

Powder-Free Processes

Introduction

Just as the term implies powder-free gloves are free of powder. In certain situation, such gloves are also described as powder-less, which probably means not so much as free of powder but of such a low powder content that it is almost negligible. In the early days of examination gloves manufacture, they were powdered online by passing finished gloves through an array of powder-coated towels inside a dusting chamber. Such a process leads to uneven powdering with a tendency to over-powdering. It was a common sight to see users with powder stained hands and pants.

Users began to expect a more consistently powdered glove. They expect the powder to be low enough that they will not fly off the gloves when they are pulled off the box and worn. They expect the gloves to be donned easily and yet not stick because of low powder. Cornstarch is the most common powder found on gloves. The other powder used, calcium carbonate, prevents gloves from sticking to the molds.

Powder Free Processes

The most common powder-free process is that of chlorination. Chlorine modifies the surface texture of latex films on gloves to make them non-tacky. In other words, chlorination displaces powdering as a means of preventing tackiness of the gloves. Chlorination became hugely popular as a powder free process because it also reduces the level of extractable protein greatly. Extractable protein is a major cause of allergy that affects some users.

Other methods of achieving powder-free condition on gloves are polymer coating and silicone treatment. Both methods find niches among users who find them suitable.

More on Chlorination

Chlorine is a very corrosive gas. It is applied either in the gas form or generated from a reaction between an acid and a hypochlorite. You may be familiar with bleaching solution, which is a mild chlorine solution. Chlorination is carried out conventionally offline. This means the gloves to be chlorinated are treated after they are removed from the lines. They are treated in batches. Each batch of gloves is soaked in water inside a tumbler, much like an industrial washing machine. Chlorine solution is added and the entire mixture tumbled for a pre-determined period of time during which chlorination takes place. At the end of this first stage, the spent chlorine solution is drained away. Ammonia solution is added to neutralize excess chlorine as well as to terminate the reaction and prevents over-chlorination caused by residual chlorine. The liquid is then drained away and the gloves are rinsed several times with water to remove residual chemicals. The quality of the rinsing water helps determine the final state of cleanliness of the chlorinated gloves.

The gloves are removed from the tumbler and inverted to expose the inner surfaces that has not been properly chlorinated. The entire chlorination process is repeated on the inverted gloves and washed thoroughly as in the first instance.

The gloves are next drained of excess water and dried. They are sorted and tested for pinholes and physical defects prior to packing.

Online Chlorination Process

New glove dipping lines are long. They are equipped with chlorination tanks to chlorinate the gloves while still on the line. Such gloves are typical called single chlorinated gloves because only one surface is chlorinated. The other surface is either coated with polymer or carries residual calcium carbonate. Unless the manufacturer washes these gloves off line, such single chlorinated gloves are likely to carry residual by-products of the chlorination process.

What is the Difference?

Double chlorination is carried out off line; it is more elaborate, more labor intensive. It is cleaner as a result of multiple washing carried out that removes non-rubber water-soluble materials from the glove surfaces as well as chlorination by-products. Because of double sided chlorinated, the protein level is also expected to be lower. The gloves are generally more yellow and may have a more evident chlorine odor. Because of the added attention given, double chlorinated gloves are slightly more expensive. Online or single chlorination is faster, produces a whiter less odorous glove and cheaper to produce. However, it is incomplete, as the second surface is not treated in the same manner. Online chlorinated gloves, without additional offline washing, may still contain non-rubber and chemical residues.

Choice to Make

Having gone this far as to choose powder-free over powdered, another level of choice arises.

- ⊖ Which powder-free?
- ⊖ Are the options attractive to choose a more expensive powder-free?
- ⊖ What are the health and safety considerations?
- ⊖ Are there long term implications I need to know?
- ⊖ Do the economics of cost saving make sense?

Conclusion

The above information was brought to you as part of our corporate responsibility to inform our customers and web visitors on the various aspects of glove making and usage. We hope that this article has enlightened you of the options available.

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