

Life Cycle Environmental Assessment of Incontinence Pads: **Reusable and Disposable**

Among many benefits, this study found that facilities that use reusable incontinence pads can reduce their waste stream by 97%.

By Evan Griffing, PhD, and Michael Overcash, PhD

The latest contribution to ARTA's library of life cycle assessments (LCAs) on key textile products is the "Life Cycle Environmental Assessment of Incontinence Pads," comparing reusable and disposable products. This LCA of reusable incontinence pads was compared to that of disposable incontinence pads on a cradle-to-end-of-life

basis. The functional unit was 1,000 reusable pad uses. Environmental performance metrics used for comparison were

- (1) Total fossil energy resources
- (2) Fossil resources combusted for energy
- (3) Global warming potential (carbon equivalents)
- (4) Blue-water use (water loss)
- (5) Solid waste generation.

Results

Disposable pads are generally known to be used at a higher frequency than reusable pads,

WHY IS PEER REVIEW IMPORTANT?

Peer review is the standard that determines whether research, a study, or literature review is considered scientifically valid. Without the peer-review process and stamp of approval, data is considered anecdotal.

ARTA is building a library of peer-reviewed research on textile products, which allows the textile services industry to irrefutably claim that reusable textiles are the sustainable choice — because the future is NOT disposable! This is important and will become even more important as water shortages continue and companies come under pressure to demonstrate their compliance with sustainability guidelines.

Check out ARTA LCAs and studies at **www.ARTA1.com.**

Questions? Contact Nancy Jenkins at njenkins@ARTA1.com

and this study found that 2.12 disposable pads are used per each reusable pad on an adjusted patient day (ADP) basis. Therefore, 2,120 disposable pad uses were compared to 1,000 reusable pad uses. Reusable pads achieve better environmental performance than disposable pads in all categories. When compared to disposable pad

use, reusable pads were found to:

- **1. Save 71%** of fossil resources
- 2. Result in 52% less fossil resources combusted for energy
- 3. Result in 56% less water loss (blue water savings)
- 4. Result in 61% less carbon equivalent emissions
- 5. Generate 97% less solid waste at laundry or healthcare facility

Two parameters found to vary significantly from site to site were the number of laundry cycles for each new reusable pad before replacement and the number of pads used per adjusted patient day. Scenario analyses were done to check how the results depend on these parameters within the ranges observed. In each scenario, the reusable pads were superior or about equal to the disposable pads in each category.

Additional findings and assumptions

The market for reusable pads includes both polyurethane (PU) and polyvinyl chloride (PVC) barrier pads. The market was determined to be about 48% PU and 52% PVC. and these life cycle results reflect this market.

These pads have a rayon/ polyester absorbent layer, a PU or PVC barrier layer, and polyester top and bottom layers. The representative pad was a nominal 34-by-36 inches and the weight was found to be 433 g/pad. The disposable pads were represented by a typical architecture based on a superab-

sorbent polymer/cellulose soaker with a polyethylene barrier and non-woven polypropylene top and bottom layers. The representative pad was a nominal 30-by-36 inches and the weight was found to be 144 g/pad.

The functional unit selected was 1,000 reusable pad uses. The reusable pads were found to be used an average of 46 times before being removed from service. The pads were often transferred with a patient and may have achieved additional use. When pads were removed from service by the laundry, these pads achieved an average of 75 uses.

The life cycle results are based on 46 uses, and 21.7 new pads were manufactured per 1,000 reusable uses.

KUDOS!

ARTA Incontinence Pad LCA Committee

Many thanks to members of the ARTA Incontinence Pad Life Cycle Assessment (LCA) Committee who provided invaluable support and insight into the manufacture and use of reusable and disposable incontinence pads.

Beck's Classic — Steven Beck, Jeff Bloom, Greg Mitchell

Cooley Group — Paul Helsby, Kasper Van Veen

Encompass — Steve Berg, Kristv Warren

George Courey — Jeff Courey IAHTM — Christi Carper

London Hospital Linen — Brendan O'Neill

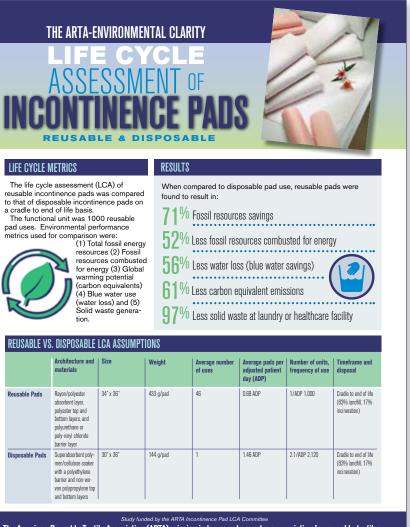
Medline — Dan Sanchez MIP — Gabriel Boardman, Chair **Phoenix Textiles** — Mike Hayes Standard Textile — Cecil Lee. John Wintz

Virginia Hospital Laundry — Meredith Bowery

The average number of reusable pads per adjusted patient day was found to be 0.69 pads / ADP. The disposable pad use rate was 1.46 pads / ADP. Therefore 2,120 disposable pads were assumed to be used to achieve the same functionality as 1,000 reus-

able pads.

The end of life was a mix of landfil and incineration for the pads. These pads are mostly polymer, so the endof-life landfill : incineration ratio was based on the typical ratio for plastics in the United States (83% landfill and 17% incineration). The pad soil was treated in the wastewater treatment plant for reusable pads and the landfill and incineration facilities for disposable pads.





This study was conducted with technical contributions and financial support from the ARTA Incontinence Pad LCA Committee. The Committee consists of 11 organizations and 17 experts, covering the manufacturers, suppliers, product design, and laundry operations supporting reusable and disposable pads. 💈

Drs. Evan Griffing and Michael Overcash are with Environmental Clarity and have conducted several other LCAs, including those for cleanroom coveralls, isolation and surgical gowns, and surgical drapes.

Members can download an $8.5 \times 11^{\prime\prime}$ copy of this infographic at www.ARTA1.com

The American Reusable Textile Association (ARTA) mission is to promote greater appreciation for reusable textiles.