

Fleckless

A new apron material prevents vinyl chipping and flaking, avoiding contamination

A new-age non-woven material is emerging to challenge the dominance of vinyl in the fabrication of disposable protective garments. Developed by PolyConversions, Inc., of Rantoul, Ill., the new material has been dubbed VR, for vinyl replacement. VR is a polyolefin that combines plastic resins with modern extrusion techniques to create longer-wearing, more comfortable protective products.

“VR aprons are easy to clean and remove fat residue from. They don’t retain the build-up of animal fats like vinyl and some other traditional apron materials. Our employees put them through rugged use and they hold up exceptionally well,” comments Karem Kone, quality manager at Meadowbrook Farms, Rantoul, Ill.

According to Maria Kennedy, who is complex purchasing manager for the Keystone Foods poultry operation in Baker Hill, Ala., “We got a better return on VR aprons compared to the vinyl aprons that we had previously purchased. VR aprons don’t crack or rip like the vinyl aprons. Employees don’t replace VR as frequently as they did with vinyl.”

As Scott Carlson, PolyConversions sales manager, explains, with the lower temperatures of a processing facility and the constant contact with animal materials, “the conventional plasticizers put into vinyl to keep it soft leach out, which causes the aprons to degrade. The leaching of plasticizers has been demonstrated in scientific studies and, as a result, the pliability of vinyl decreases over time.”



PolyConversions tested its new apron material at the University of Illinois and at several processors. (Photo courtesy PolyConversions.)

A stiffening vinyl apron has a distinct drawback: small flecks of material can dislodge from the garment surface giving rise to the concern that they could wind up in the processing stream. This shortcoming was one of the motivators behind the founding of PolyConversion in 1994. The company principals decided to focus their engineering efforts on creating a longer-lasting alternative material that would remain intact with repeated use. Several years of development produced a unique polyolefin material whose physical characteristics allow it to be made without plasticizers. As an inert piece of film material, VR remains soft and supple, even in below-freezing temperatures. In comparison to vinyl, testing has shown VR to be superior in tensile strength, providing puncture-, tear-, and cold-crack-resistance.

VR aprons have already replaced some of the vinyl aprons used by employees at a major Midwestern pork-processing facility. The 400,000-square foot plant has a total workforce of 2,200, divided evenly between two production shifts. To safeguard those engaged in slaughter, fabrication, and boning tasks, the company issues blue vinyl aprons to workers on an as-needed basis.

According to the plant’s lab manager responsible for the safety of employees’ personal protective wear, the vinyl aprons need to be replaced approximately once per week. While cleaned daily, the aprons wear out under the harsh environmental conditions of the production floor, which include temperatures as low as 45°F and repeated exposure to animal fats and fluids.

Under this kind of stress, the vinyl aprons “become less pliable with repeated use and actually become brittle and crack,” says the lab manager.

Early last year, the processor decided to give the new VR aprons a trial run, issuing samples to a test group of individual processing line workers. The result of the evaluation showed that the PolyConversions products stood up well to their challenging surroundings. Because the VR aprons did not stiffen or crack with repeated use, they presented “less chance of having apron pieces becoming a potential source of foreign material in the product,” according to an executive. That’s a big benefit for any company concerned with the integrity of its output.

Along with eliminating the potential for product contamination, VR has another inherent property that makes it an attractive alternative to vinyl: its cleanability. Approved for direct food contact, the odorless and non-toxic VR reduces the adhesion of fats, oils, and meat residues to its surface. This physical attribute is particularly important because of the primacy of sanitation in the food processing environment. Removing meat and meat byproducts from an employee’s apron at the end of each shift is critical in order to provide proper disinfection and bacteria control. It’s only logical that VR’s intrinsic resistance to these fluids and residues should promote more effective cleaning and bacterial reduction than its vinyl counterpart.

Problem: Solution

To substantiate this assumption, PolyConversions turned to the Meat Science Department of the University of Illinois at Urbana-Champaign and the Environmental Health Management Systems, Inc. to conduct quantitative studies. These investigations measured final bacterial counts on both VR and vinyl after controlled washings at various times, temperatures, and detergent/germicide concentrations. The findings demonstrated the VR material provided a significantly higher degree of "cleanability" (10- to 100-fold reduction in bacterial counts, in some instances) as compared to the vinyl.

These conclusions stand up beyond the confines of the laboratory in real-world conditions. Responsible for laundering their own protective garments before leaving the production floor, employees at the pork processor use scrub brushes and sodium hypochlorite to clean their new VR aprons at wash stations supplied with 140°F water. They are then required to dip their equipment in a sanitizer, a step they take before coming onto the production floor at start-up as well.

The company checks the aprons for cleanliness via daily

visual inspection and random microbial evaluation. "Cleaning results seem to be comparable," says the lab manager, adding that "there have been no complaints with cleaning."

VR protective wear has several additional advantages that give it a leg up on vinyl, Carlson says. At four mils thick, PolyConversions aprons are lighter in weight than comparable vinyl products, making them more comfortable for employees who typically wear them during their entire eight-hour shift. They are also easy to dispose of, either in landfills or incinerators, or via recycling. "VR waste material commands a premium price from recyclers and film reprocessors due to strong bonding and reprocessing qualities," he notes.

Especially in light of polyolefin's positive performance attributes, the vinyl-VR contest promises to be an interesting rivalry.

"There is a definite cost-savings," comments Keystone's Kennedy. "VR aprons have been worn, cleaned and reused for as long as three months at a time. Frequent change-outs (replacements) are only due to the carelessness of the employee in properly using or managing their aprons." **MP**



Protective Wear

PolyCo Advances Environmental Sustainability

PolyConversions, Inc. ("PolyCo") is a U.S. manufacturer of personal protective wear made of recyclable polyolefin materials. PolyCo actively promotes and assumes the responsibility of natural resource conservation and the elimination or minimization of adverse environmental impacts in its manufacturing activities and projects.



Manufacturing

- Minimizes use of non-renewable resources
- Recycles all material scrap & spent supplies
- Reduces energy use through planning & conservation
- Promotes environmental awareness among employees
- Designs low-impact manufacturing processes
- Engineers products to minimize waste & energy
- Prohibits use of hazardous materials in all processes



Products

PolyCo manufactures protective wear designed with non-hazardous materials that can be reused, recycled and replace traditional protective wear made of PVC (vinyl). PolyCo complies with all aspects of environmental law that applies to its plant operations and constantly tracks and monitors all applicable federal, state and local governmental regulations.



Recycling

Another Innovative PolyCo Solution

PolyCo derives its materials from polyolefin plastomer resins that incorporate a new metallocene catalyst technology. PolyCo VR products exhibit very attractive recycling properties and benefits. Contact PolyCo for more information on how to develop a recycling program.



innovative protective solutions

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