Summary of Current, Most Commonly Utilized Disposable Food Service Glove Materials

Sources:

NSF Protocol P155
ASTM
FDA

Polyethylene

Polyethylene gloves are made of plastic resins extruded into lightweight sheet films. Two sheets of polyethylene film are seamed and heat sealed to form gloves; these gloves are non-powdered. Different resins and extrusion processes are utilized to manufacture three grades of Polyethylene gloves:

- Low Density Polyethylene (LDPE)
- Cast Polyethylene (CPE)
- High Density Polyethylene (HDPE)

Benefits

- Least costly
- Appropriate for single-use, light tasks
- Easy donning – loose fit, flexibility

Disadvantages

- Decreased dexterity and durability compared to other glove materials

Vinyl

Vinyl gloves are made by dipping hand molds into the synthetic material polyvinyl chloride (PVC). Other synthetic glove materials are made from different formulations of PVC to improve flexibility and durability. Vinyl gloves are available in powdered and powder-free.

Benefits

- Low cost
- Appropriate for single-use, light and medium tasks
- Closer fit for tasks requiring dexterity
- Alternative for those concerned with Hevea NRL latex allergy

Disadvantages

- Decreased dexterity and durability compared to other glove materials
- Can cause allergic contact dermatitis from residual processing chemicals

Nitrile

Nitrile gloves are made by dipping hand molds into the petroleum-based synthetic material - carboxylated butadiene acrylonitrile copolymer (butyl rubber / BR). Nitrile gloves have excellent puncture and abrasion resistance and are resistant to breakdown from exposure to animal fats. Nitrile gloves are available in powdered and powder-free.

Benefits

- Appropriate for single-use, medium to heavy tasks
- Form-fitting for good tactile sensitivity and dexterity
- Alternative for those concerned with Hevea NRL latex allergy

Disadvantages

- More costly
  - Due to escalating crude oil prices, nitrile prices have steadily increased
    - In 2004 butyl rubber prices rose by 40%
- Can cause allergic contact dermatitis from residual processing chemicals

Natural Rubber Latex

Natural rubber latex (NRL) gloves are made by dipping hand molds into processed natural latex, a sap-like plant byproduct harvested from the rubber tree *Hevea brasiliensis*. NRL gloves are available in powdered and powder-free.

Benefits

- Appropriate for single-use, light to moderate tasks
- Form-fitting for good tactile sensitivity and dexterity

Disadvantages

- Cost has dramatically increased
  - (ROSWELL, Ga. – JUNE 28, 2006) – Kimberly-Clark Health Care announced today that it will be shifting the production of exam gloves from latex to synthetic alternatives over the next four to 18 months. The decision was based on growing customer demand for synthetic solutions and in response to unprecedented increases in the cost of latex raw materials.
- NRL gloves can cause IgE-mediated allergic reactions in sensitized individuals and can cause sensitization, especially in atopic individuals
- Can cause allergic contact dermatitis from residual processing chemicals

New Disposable Glove Materials on the Horizon

Yulex® latex

Yulex® latex gloves are made by dipping hand molds into processed guayule latex (NRG), extracted from the desert shrub indigenous to the southwest United States and northern Mexico. The species (Parthenium argentatum (Gray)) is a new industrial crop.

- Clinical trials indicate NRG is safe for use in individuals who have developed an allergy to Hevea NRL.
- Commercial

ASTM D 1076: Standard Specification for Rubber - Concentrated, Ammonia Preserved, Creamed, and Centrifuged Natural Latex

Publication Date: Jun 1, 2006

Category 4—Centrifuged, or centrifuged and creamed, guayule latex, or other natural rubber latex, containing less than 200 µg total protein per gram dry weight of latex, with ammonia or other hydroxide, with other necessary preservatives and stabilizers.

This specification is not necessarily applicable to latices prepared or preserved by other methods, and shall not be construed as limiting the desirability or usefulness of other categories of latices. It does apply to natural latex sources other than Hevea brasiliensis but does not apply to compounded latex concentrates.

Additional source of natural rubber

Alternative sources of natural rubber in development include:

- Sunflower
- Russian dandelion
- Goldenrod