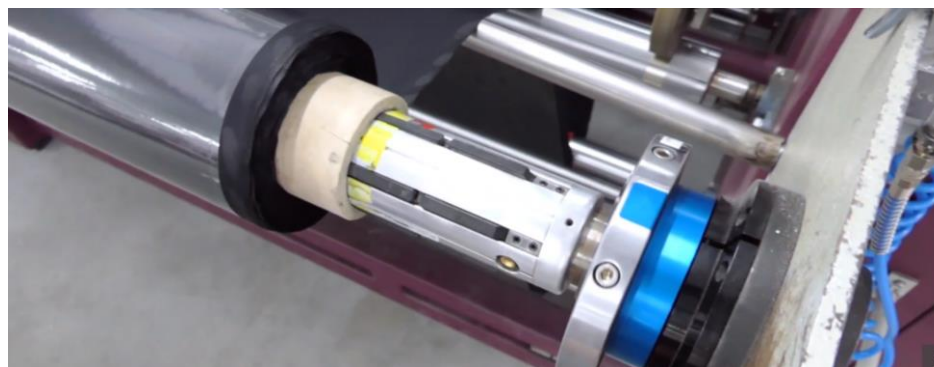
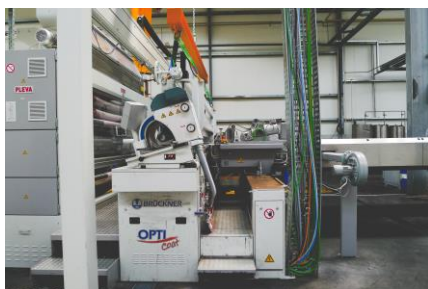


## Type of Application

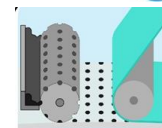
Water based  
coating textiles

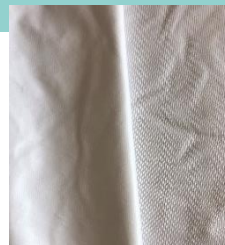

Coating and  
lamination  
hotmelt  
technologies

## Production Technologies



- The firsts most promising developmets with breathable membranes



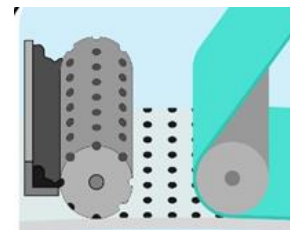
New material	Performance according to standard EN 13795-1 after 20 industrial washing/ drying cycles	Breathability	Laminated materials
knitted fabric 100% Lyocell laminated with PU membrane.	Good	Low	 
knitted fabric 100% PES, laminated with PU membrane.	Good	Low	

The new developed meet the requirements of the standard 13795-1, at least after **20 industrial washing / drying cycles**, although present **low breathability** around 600gr/mq x 24h ( ASTM E96 BW).



# Covitec4Life | Ongoing tests

- The most promissing ongoing improvements to achieve better breathability and performance for laminated materials with membranes



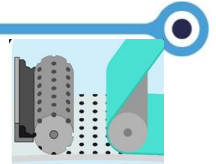
- Knitted fabric 100% Lyocell, laminated with **PU membrane**
- Knitted fabric 100% PES, laminated with **PU membrane**



Liquid penetration	ISO 811:2018	cmH2O	Standard $\geq 20$
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Already assessed  
after 20 industrial  
washing and drying  
cycles

Ongoing other laboratory tests to asses the performance according to standard EN 13795-1 after 20 industrial washing/ drying cycles.

- The firsts most promising developments with water based coatings

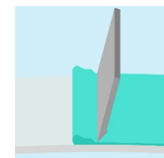


New material	Performance according to liquid penetration standard ISO 811:2018	Breathability	Coated materials
Knitted fabric, 100% PES, coated with polymeric stable foam formulation	<b>Good</b> after 10 industrial washing/ drying cycles	<b>Medium</b>	
Knitted fabric, 100% PES, 70 g/m <sup>2</sup> , coated with polymeric stable foam formulation	<b>Good</b> after 20 industrial washing/ drying cycles	<b>Medium</b>	
Knitted fabric, 100% PES, 70g g/m <sup>2</sup> , coated with polymeric stable foam formulation	<b>Good</b> after 20 industrial washing/ drying cycles	<b>Medium</b>	





- The most promissing ongoing improvements to achieve better performance of water based coatings



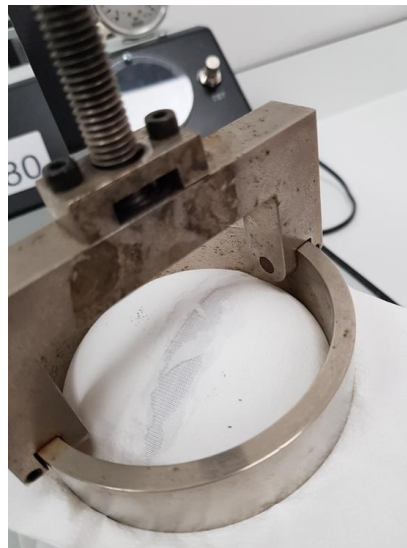
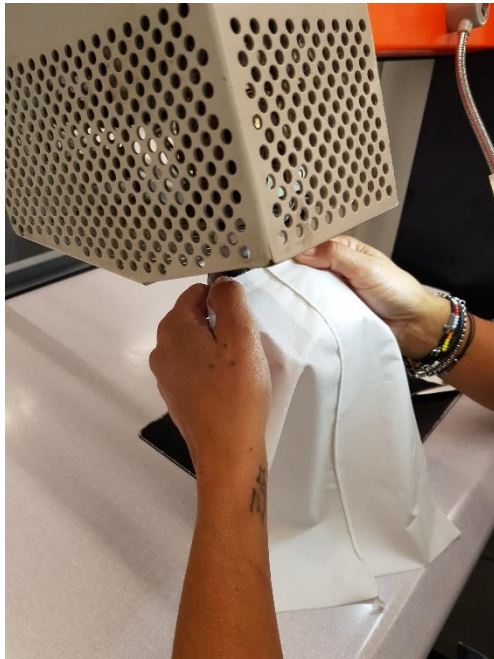
- Knitted fabric **100% PES**, coated with **polymeric stable foam** formulation.
- Knitted fabric **100% PES**, coated with **polymeric stable foam** formulation.

Liquid penetration	ISO 811:2018	cmH2O	Standard $\geq 20$
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Already assessed  
after 20 industrial  
washing and  
drying cycles

Ongoing other laboratory tests to asses the performance according to standard EN 13795-1 after 20 industrial washing/ drying cycles.

- **Waterproof seams tests performed in the most promising materials: study of best tapes**



Liquid penetration

ISO 811:2018

cmH2O

Standard  $\geq 20$

Seams liquid  
penetration already  
assessed after 20  
industrial washing  
and drying cycles

# Covitec4Life | Prototypes





Product Life Cycle Assessment (LCA) ongoing  
Comparison with disposables DM/PPEs and with the end of Life of incinerated DM/  
PPEs

- Social impact:
  - Helping the fight against Covid-19
- Economic impact:
  - European product. Provides an easier solution for other companies to adapt their production or enter a new area of activity
- Sustainable impact:
  - LCA assessment comparing with disposable DM/PPE or end of life of incinerated DM/ PPEs
- Marketing:
  - Strong dissemination of the project and the promoters in the media
- Portfolio:
  - New business area / New clients
- Sales:
  - Several DM/ PPEs sold in Portugal and other European countries



# Covitec4Life

Start Date 01/06/2020

(8 months)

Conclusion Date 28/02/2021

Total Eligible Cost € 336 364,49

Financial Suport FEDER € 269 091,59



Cofinanciado por:



UNIÃO EUROPEIA  
Fundo Europeu  
de Desenvolvimento Regional



# Thank You

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