

LIFE CYCLE ASSESSMENT OF ISOLATION GOWNS: REUSABLE AND DISPOSABLE

E. Vozzola, M. Overcash, E. Griffing
Environmental Clarity, Inc.

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Isolation gowns serve a critical role in the healthcare industry by protecting healthcare workers, visitors, and patients from the transfer of microorganisms and body fluids. These and other medical textiles are available in reusable and disposable types. This report includes the results of a comparative environmental life cycle study of reusable and disposable isolation gowns.

In this study, an isolation gown was defined as a single-piece, size extra-large (XL) or one-size-fits-most, long-sleeve tie-up garment. The functional unit, or basis of comparison, was 1,000 isolation gown uses in a healthcare setting. For the reusable gowns, this was 16.7 new gowns each used for 60 cycles while for the disposable gowns this was 1,000 new gowns. Two market representative ANSI/AAAMI Level 1 isolation gowns were investigated: a reusable polyester gown and a disposable nonwoven gown. The representative reusable gown weighed 240 g (8.5 oz.) and was composed primarily of woven polyethylene terephthalate (PET) fabric. The representative disposable gown weighed 63 g (2.2 oz.) and was composed primarily of nonwoven spunbond-meltblown-spunbond (SMS) polypropylene fabric.

For the reusable and disposable gown alternatives, the supply chain, manufacture, use, and end-of-life phases were considered and compared on a life cycle basis (cradle-to-end-of-life). The starting point for analysis was natural resources in the earth, such as fossil materials and ores. The entire supply system required to manufacture a final gown was included. The use phase (laundry/wastewater treatment for reusable gowns) and the end-of-life phase (landfill for disposable gowns and landfill or reuse in other industries for reusable gowns) were also included to provide a complete life cycle profile.

Selecting the reusable isolation gown system resulted in significant environmental benefits compared to selecting the disposable system, including a 28% reduction in natural resource energy consumption, 30% reduction in greenhouse gas emissions, 41% reduction in water consumption (blue water), and 93% reduction in solid waste generation.

ARTA LCA Committee

The study was organized by ARTA's LCA Committee, which contracted with the independent research firm Environmental Clarity. The research team includes **Overcash, Eric Vozzola** and **Evan Griffing**. The LCA Committee members include:

- **Myles Noel** of International Healthcare Association for Textile Management (IAHTM)
- **Duane Houvener** of American Dawn
- **Janice Larson** of Encompass
- **Robert Long** of European Textile Services Association (ETSA)
- **Scott Delin** of Fashion Seal
- **Shelley Petrovskis** of Lac Mac Limited
- **Brendan O'Neill** of London Hospital Linen Service and ARTA President
- **Dan Sanchez** of Medline
- **Joe Ricci** of TRSA

ARTA was founded in 1982 with the mission to create greater awareness and appreciation for reusable textiles. Members represent all facets of the textile services industry — from manufacturers, suppliers, and distributors to profit and not-for-profit laundry operators, as well as allied associations. For more information: www.ARTA1.com.

IAHTM is a network of senior-level experts in healthcare textile management who regularly interact to share ideas and information for the mutual and continuing success of their respective laundry cooperatives. IAHTM is a nonprofit membership organization that exists specifically for healthcare laundry cooperatives. www.IAHTM.com.

MEDIA CONTACT: Nancy Jenkins, njenkins@ARTA1.com