

European Good Practices in Smart textiles and new ways of production

SeaB2 – Clothing System With Integrated Inflation

Gilda Santos | gsantos@citeve.pt

**CITEVE – Centro Tecnológico das Indústrias Têxtil
e do Vestuário de Portugal**

4th RESET Seminar on
“Smart textiles and new ways of production”
Chemnitz, 20th June 2017



Damel 7nnovation

CONTENT:



About CITEVE



Problem



Idea



Development



Results



Difficulties



Transferability



About CITEVE...





CITEVE's Technology Campus



| PORTUGAL

| BRASIL | TUNISIE | ARGENTINA | PAKISTAN | CHILE |
INDIA |







Main Activity Areas



Laboratorial Testing



Product & Process Certification



Technology & Engineering



Innovation & Entrepreneurship



Sustainable Production



Industry 4.0 & Shop of the Future



Training & Coaching

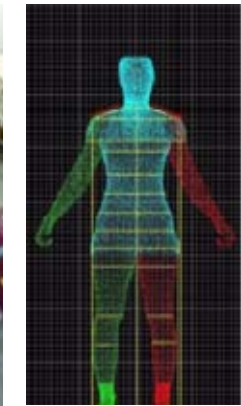
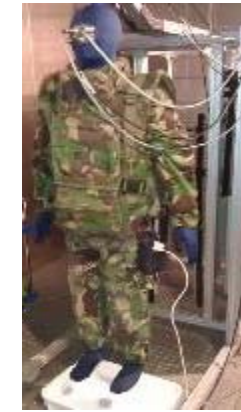


Standardisation

Design & Fashion Intelligence



International consultancy





Product & Process Engineering

R&D ▪ Consulting ▪ New Product Development ▪ Prototyping ▪ Scale up ▪ Sustainable Production ▪ Process Efficiency



Pilot Plants Facilities

Coating ▪ Laminating ▪ Dyeing & Finishing ▪ Digital Printing ▪ 2D e 3D Knitting ▪ Clothing Manufacturing



Testing Services

Quality control ▪ Product
Performance Assessment ▪ Lab
Management Consultancy



Lab Facilities

Physics and Comfort ▪ Chemical &
Human Ecology ▪ Electronic Microscopy
(SEM) ▪ Product Performance Evaluation
▪ Microbiology/Cytotoxicology



Damel **i**nnovation

Seab2

CLOTHING SYSTEM WITH INTEGRATED INFLATION



Damel 7nnovation

CONTENT:



About CITEVE



Problem



Idea



Development



Results



Difficulties



Transferability

Despite the strong legislation and regulation for ensuring the safety of life at sea, continue to occur accidents, which cause the death of people.



https://antidotezine.files.wordpress.com/2015/04/10933740_10152806652692215_4262599774782932170_n.jpg?w=918

According to Council Directive of 21 December 1989 considering the approximation of the Member States laws related to personal protective equipment - 89/686 / EEC, the lifesaving equipment must allow a prolonged use throughout the period of activity.

Lifejackets do not meet this basic requirement - being uncomfortable and restricting movements, thus not being continuously used.



http://www.bartsbash.com/sites/default/files/styles/368x488_scale_crop/public/post-image/Bart%27s%20Bash%20Raising%20Funds%20for%20Disabled%20Sailing-1.jpg?itok=HxFjXTVL

Smart protective garment with an inflation device completely unnoticeable and automatically inflated when it hits the water, combining functionality with an appealing, comfortable and practical design for continuous use.

INFLATION SYSTEM

- Manual
- Automatic
- Oral
- Easy Maintenance



Reflective tape
Whistle
Emergency light
Oral inflation tube

CO2 Cylinder
Automatic/manual
inflation system

As a part of regular clothing (jacket, overalls or vest) allows the user to swim and access the nearest vessel or platform, preventing deaths due to the negligence in the use of uncomfortable and restrictive life jackets existent in the market.

☐ Resources needed:

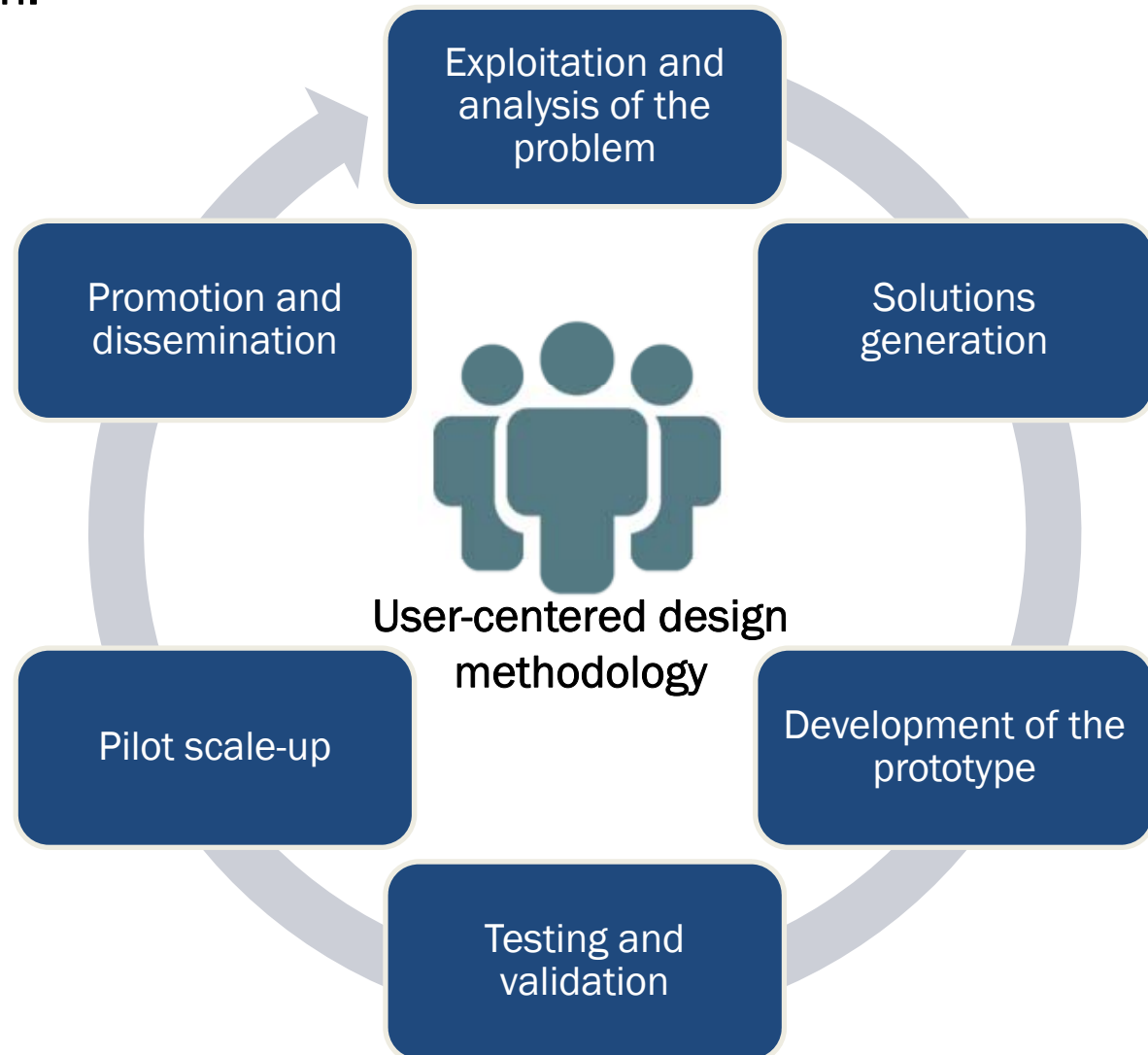


☐ Timescale:

Start: November 2009

End: April 2013

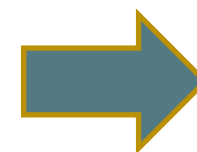
❑ Methodology / Work Plan:



❑ New ways of production:



❑ RDI Certification:



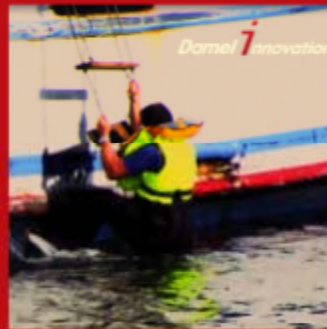
❑ RDI Certification:



Follows a PDCA - Plan-Execute-Check-Act approach, oriented to the continuous improvement.

This standard was aligned with NP EN ISO 9001: 2000 "Quality management systems - Requirements (ISO 9001: 2000)" and with NP EN ISO 14001: 2004 "Environmental management systems - Requirements and guidelines for use (ISO 14001: 2004), as well as with other management system standards, by adopting the concept of compatibility developed jointly by ISO / TC 176 Technical Committees "Quality Management and Quality Assurance" and ISO / TC 207 "Environmental Management".

- ❑ 3 products with integrated inflation:



Sailing
Nautical Sports
Leisure Activities
Professional Activities
Fishing

Vest with integrated inflation



Innovative Design
Freedom of movements
Ergonomics
Lightness
Functionality
Impermeability
Breathability
Security
Protection



Product developed and
tested in accordance to
EN ISO 12402

Jacket with integrated inflation



Innovative Design
Freedom of movements
Ergonomics
Lightness
Functionality
Impermeability
Breathability
Security
Protection



Product developed and
tested in accordance to
EN ISO 12402

Overalls with integrated inflation

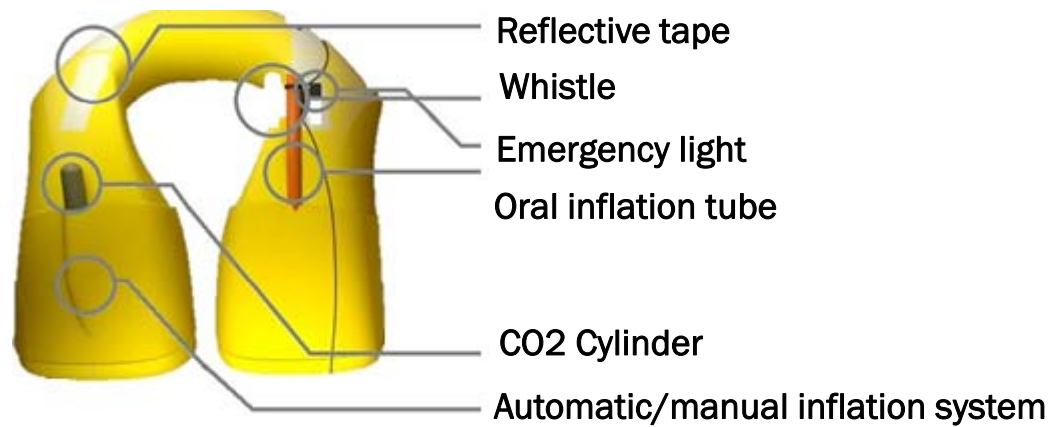


Innovative Design
Freedom of movements
Ergonomics
Lightness
Functionality
Impermeability
Breathability
Security
Protection



Product developed and
tested in accordance to
EN ISO 12402

INFLATION SYSTEM



INFLATION SYSTEM

- Manual
- Automatic
- Oral
- Easy Maintenance



<http://www.damel.pt/en/noticias/video-promocional-damel-26092013/>

- ✓ **SeaB2 promises to revolutionize the security in maritime activities** - is used as a part of regular clothing (jacket, overalls or vest) being completely unnoticeable, combining functionality with an appealing, comfortable and practical design;
- ✓ **Its activated automatically as soon as it hits the water and allows the user to swim crawl** accessing the nearest vessel/platform;
- ✓ **Can be used for sailing, fishing & other water sports, by oil and naval station workers, navy and even in the assembly of off-shore wind towers;**

- ✓ Its innovation led Damel to submit patent applications in UAE, USA and EU;
- ✓ Awards: INOVAtêxtil 2014; ISPO 2015.
- ✓ DAMEL's Research, Development and Innovation activities were formalized through the implementation and certification of a Research, Development and Innovation Management System (RDI) under the standard NP 4457: 2007.



- ❑ Existing European standards for inflation devices (EN 12402) as well as other maritime legislation are not yet suitable for innovative smart textile products.
- ❑ Taking into account this and being aware the development of an innovative Clothing System With Integrated Inflation is complex by nature, reengineering cycle and evaluation processes (laboratory and simulated conditions) are of major importance.

- ❑ **SeaB2** (Clothing system with integrated inflation) is a smart protective garment system with an inflation device **firstly developed within three main applications**: jacket for sailing, overalls for fishing and vest for nautical sports and recreational activities.
- ❑ At **product level**, it has raised the leverage effect to the **development of a wide range of other smart PPE garments**: jacket for the Navy, overall for surfing in extreme conditions with active heating elements, overall for solo sailors, jacket for workers in oil platforms, among others.
- ❑ Regarding the suitable **User-centered design methodology** used and the **interactive, articulate and dynamic work plan** envisaged, key success factors for the good results achieved, both are transferable also to other products, regions and countries.
- ❑ The GP concerning **intellectual property registration** and the **formalization of Research, Development and Innovation (RDI) activities** have also feasibility and transferability conditions.

SeaB2



Mateus Rosé Sailing Cup



Regatta OSTAR 2017: Taylor325, Solo sailor Ricardo Diniz



SeaB2 for surf in extreme conditions tested by Sebastian Steudtner.



European Union
European Regional
Development Fund

Thank you!



Gilda Santos | gsantos@citeve.pt



Project smedia