

The Environmental Impact of reusable bed pads

*An overview of the real impact of reusable bed pads from
cradle to grave*

Presented by;

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Current Status

- As an industry, we believe that reusable healthcare textiles are the socially responsible solution
- The “Disposable” industry hasn’t taken this lying down
- We understand that no solution is perfect but one is better than the other

Evolution of Reusable Pad

- circa 1970 –
 - Heavy butyl rubber on broadcloth, natural fiber soaker and face
 - Maximum life - ~80 cycles
- circa 1980-1990
 - Lighter weight flexible PVC on synthetic fabric
 - Synthetic/natural blends for soaker and face
 - Maximum life 200 cycles
- circa 2000
 - Increasingly lighter weight PVC on synthetic fabric
 - Optional fully bonded product
 - Maximum life 200 cycles

Circa 2010

- Face and Soaker:
 - Products can dry quicker (save energy)
 - Synthetic surfaces have quick stain-release properties (no need for rewash, save energy)
- Barrier:
 - Phthalate free and Heavy-metal free PVC
 - Light weight coatings and components
- Industry works as a team to address common environmental concerns (ARTA, etc)
- One reusable pad can replace up to 200 disposable underpads

Factors to Consider

- Socio-, Economic-, Environmental-
Impact of
 - Raw material manufacturing
 - Intermediate manufacturing
 - Converting / Assembly
 - Use
 - End of life

Cradle

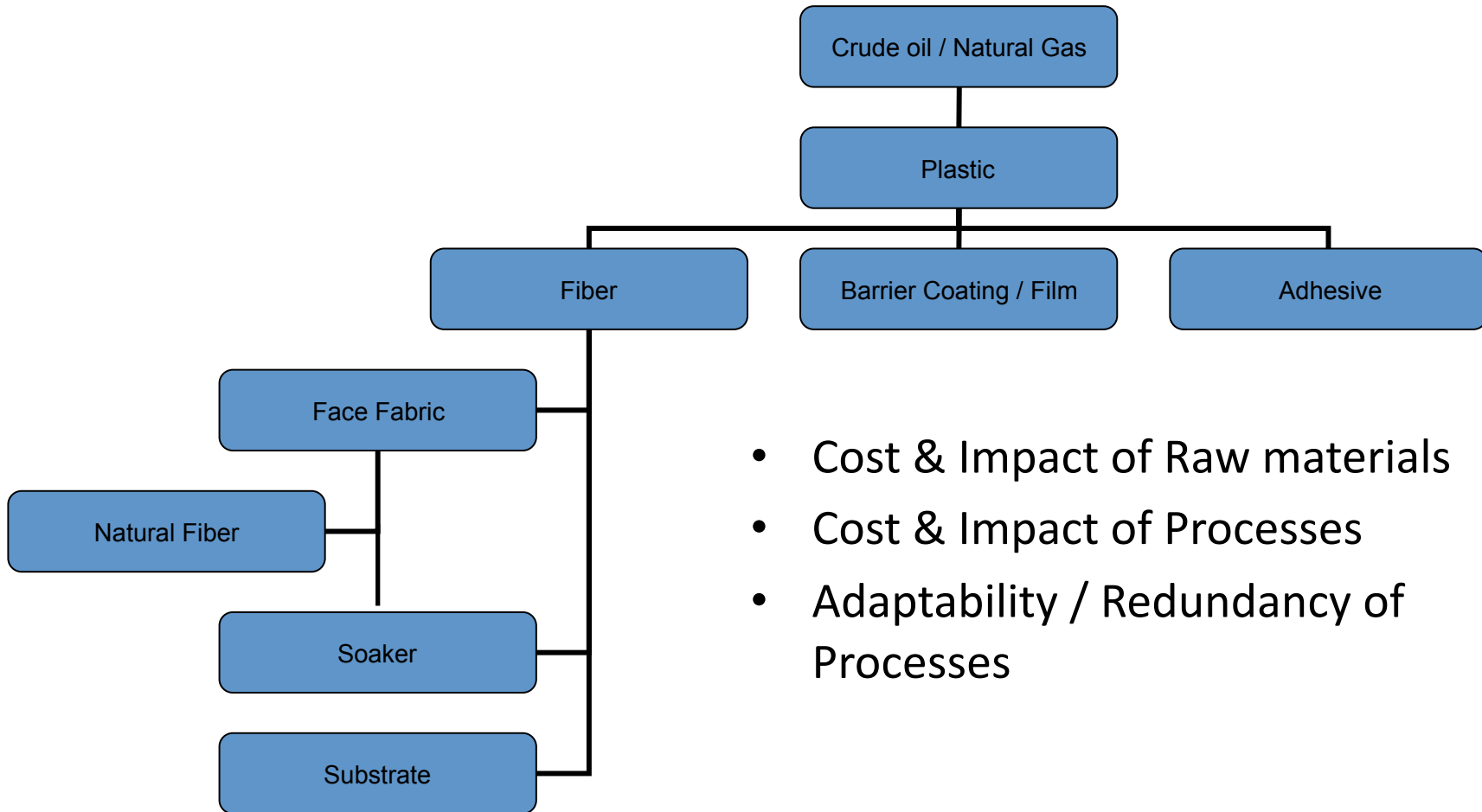


Grave

- Reusable and Disposable -

Factors to Consider

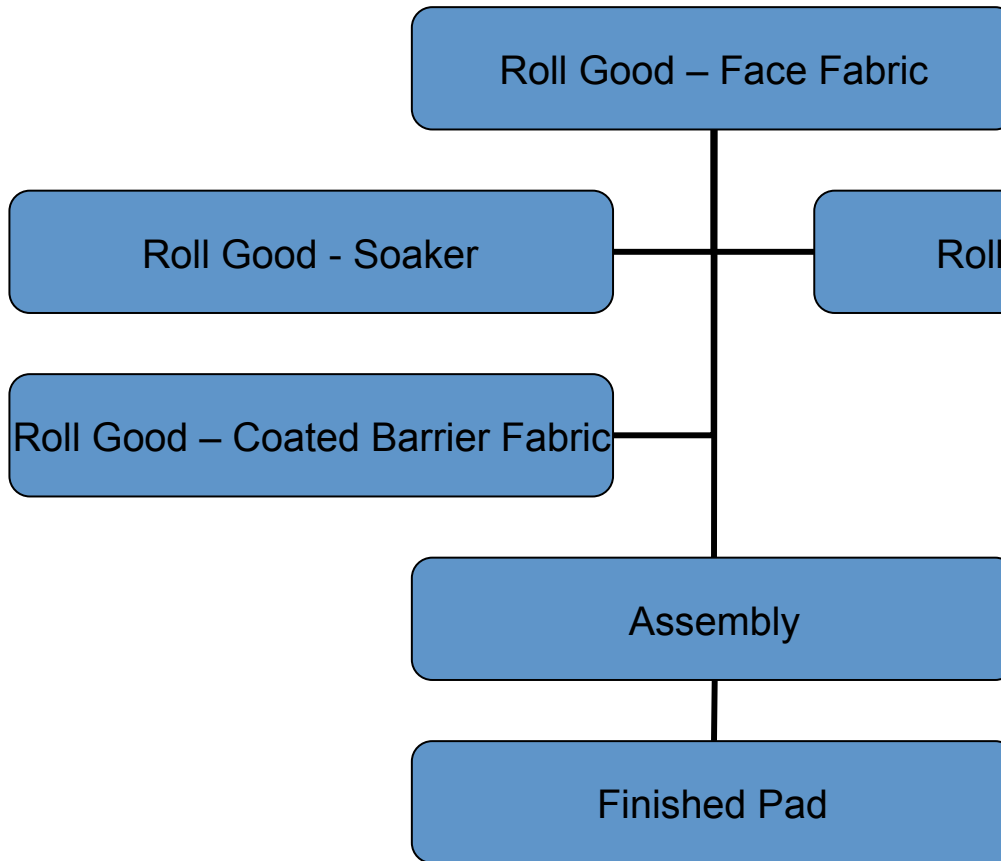
Raw Materials



- Cost & Impact of Raw materials
- Cost & Impact of Processes
- Adaptability / Redundancy of Processes

Factors to Consider

Intermediate Mfg & Converting / Assembly



- Cost & Impact of Raw materials
- Cost & Impact of Processes
- Adaptability / Redundancy of Processes

Factors to Consider

Use

- Reusable
 - Functionality
 - Single pad
 - Layflat properties
 - Long lifetime
 - Patient comfort
- Disposable
 - Functionality
 - Multi-pad application for extra protection
 - ~30% used for non-incontinence applications
 - “Pad-Lasagna”
 - Single-use
 - Patient comfort

Factors to Consider

End of Life

- Reusable

- Laundry to re-use – 200x

- Soiling to wastewater treatment via laundering
- End of life pad to:
 - Landfill (0.006 lbs/pad-use impact)
 - Recycling opportunities
 - » Barrier into lower technical markets
 - » Fabric ragged out to rags or shoddy

- Disposable

- Use to landfill – 1x

- Soiling contamination and all pad components to landfill (0.25 lbs/pad-use)
- Recycling is likely untenable

- 1970's

The technological step change was going from butyl rubber to Flexible PVC.

- Significant decrease in acquisition and maintenance cost

- Significant increase in usage and value added

- 2000's

Environmental and social concern regarding:

- Recycling and re-use of products

- Chemicals in the environment re PVC

What is PVC?

- PVC = polyvinylchloride
 - Polyvinyl chloride is produced by complete polymerization of the vinyl chloride monomer.
 - Significant proportion of its mass is chlorine:
 - PVC requires less petroleum than other polymers and uses naturally abundant Chlorine
 - Produces a very porous particle which accepts oils (plasticizers) to customize the softness / hand
 - Extremely durable, inherently flame retardant and low cost

Where is PVC used?

- WWII developed as a synthetic rubber
 - Wide adaptability (hard & soft goods) resulted in dramatic growth in use of PVC
- Applications include:
 - rainwear, blood bags, medical tubing, upholstery, flooring, trays, gloves, carts, handles, credit cards, seat covers, siding, roofing, pen barrels, weather-stripping, mud flaps, shower curtains, children's toys, pillow covers, food wrap, aprons, tents, tonneau covers, packaging, ..., ...

And of course reusable underpads

Why is PVC used?

- Durable – can last 200 wash dry cycles without leaking, cracking or losing it's flexible properties
- Controllable – applied as the protective coating without the use of adhesives
- Adaptable – can be formulated, adjusted to suit a variety of end uses
- Recyclable – all post industrial scrap (including mixed polymer streams) can be recycled; opportunities for post-consumer recycling programs
- Low cost with superior performance

What are 21st century concerns?

- Environmental and social concern regarding:
 - Recycling and Re-use of products
 - Chemicals in the environment re Flexible PVC

specifically

- Phthalates
- Heavy Metals
- End-of-life

What are the PVC Myths

PVC is not recyclable

PVC = Phthalates

PVC = Lead

Not true for the reusable underpad

PVC Recycling

- Proven infrastructure for post-industrial and some post-consumer waste
- Technologically balanced to one step-down
 - Coated textiles, flooring, floor mats, air deflectors, sound barriers, mud flaps
- Challenge – infrastructure to collect and separate coated textile from current supply chain

Plasticizers

- Plasticizers are needed to soften PVC
 - Takes PVC from the consistency of vinyl siding or credit cards to seat cushions or fishing lures
- Variety of plasticizers can be used to soften PVC
 - The technical challenges for plasticizers are:
 1. Exudation – stickiness or film build – leaving the product unusable
 2. Extraction – being removed through solvents, soaps or detergents – leaving the product stiff or brittle and subject to performance failure

Phthalate Plasticizers

- Phthalates are a broad category of highly effective plasticizers
- Have been the focus of debate re safety for use in children's toys and consumer products
- CPSIA actions:
 - Permanent restrictions to three types of phthalates in children's toys and child care articles
 - Interim (temporary) restrictions to three others in children's toys that can be placed in a child's mouth
 - Interim restriction to be re-evaluated based on a scientific study conducted by a Chronic Hazard Advisory Panel convened by the Consumer Product Safety Commission.

Phthalate Plasticizers

- North America programs provide phthalate-free, flexible PVC barrier fabrics in the market place.
- Most North American suppliers of coated textiles discontinued use of “restricted three” years ago, moved to the “interim three”
- The CPSIA legislation demonstrated the need for an alternative plasticizer package in the marketplace.
- Healthcare customers tend to err on the side of caution pertaining to the safety of their employees and people entrusted to their care.
- Majority of offshore pads contained PVC plasticized with one of the “restricted three” plasticizers...

North American programs provided a phthalate-free alternative to our healthcare customers

Metals in PVC

- Heat Stabilizers
 - PVC when exposed to intense heat can start to decompose
 - Mixed-metal heat stabilizers prevent decomposition
- Pigments and Colorants
 - Inorganic pigments are based on metal oxides
 - Iron oxide (rust) is a red pigment

Lead and other Heavy Metals

- North American coated textile manufactures do not stabilize product with lead
 - Lead and Cadmium based pigment and stabilizer discontinued in NA coated textiles over 20 years ago
 - Arsenic based antibacterial agents to control microbial growth; phased out of many PVC formulations
- CPSIA mandated increasingly lower content of lead and numerous other heavy metals in consumer products
- This legislation continues to result in significant recalls in imported consumer products (toys, bibs, bags, etc)

North American programs provide a consistent supply of barrier fabrics that meet the reduced heavy metal levels specified by CPSIA .

Evolution of Reusable Pad

- circa 1970 –
 - Heavy butyl rubber, limited re-use life
- circa 1980-1990
 - Light weight PVC , extended re-use life
- circa 2000
 - Lighter weight PVC, long life, product options
- circa 2010
 - Phthalate free, lightweight PVC, same long life and product options

Continued Evolution of Reusable Pad

- circa 2050 –
 - Phthalate free, even lighter weight F-PVC?
 - Alternate polymers beyond current offerings?
 - Higher performing components for >200 laundering cycles?
 - Alternative face and soaker component to improve per-use performance?
 - Recycling opportunities realized?