

68th Annual Technical Meeting and Exposition of the Institute of Environmental Sciences and Technology (ESTECH 2022)

Online
2 - 5 May 2022

ISBN: 978-1-7138-9978-5

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2022) by Institute of Environmental Sciences and Technology (IEST)
All rights reserved.

Printed with permission by Curran Associates, Inc. (2025)

For permission requests, please contact Institute of Environmental Sciences and Technology (IEST)
at the address below.

Institute of Environmental Sciences and Technology (IEST)
1827 Walden Office Square, Suite 400
Schaumburg, IL 60173
USA

Phone: (847) 981-0100
Fax: (847) 981-4130

information@iest.org

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2633
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

CC SESSIONS

AIRFLOW AND AIR QUALITY

AVS in Pharmacies	1
<i>K. Mulder</i>	
Smoke Studies for Pharma Looking at the Guidance	10
<i>S. Drummond</i>	

CONTAMINATION CONTROL IN CLEANROOMS

Annex 1 Update – the Start of a Revolution in Environmental Monitoring	21
<i>M. Dingle</i>	
Striving for Complete Data Automation in a Cleanroom: Cleanroom Hardware that Allows Big Data and IoT Applications to Flourish.....	28
<i>B. Hayes, M. Lohmeyer</i>	
The Importance of Cleanliness of Cleanroom Surfaces in Environmental Monitoring and Contamination Control	40
<i>K. Agricola</i>	

CONTAMINATION CONTROL IN MICROELECTRONICS

Metrologies for Process Tool Component Cleanliness.....	54
<i>V.K.F. Chia</i>	
Mitigating Chemical Migration in a Semiconductor FAB, a Case Study	69
<i>G. Lei</i>	
UHP Gas Component Testing for Microcontamination.....	80
<i>D. Cowles</i>	

GENE AND CELL THERAPY

Cleaning Validation and Critical Cleaning of Cell and Gene Therapy Processes.....	96
<i>P. Lopolito</i>	
Comparison of Biological Safety Cabinet Japanese Standard JIS K 3800 and American Standard NSF/ANSI 49	104
<i>T. Masubuchi</i>	
The Importance of High-Quality Foundational Aseptic Training for Emerging Biotechnologies.....	124
<i>B.D. Wilkin</i>	

HARD TO KILL STUFF

Hard to Kill Stuff - Radiation and Disinfectant Resistance in Microorganisms	131
<i>Z. Abraham</i>	

PARTICLE ANALYSIS AND CONTROL

Novel Airborne-Based Particle Measurement Methodologies	166
<i>P. Godoy, Y. Vanek</i>	

PASS THRU DECONTAMINATION IN CLEANROOM OPERATIONS

A Roadmap for Developing an Effective Bioburden Control Process for Pass Thru Decon	177
<i>J.N. Polarine</i>	
Disinfecting Problematic Microbes	207
<i>D. Klein</i>	
Sterile Hold Time Testing for Autoclaved Items Used Within Parenteral Drug Manufacturing.....	215
<i>R. Buthe</i>	

STERILE COMPOUNDING

Best Practices for Cleaning and Disinfecting a Sterile Compounding Suite	222
<i>M.T. Myers</i>	

DTE AND PR SESSIONS

APPLICATIONS FOR SHOCK AND VIBRATION TESTING

Multiple Exciter Single Axis Vibration Control	239
<i>J. Zhuge, J. Zhao</i>	

CLIMATICS TESTING

Compliant Internal Calibrations in the Test Laboratory	254
<i>D. Burnette</i>	
Performance to Meet the Demand: Humidity Instruments for Modern Test Chambers	266
<i>J. Walsh</i>	
Spectrum Checks of Metal Halide Solar Simulators Used for MIL-STD-810H	277
<i>O.D. Rahauser</i>	

DEVELOPMENT OF SHOCK AND VIBRATION TEST CRITERIA

Comparisons Between a Spectral Density Matrix Based Six Degree-Of-Freedom and a Traditional One Degree-Of-Freedom Vibration Specification Development for a Common Large Cargo Truck Bed	287
<i>M.T. Hale</i>	

ISO Standardization for Vibration Testing of E-Mobility Components in Road Vehicles.....	300
<i>C. Dindorn</i>	

PROGNOSTIC AND HEALTH MANAGEMENT FOR TEST ITEM AND TEST EQUIPMENT

R&D Pertaining to Machine Learning and Reliability	307
<i>J. Pulido</i>	
Buffer Sizing for a Chemical Process Design	314
<i>H. Lin</i>	

REAL LIFE FIXTURING CHALLENGES AND PRINCIPLEES

Experimental Vibration Fixture Evaluation.....	325
<i>S. Brenner</i>	
Reliability of Membranes in Heat Exchangers Under Creep Failure Mode	337
<i>J. Pulido</i>	

TESTING HAZARDOUS PRODUCTS

Battery Testing for DOT Hazardous Materials Certification.....	347
<i>J.S. Jennings</i>	
Flammable Materials in Environmental Test Chambers.....	364
<i>B. Shank</i>	

Author Index