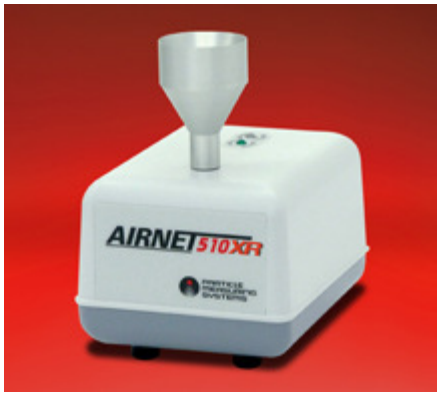
PARTICLE MEASURING SYSTEMS
www.pmeasuring.com
5475 Airport Boulevard, Boulder, Colorado 80301-2339
303.443.7100 1.800.238.1801 Fax: 303.546.7380
Customer Service Center 1.877.475.3317
Instrument Service 1.800.557.6363

Advice for EU GMP 5 µm Particle Limits

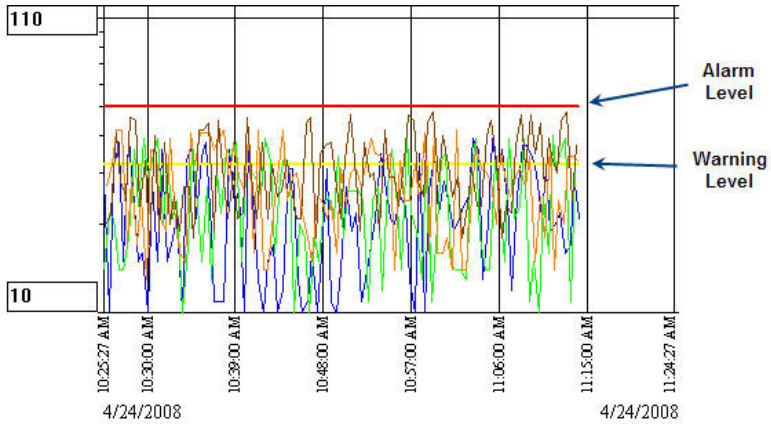
There is a common industry misconception that 1m^3 particle monitoring should be performed. This is not stated anywhere. Unfortunately, the original EU GMP text was confusing and frequently misinterpreted.



The guide is for continuous particle monitoring in Grade A and immediate Grade B areas using an insitu particle counter, such as the Airnet® or IsoAir® PLUS. This is because the risk of contamination of finished product is very high and the greatest risk, the operator, is in close proximity. The operator is not only the greatest risk posed to product but also a random generator of those particles. These are not all inert particles; some will be viable, which poses an even greater risk to the finished product. Since we cannot control the risk, we must measure it. If it is in excess of proven acceptable limits, then the system must alert the users. How quickly the facility monitoring system alarm should alert the users, is dependant upon the risk.

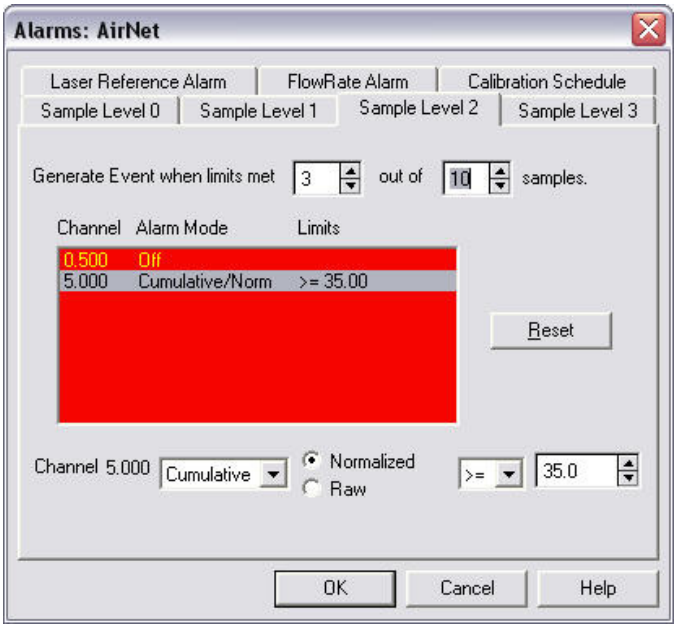
Analysis of risk can be considered as how resilient the filling operation is to potential contamination events while still able to protect product. If the system is very robust (Isolator, RABS) then an event has a relatively low risk of contamination. If it is an ampoule line with curtain protection then small deviations could have a greater impact. No answer will fit all applications as all risk is variable; considerations such as what gowns are used, what under garments are supplied, air changes / hour rate, number of personnel in room…..etc. are all important factors.

Particle Measuring Systems' Recommended System Set up for a Grade A Zone

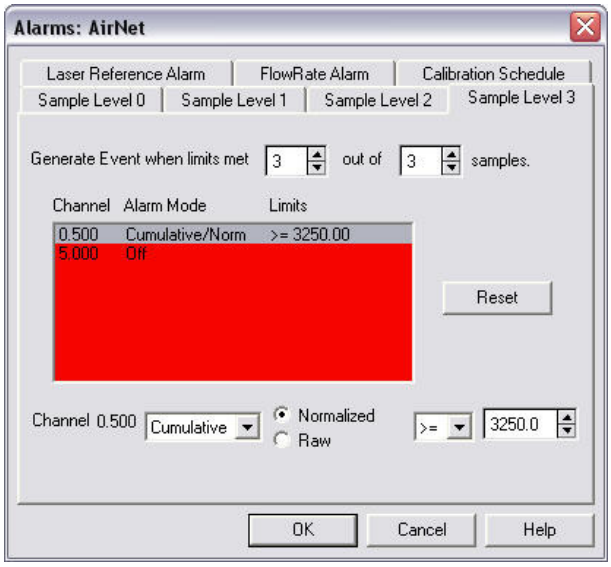


Step 1: Set all values in the facility monitoring system to m3

Step 2: Set the 0.5 µm alarm channels (2 = alert, 3 = alarm) to 1625 and 3250 n/m3. (These values are temporary until the real values are discovered from the process.)

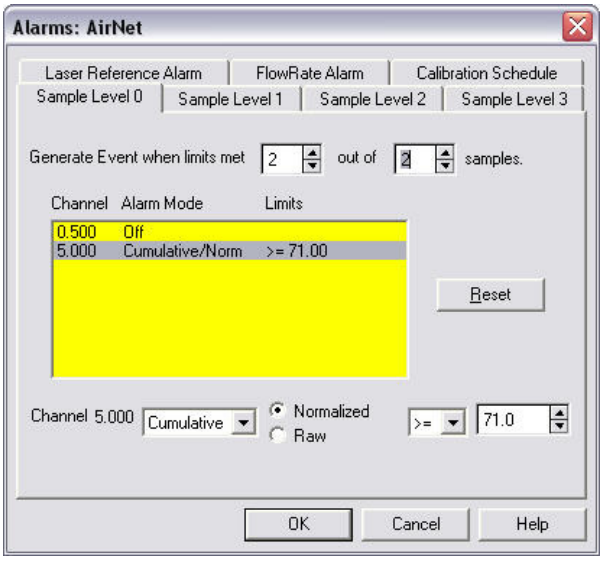


Step 3: Set the alarm level 2 (alert 0.5 µm) to react on a frequency of 2:2 events. So two consecutive events will trigger an alert = Orange light.

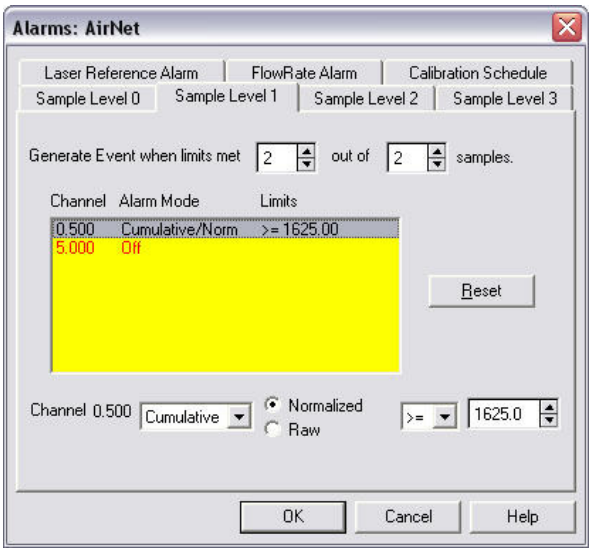


Step 4: Set the alarm level 3 (alarm 0.5 µm) to react on a frequency of 3:3 events. So three consecutive events will trigger an alarm = Red light.

Step 5: Set the 5.0 µm alarm channels (0 = alert, 1 = alarm) to 71 and 35 n/m3. (These are identical, but we will use a different frequency to determine risk.)



Step 6: Set the alarm level 0 (alert 0.5 µm) to react on a frequency of 2:2 events. So two consecutive events will trigger an alert = Orange light



Step 7: Set the alarm level 1 (alarm 5.0 µm) to react on a frequency of 3:10 events. So three consecutive events will trigger an alarm = Red light.

This rationale allows you to respond quickly to 0.5 µm events but not be alerted for nuisances - very short lived events that may exceed the alarm limit, while posing little threat. It also allows you to look at the 5.0 µm alarm as an event-based approach rather than one of number of particles. ISO14644-1 gives a demonstration that as 5.0 µm levels rise, a corresponding 0.5 µm will happen [(0.1 / D) ^2.08]. Therefore, if it is of environmental importance you will know as it will also trigger the 0.5 µm channel. If it is of microbial importance it will trigger the 5.0 µm channel.

After three to six months of using this method, you should look back through the finished product quality records, viable sampling records, and the number of alarm events and again apply the guidance for the system against these findings.

It should be noted that the that $1m^3$ value is to be used for certification purposes only using a portable particle counter, such as the Lasair® II or Lasair III, which have been designed specifically for the purpose of routine testing.

Author

Mark Hallworth
Pharmaceutical Business Manager
Particle Measuring Systems

TP50
200804

Lasair®, IsoAir®, and Airnet® are registered trademarks of Particle Measuring Systems, Inc.
© Copyright Particle Measuring Systems. All rights reserved.
Reproduction or translation of any part of this work without the permission of the copyright owner is unlawful.
Requests for permission or further information should be addressed to Particle Measuring Systems, Inc. at 1-800-238-1801

PARTICLE MEASURING SYSTEMS
www.pmeasuring.com
info@pmeasuring.com

Particle Measuring Systems Headquarters
5475 Airport Blvd., Boulder, CO 80301
1-303-443-7100 1-800-238-1801 Fax: 1-303-546-7331
Instrument Service & Support: 1-800-557-6363
Customer Response Center: 1-877-475-3317

Particle Measuring Systems Europe
Tel: +44 1684 581000
PMSEurope@pmeasuring.com

Particle Measuring Systems Japan
PMSJapan@pmeasuring.com

Particle Measuring Systems Asia Pacific
PMSAsiaPacific@pmeasuring.com

Particle Measuring Systems Singapore
Tel: +65-6496 0330
PMSSingapore@pmeasuring.com

Particle Measuring Systems China
PMSChina@pmeasuring.com

Particle Measuring Systems Mexico
PMSMexico@pmeasuring.com

Particle Measuring Systems Puerto Rico
PMSPuertoRico@pmeasuring.com

© 2008 Particle Measuring Systems, Inc. All rights reserved.