



# OUR EVERYDAY MISSION: NON STOP INNOVATION.

• WE EMPLOY  
**STATE-OF-THE-ART TECHNOLOGY**  
TO ACHIEVE THE HIGHEST  
MANUFACTURING STANDARDS

• **THE SUPERIOR QUALITY**  
OF FAMECCANICA  
IS IN EVERY COMPONENT  
OF OUR PRODUCTS

• WE ARE RESPONSIVE  
TO MARKET DEMAND  
AND FULLY  
**DEDICATED TO OUR JOB**

• **TECHNOLOGY INSIDE**  
THAT'S WHY WE DELIVER  
BENCHMARK **SOLUTIONS**  
TO OUR MARKET

## FAMECCANICA GROUP AT A GLANCE

1

**FOUNDED IN 1975**, Fameccanica is recognized as a benchmark manufacturer of machinery for disposable hygienic absorbent products

2

**MORE THAN 1100 MANUFACTURING** lines delivered since 1975

3

**CONSTANT FOCUS ON INNOVATION:** technology, manufacturing processes and finished product design

4

**SERVING TODAY OVER 75 MULTINATIONAL**, Regional and Local Companies

5

**GLOBAL PRESENCE** with 4 plants located in **ITALY, CHINA, BRASIL** and **U.S.A.**

6

Over **900** employees worldwide



# LIFE+ GLUELESS™ PROJECT

AS NATURAL AS WE CAN



Co-funded by EU's financial instrument supporting environmental, nature conservation and climate action projects

MANCHESTER  
1824

CCaLC Carbon  
Footprinting Tool  
Results validated by the  
University of Manchester



CONFINDUSTRIA  
CHIETI PESCARA



## FINANZIARE L'INNOVAZIONE: L'ESPERIENZA FAMECCANICA

28 novembre 2016

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Il programma EU Life, i numeri in gioco e l'approccio adottato da fameccanica per la decisione di partecipare al programma



Francesco D'Aponte, Director of Design and R&D

2

Il Progetto Fameccanica Life+ Glueless e le 5 features identificate: obiettivi e risultati del progetto

Alessandro D'Andrea, Marketing & Innovation Manager

3

L'assessment LCA dell'università di Manchester per valutare l'impatto ambientale delle soluzioni: l'approccio, gli strumenti e una sintesi dei risultati

Diego Gualtieri, R&D Project Manager

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# What is EU's LIFE programme?

"LIFE is the **EU's financial instrument supporting** environmental, nature conservation and climate action **projects** throughout the EU. The general objective of LIFE is to contribute to the implementation, updating and development of EU environmental policy and legislation by co-financing pilot or demonstration projects with European added value."



LIFE began in 1992 and to date there have been four complete phases of the program:

- LIFE I: 1992-1995
- LIFE II: 1996-1999,
- LIFE III: 2000-2006
- **LIFE+: 2007-2013**

During this period, LIFE has co-financed some 3954 projects across the EU, contributing approximately €3.1 billion for the protection of the environment.

EU already started phase LIFE 2014-2020



ENVIRONMENT  
LIFE Programme



# Fameccanica and LIFE+

On July 1st, 2013 **Fameccanica** was granted financial support to project proposal N° LIFE12 ENV/IT/000423 concerning the development of means for cost savings in diaper production processes.

The project **LIFE Glueless "Petrol based Glue and Energy consumption reduction in diapers production processes"**, aims to demonstrate to industry and policy makers that **significant environmental impact reduction** in Absorbent Hygiene Products (AHP), such as diapers, can be realized, with appropriate solutions that will be the subject of this project.

The project will showcase how environmental impact can be reduced, while **cost competitiveness can be held or even increased**.

The project has started on July 1st, 2013 and will continue until Dec. 31st, 2016.

Partners: FATER and University of Manchester



# When is it appropriate to look for EU co-funding?

## Our experience:

The opportunity of a co-funding from the EU should be done only if the project is part of the company strategy, not the opposite.

## The questions are:

- Is the project part of our Strategy?
- Is the Company willing to do the project even in absence of co-financing?

IF THERE ARE SUCH CONDITIONS EU OFFERS MANY OPPORTUNITIES.

# How difficult is to manage projects involving EU?

## Our experience:

EU requires a lot of attention to the progress of each step of the project.

All the steps are monitored periodically in detail.

There is a significant amount of documents to prepare.

EU requires that the progresses are divulged to the public.

## Consequent Benefit:

The systematic control of the EU keeps the team focused on project results.



# Partnerships

- ✓ Project can **not** be done as **single companies**.
- ✓ **Partnerships** with other companies and **universities/research centers** are normally required.
- ✓ **EU requires** all partners **not** to have the **same nationality**. Our project included University of Manchester.
- ✓ There are professional **companies** that **help** in the **selection** of universities and research centers for EU projects.
- ✓ The selection of the **Partner** must be **strategic** for the **achievement** of the project results.

# Dissemination to the public: Example: The Fameccanica Life+ website

Since November 2013, the Fameccanica Life+ website has been published on line.

<http://www.fameccanica.com/en/life-project>

The website has the aim to disclose a selection of key information to the audience and demonstrate the process steps already achieved

The website includes the key achievements and periodical newsletters since the start of the project.



# Dissemination to the public:

## Example: Conferences and Exhibitions

The Glueless Project has been presented:

- ❑ At Index Exhibition in Geneva in 2014
- ❑ At Cidpex conference exhibition in China in 2014
- ❑ At Outlook Edana 2014 Conference in Barcelona, Spain
- ❑ At IDEA Exhibition in Boston in 2016
- ❑ At INDA Hygienix 2016 Conference in Orlando, Florida

and of, course...

- ❑ Today at Confindustria Chieti-Pescara



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# The purpose of Fameccanica Life+ GLUELESS project

## Purposes:

- Definition of **5 sub-processes**: technical assessment of thermal welding and ultrasonic technologies as replacement of current gluing processes
- Verification of **the weldability** of raw materials
- Design of the Test Equipment and **validation of the prototypes** in the R&D laboratories
- Manufacture of **samples** for each of the 5 sub-processes

## During the project:

- Introduction of **innovative concepts** to achieve the result

## In addition

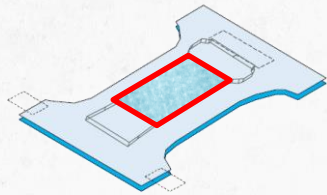
- Other opportunities have been also investigated on top of the 5 sub-processes identified and funded on separate internal projects.

**2 additional sub-processes** have been identified and developed

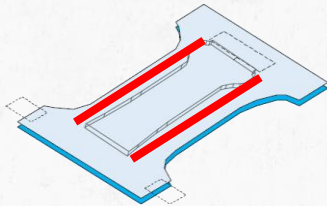


# The 5 areas identified as part of the project

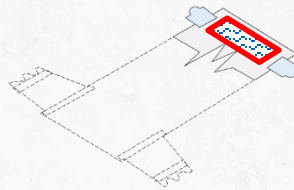
Glueless™ ADL



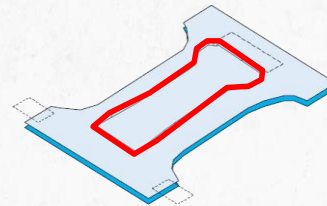
Glueless™  
Intermittent elastics



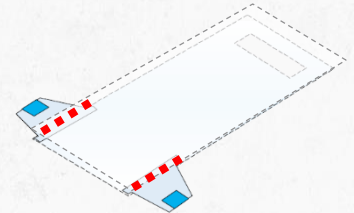
Glueless™ Frontal Tape  
construction



Glueless™ Core



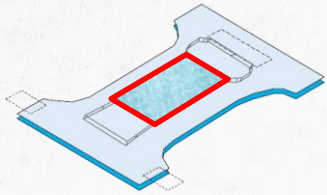
Glueless™ Back Ear  
application





# The 5 areas identified as part of the project

## Glueless™ ADL



Glueless™ ADL  
Intermittent elastics



Glueless™ Frontal Tape  
construction



Glueless™ Core

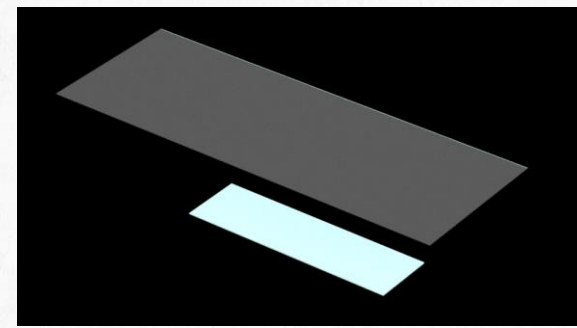
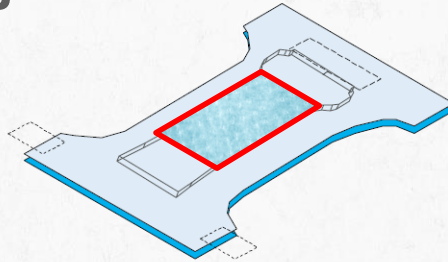


Glueless™ Back Ear  
application





# GLUELESS™ application of ADL: opportunities



GLUELESS™ application of ADL is identified as an opportunity for the project, not only for its potential **less environmental impact**, but also as:

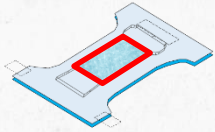
1. It shows a potential glue **saving** in the range of 9÷15 tons/yeas and a cost saving in the range of 30.000÷60.000 € per year for each baby diaper machine.
2. It gives an opportunity to **improve** performances in terms of fluid handling/acquisition and provide better product appearance (dotted topsheet)
3. Less or zero glue is an opportunity for less machine contamination → **process improvement** especially in case of low basis weight materials





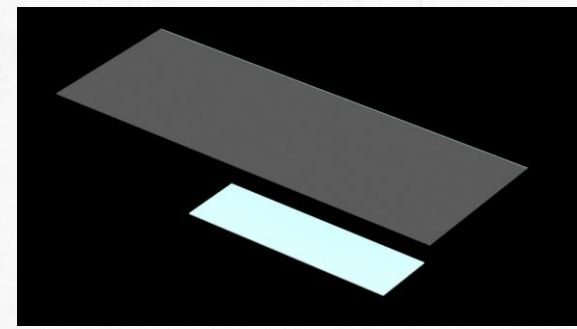
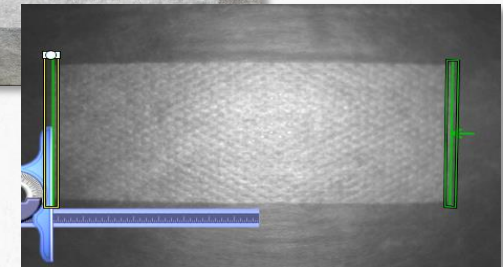
# GLUELESS™ application of ADL

ADL to be welded on NW Topsheet with Ultrasonic System using properly designed pattern



## Key activities:

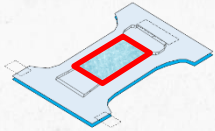
- Design of the Test Stand
- Laboratory validation of the prototype with several different raw materials and different patterns
- Check process stability with Vision System up to 450 m/min or 1000ppm with 100% of flawless products
- Analysis of weldability of a selection of raw materials (NW Topsheet e ADL) and test of different type of patterns (different design)
- Analysis of the Fluid Handling performances





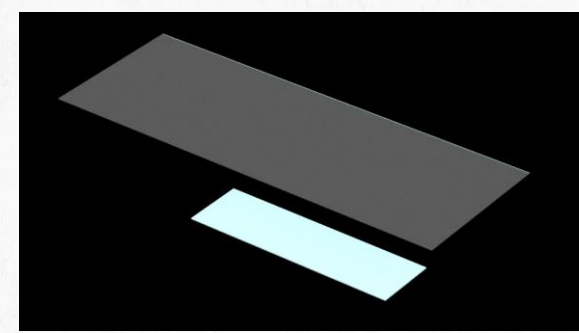
# GLUELESS™ application of ADL

ADL to be welded on NW Topsheet with Ultrasonic System using properly designed pattern

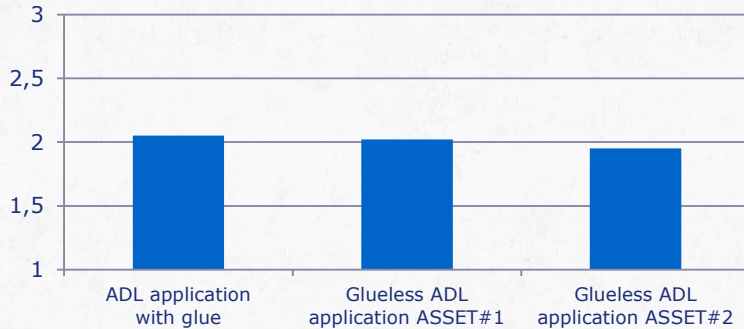


## Key results:

The comparative tests (\*) of product performance vs. traditional technologies show that the GLUELESS™ solution offers **equivalent or even improved results in terms of Acquisition Time and Wetback of the final diaper element assembly.**

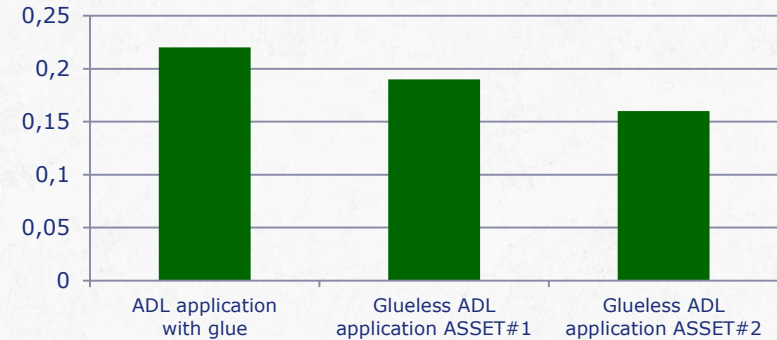


Acquisition Time (sec)



Same behaviour in acquisition time test

Wetback (g)



Slightly improved behaviour in wetback test

(\*) Methodics defined with partner Fater

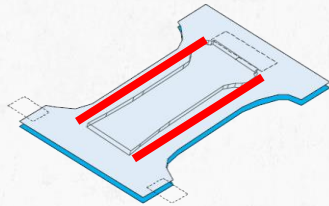


# The 5 areas identified as part of the project

Glueless™ ADL



**Glueless™  
Intermittent elastics**



Glueless™ Frontal Tape construction



Glueless™ Core

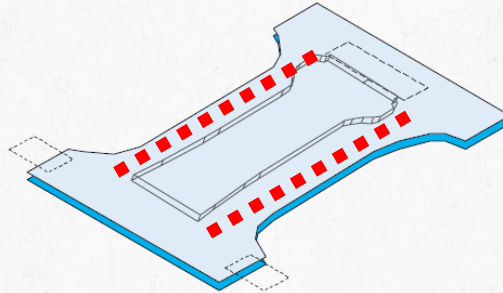


Glueless™ Back Ear application





# GLUELESS™ application of elastics: opportunities



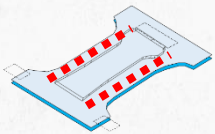
GLUELESS™ application of elastics is identified as an opportunity for the project, not only for its potential **less environmental impact**, but also as:

1. It shows a potential cost **saving** in the range of 150.000÷200.000 € per year for each baby diaper machine.



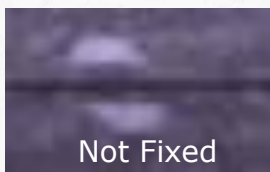
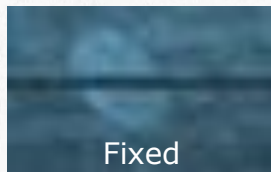
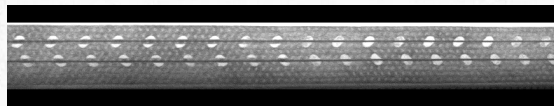
# GLUELESS™ elastic entrapment

## Cuffs Elastics mechanically fixed between two layers of NW in intermittent mode



### Key activities:

- Definition of a solution on the basis of a patent owned by Cera Engineering France, to realize the intermittent application in a way to achieve process stability at higher speed than the state-of-the-art
- Optimization of the elastics entrapment process
- Design of the kit and validation of the prototype in the laboratory



(11) EP 3 056 176 A1

### (12) EUROPEAN PATENT APPLICATION

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 Designated Extension States:  
 BA ME  
 Designated Validation States:  
 MA MD

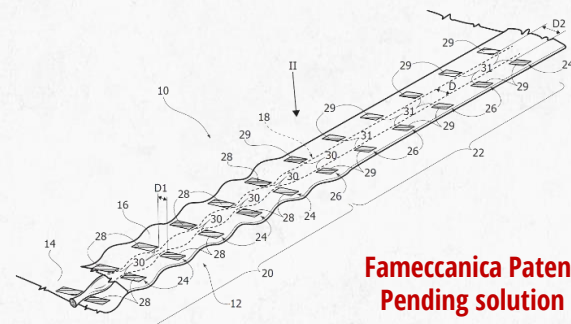
(30) Priority: 11.02.2015 IT UB20150478

(71) Applicant: Fameccanica.Data S.p.A.  
65129 Pescara (IT)

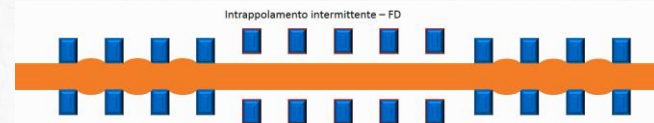
(51) Int. Cl.:  
 A61F 13/49 (2006.01) A41D 27/24 (2006.01)  
 A41F 9/02 (2006.01) A61F 13/15 (2006.01)  
 B29C 65/08 (2006.01) B29C 65/18 (2006.01)  
 B29C 65/00 (2006.01) B29L 31/48 (2006.01)

(72) Inventors:  
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(74) Representative: Marchitelli, Mauro  
 Buzzi, Notaro & Antonielli d'Ouix Srl  
 Via Maria Vittoria 18  
 10123 Torino (IT)



**Fameccanica Patent Pending solution**



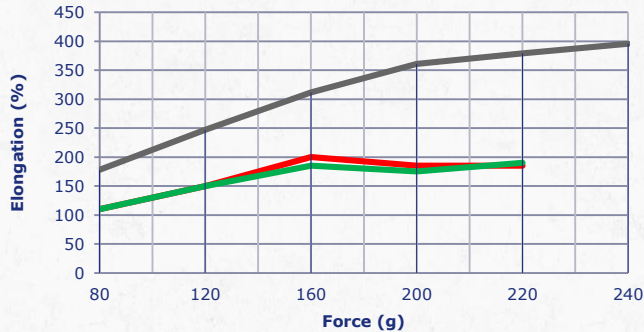
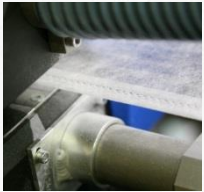


# GLUELESS™ elastic entrapment

## Cuffs Elastics mechanically fixed between two layers of NW in intermittent mode

### Key results:

- The comparative tests (\*) of product performance vs. traditional technologies show that the GLUELESS™ solution offers **equivalent results in terms of tension-elongation** of the standard application with glue.
- Confirmed strength of the welding
- Process stability up to 450 m/min or 1000ppm



- 800 dtex. Elongation of individual elastic threads NOT bonded with nonwoven (%)
- 800 dtex. Actual elongation with glueless application (%)
- 800 dtex. Actual elongation with in case of application WITH glue (%)



*Details of process and samples with GLUELESS™ elastic application*

*(\*) Methodics defined with partner Fater*





# The 5 areas identified as part of the project

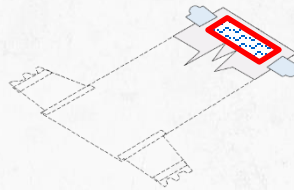
Glueless™ ADL



Glueless™ ADL  
Intermittent elastics



Glueless™ Frontal Tape  
construction



Glueless™ Core

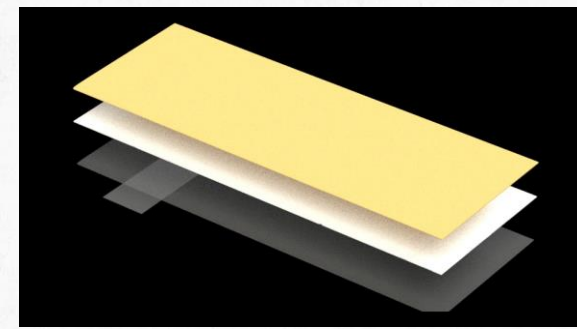
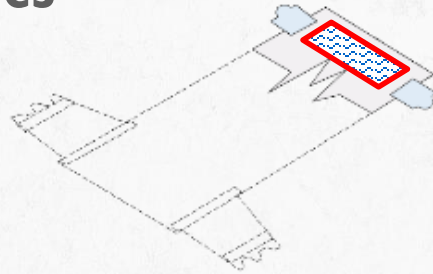


Glueless™ Back Ear  
application





# GLUELESS™ frontal tape application: opportunities



GLUELESS™ application of Frontal Tape is identified as an opportunity for the project, not only for its potential **less environmental impact**, but also as:

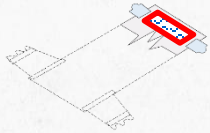
1. It shows a potential cost **saving** in the range of 200.000÷250.000 € per year for each baby diaper machine.
2. The solution identified by Fameccanica potentially creates product better appearance in terms of better visibility of backsheet printing





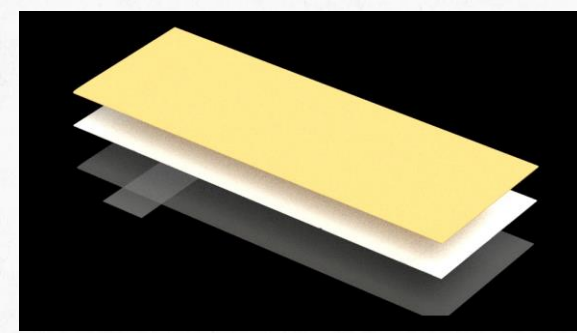
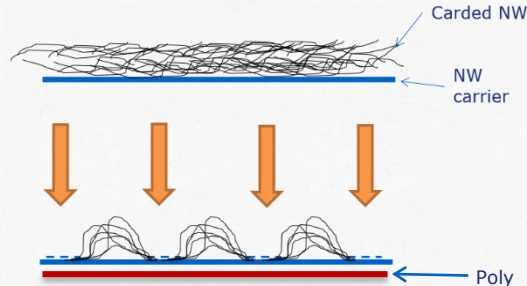
# GLUELESS™ frontal tape application

In line creation of a backsheet with “loop frontal tape”



## Key activities:

- Definition of a **new solution**, to achieve the result of creating the glueless sealing, without compromising backsheet functionality (impermeability)
- Analysis of the **weldability** of a family of raw materials (nonwoven backsheet and material for frontal tape) and test of different sealing **pattern** designs
- Design of **test** equipment
- **Validation** of the new solution in the laboratory with several different raw materials and 2 different patterns

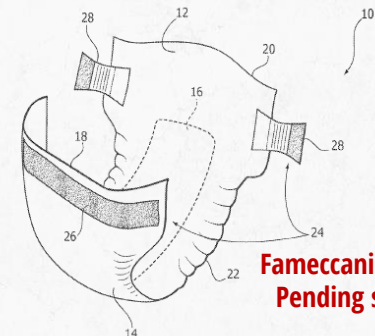


(19) **United States**  
 (12) **Patent Application Publication** (10) Pub. No.: US 2016/0128878 A1  
 BONELLI et al. (43) Pub. Date: May 12, 2016

(54) **METHOD FOR PRODUCING A BACKSHEET FOR ABSORBENT SANITARY ARTICLES AND AN ABSORBENT SANITARY ARTICLE INCLUDING THIS BACKSHEET** (57) **ABSTRACT**

(71) Applicant: Fameccanica>Data S.p.A., Pescara (IT)  
 (72) Inventors: Guido BONELLI, Pescara (IT), Diego GUALTIERI, Sulmona (L'Aquila) (IT)  
 (21) Appl. No.: 14/931,589  
 (22) Filed: Nov. 3, 2015  
 (38) Foreign Application Priority Data  
 Nov. 6, 2014 (IT) ..... TC2014/A-000918  
 Publication Classification  
 (51) Int. Cl. (2006.01)  
 B61F 1/862 (2006.01)  
 B61F 1/115 (2006.01)  
 B29C 65/48 (2006.01)  
 B61F 1/856 (2006.01)

A method for producing a backsheet for absorbent sanitary articles provided with hook-and-loop fasteners, comprising the steps of: advancing a continuous web of fibrous material without support at a first speed, cutting the continuous web of fibrous material in a transverse direction so as to form sections of fibrous material, accelerating the sections of fibrous material at a second speed greater than said first speed, welding said sections of fibrous material spaced apart at constant intervals onto a continuous non-woven support web advancing at said second speed, so as to convert said sections of fibrous material into frontal tapes of loop-material for hook-and-loop fasteners, and fixing a continuous impermeable film to said continuous non-woven support web with said frontal tapes of loop-material, so as to form a continuous backsheet web provided with frontal tapes of loop-material spaced apart at constant intervals.



**Fameccanica Patent Pending solution**





# GLUELESS™ frontal tape application

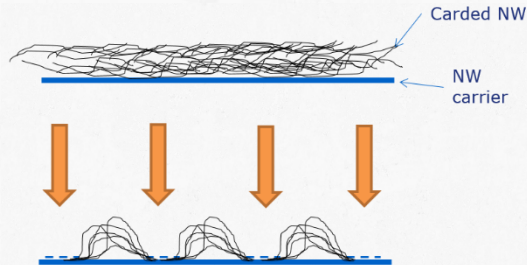
In line creation of a backsheet with “loop frontal tape”

## Detail about the new solution:

The innovation consists of the in-line creation of a complete assembly including:

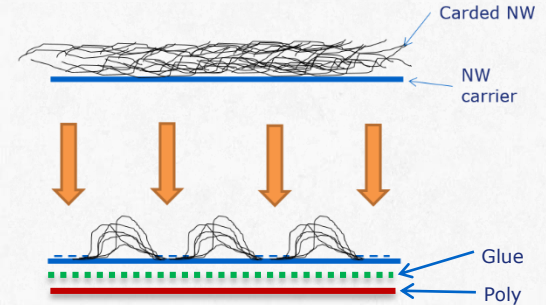
1. a “loop” material acting as frontal tape
2. a nonwoven carrier (nonwoven backsheet)
3. a poly backsheet

Materials are laminated in line in the following order:



**LOOP + NONWOVEN CARRIER are combined together with a mechanical or ultrasonic sealing with a proper pattern**

**Then:**



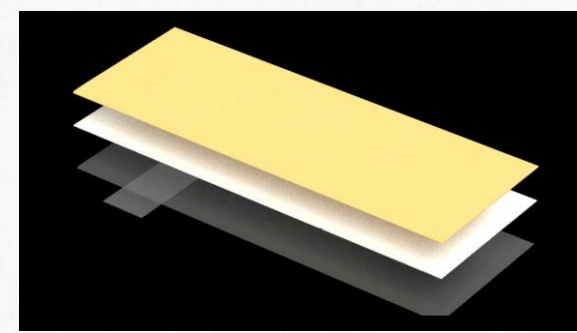
**This is laminated with POLY BACKSHEET using standard gluing technology**





# GLUELESS™ frontal tape application

In line creation of a backsheet with “loop frontal tape”



## Key results:

- Internal validation of the product design concept
- Process stability up to 450 m/min or 1000ppm
- Realization of samples
- Confirmed strength of the welding (peel test)
- Confirmed strength when combined with the fastening tape



Commercial benchmark



Glueless Landing Zone





# The 5 areas identified as part of the project

Glueless™ ADL



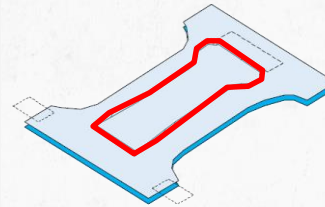
Glueless™ ADL  
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construction



Glueless™ Core

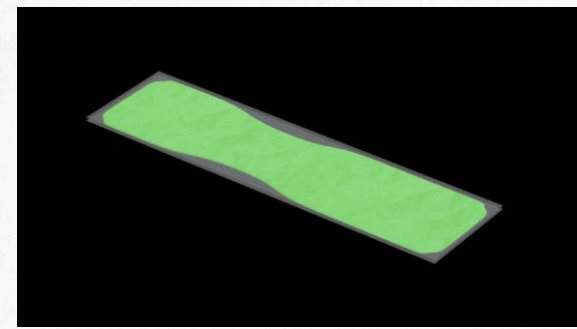
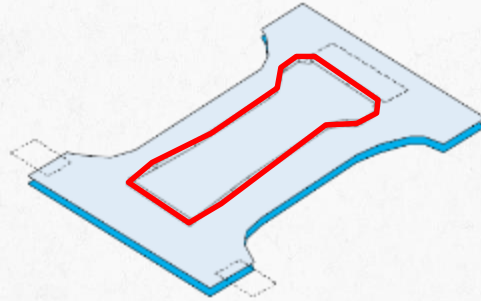


Glueless™ Back Ear  
application





# GLUELESS™ absorbent core: opportunities

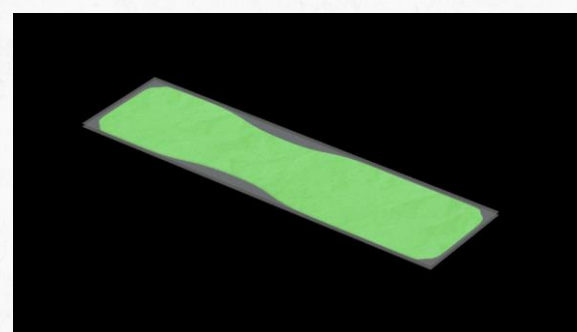
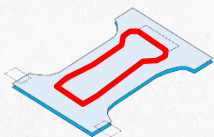


GLUELESS™ absorbent core shows a potential cost **saving** in the range of 200.000÷300.000 € per year for each baby diaper machine.



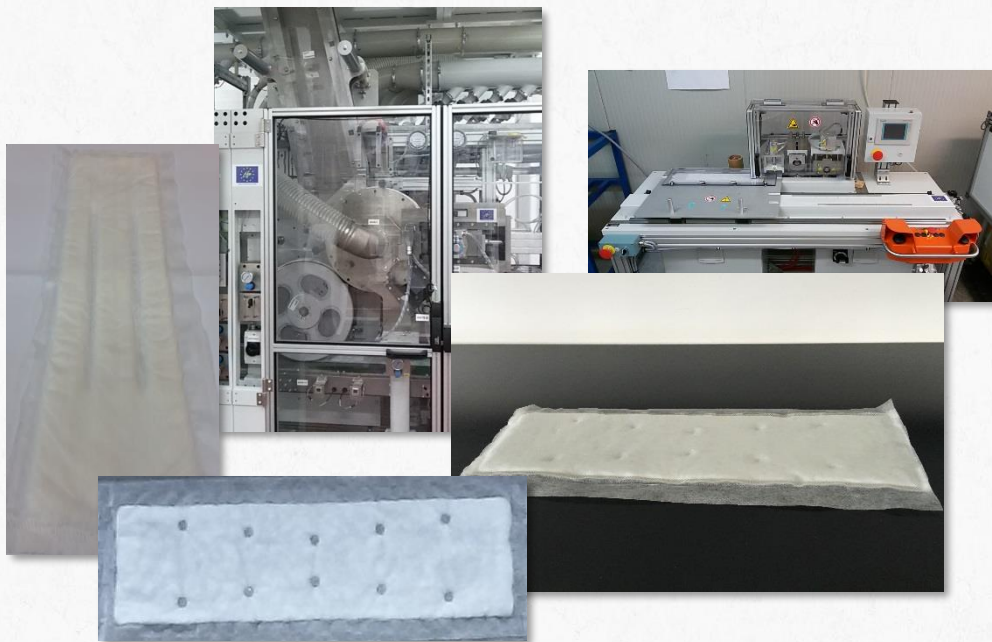
# GLUELESS™ absorbent core

Core welded between two layers with mechanical or ultrasonic system using properly designed pattern



## Key activities:

- Laboratory definition and validation of the **Core design** with several different welding patterns
- Design of the **Test** Equipment
- Laboratory validation of the **prototype** including qualification of the technology at the target speed.
- Analysis of different **sub-processes**: defibration, SAP dosing and entrapment, core closing and welding
- Product **sampling** to achieve the quality and performance tests defined.
- Analysis of Core integrity and Fluid Handling **performances**

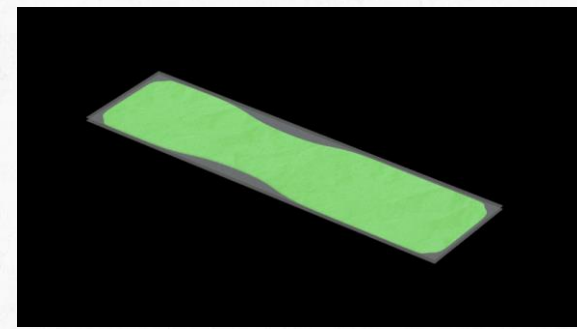
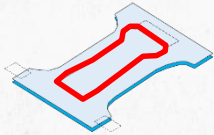




# GLUELESS™ Core forming

Glueless core with a specific welding design

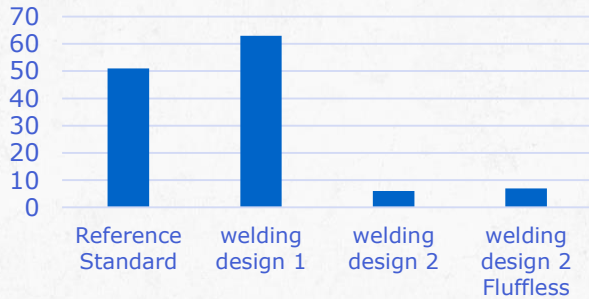
SAP/Fluff ratio 80/20



## Key results:

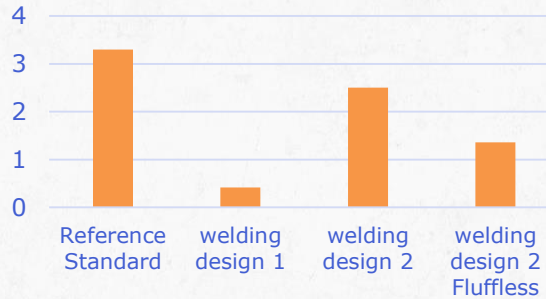
The comparative tests (\*) of product performance vs. traditional technologies show that the GLUELESS™ solution offers **equivalent or even improved results in terms of Fluid Acquisition and Core Integrity**.

### Acquisition time (s)



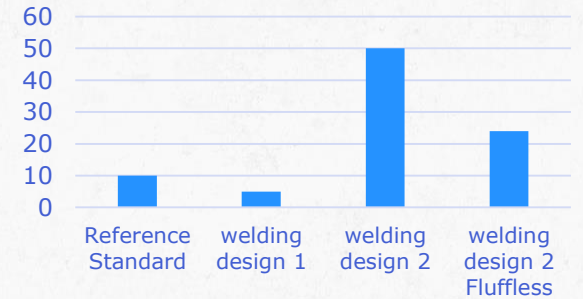
Improved behaviour in acquisition time for welding design 2

### Rewet (g)



Improved behaviour in Rewet for all configurations

### Hardy test (N° drops)



Poor results for welding design 1. Significant improvement for welding design 2.

(\*) Methodics defined with partner Fater





# The 5 areas identified as part of the project

Glueless™ ADL



Glueless™ ADL  
Intermittent elastics



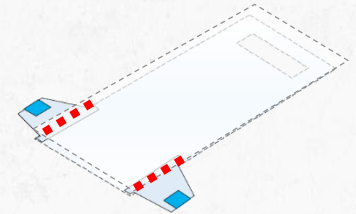
Glueless™ Frontal Tape  
construction



Glueless™ Core



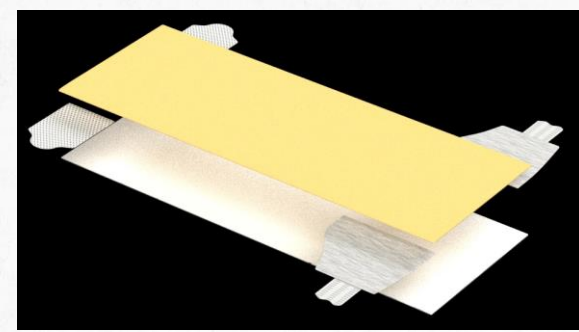
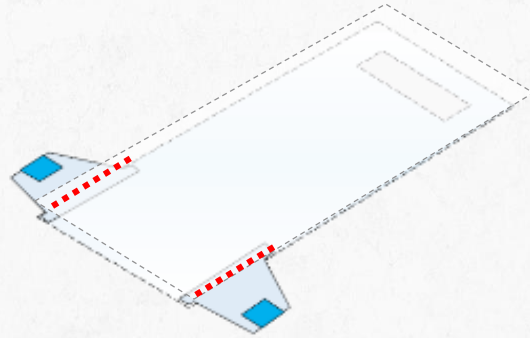
Glueless™ Back Ear  
application







# GLUELESS™ ears application: opportunities

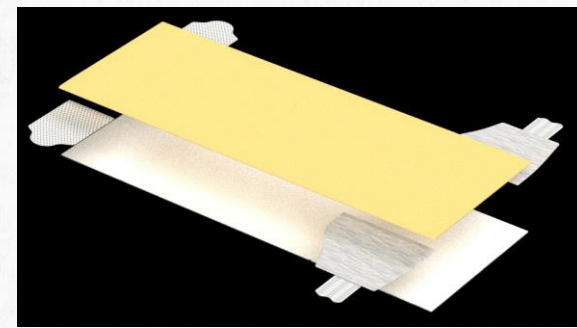
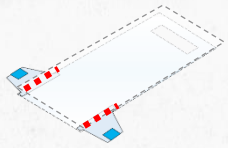


GLUELESS™ ears application (back and front) shows a potential cost **saving** in the range of 40.000÷60.000 € per year for each baby diaper machine.



# GLUELESS™ ears application

Application of the ears (back and/or front)  
without glue reinforcement



## Key activities:

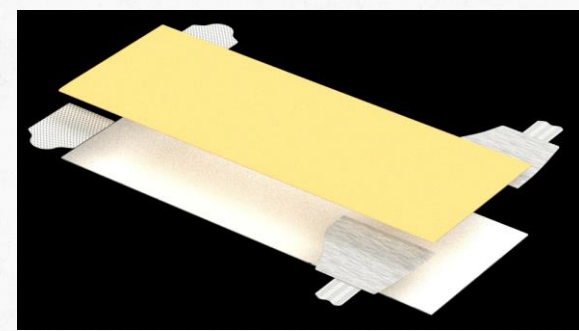
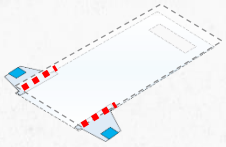
- Definition of the product **structure**
- Study of the glueless fixing process of **back and front ears**
- Realization of **samples** and quality control





# GLUELESS™ ears application

Ears application (back and/or front)  
without glue reinforcement



## Key results:

- The comparative tests (\*) vs. traditional technologies show that the GLUELESS™ solution offers **equivalent results in terms of strength of side seal** confirming that the welding strength is higher than the breaking point of the ear itself
- Defined process and machine configuration to disclose this version to the market



	With Glue	Glueless			
Side seal strength [N]	Benchmark	Asset 1 pattern1=S Pattern2=D Mat=Comm	Asset 2 pattern1=S Pattern2=D Mat=FLS	Asset 3 pattern1=S Pattern2=T Mat=Comm	Asset 4 pattern1=S Pattern2=T Mat=FLS
Average	28,7	28,5	28,2	28,9	28,3
St. dev.	1,4	1,7	2,4	2,5	2,4
Min	24,1	22,9	22,0	23,5	22,0
Max	31,0	31,3	33,0	35,5	33,1

(\*) Methodics defined with partner Fater



# FINANZIARE L'INNOVAZIONE: L'ESPERIENZA FAMECCANICA

28 novembre 2016

## LIFE+ GLUELESS™ PROJECT AS NATURAL AS WE CAN



Co-funded by EU's financial instrument supporting environmental, nature conservation and climate action projects

MANCHESTER  
1824

CCaLC Carbon  
Footprinting Tool  
Results validated by the  
University of Manchester

1

Il programma EU Life, i numeri in gioco e l'approccio adottato da fameccanica per la decisione di partecipare al programma



Francesco D'Aponte, Director of Design and R&D

2

Il Progetto Fameccanica Life+ Glueless e le 5 features identificate: obiettivi e risultati del progetto

Alessandro D'Andrea, Marketing & Innovation Manager

3

L'assessment LCA dell'università di Manchester per valutare l'impatto ambientale delle soluzioni: l'approccio, gli strumenti e una sintesi dei risultati

Diego Gualtieri, R&D Project Manager

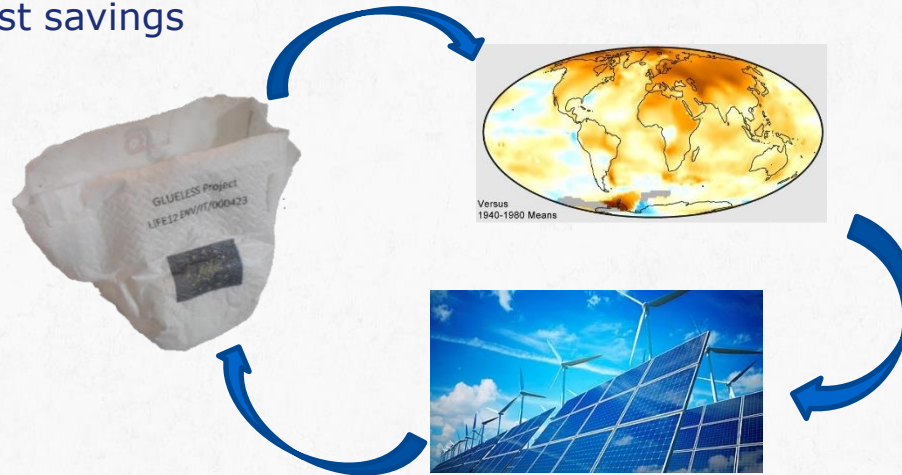
# Key results from: Glue and energy consumption reduction in baby diapers manufacturing

from a study realized by the University of Manchester

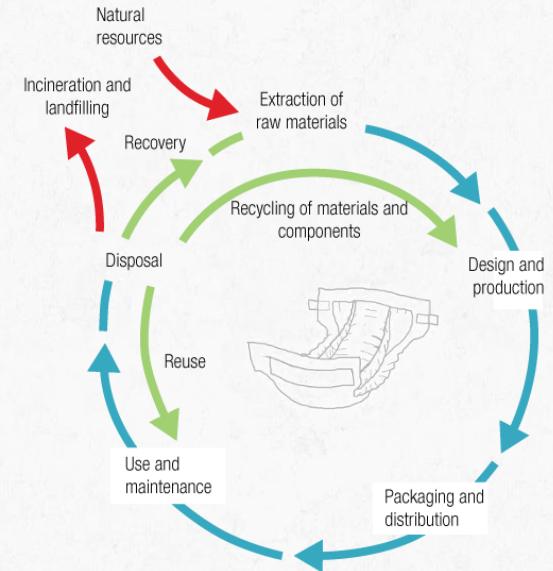
Prof. Adisa Azapagic (Project Leader)  
Dr. Joan Manuel F. Mendoza (Research Associate)  
Dr. Simona Andreea Popa (Research Associate)  
Contact: [joan.mendoza@manchester.ac.uk](mailto:joan.mendoza@manchester.ac.uk)

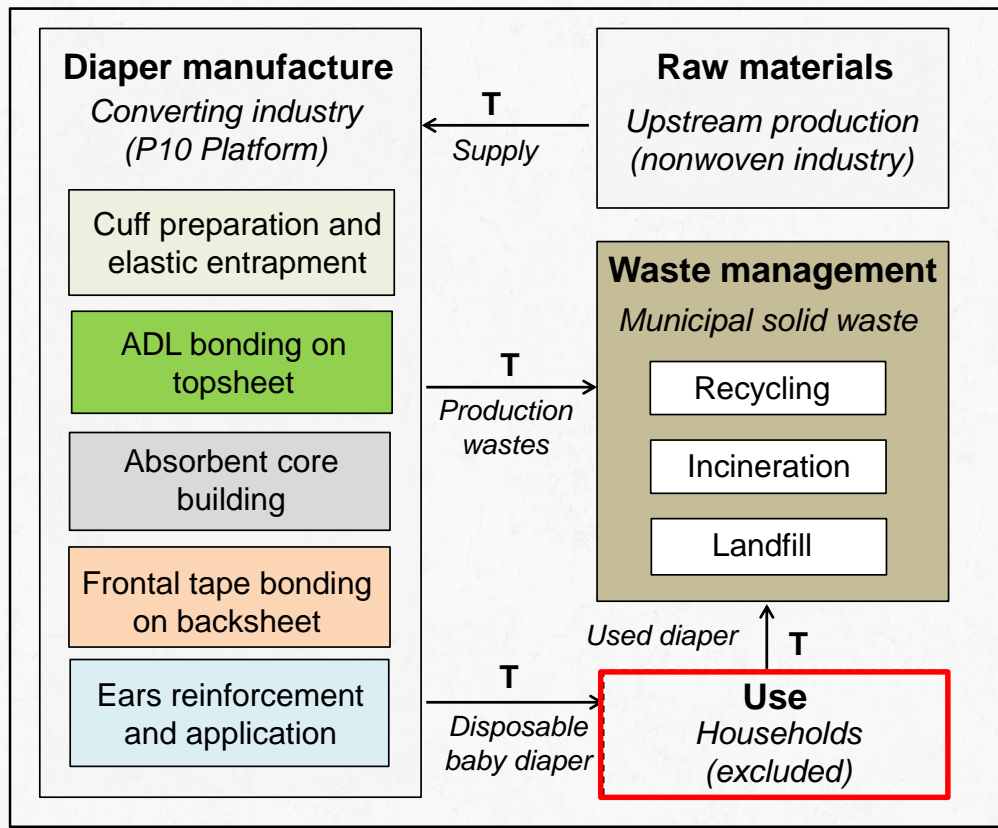
Determine potential savings in greenhouse gas emissions, primary energy and costs of glueless disposable baby diapers:

- Glue, raw material and electricity savings
- Reduction in greenhouse gas emissions and primary energy demand
- Life cycle cost savings



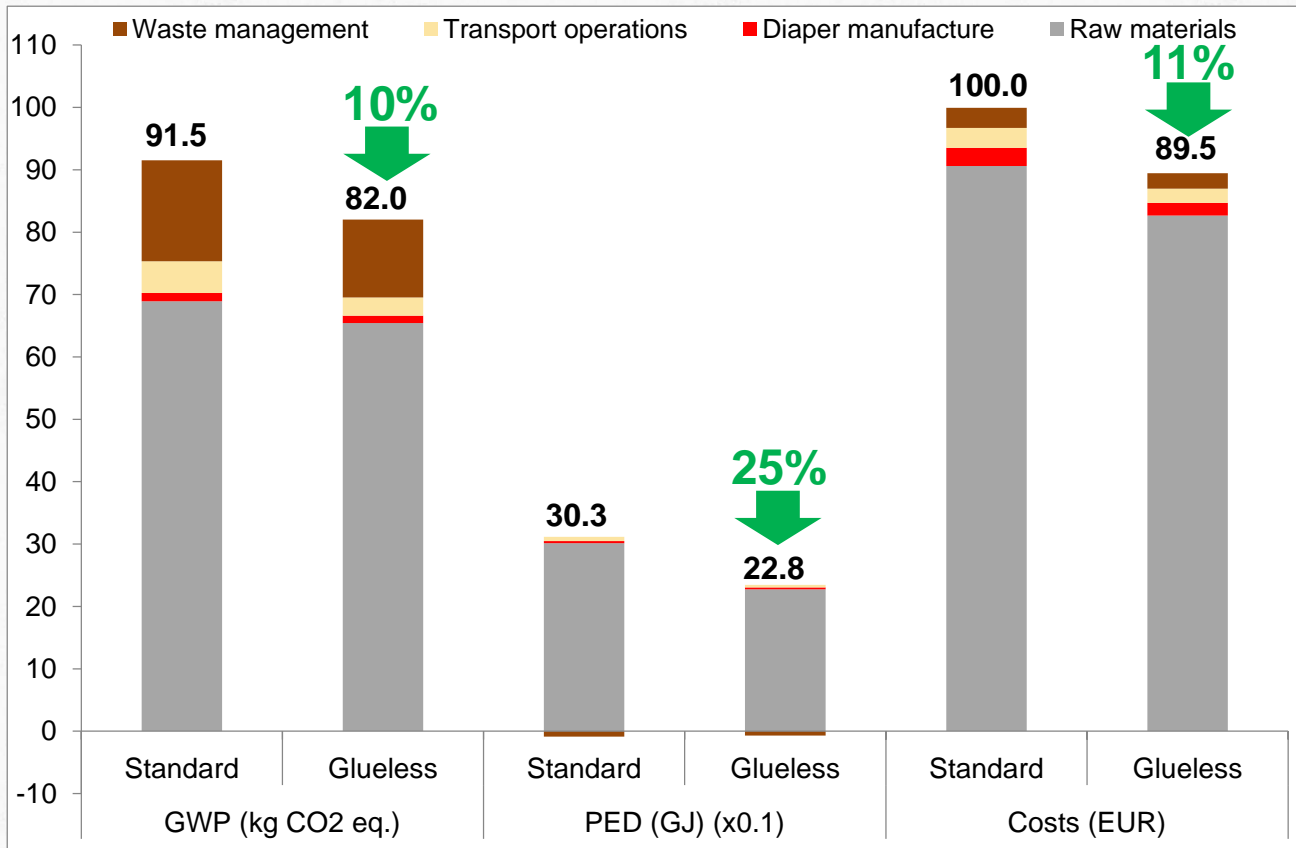
- Life cycle assessment
  - GWP: Global warming potential (kg CO2 eq.)
  - PED: Primary energy demand (MJ)
  
- System boundary
  - From cradle to gate
  
- Comparison with standard disposable diapers
  
- LCA software and databases: GaBi , CCaLC and Ecoinvent



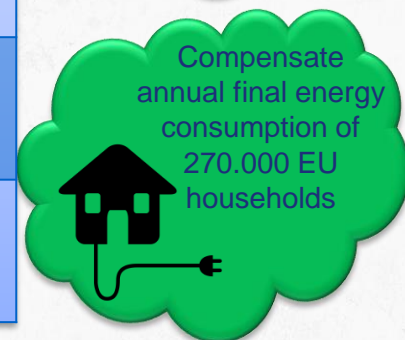




# Results (1,000 diapers) GLUE + all other changes



Resource and environmental Savings	P10 Platform	Industrial plant	Italy	European Union
	(225 mill)	(675 mill)	(1,8 bill)	(20,8 bill)
Raw materials (kt)	2,1	6,2	17	192
GWP (kt CO <sub>2</sub> eq.)	2,1	6,4	17	184
PED (TJ)	169	507	1352	15601
Costs (million EUR)	2,4	7	19	218



- Raw materials are the key life cycle hotspot for disposable diapers
- Product light-weighting is important for minimising environmental impacts and costs
- Even small improvements in the resource and energy efficiency can lead to significant environmental savings at the EU level
- Fameccanica Glueless™ solution for the manufacture of diapers has a great potential for achieving the resource, energy and climate change sustainability goals defined by the EU 2020 strategy



# LIFE+ GLUELESS™ PROJECT

AS NATURAL AS WE CAN



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