Bio based solution for environmental challenge: Developing Viscose based top sheet for female hygiene product

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Aditya Birla Group (ABG) – Introduction

Globally, the Aditya Birla Group is

A USD 48.3 Billion Corporation

In the League of Fortune 500

120,000 Employees from 42 Nationalities

Operates in 34 Countries

Aditya Birla Group (ABG) – A Global Conglomerate!
Birla Cellulose – Introduction

Pulp Units (5)
- Canada (3)
- Sweden (1)
- India (1)

R&D Centres (6)
- India (4)
- Sweden (1)
- Indonesia (1)

Fibre Plants (7)
- India (4)
- Indonesia (1)
- Thailand (1)
- China (1)

Birla Cellulose – Globally one of the largest VSF producers!
Is not just a brand

It is our continued commitment to work with our partners to create mutually beneficial and sustainable solution for the consumers and the planet.

Built on the tenets of caring for

- Planet
- Innovation
- Partnership
Succeeding with Sustainability

Voluntary Action
- Enhanced Regulatory Pressure
- Increased Consumer Activism
- Forced Compliance

Regional Phenomenon
- Sustainability Provisions in Trade Agreements
- Regulation Standardization
- Rapid Global Transition

Insulated Balance Sheets
- Direct Cost of Environment Footprint
- Large Consuming Population by 2030
- Linked Balance Sheets

By 2030, demanding law and regulation will shrink the business operating space.

Environmental Friendliness ≠ Business Competitiveness
Nonwoven Industry – Current Challenges

Challenges

- Landfill Issue
- Marine Pollution
- Sewage Clogging
- Chemical Heavy

Regulatory Pressure Building Upon

- Disposable Hygiene
- Single Use Plastic
- Non Flushable Wipes
- Preservative Infused

SUPD Regulations Worldwide

- EU
- India
- California
- South Australia

More Countries & States to follow…

Nonwoven industry immediately needs sustainable alternatives
Raw Material is the Key to Sustainability
Regenerated Cellulose combines the advantages of Natural & Plastic/Synthetics
Exclusivity to Co-creation

Paradigm shift in Value Chain Partnerships
Value Chain Partnership

Collaboration is the fastest way to solve world problems
Sustainable Female Hygiene Products

Tackling Landfill Issue
Female Hygiene Products (FHP) – Current Challenges

No. of Sanitary Pads / Tampons Per Month

20

No. of Sanitary Pads / Tampons Per Year

240

40 Years of Menstruating Lifespan

Global Female Population 2019

3.83 Billion

9,600

(130-200 Kg of Waste)\(^{(1)}\)

Millions of Ton of Potentially Avoidable Waste

Source:
- Sustainable Menstruation: The Impact of Menstrual Products on the Environment
- World Population

With increasing population & penetration of FHP – we’ve much bigger problem!
Sanitary Napkins – Layer wise Alternatives

Layer by layer approach to make a fully biodegradable sanitary napkin

Source: https://eufactcheck.eu/factcheck/uncheckable-conventional-menstrual-pads-are-made-up-of-90-plastic-materials/ & Credits: ©Vania
Our Co-creation Approach

We were able to approach the FHP issue in fastest way only due to co-creation.
## Sanitary Napkin – Qualifying Criteria

<table>
<thead>
<tr>
<th>Test</th>
<th>Description</th>
<th>Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absorption</td>
<td>It should absorb 30 ml liquid flowed on to the center of sanitary napkin (at the rate of 15 ml per minute and it should not leak through back sheet of napkin.</td>
<td>WSP 070.3 &amp; ISO 9073-8</td>
</tr>
<tr>
<td>Repeated Liquid Strike Through Test</td>
<td>It is defined as the time taken for a known volume of liquid to pass through the sanitary napkin till it’s back sheet, the test is usually conducted for three consecutive times.</td>
<td>WSP 70.8 &amp; ISO 9073-14</td>
</tr>
<tr>
<td>Wetback</td>
<td>It examines the ability of sanitary napkin to resist the transport back onto the skin through the top layer after repeated liquid strike through test</td>
<td>WSP 70.8 &amp; ISO 9073-14</td>
</tr>
</tbody>
</table>

A top sheet meeting above criteria can be used in a sanitary napkin.
Sanitary Napkin – Top Sheet Overall Comparison

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Polypropylene</th>
<th>Purolcel EcoDry (Viscose)</th>
<th>Cotton</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price</td>
<td>5</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Biodegradability</td>
<td>1</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Performance</td>
<td>5</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Ease of Processing</td>
<td>5</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Score</strong></td>
<td><strong>16</strong></td>
<td><strong>19</strong></td>
<td><strong>13</strong></td>
</tr>
</tbody>
</table>

Purolcel EcoDry combines the advantages of Cotton & Polypropylene.
Sanitary Napkin – Product Comparison
(Absorbency Test – 30 ml in 2 Minutes)

Absorbency tests performed as per WSP 070.3 & ISO 9073-8 standards, this test is like a quality check for sanitary napkins

Purocel EcoDry top sheet based sanitary napkins passes the quality check
Sanitary Napkin – Product Comparison
(RLSTT & Wetback)

<table>
<thead>
<tr>
<th>Top Sheet Type</th>
<th>Repeated Liquid Strike Through Test (Seconds/10 ml)</th>
<th>Wetback (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polypropylene</td>
<td><img src="chart1.png" alt="Polypropylene chart" /></td>
<td>100</td>
</tr>
<tr>
<td>Purocel EcoDry (Viscose)</td>
<td><img src="chart2.png" alt="Purocel chart" /></td>
<td>~125</td>
</tr>
<tr>
<td>Cotton</td>
<td><img src="chart3.png" alt="Cotton chart" /></td>
<td>~182</td>
</tr>
</tbody>
</table>

Repeated Liquid Strike Through Test & Wetback Test performed as per WSP 070.3 & ISO 9073-8 standards

Purocel EcoDry top sheet based sanitary napkin checks all the performance boxes!
Introducing Purocel EcoDry Top Sheet

**Biodegradability**
- Soil
- Water
- Marine

**Physical Performance**
- Fast Absorption
- No Wetback / Dry
- Sufficient Shear Strength

**Comfort Performance**
- Soft to Skin
- Breathable
- Hypoallergenic

Purocel EcoDry Top Sheet for Hygiene Products
Exploring Sustainable Solutions to Nonwoven Industry Challenges

Tackling other Issues
Constantly Striving towards Sustainable Solutions

Challenges
- Landfill Issue
- Marine Pollution
- Sewage Clogging
- Chemical Heavy

Sustainable Products
- Purocel EcoDry
- Biodegradable Single Use Products
- Purocel EcoFlush
- Purocel AntiBac

Our sustainability quest to solve world problems
Create innovative & sustainable applications with Birla Purolcel

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Our journey to create even more innovative fibres continues with your support