

Outlook 2014 **Nonwoven Personal Care Products Conference**
September 24th – 26th, 2014

**FAMECCANICA LIFE+ INITIATIVE FOR
ENVIRONMENTAL IMPACT REDUCTION IN
AHP PRODUCTION PROCESSES**

Alessandro D'Andrea
Marketing and Innovation Manager
Fameccanica Group
alessandro.dandrea@fameccanica.com



Outlook 2014 Nonwoven Personal Care Products Conference

Summary

- 1** What is EU's LIFE programme
- 2** The purpose of Fameccanica Life+ GLUELESS project and key R&D project steps
- 3** The first achievement: GLUELESS lamination of back ears for baby diapers
- 4** Other activities already carried-on for the target product features (case of baby diaper construction: ADL and elastics)
- 5** A look at the diapers with the new construction features: product performances initial test results
- 6** Fameccanica Group at a Glance

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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."



What is EU's LIFE programme?



ENVIRONMENT LIFE Programme

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

- 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 to the protection of the environment.

EU recently started phase LIFE 2014-2020



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 shall run for three years, starting July 1st, 2013 to Dec. 31st, 2016.



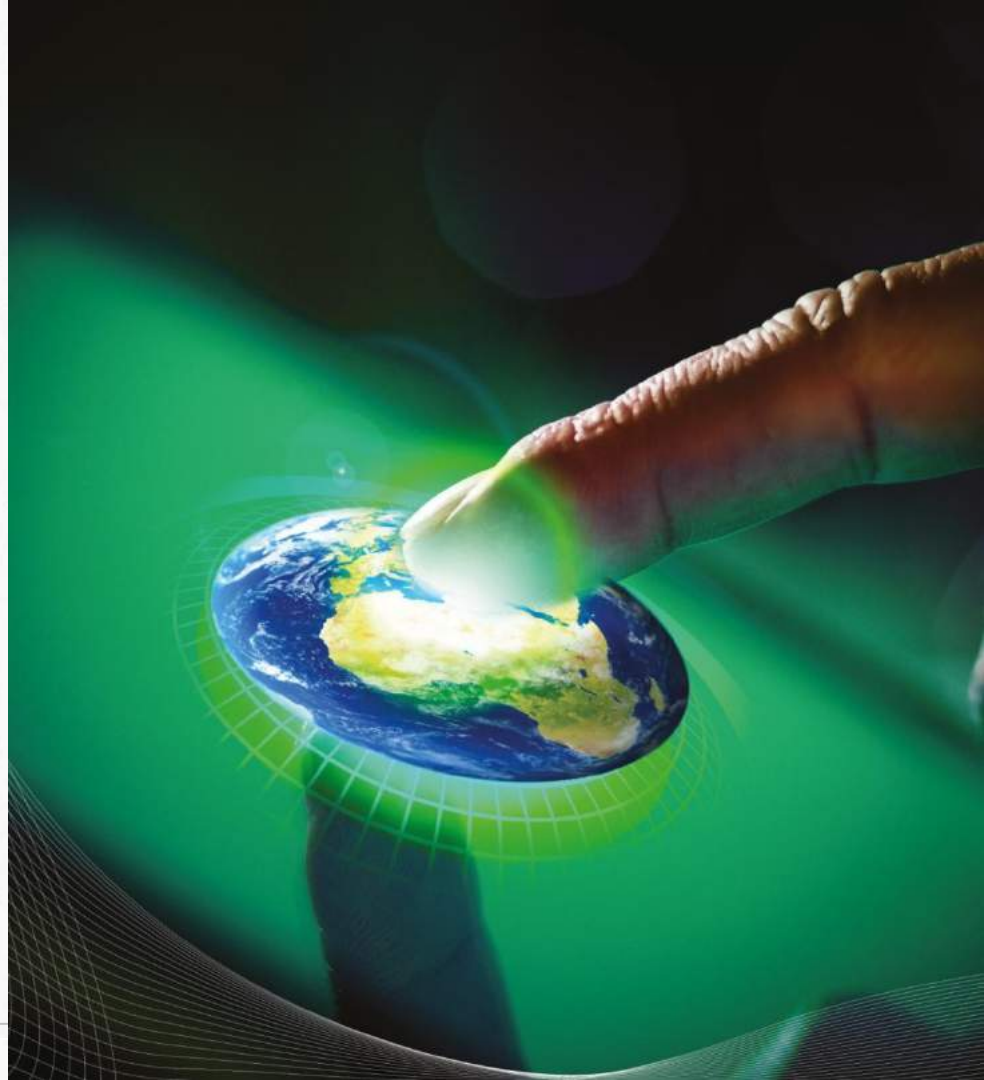
LIFE+PROJECT
AS NATURAL AS WE CAN



Fameccanica and LIFE+

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 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 make available a selection of key information to the audience and demonstrate the process steps already achieved

FABRICATIONS GROUP FAMECCANICA AT A GLANCE PRODUCTS & SOLUTIONS SERVICE & CUSTOMER CARE NEWS EMPLOYMENT LIFE+

LIFE+ PROJECT AS NATURAL AS WE CAN

YOU ARE HERE: HOME + LIFE+

LIFE+

ACHIEVEMENT THE PROJECT WHAT IS EU'S LIFE PROGRAMME?

DESCRIPTION

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. Such financial support was acknowledged by Regulation (EC) N° 934/2007 of the European Parliament and of the Council of 23 May 2007 concerning the Financial Instrument for the Environment (LIFE+).

The project LIFE+ Glueless Tetraol 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 shall run for three years, starting July 1st, 2013 to Dec. 31st, 2016.

PARTNERS

University of Manchester
The Sustainable Industrial Systems group at University of Manchester will be carrying out life cycle assessment and life cycle costing to estimate the potential environmental and economic savings.

SUSTAINABLE-SYSTEMS.ORG.UK

Tags: development • environment • cost savings • diapers • diaper production • life+

NEWSLETTER

- Newsletter Issue 1 +
- Newsletter Issue 2 +
- Newsletter Issue 3 +
- Newsletter Issue 4 +

EXTERNAL LINKS

- FibreFashion: "Fameccanica bags grant to cut diaper production cost" +
- Homecare Industry: "The Life+ Project and Fameccanica" +
- ENDA Association of the Homecare Fabric Industry +
- GlobalNews +
- NETWORKING WITH OTHER LIFE+ PROJECTS
- The bio-kinetic project +
- Sustainable-Systems.org.uk +



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1

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(case of baby diaper construction: ADL and elastics)

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A look at the diapers with the new construction features:
product performances initial test results

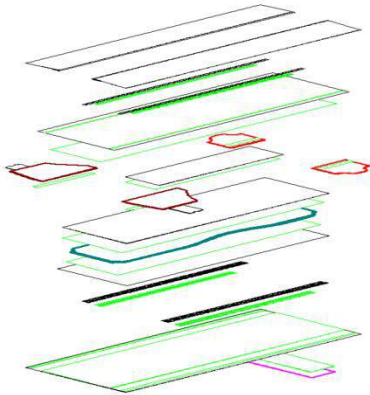
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Fameccanica Group at a Glance



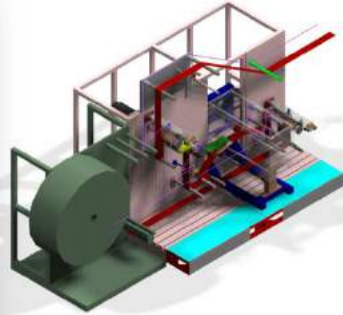
Key activities

Saving opportunities



A number of saving opportunities have been analyzed

4 new test stands



Fameccanica to install 4 new test stands in the R&D labs

To date, 3 test stand out of 4 have already been installed

Validation of solutions



Results will be validated with University of Manchester

CCaLC analysis will start in 2015

Steps achieved/ongoing



Already **achieved** GLUELESS™ lamination of back ears.

Activities at **mature-level** for ADL and Elastics applications.

Other activities **on-going** or next to start



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GLUELESS™ lamination of back ears for baby diapers

The first achievement of the project has been reached at the end of December 2013, with the completion of the qualification of a new

GLUELESS™ lamination concept for back ears for baby diapers

This GLUELESS™ construction is now a commercially available solution with Fameccanica laminating machine model **FLS**.



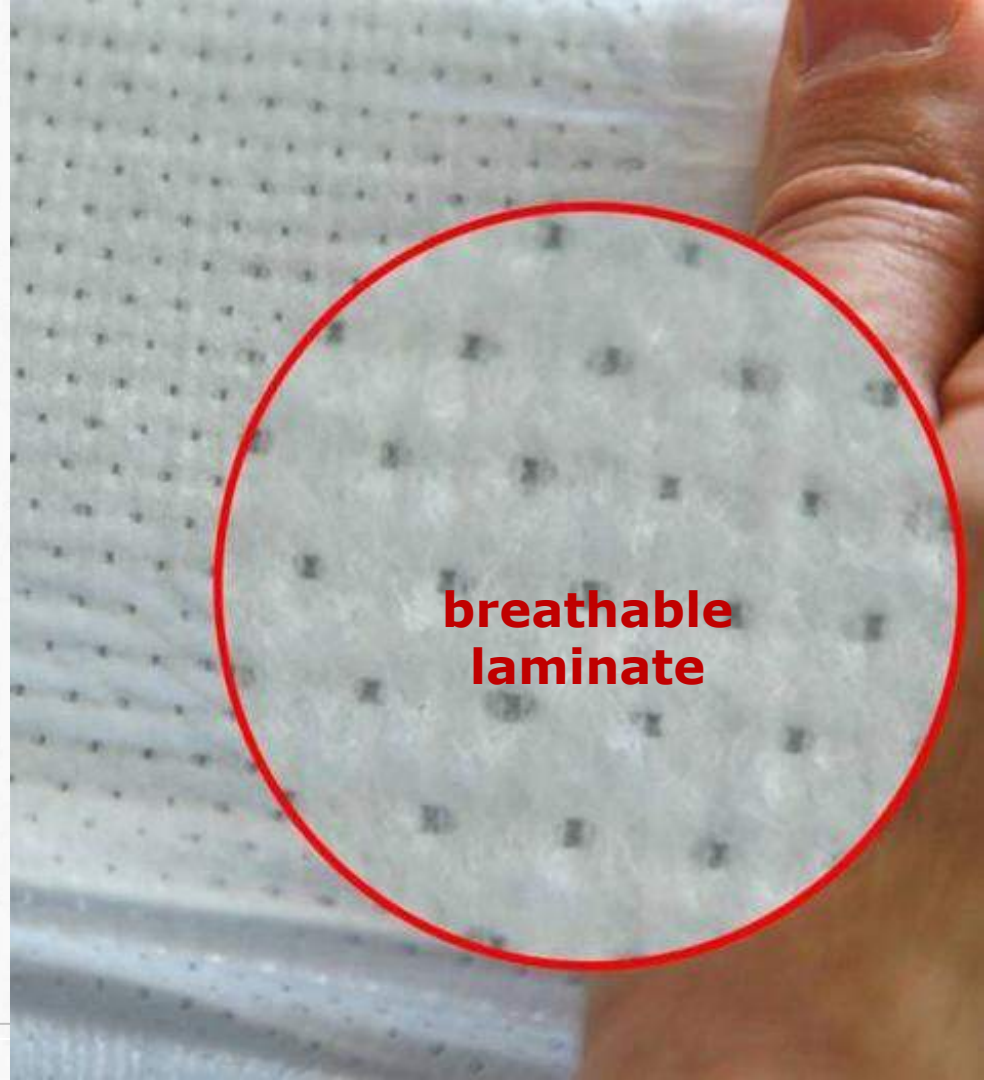


GLUELESS™ lamination of back ears for baby diapers

Fameccanica is known for its patented solution for a

**unique technology for in-line processing of
breathable laminates with ultrasonically bonded
transpiring spots**

The latest improvement has been reached with the complete elimination of the glue applications in this laminate and this is by itself, an evident step in the direction of cost saving in diaper production processes and environmental impact reduction.





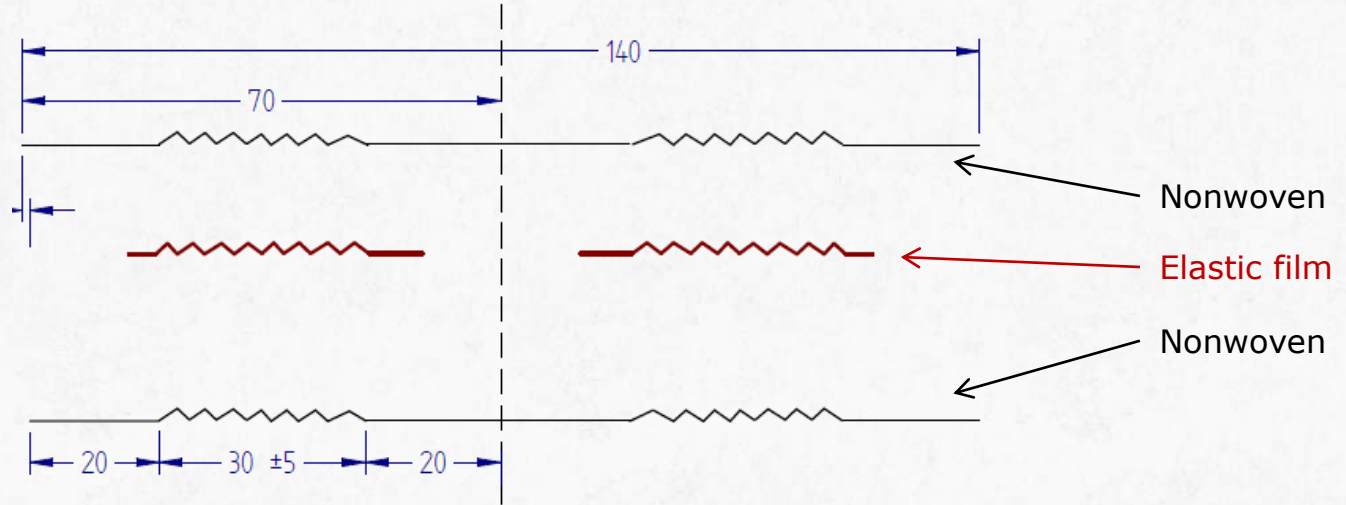
GLUELESS™ lamination of back ears for baby diapers



**Example of real
application
on a baby
diaper**



Example of structure for baby diaper ears



LAMINATE WITH TWO EARS WITH WIDE ELASTIC ZONES



GLUELESS™ lamination of back ears for baby diapers

Equipment overview



Version of FLS Lamination system with rewinding in spool (rewinding in reels also available)

Equipment detail



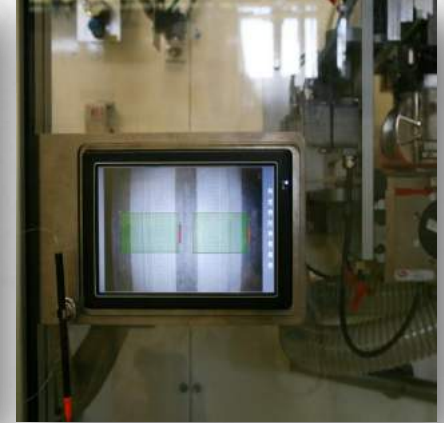
Detail of the elastic film stretching and sealing section to create the web laminate

Laminated web



The laminate can be a dual laminate (e.g. picture) or can be split in two individual webs

Quality control

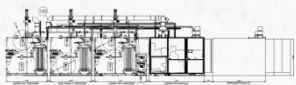


The machine can be equipped with on-line web inspection system to guarantee quality

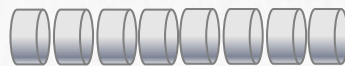


FLS serving several converting machines

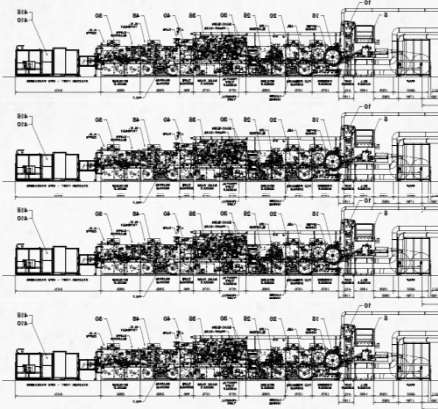
A NORMAL MANUFACTURING PLANT USES **1 FLS LAMINATOR**
TO SERVE UP TO **8 BABY DIAPER MACHINES**



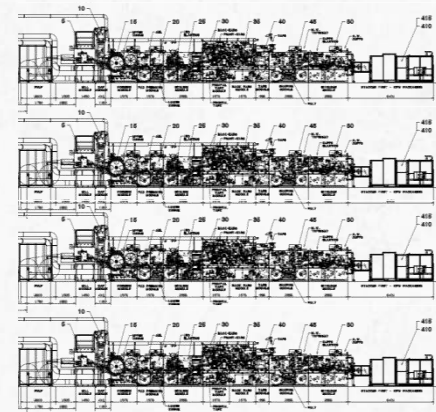
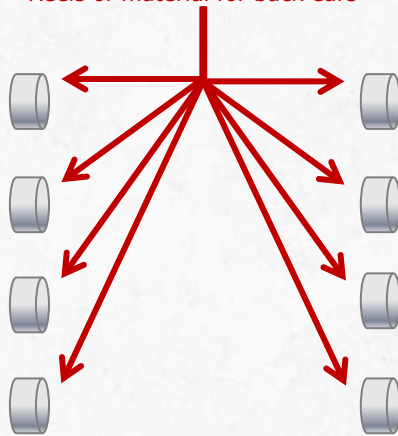
FLS LAMINATOR



Reels of material for back ears



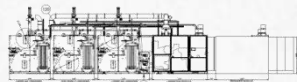
BABY DIAPER MACHINES



BABY DIAPER MACHINES



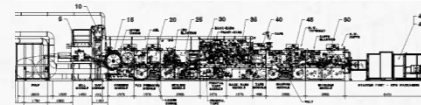
FLS saving estimate compared to premade material



FLS LAMINATOR



*Reels of
material for
back ears*

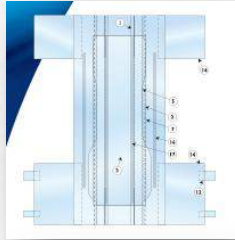


BABY DIAPER MACHINE

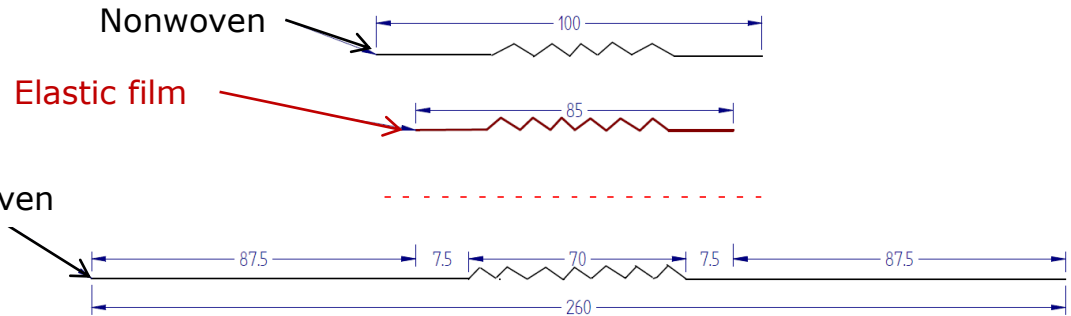
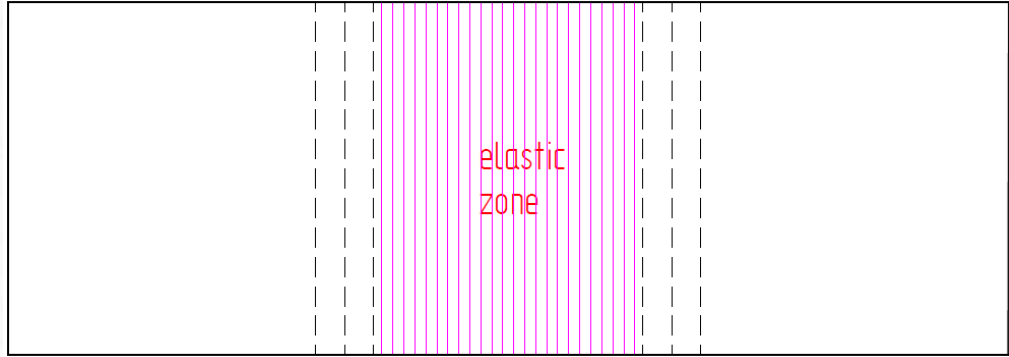
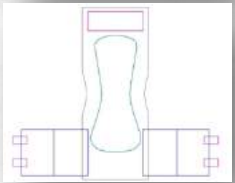
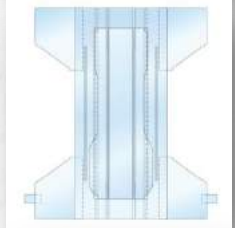
Estimated **saving** for each baby diaper machine using the Fameccanica laminate is in the range of 150.000÷250.000 € per year compared to common premade materials available in the market today

In case of feeding 8 baby diaper machines saving can reach 2 Million € per year

This technology can be used also for adult inco



**EXAMPLE OF
STRUCTURE FOR
ADULT INCO
DIAPER EAR**



LAMINATE FOR ONE EAR WITH ELASTIC ZONE IN THE CENTER



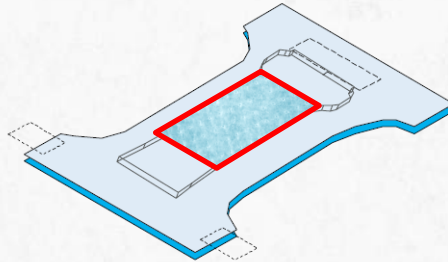
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GLUELESS™ application of ADL: opportunities



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** expecially in case of low basis weight materials



GLUELESS™ application of ADL is under lab test qualification



GLUELESS™ ADL test stand in the R&D Lab

Fameccanica has started the qualification of its GLUELESS™ application of ADL (acquisition-distribution-layer) on diaper topsheet.

The objective of this project phase is to make available a proven technology to be used on Fameccanica converters with commercially available raw materials and a validated set of product performance data.





GLUELESS™ application of ADL is under lab test qualification

The initial lab test demonstrated that **the process and technology developed are appropriate** to realize this type of application at the full speed of the commercially available diaper machines.

Also, the product performance validation phase shows that the **key performance indicators** selected (peel force test and fluid handling-acquisition) meet the initial **objectives**.

**Diaper topsheet
with GLUELESS™
application of ADL**





GLUELESS™ application of ADL: initial test results

PEEL FORCE TEST

Peel force is considered mainly as a **“process requirement”**, as it is required for runnability in the converting machine that the ADL is properly bonded to the topsheet.

Test conducted at high speed showed that:

- **NW**: All the Top sheet Nonwovens analyzed (*) **have a good attitude to be welded** even if they come from different suppliers.
- **ADL**: **the majority of commercial material tested have a good attitude to be welded**, if containing at least small compatible termoplastic resin. According to the test results, the best way to weld using ultrasonic equipment and ADL with a NW topsheet is to use a bi-component ADL containing PolyPropylene to seal with a PP-based NW top sheet. Among the different ADL tested from different suppliers, a benchmark has been identified.

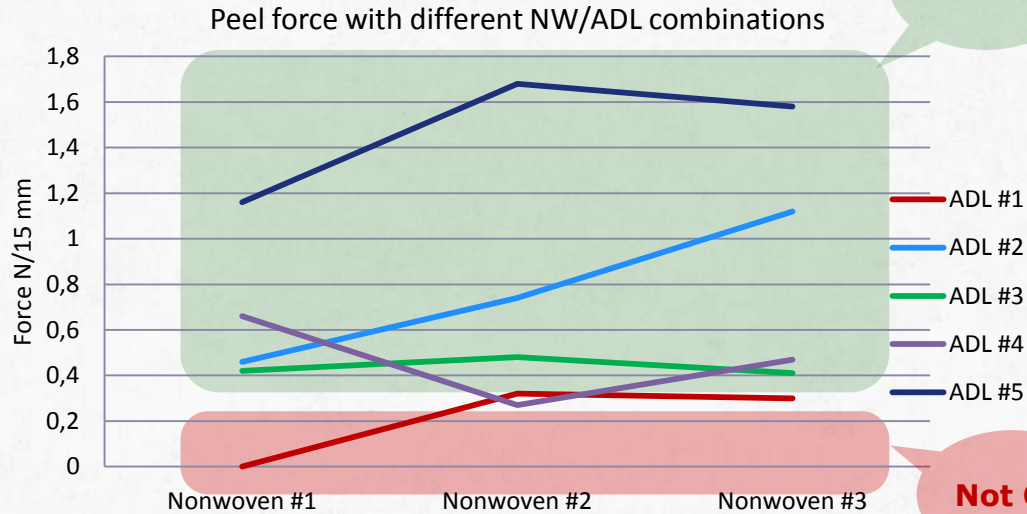
(*) *Commercially available Polypropylene-based spunbonded*





GLUELESS™ application of ADL: initial test results

PEEL FORCE TEST.



The test demonstrate that Fameccanica equipment is capable to run the majority of commercial material tested.

ADL#5 highlighted as the benchmark

Not OK

ADL#1 was the only one considered not acceptable as not matching the process requirements.

Synthetic chart after testing a total of 35 different combinations of 5 different nonwoven topsheet, 10 different ADL and 3 bonding patterns.

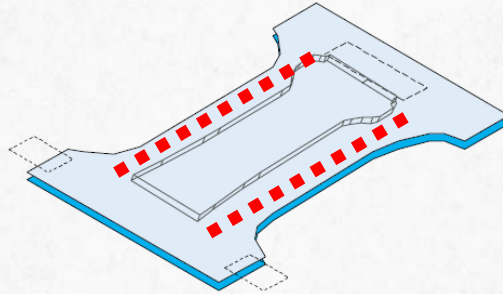
Present chart show a selection of 3 different nonwoven topsheet (spunmelt PP/base), 5 different ADL (ATB or Resin Bonded at different basis-weight).

Test speed 450 m/min





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 80.000÷200.000 € per year for each baby diaper machine.



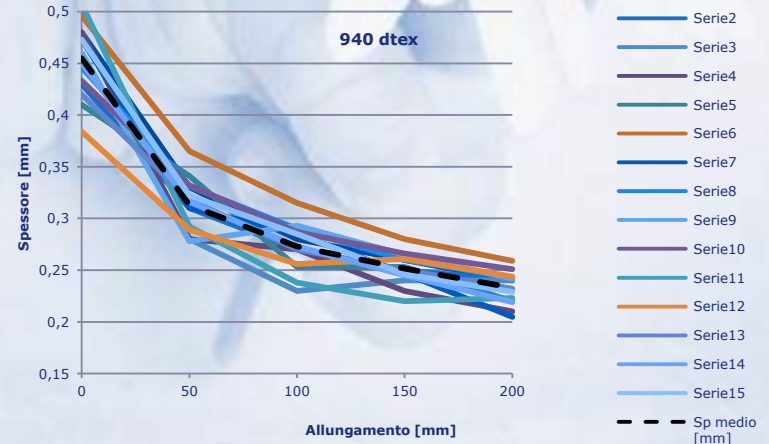
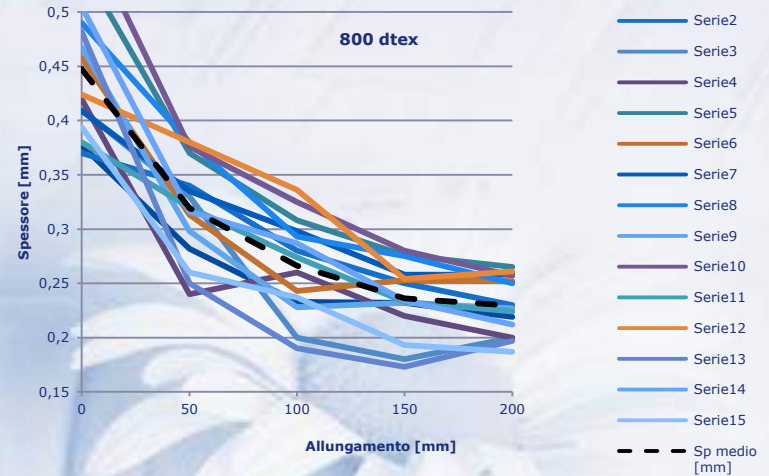
GLUELESS™ elastic application

Characterization of elastic strand physical properties

As a pre-work for the activities pertaining the GLUELESS™ application of this feature, a specific lab test was started since Feb. 2014, with the aim of **creating a database** pertaining the physical properties and behavior under tension of commercially available elastic strands for baby diapers.



Lab area for elastic strands characterization



Examples of data from the new database





GLUELESS™ elastic application



*The lab test stand for
GLUELESS™ elastic strands application*

Fameccanica has started the qualification of its GLUELESS™ **application** of elastic strands.

The objectives of this project phase are:

- to make available in the future a proven technology capable to fit the real production conditions and requested speed of Fameccanica high performance converter,
- to make available comparative test results of final samples vs. traditional gluing technology.

The initial lab test demonstrated that the equipment utilized by Fameccanica on the basis of a patent owned by Cera Engineering France is appropriate to realize this type of **application at the target performance.**

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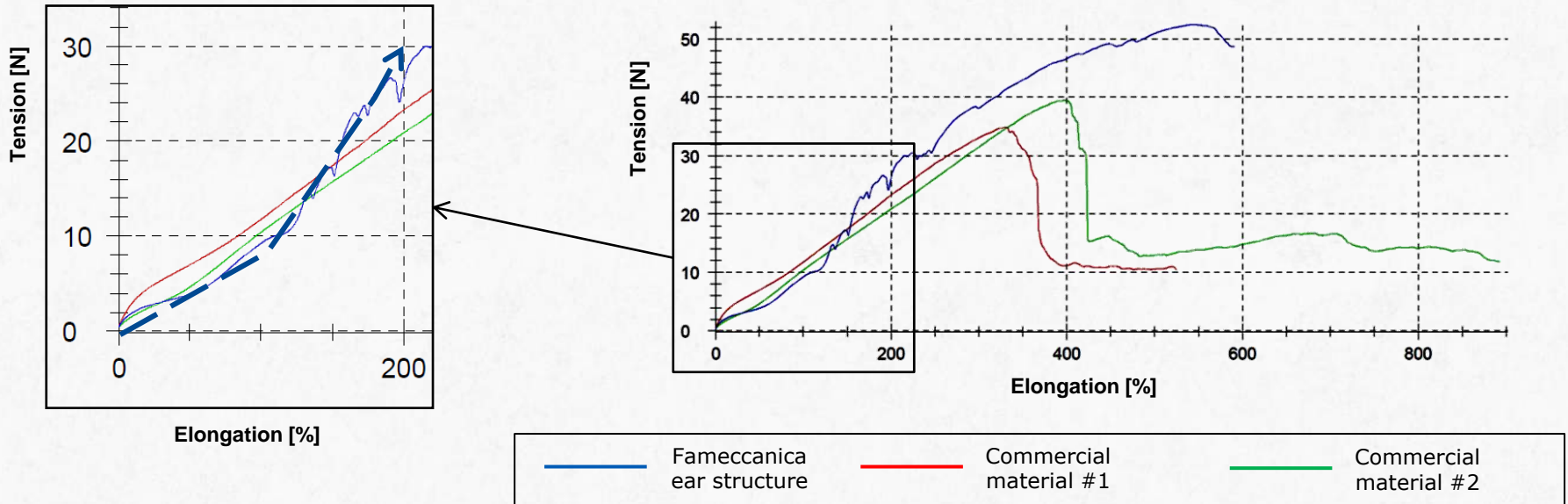


GLUELESS™ lamination of back ears

Product performances initial test results

The comparative **tension-elongation** tests show a **substantially equivalent results** of Fameccanica GLUELESS™ Ear structure vs. commercial materials in the area actually performed by the end user.

It also highlights a peculiarity of Fameccanica ear structure, where the force increases with elongation after 100% elongation.



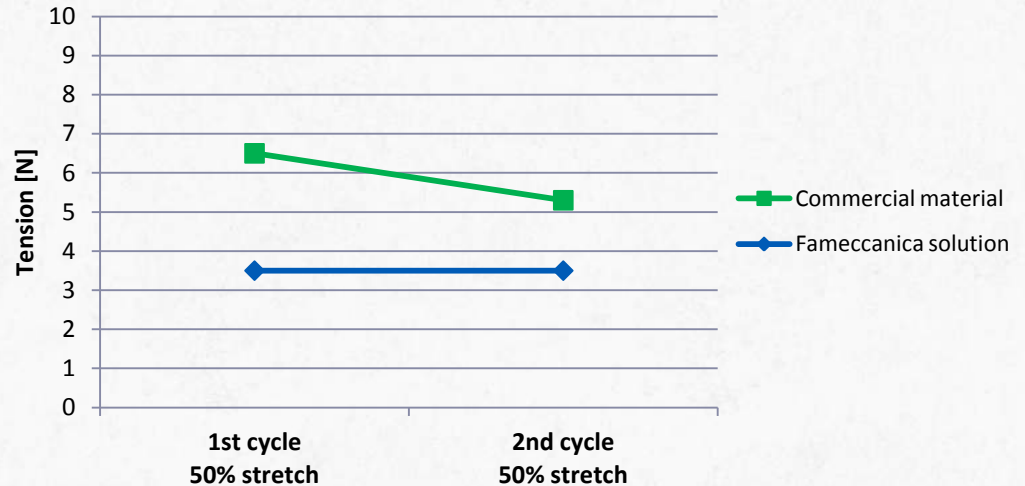


GLUELESS™ lamination of back ears

Product performances initial test results

In case of **multiple cycles** conducted at the reference elongation of 50%, the comparative tension-elongation tests show a **more stable behaviour** of Fameccanica GLUELESS™ Ear structure vs. commercial materials.

This behaviour is related to the specific structure adopted for Fameccanica solution, where the performance of the internal elastic film in such elongation range is independent from the activation of the external nonwovens.



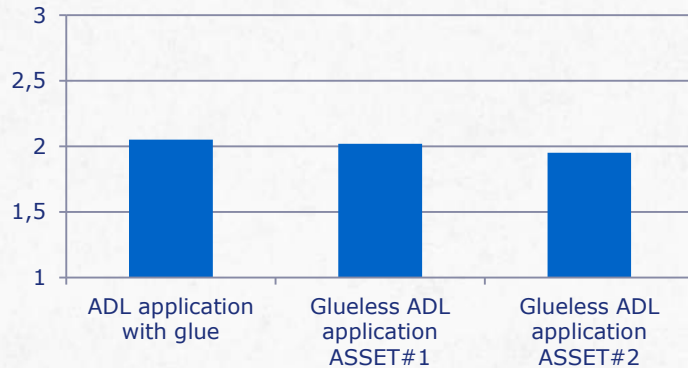


GLUELESS™ application of ADL:

Product performances initial test results

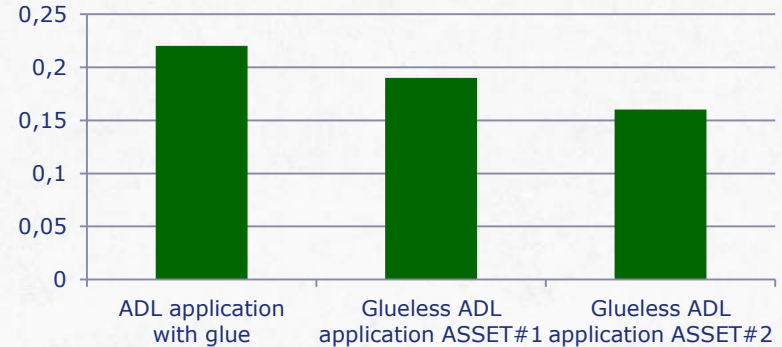
The comparative tests (*) of product performance vs. traditional technologies shows that the GLUELESS™ solution offers **equivalent or even improved results in terms of Acquisition Time and Wetback of the final diaper element assembly.**

Acquisition Time (sec)



Same behaviour in acquisition time test

Wetback (g)



Slightly improved behaviour in wetback test

(*) Test conducted with ADL#5 (PP/PE bico fiber)

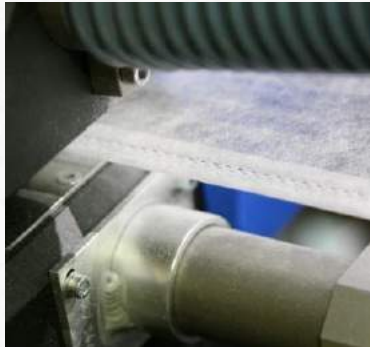




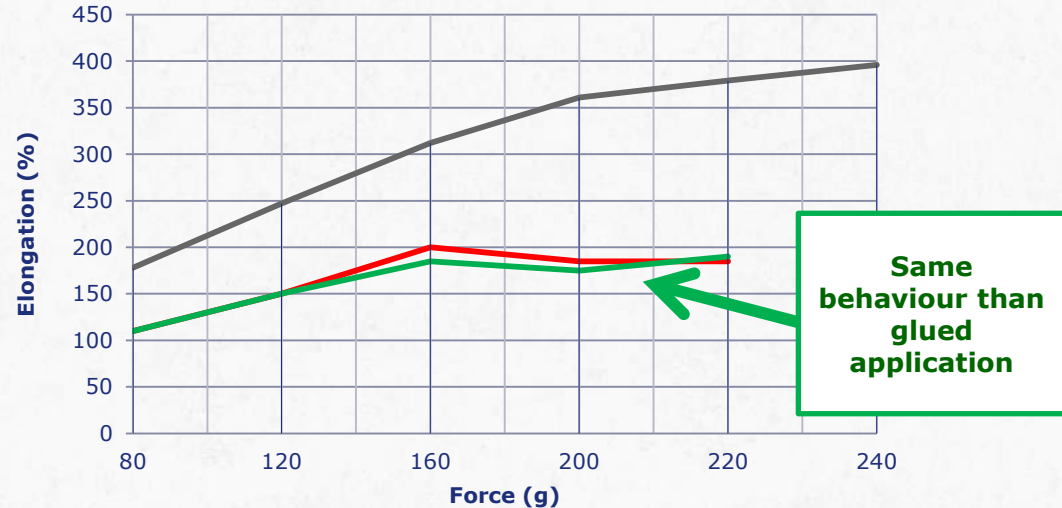
GLUELESS™ elastic application

Product performances initial test results

The comparative tests of product performance vs. traditional technologies shows that the GLUELESS™ solution offers **equivalent results in terms of tension-elongation of the final diaper element assembly.**



Details of process and samples with GLUELESS™ elastic application



- 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 (%)



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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 hygiene absorbent products

2

MORE THAN 1000 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 **850** employees worldwide



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THANK YOU

Alessandro D'Andrea
Marketing and Innovation Manager
Fameccanica Group
alessandro.dandrea@fameccanica.com

