Are Your Gloves Measuring Up?

RICHARD BRAND, CARMEN CASTRO & MARIANNE RODIT

Photo 1. Glove inspection

Photo 2. Gloves ready for dryer

Photo 3. Gloves being packaged in a cleanroom

There are numerous issues to consider when evaluating gloves for your critical environment. It is imperative that the critical environment gloves provide you with the assurances you need for your application. Here is a list of questions you need to ask when evaluating critical environment gloves:

- Will these gloves prevent contamination of the product by human contact? (No pinholes, tears, cuts, plus provide proper length and fit over garment)
- Will they provide the chemical protection you need? (Gloves should be liquid proof, plus provide appropriate chemical resistance)
- Are you sure they will not be a source of contamination? (Minimum particle shedding, low levels of surface contaminants, should not contain components that could cause corrosion)
- Do the gloves provide electrostatic dissipative (ESD) properties necessary for your application? (Need to prevent particle attraction and concentration, along with discharge that can damage circuits)
- Do they meet your functional requirements? (Material strength—physical properties, flexibility and elasticity for maximum dexterity)
- Skin Tolerance (Natural rubber or proteins and accelerators)

To focus in more detail on the cleaning processes and testing of gloves for particles, we provide below the standard procedure to determine cleanliness levels. Particle tests are conducted in accordance with IEST-RP-CC005.2 protocol before and after packaging. These results are also correlated to independent lab results performed periodically. Please keep in mind, at this time there is no specific glove test standard to determine glove surface particles. This wet test method is the most reliable standard procedure used by independent and glove manufacturing labs to assess glove cleanliness and it is largely recognized in the industry. (The test can only be meaningful if carried out after full cleaning and drying of the gloves. The test method in wet condition provides more accurate and reproducible results than the dry methods.)

IEST-RP-CC005.2 - Wet Test Method

- Weigh a square section cut in the glove, and then weigh the entire glove.
- Calculate glove surface in cm2.
- Immerse glove in DI (deionized) water, fill it with DI water and shake for 10 minutes.
- Count the particles in 25 ml of the water using a liquid particle tester (laser particle analyzer). Perform 3 counts (3 different gloves) and average the numbers.
- Do a blank count of DI water before and after testing the glove. The same procedure is used, without a glove.

Table 1 illustrates the MAPA AdvanTech critical environment glove classification guideline based on maximum number of particles >0.5µm in size.

Table 1. Critical Environment Glove Classification Guideline

Present average test results and general acceptance levels	Cleanroom Class	Maximum number of particles >0.5µm in size
Microelectronics	ISO 4 & 5 (Class 10 & 100)	250 to 500
General Cleanroom (Electronics, Pharmaceuticals, Medical Devices) and Assembly	ISO 5 (Class 100)	500 to 1000
Packaging areas	ISO 6 (Class 1000 up)	1000 to 1700

Again, there is no industry standard regulating the cleanliness levels of gloves for ISO Class 1-8 controlled environments. MAPA has based the cleanliness glove table on user requirements, along with IEST-RP-CC005.2 limitations adapted to gloves. The cleanliness restrictions vary widely between critical environment manufacturing facilities. Particle Count Test Data should be requested from your glove manufacturers/suppliers in order to assess if that glove will work in your application.

Given the magnitude of damage and loss in yield that contamination can cause in your operation it is imperative that you make sure your gloves are coming from a reputable glove manufacturer. A glove manufacturer should be able to control the manufacturing as well as the cleaning process in an ISO certified cleanroom facility.

For more information, please visit www.cemag.us *[1].*

Source URL (retrieved on *07/11/2014 - 5:09pm*):
http://www.chem.info/articles/2013/02/are-your-gloves-measuring?qt-recent_content=0

Links:
[1] http://www.cemag.us